APPROVED
FEB 03 2022
BOARD OF RECREATION
AND PARK COMMISSIONERS

BOARD REPORT **NO.** 22-029

DATE February 03, 2022 C.D. 3

BOARD OF RECREATION AND PARK COMMISSIONERS

SUBJECT: RESEDA SKATE FACILITY – RESEDA ICE SKATING AND ROLLER RINK (PRJ21167) (PRJ21326) (W.O. #E170121F) PROJECT – CALL FOR BIDS

AP Diaz		M. Rudnick	
H. Fujita		*C. Santo Domingo	DF
J. Kim		N. Williams	

for

M. Rudnick
General Manager

Approved X Disapproved Withdrawn

RECOMMENDATIONS

1. Approve the proposed Reseda Ice Skating and Roller Rink (PRJ21167) (PRJ21326) (W.O. #E170121F) Project (Project) in substantial conformance with the plans and specifications as on file with the Board of Recreation and Park Commissioners (Board) Office and as attached to this Report as Attachment No. 1 to be bid and constructed through the Department of Recreation and Parks (RAP) As-Needed Pre-Qualified General Contractors for Park Facilities Construction – New Facility Construction (PQGC);

2. Approve the date to be advertised for receipt of bids as May 4, 2022 at 2:00 P.M. in the Board Office; and,

3. Authorize RAP's Chief Accounting Employee or Designee to make technical corrections as necessary to carry out the intent of this Report.

SUMMARY

The Reseda Ice Skating and Roller Rink (PRJ21167) (PRJ21326) (W.O. #E170121F Project (Project) is located at 18128 and 18210 Sherman Way, in the Reseda area of the City, and is proposed to include the development of an ice skating rink and a roller hockey rink, and a small parking area.

BACKGROUND

On January 17, 2018, the Board authorized RAP to proceed with the acquisition of four CRA/LA parcels, totaling 2.13 acre, for the construction of the Project (Report No. 18-014). The Board action included various requests for GSD to implement the property acquisition on behalf of RAP.

The Board also approved the proposed conceptual plan for the Project to locate the roller hockey rink and the ice skating rink on the 18210 Sherman Way parcel and locate the parking lot on the 18128 Sherman Way parcel.

The properties located at 18128 and 18210 Sherman Way were acquired by RAP on September 7, 2018. The properties are currently vacant and fenced off.

The approved conceptual plan for the Project included:

- A 60' x 120' roller hockey rink built on grade with a shade structure and 1,200 square-foot building to house related rink offices, restrooms and storage.
- An approximately 26,800 square-foot ice rink building with a 85' x 200' ice surface, cooling infrastructure, ice grooming equipment storage, Zamboni machine room, locker rooms for two teams, restrooms, office space, public seating, skate rental area, pro shop and concessions space, and other ancillary spaces required by ice hockey and figure skating.
- A 127-space parking lot with driveways, fencing, landscaping and security lighting

On October 1, 2020, the Board authorized RAP to proceed with preliminary acquisition activities for portions of two parcels located at 18214 Sherman Way in order to facilitate the implementation of the Project (Report No. 20-195). As detailed in Report No. 20-195, the purpose of the acquisition is to provide additional space for the Project in order to achieve the optimal and most cost-efficient design for the Project; meet all the programming and operation and maintenance requirements; and meet other Project requirements without the need to construct a multi-story building on the current site. The acquisition of this property is still pending completion and the City continues to discuss the terms of the proposed acquisition with the property owner.

PROJECT SCOPE

The Proposition K ballot measure set aside to the City Two Hundred Ninety Eight Million, Eight Hundred and Fifty Thousand Dollars ($298,850,000.00) of the total amount generated over 30 years for 183 specified projects. The Project was one of the 183 specified projects included in the Proposition K ballot measure. The scope of the Project, as described in the ballot measure, is for "acquisition and construction of an ice hockey and roller blading facility".

The design of the Project is substantially complete. Brooks + Scarpa Architects Inc. and their team of sub-consultants produced these bidding plans and specifications for the Project under the direction of the Bureau of Engineering (BOE), Architectural Division.

The design and scope of the proposed Project includes the following:

- Demolition and foundation work, as well as building the ice rink building (approximately 26,800 square feet in size), within a flexible membrane type structure designed to house an 85' x 200' ice surface with an electrical and machine room, locker rooms, ADA compliant restrooms, office space, a skate rental area, a pro shop and concessions. The ice rink building would be located at the back parcel of 18210 Sherman Way.

- All necessary Fixtures, Furnishing and Equipment (FF&E) for the ice rink building, including all the related ice-making equipment, related sub-floor ice rink piping, dasher boards, dehumidifier equipment, score board and sound systems, specialty lighting, all building furnishings include benches, bleachers, scoreboard, skate racks, skate sharpeners and vending machines.
- Building the outdoor roller rink, with all the program components. The roller rink will be fenced all around with gates on the north side and south side to allow access for the Fire Department, visitors, and patrons of the ice-skating facility. The outdoor roller rink would be located in the front parcel of 18210 Sherman Way.

As described, this scope of the Project has changed from the previously approved conceptual plan. In addition, the parking lot work has been deferred to a later date.

The Project plans and specifications that will be bid will be substantially in the form as on file with the Board of Recreation and Park Commissioners (Board) Office and as attached to this Report (Attachment No. 1). Prior or simultaneously with a recommendation for award of a bid for this Project, staff will return to the Board for approval of an official set of final plans for the Project as well as any additional CEQA determinations that may be necessary.

The design of the ice rink building and the outdoor roller rink was based on the programming and operational requirements of a full size ice-hockey rink. All the specialty equipment related to ice-making and the ice-rink floor specified in the Project meet the performance criteria set of the current professional standards. However, none of the specialty equipment is a proprietary system that requires sole sourcing. Approved equal equipment can be used, provided it meets the performance and the design criteria of the ice rink, to maintain the same building functions as designed.

After reviewing the Project design, the RAP and BOE staff have determined that the work can be performed by RAP's PQGC list of contractors and that BOE can provide construction management services during construction.

PROJECT FUNDING

The City Engineer's estimate for the Project is Seventeen Million, One Hundred Seventy Six Thousand and Five Hundred and Two Dollars ($17,176,502).

Funds are available for the construction of the Project from the following funds and accounts:

FUNDING SOURCES	FUND/DEPT./ACCT. NO.
Prop K – Interest	43K/10/10MPGB
Prop K Gap	43K/10/10RPBM
Park Fees	302/89/89716H
MICLA	298/50/MICLA

TREES AND SHADE

The implementation of the Project will require the removal of a total of thirteen (13) trees that are non-native and non-protected. All thirteen (13) trees need to be removed in order to build the Project. The RAP's arborist has inspected the Project site and has approved the removal of thirteen (13) trees.

In conformance with RAP's Tree Preservation Policy, the removal of the thirteen (13) trees will need to be mitigated.

The Project will include the installation of eleven (11) trees, including six (6) California Oaks trees and five (5) California Sycamore trees. All eleven (11) new trees will be installed near the roller rink and in the front parcel of 18210 Sherman Way.

ENVIRONMENTAL IMPACT

The Project was previously evaluated for environmental impact in accordance with California Environmental Quality Act (CEQA), and the Board determined that the proposed Project is categorically exempt from CEQA pursuant to Article 19, Sections 15325 and 15332 of the State CEQA Guidelines (Board Report No. 18-014). A Notice of Exemption (NOE) for the Project was filed with the Los Angeles City Clerk and the Los Angeles County Registrar/Recorder on January 24, 2018.

However, subsequent to the filing of the NOE, the Project scope has been modified to include the acquisition of a portion of the adjacent parcel to the west of the Project site (18214 Sherman Way) to accommodate the Project ice rink building. Additionally, at the time the Project was evaluated the City used volume-to-capacity (V/C) ratios and levels of service (LOS) to determine potential traffic impacts and the current standard is to use vehicle miles traveled for the traffic impact analysis.

It should be noted that the recommendations in this Report does not authorize RAP to award the construction contract for this Project. Since the Project scope has changed since the Board's previous evaluation of this Project, staff will return to the Board for approval of any additional necessary CEQA determinations prior to the award of the construction contract for this Project. Upon the Board's approval of any such subsequent CEQA determinations, the NOE for the Project shall be updated as applicable.

FISCAL IMPACT

At this time, it is anticipated that construction of the Project will be funded by a combination of the aforementioned funding sources. There is no immediate fiscal impact to RAP's General Fund at this time. However, operations and maintenance costs for the Project be evaluated and included in future RAP budget requests.

The City's liability under the contract resulting from this bid process shall only extend to the present City appropriation to fund the contract. However, if the City appropriates funds for any

succeeding years, the City's liability shall be extended to the extent of such appropriation, subject to the terms and conditions of the contract. In returning to the Board for approval of an award for such contract, staff will more fully set forth funding levels and any possible shortfalls in funding that may exist.

STRATEGIC PLAN INITIATIVES AND GOALS

Approval of this Board Report advances RAP's Strategic Plan by supporting:

Goal No. 3: Create and Maintain World Class Parks and Facilities
Outcome No. 1: Newly developed open space park projects and the redesign of signature City parks

Result: This Project would allow for the construction of the most cost-efficient design for the new Reseda Skate Facility that also meets all the programming and operation and maintenance requirements. The new Reseda Skate Facility will serve approximately 5,563 City residents.

This Report was prepared by Darryl Ford, Superintendent, Planning, Maintenance and Construction, and David Wang, Project Manager, BOE Architectural Division. Report was reviewed by Deborah Weintraub, BOE Chief Deputy City Engineer. Steven Fierce, Principal Architect, BOE Architectural Division.

LIST OF ATTACHMENTS

1) Attachment No. 1 – Project Plans and Specifications

RESEDA SKATING FACILITY

BOARD REPORT ATTACHMENT 1

100% PLANS PERMIT SET
AND
PROJECT MANUAL

Department of
Recreation and Parks

PROJECT MANUAL

RESEDA SKATING FACILITY

18210 W SHERMAN WAY, RESEDA, CA 91335

W.O. No. E170121D

Department of
Recreation and Parks

RESEDA SKATING FACILITY

TABLE OF CONTENTS

GENERAL CONDITIONS……....I

GENERAL REQUIREMENTS……II

SUPPLEMENTARY GENERAL REQUIREMENTS……...III

TECHNICAL SPECIFICATIONS……...IV

GEOTECHNICAL DOCUMENTATION…… V

RESEDA SKATING FACILITY

I. GENERAL CONDITIONS

W.O. No. E170121D

Department of
Recreation and Parks

CONTENTS
GENERAL CONDITIONS

Article **Page**

GENERAL 1
1. DEFINITIONS 1
CONTRACT DOCUMENTS 8
2. SCOPE 8
3. AUTHORITY OF THE BOARD OF RECREATION AND PARK COMMISSIONERS, PROJECT MANAGER, AND INSPECTOR 8
4. INTENT OF CONTRACT DOCUMENTS 8
5. STANDARD SPECIFICATIONS 9
6. INTERPRETATION OF PLANS AND SPECIFICATIONS 9
7. PRECEDENCE OF CONTRACT DOCUMENTS 9
8. ACCURACY OF PLANS AND SPECIFICATIONS 10
9. EXAMINATION OF COVERED WORK 10
10. UNNOTICED DEFECTS 10
11. BUILDING CODES AND REGULATIONS 10
12. LENGTH OF WORKDAY AND WORK WEEK 11
13. PAYMENT OF EMPLOYEES 11
14. CONVICT-MADE MATERIALS 11
15. SALES; BUSINESS OR USE TAX 11
16. NONDISCRIMINATION IN EMPLOYMENT 11
17. APPRENTICE UTILIZATION 12
18. LAWS AND REGULATIONS 12
19. PERMITS AND CONSTRUCTION EASEMENTS 12
20. PARTIES EXCLUDED FROM THE WORK 12
21. BUSINESS TAX REGISTRATION CERTIFICATES 13
22. FINANCIAL LIABILITY 13
THE CONTRACTOR'S RESPONSIBILITIES 13
23. CONTRACTOR'S OBLIGATIONS 13
24. CONTRACTOR'S REPRESENTATIVE AT THE SITE 14
25. FAMILIARITY WITH PLANS AND SPECIFICATIONS 15
26. JOB CONDITIONS 15
27. RESPONSIBILITY FOR SITE 15
28. WORKMANSHIP AND MATERIALS 16
29. INJURY AND ILLNESS PREVENTION - SAFETY MEASURES 16
30. PROTECTION OF PERSONS AND PROPERTY AND RESTORATION OF EXISTING IMPROVEMENTS 16
31. NON-CONFORMING WORK 18
32. SUBCONTRACTORS AND SUB-SUBCONTRACTORS… **NOTE: REVISED AS OF FEBRUARY 12, 2016** 19

CONTENTS
GENERAL CONDITIONS

Article **Page**

33. RESPONSIBILITY OF CONTRACTOR TO ACT IN EMERGENCY 23
34. ASSIGNMENT 23
35. INDEPENDENT CONTRACTOR 24
INDEMNIFICATION AND INSURANCE REQUIREMENTS 24
36. INDEMNIFICATION 24
37. INSURANCE 24
38. SERVICE OF NOTICE 28
39. AGENT TO ACCEPT SERVICE 28
PROGRESS OF WORK 29
40. TEMPORARY SUSPENSION OF WORK 29
41. UNAVOIDABLE DELAY 29
42. ARCHAEOLOGICAL AND PALEONTOLOGICAL DISCOVERIES 30
43. OTHER CONTRACTS 30
44. TERMINATION OF CONTRACT BY CITY (CONTRACTOR NOT AT FAULT) 30
45. TERMINATION OF CONTRACT BY CITY (CONTRACTOR DEFAULT) 33
46. PRE-FINAL INSPECTION 33
47. FINAL INSPECTION 33
48. PARTIAL ACCEPTANCE 34
49. FINAL ACCEPTANCE 34
50. LIQUIDATED DAMAGES 35
51. COMPENSATION FOR DELAY, DISRUPTION, AND UNANTICIPATED OVERHEAD 35
CHANGES TO THE CONTRACT 36
52. CHANGES AND EXTRA WORK 36
53. DIFFERING SITE CONDITIONS 37
LEGAL REQUIREMENTS 38
54. CLAIMS AND PROTESTS 38
55. COMMENCEMENT OF STATUTE OF LIMITATIONS 40
56. GOVERNING LAW 40
57. VENUE 40
58. NO WAIVER OF RIGHTS 40
59. ACCEPTANCE OF FINAL PAYMENT CONSTITUTES RELEASE 40
60. PATENTS AND COPYRIGHTS 41
61. PUBLIC RECORDS ACT 41

GENERAL

1. DEFINITIONS

The following terms as used in the Contract shall be defined and interpreted as follows:

ADDENDA

Written documents issued during the bidding period which modify, supersede, or supplement the original Contract Documents.

AGREEMENT

See "CONTRACT."

AS SHOWN, AS INDICATED, AND AS SPECIFIED

These words are understood to be followed by the words "in the Contract Documents."

BENEFICIAL USE

Use of a building, system, structure, or facility by the CITY.

BID

The offer of the Bidder submitted on the prescribed forms setting forth the price(s) for the Work.

BIDDING PERIOD

The time period allocated to the Bidder to enable preparation of a Bid or Proposal.

BIDDER

The person or persons, partnership, firm or corporation submitting a Bid or proposal for the Work defined in the Contract Documents.

BID GUARANTY

The cash, certified check or Bidders Surety Bond accompanying the Bid as a guaranty that the Bidder will enter into a contract with the RECREATION AND PARK COMMISSION for the performance of the Work.

BOARD OF RECREATION AND PARK COMMISSIONERS

The Board of Recreation and Park Commissioners, of the City of Los Angeles.

BOND

Bid bond, performance and payment bond or other instrument of security.

CHANGE ORDER

A written order to the CONTRACTOR signed by the GENERAL MANAGER directing an addition, deletion or revision in the Work, or an adjustment in the Contract Price or time which is issued after the effective date of the Contract and effects less modification than is effected by a Supplemental Agreement. A Change Order may or may not also be signed by the CONTRACTOR.

CITY

The CITY of Los Angeles, a municipal corporation.

CLAIM

A written demand or assertion by one of the parties seeking, as a matter of right, an interpretation of the Contract Documents, payment of money, extension of time or other relief. The party asserting the claim must set forth the facts and circumstances for which the other party is responsible.

CODE

Codes of the State of California as well as any other Federal or local law, statute, ordinance, rule or regulation.

CONTRACT

A binding agreement between the CITY and the CONTRACTOR for the Work described in the Contract Documents.

CONTRACT COMPLETION DATE

The date the CITY accepts the entire Work as being in compliance with the Contract Documents, and authorizes the final payment in accordance with the requirements set forth in Article 25, FINAL PAYMENT of the General Requirements.

CONTRACT DOCUMENTS

The following documents constitute a part of and comprise the Contract Documents: Agreement, Notice Inviting Bids or Proposals, Instruction to Bidders, Contractor's Bid or Proposal, Special and Supplementary Conditions, General Requirements, Geotechnical Baseline Report (if provided for the in the General Requirements), Federal and State Requirements, Standard and Reference Specifications, Standard Plans, Plans and Specifications, Soil Reports and Subsurface Investigation Reports, Summary of First Notice Replies, Addenda and Notice to Bidders issued prior to the opening of bids, Plan Clarifications, Request for Information, Supplemental Agreements and Change Orders issued after Contract award.

CONTRACTOR DEFAULT

See TERMINATION OF CONTRACT BY CITY (CONTRACTOR DEFAULT) Article of these General Conditions.

CONTRACT PRICE

The total amount of money for which the Contract is awarded.

CONTRACT UNIT PRICE

The amount stated in the Bid for a single unit of an item of Work.

CONTRACTOR

The person or persons, partnership, firm or corporation who enters into the Contract as stipulated in the Agreement awarded by the CITY. Prime Contractor and Contractor shall mean the same.

CONTRACTOR'S REPRESENTATIVE

The representative of the CONTRACTOR at the site who shall supervise and direct the construction and who is authorized to receive and fulfill instructions from the PROJECT MANAGER or INSPECTOR.

DAYS

Unless otherwise specifically stated, the term "days" will be understood to mean consecutive calendar days.

EASEMENT

Permission to access or utilize property not owned by the CITY.

EQUAL

See "OR EQUAL".

GENERAL CONDITIONS

Instructions to the CONTRACTOR setting forth its responsibilities and the CITY'S responsibilities for proper execution of the Work indicated herein.

GENERAL MANAGER

GENERAL MANAGER of the Department of Recreation and Parks, or an authorized representative.

GENERAL REQUIREMENTS

Instructions to the CONTRACTOR setting forth its responsibilities and the CITY'S responsibilities for proper execution of the administration and technical aspects of the project indicated herein.

GEOTECHNICAL DESIGN SUMMARY REPORT /GEOTECHNICAL BASELINE REPORT (GBR)

The report that sets forth the geotechnical interpretations regarding anticipated conditions for the design and construction of the project. This report establishes a geotechnical baseline that provides the basis for identification of changed site/ground conditions.

GEOTECHNICAL SITE ASSESSMENT

SEE AGEOTECHNICAL DESIGN SUMMARY REPORT.@

HOLIDAY

Those holidays and dates observed by the CITY. A list of such holiday dates is available from the RECREATION AND PARK COMMISSION Office.

IMMEDIATELY NOTIFY

The obligation to cause verbal notification of some condition or event as soon as possible upon discovery or knowledge of the condition or event and in all instances, no more than two (2) hours.

INSPECTOR

The Inspector of Public Works, the Director of the Bureau of Contract Administration, or an authorized representative(s) located at the Public Works Building, 1149 S. Broadway, 3rd Floor, Los Angeles, CA, 90015.

JOBSITE

The area upon or in which the CONTRACTOR'S operations are carried on and such other areas adjacent thereto as may be designated as such by the Contract Documents.

LAW

Any Federal, State or local law, statute, ordinance, rule, regulation or code.

LIQUIDATED DAMAGES

The amount the CONTRACTOR shall pay to the CITY, as determined by rates and amounts as fixed and agreed in the Contract Documents, due to the CONTRACTOR'S failure to complete the Work or submit the schedule within the time specified, or for non-compliance with other specified requirements.

MODIFICATIONS

Includes Change Orders and Supplemental Agreements. A modification may only be issued after the effective date of the Contract.

NON-CONFORMING WORK

Non-conforming Work is Work which does not conform in all respects to all requirements in the Contract Documents, including damaged Work and damaged materials, without respect to the causes or nature of such lack of conformity.

NOTICE OF AWARD

The written notice by the CITY to the successful Bidder stating that upon compliance by the successful Bidder of required conditions, the City will execute the Contract.

NOTICE TO BIDDERS

A notice included in the bidding documents that informs prospective bidders of the bidding procedures and the opportunity to submit a bid.

NOTICE TO CONTRACTOR

The written notice by the CITY to the CONTRACTOR which officially advises on direction and provides information pertinent to the Contract.

NOTICE TO PROCEED

The written notice by the CITY to the successful Bidder stating that the Work or portions of the Work may commence.

NOTICE TO WITHHOLD

The written notice by the CITY to the CONTRACTOR advising that certain payments shall be withheld due to unacceptable execution of the Work by the CONTRACTOR.

OR EQUAL

The product, equipment, or material which is proposed by the CONTRACTOR for use in the Work which in the sole judgment of the PROJECT MANAGER is equal to, better than and as suitable as the product or material specified in the Contract Documents as to function, performance, reliability, quality, and general configuration.

PARTIAL ACCEPTANCE

Any portion of the Work which has been completed in accordance with the plans and specifications and has been accepted in writing by the PROJECT MANAGER and the INSPECTOR on the "Statement of Partial Completion" form.

PLANS OR DRAWINGS

The drawings, profiles, cross sections, working drawings, and supplemental drawings, or reproductions thereof, issued or approved by the PROJECT MANAGER, which show the location, character, dimensions or details of the Work.

PROJECT

The Work and/or construction operations executed through the performance of this Contract.

PROJECT MANAGER

The authorized representative of the GENERAL MANAGER.

PROTEST

See definition of Claim.

REFERENCE SPECIFICATIONS

Those bulletins, standards, rules, methods of analysis or test, codes, and specifications of other agencies, PROJECT MANAGER societies, or industrial associations referred to in the Contract Documents. These refer to the latest edition, including amendments in effect and published at the time of advertising the project, adopted by the RECREATION AND PARK COMMISSION, if applicable, unless specifically referred to by edition, volume, or date.

RIGHTS OF ENTRY

Written permission from an owner of a facility or property to access the facility or property for a specific purpose.

RIGHT OF WAY

Rights of way, easements, or rights of entry for the Work will be provided by the CITY. The CONTRACTOR shall make arrangements, pay for, and assume all responsibility for acquiring, using, and disposing of additional work areas and facilities temporarily required in addition to those provided by the CITY. The CONTRACTOR shall indemnify and hold the CITY harmless from all claims for damages caused by such actions.

SPECIAL PROVISIONS

Any provision which supplements or modifies the Specifications.

SPECIFICATIONS

The Contract Documents and revisions to it which were prepared to specifically describe the commercial, legal, technical and nontechnical requirements of the project. Specifications include but are not limited to Terms, Provisions, General Conditions, General Requirements, Special Provisions, Technical Specifications, Equipment Schedules, and all revisions made to the specifications in Addenda, Notice To Bidders, and Change Orders or Modifications, signed by the GENERAL MANAGER.

STANDARD PLANS

Details of standard structures, devices or instructions referred to on the plans or in the specifications by title or number issued by the CITY.

STANDARD SPECIFICATIONS

Documents, Materials and items specified in Article 5 of these General Conditions.

STARTUP

That stage of performance testing as defined in the specifications which use the actual process fluid, material, or medium for a specified number of days of continuous operation without major interruptions and prior to acceptance by the CITY.

SUBCONTRACTOR

A "Subcontractor" is a contractor who is licensed pursuant to California Business and Professions Code, Section 7000 *et.seq.* and who contracts directly with the prime CONTRACTOR. The Subcontractor performs some part of the Work of the Contract. A Subcontractor does not have any direct contract with the CITY related to the project.

SUB-SUBCONTRACTOR

A "Sub-subcontractor" is a Subcontractor, within the definition of that term, who has a contract with a Subcontractor and has no Contract with the City related to the project.

SUPERVISOR

The designated individual who is responsible for the proper execution or installation of some portion or portions of the Work. The SUPERVISOR reports directly or indirectly to the CONTRACTOR'S REPRESENTATIVE.

SUPPLEMENTAL AGREEMENT

A written amendment of the Contract Documents which modifies the Contract in price or scope by a percentage which is more than can be accomplished by a Change Order and signed by the CITY and the CONTRACTOR.

SUPPLIER

An individual, organization, or firm who is not required for the purposes of the Work to be licensed pursuant to California Business and Professions Code as a CONTRACTOR, Subcontractor, or Sub-subcontractor, within the meanings of those terms as defined herein above, who provides equipment and/or materials for the Work, to the CONTRACTOR, a Subcontractor, or a Sub-subcontractor, including that fabricated to a special design, but who does not perform labor at the site except for labor or labor

supervision required by some manufacturers as part of their equipment installation for warranty or other purposes. The term "supplier" also includes fabricator, manufacturer, or vendor.

SURETY

Any individual, firm or corporation, bound with and for the CONTRACTOR for the acceptable performance, execution and completion of the Work, and for the satisfaction of all obligations incurred.

TERMS

Unless otherwise stated, the words "directed, required, permitted, ordered, instructed, designated, considered necessary, prescribed, approved, acceptable, satisfactory," or words of like meaning, refer to actions, statements, judgments, conclusions, and decisions within the responsibility of the PROJECT MANAGER or the INSPECTOR.

UNAVOIDABLE DELAY

Delay arising from causes beyond the control and without the fault or negligence of the CONTRACTOR and its Subcontractors at all tiers.

UTILITY

Tracks, overhead or underground wires, cables, pipeline, conduits, ducts, or structures, sewers, or storm drains owned, operated, or maintained in or across a public right of way, private easement, or jobsite.

VOLUME I

Are the items in the bid package entitled “CITY OF LOS ANGELES, CALIFORNIA, DEPARTMENT OF RECREATION AND PARKS INSTRUCTION TO BIDDERS, PROPOSAL, AFFIDAVIT AND BOND FOR…” inclusive.

VOLUME II

Are the items in the bid package entitled “CONTENTS GENERAL CONDITIONS”, “CONTENTS GENERAL REQUIREMENTS”, and any specifications and attachments inclusive.

WORK

Includes all material, labor, utility services, tools, expendable equipment, and all appliances, machinery, transportation, appurtenances and specified services necessary to perform and complete the Contract; and such additional items not specifically indicated or described that can be reasonably inferred as belonging to the item described or indicated and as required by good practice to provide a complete and satisfactory system or structure. As used herein, "provide" shall be understood to mean "furnish and install, complete in place."

WORKSITE

See "JOBSITE."

WORKDAY

Any day within the period between the start of the Contract time and the date provided in the Contract for completion or the date established in the Statement of Completion by the CITY acknowledging that all Work under the contract is complete, whichever occurs last, other than:

- Saturday,
- Sunday,
- any day designated as a holiday by the CITY, and,
- any other day designated as a holiday in a Master Labor Agreement entered into by the CONTRACTOR or on behalf of the CONTRACTOR as an eligible member of a Contractor's Association,

- any day the CONTRACTOR is prevented from working for cause as established by UNAVOIDABLE DELAY of these General Conditions; and,
- any day the Contractor is prevented from working during the first five (5) hours of the workday with at least sixty percent (60%) of the normal Work force from cause as established by an Unavoidable Delays of these General Conditions.

CONTRACT DOCUMENTS

2. SCOPE

A. The work to be performed under this Contract shall consist of furnishing all tools, equipment, materials, supplies and manufactured articles, and for furnishing all transportation, services, including fuel, power and water, and essential communications, and the performance of all labor, Work, or operations required for the fulfillment of the Contract, in strict accordance with the specifications, schedules, and drawings, all of which are made a part hereof, and including such detail sketches as may be furnished by the PROJECT MANAGER from time to time during the construction in explanation of said drawings. The items shall be complete and all Work, material, and services not expressly called for in the Specifications, or not shown on the drawings, which may be necessary for complete and proper construction to carry out the Contract in good faith shall be performed, furnished, and installed by the CONTRACTOR at no increase in cost to the CITY.

B. The Work required by the Contract shall be completed within **Six Hundred Forty (640)** calendar days of the date specified by the General Manager in the notice to proceed with the work. The Contract completion time shall consist of **Four Hundred Sixty (460)** calendar days for construction, and **One Hundred Eighty (180)** calendar days for maintenance.

3. AUTHORITY OF THE RECREATION AND PARK COMMISSION, PROJECT MANAGER, AND INSPECTOR

The GENERAL MANAGER, RECREATION AND PARKS has the final authority in all matters affecting the Work The CONTRACTOR shall promptly comply with instructions from the PROJECT MANAGER or the INSPECTOR.

On all questions relating to quantities, the acceptability of material, equipment, or Work, the execution, progress or sequence of Work, and the meaning of specifications or drawings, the decision of the PROJECT MANAGER is final and binding, and shall be precedent to any payment under the Contract, unless otherwise ordered by the BOARD OF RECREATION AND PARKS.

The PROJECT MANAGER is authorized to require performance of the Work consistent with the meaning of the plans and specifications and to approve necessary additive changes in Plans up to a maximum as authorized by the Recreation and Park Commission. The PROJECT MANAGER may initiate changes in Plans or scope of Work, regardless of cost, for submission to the RECREATION AND PARK COMMISSION for its approval.

The INSPECTOR is authorized to enforce compliance with Plans and Specifications, to determine the acceptability of materials and workmanship, administer requirements with respect to subcontracts, and to prepare and process progress payment estimates. In the event of a dispute between the CONTRACTOR and the INSPECTOR, the latter is authorized to reject materials or suspend the Work until any questions at issue can be referred to and decided by the RECREATION AND PARK COMMISSION or, in design matters, by the PROJECT MANAGER.

The INSPECTOR may sample and test all materials to be incorporated into the Work. The INSPECTOR may delegate this authority to sample materials and perform tests to the Department of General Services, Standards Division, or other approved agencies, the CONTRACTOR will pay for testing.

4. INTENT OF CONTRACT DOCUMENTS

The Contract Documents are complementary, and what is called for by one part shall be as binding as if called for by all. The intent of the Documents is to include all Work consistent therewith and reasonably inferable there from as being necessary for completion of the Contract. Materials or Work described in words that indicate the proper execution and a well known technical or trade designation shall be held to refer to such recognized standards.

It is understood and agreed that the written terms and provisions of the Contract Documents represent the entire and integrated agreement between the parties hereto and supersede all prior negotiations, representations, or agreements, either written or oral. The Contract Documents shall not be construed to create any contractual relationship of any kind between the PROJECT MANAGER or the INSPECTOR and the CONTRACTOR.

5. STANDARD SPECIFICATIONS

The applicable portions of the Standard Specifications for Public Works Construction (SSPWC) shall become part of these Contract Documents, and unless otherwise specified, all Work and materials shall conform to the Standard Specifications as modified by the corresponding issue of Standard Plan No. S-610 as amended or revised and adopted by the RECREATION AND PARK COMMISSION in effect on the date of advertising for bids.

6. INTERPRETATION OF PLANS AND SPECIFICATIONS

Every part of the Contract, as shown on the Plans and described in the Specifications, must be completed and finished. No deviations are to be made from the Plans or Specifications without previous written authorization from the PROJECT MANAGER.

In general, the Plans will show dimensions, positions and type of construction, and the Specifications will define materials, quantities, and if indicated, required methods of construction. Any Work called for on the Plans and not mentioned in the Specifications, or vice versa, shall be performed as though fully set forth in both. Work not particularly detailed, marked, or specified shall be the same as similar parts that are detailed, marked, or specified.

The Plans have been drawn to the indicated scales except where otherwise noted. Dimensions indicated by figures or numerals shall govern in all cases whether drawn to scale or not. Larger scale drawings shall take precedence over smaller scale drawings. Drawings shall not be scaled for dimensions.

The general character of the detailed Work is shown on the Contract drawings, but minor modifications may be made in larger scale drawings. The PROJECT MANAGER will furnish additional details, when needed, to more fully explain the Work, and the same shall be considered part of the Contract.

Where on any drawings, a portion of the Work is drawn out or detailed and the remainder is indicated in outline, the drawn out or detailed parts shall apply also to all other like portions of the Work. Where ornament or other detail is indicated by starting only, such detail shall be continued throughout the courses or parts in which it occurs and shall also apply to all other similar parts in the Work, unless otherwise indicated.

References made to other specifications and codes refer to the edition including amendments in effect and published at the time of advertising the project or issuing the permit, unless specifically referred to by edition, volume, or date as noted in the Contract Documents.

The CONTRACTOR shall furnish and install all equipment and materials required to complete installations whether or not the quantities are specifically shown, called out, or reflected in the Contract Drawings.

7. PRECEDENCE OF CONTRACT DOCUMENTS

In resolving inconsistencies or ambiguities among two (2) or more components of the Contract Documents, the highest precedence shall be given to Permits from the other agencies as may be required by law and decreasing order as follows:

1. Permits from other agencies as may be required by law
2. Agreement
3. Special Provisions
4. General Conditions
5. Specifications - Division 01: General Requirements
6. Specifications - Divisions 02 - 17
7. Geotechnical Site Assessment
8. Drawings
9. Standard Plans

10. Standard Specifications

11. Reference Specifications

12. Reference Drawings

Supplemental Agreements, Change Orders, PROJECT MANAGER'S written interpretations and clarifications, Notice to Bidders and Addenda, in the precedence listed, will take precedence over all other Contract Document components referenced therein. Figure dimensions on Drawings will take precedence over scaled dimensions.

Detailed Drawings, including Process and Instrumentation Drawings (P & ID's), will take precedence over general Drawings.

8. ACCURACY OF PLANS AND SPECIFICATIONS

Omissions from the Plans and Specifications shall not relieve the CONTRACTOR from the responsibility of furnishing, making, or installing all items required by law or usually furnished, made, or installed in a project of the scope and character indicated by the Plans and Specifications. If the CONTRACTOR is of the opinion that it will incur costs above and beyond what would reasonably be anticipated in meeting the above requirements, it shall inform the PROJECT MANAGER in writing within twenty (20) calendar days after discovering the omission and before starting the Work.

The Plans show conditions as they are supposed or believed by the PROJECT MANAGER to exist, but it is not intended or to be inferred that the conditions as shown thereon constitute a representation or warranty, expressed or implied, by the CITY or its officers, that such conditions are actually existent, nor shall the CITY, or any of its officers, be liable for any loss sustained by the CONTRACTOR as a result of any variance between conditions as shown on the Plans, and the actual conditions revealed during progress of the Work or otherwise, except as indicated in Article 53, Differing Site Conditions of these General Conditions.

9. EXAMINATION OF COVERED WORK

If any Work is covered without inspection, approval or consent of the INSPECTOR, and examination is required by the INSPECTOR, it shall be uncovered at the CONTRACTOR'S sole expense.

Examination of covered Work may be ordered by the PROJECT MANAGER and if so ordered, the Work shall be uncovered by the CONTRACTOR. If such Work is found to be in accordance with the Contract Documents, the CITY will issue a Change Order authorizing payment for the cost of examination and replacement. If such Work is found to be not in conformance with the Contract Documents, the CONTRACTOR shall correct the non-conforming Work and the cost of examination and correction of the non-conforming Work shall be borne solely by the CONTRACTOR.

10. UNNOTICED DEFECTS

Any non-conformity in the Work that is discovered before Contract Completion, or before final payment has been made, or during the guarantee period, shall be removed and replaced by the CONTRACTOR with Work which conforms to the provisions of the Contract Documents. Failure on the part of the PROJECT MANAGER or the INSPECTOR to condemn or reject non-conforming Work shall not constitute acceptance or implied acceptance of such Work.

11. BUILDING CODES AND REGULATIONS

The CONTRACTOR shall perform the Work in accordance with the requirements of the Los Angeles City Building Code and all other regulations, laws, and ordinances, even though such requirements are not specifically mentioned in the Specifications or shown on the drawings.

It is not the responsibility of the CONTRACTOR to make certain that the Contract Documents are in accordance with applicable laws, statutes, building codes and regulations. If the CONTRACTOR observes that any of the Contract Documents are at variance therewith in any respect, it shall promptly notify the PROJECT MANAGER in writing, and any necessary changes shall be accomplished by issuance of a Change Order.

If the CONTRACTOR performs any Work knowing it to be contrary to such laws, ordinances, rules and regulations, and without such notice to the PROJECT MANAGER, it shall assume full responsibility therefore and shall bear all costs attributable thereto.

12. LENGTH OF WORKDAY AND WORK WEEK

Eight (8) hours of labor shall constitute a calendar day's work for employees of the CONTRACTOR under this Contract. Said employees shall be paid not less than the prevailing wage rate for the first eight (8) hours work of each day.

A working day shall be Monday through Friday, and work shall be between 7:00 a.m. and 4:00 p.m., unless otherwise approved by the PROJECT MANAGER or the RECREATION AND PARK COMMISSION or revised by CITY Ordinance.

When work in excess of eight (8) hours per day, or forty (40) hours during any one (1) week is performed, wages for all hours over eight (8) hours in any day or over forty (40) hours during any one (1) week shall be paid at the prevailing wage rate, as provided in the California Code and the CITY's code requirements.

13. PAYMENT OF EMPLOYEES

The CONTRACTOR and each Subcontractor shall pay each employee engaged in Work on the project under this Contract in compliance with the Federal and State wage provisions indicated on the appropriate page of the Proposal (General Instruction and Information for Bidders), and LENGTH OF WORKDAY AND WORK WEEK of these General Conditions.

The certified payroll and the Statement of Compliance shall be submitted to the INSPECTOR by the CONTRACTOR and all Subcontractors performing Work on the project, regardless of dollar amount or type of contract.

If there is a difference between the Federal and State minimum wage rates for similar classifications of labor, the CONTRACTOR and its Subcontractors shall pay not less than the higher wage rate.

When the CONTRACTOR intends to use a craft or classification not shown on the general prevailing wage determinations, it will be required to pay the wage rate of that craft or classification most closely related to it as shown in the general prevailing wage determinations. In case of disagreement between the CONTRACTOR and the CITY, the INSPECTOR shall make the final determination as to the prevailing wages for the Work.

14. CONVICT-MADE MATERIALS

No materials manufactured or produced in a penal or correctional institution shall be incorporated in the project under this Contract.

15. SALES; BUSINESS OR USE TAX

Purchases of materials and equipment which will be incorporated or installed permanently in the Contract Work, or which will be used in the operation of the CONTRACTOR or Subcontractors, and not incorporated in the Contract Work, are not exempt from City of Los Angeles and California State Sales or Use Taxes as applicable. The CITY shall consider any required business taxes to be included in the overhead costs of the CONTRACTOR.

16. NONDISCRIMINATION IN EMPLOYMENT

The CONTRACTOR shall comply with all of the provisions of the Los Angeles Administrative Code, Mandatory Provision Pertaining to Nondiscrimination in Employment.

The CONTRACTOR shall submit Monthly Ethnic Composition of Work Force Reports to the INSPECTOR indicating the number of employees in the various work categories and ethnic groups and gender on forms furnished by the CITY. Failure to furnish the reports shall constitute grounds for the CITY to withhold the progress payment.

Nondiscrimination Clause: "The CONTRACTOR shall not discriminate during the performance of this Contract against any employee or applicant for employment because of employee's or applicant's race, religion, national

origin, ancestry, sex, age, sexual orientation or physical handicap." The CONTRACTOR shall include in all subcontracts awarded under this Contract the same Nondiscrimination Clause.

If conflicts exist between these provisions and the Federal Rules and Regulations governing the same, the more stringent requirements shall prevail.

17. APPRENTICE UTILIZATION

Any Contract awarded hereunder will require the CONTRACTOR to comply with the provisions of the California Labor Code relating to apprentice employment and training; and will require the CONTRACTOR to assume full responsibility for compliance with said section with respect to all Apprenticing Occupations involved in the Project. (Compliance with said Apprentice Utilization provisions of the Labor Code is not required for Public Works Contracts involving less than $30,000 or less than twenty (20) Working days in duration).

18. LAWS AND REGULATIONS

The CONTRACTOR shall observe and comply with all Federal, State, and local laws, ordinances, codes, orders, and regulations which in any manner affect those engaged or employed on the Work, the materials used in the Work, or the conduct of the Work. If any discrepancy or inconsistency should be discovered in this Contract in relation to any such law, ordinance, code, order, or regulation, the CONTRACTOR shall report the same in writing to the PROJECT MANAGER. The CONTRACTOR shall indemnify and save harmless the CITY, and its officers, agents, and employees, against all claims or liability arising from violation of any such law, ordinance, code, order, or regulation, whether by itself or by its employees or subcontractors as stated in these Contract Documents. Any particular law or regulation specified or referred to elsewhere in these specifications shall not in any way limit the obligation of the CONTRACTOR to comply with all other provisions of Federal, State, and local laws and regulations.

19. PERMITS AND CONSTRUCTION EASEMENTS

The CONTRACTOR shall anticipate, obtain and pay for all permits, excluding the General Building Permit, necessary for performance of the Work.

The CONTRACTOR shall obtain and pay all costs incurred and submit to the PROJECT MANAGER copies of all permits required for the construction and installation of all Work called for on this project. All costs shall be included in the CONTRACTOR'S bid. The permit list to be obtained by the CONTRACTOR shall include, but not be limited to the following:

1. Night Work, hauling, overload, grading, excavation, demolition, foundation, and associated building permits.
2. Electrical permits.
3. Mechanical permits.
4. Plumbing permits.
5. South Coast Air Quality Management District permits.
6. Fire sprinkler permit.
7. All Federal, State, County and CITY issued permits.

Rights of ways, easements, or rights of entry for the Work will be provided by the CITY. The CONTRACTOR shall make arrangements, pay for, and assume all responsibility for acquiring, using, and disposing of Work areas and facilities temporarily required which are necessary in addition to those provided by the CITY. The CONTRACTOR shall indemnify and hold the CITY harmless for all claims for damages caused by such actions.

20. PARTIES EXCLUDED FROM THE WORK

Lists of individuals, firms and organizations which have been debarred, suspended or have voluntarily excluded themselves from Federal Procurement and Non Procurement Program is maintained by US General Services Administration. A copy can be obtained from Superintendent of Documents, US Government Printing Office, Washington, DC 20402, Tel: (202) 783-3238.

The CITY will not conduct business with an individual, firm or organization, and the CONTRACTOR shall not employ or otherwise utilize any Subcontractor, supplier or equipment vendor at any tier which is on the U.S. General Services Administration "List of Parties Excluded from Federal Procurement and Non Procurement Programs". The CONTRACTOR shall not utilize or otherwise employ any subcontractors or suppliers on the CITY's list of nonresponsible bidders maintained by the General Services Division of the Bureau of Contract Administration.

21. BUSINESS TAX REGISTRATION CERTIFICATES

The CONTRACTOR represents that it has, or will obtain upon award, the Business Tax Registration Certificate(s) required by the Los Angeles City Business Tax Ordinance. The CONTRACTOR shall maintain, or obtain as necessary, all such Certificates required of it under said Ordinance and shall not cause or allow any such Certificate to be revoked or suspended.

The CITY requires all firms that have business activity within the City of Los Angeles to pay CITY business taxes.

Payments for goods or services will be withheld unless proof of tax compliance is provided to the CITY. All firms and individuals that do business with the CITY will be required to provide a Business Tax Registration Certificate number or an exemption number as proof of compliance with Los Angeles City business tax requirements in order to receive payment for goods or services.

The Tax and Permit Division of the City Clerk's Office has the sole authority to determine whether a firm is covered by business tax requirements.

22. FINANCIAL LIABILITY

The CITY's liability under this Contract shall not exceed the CITY's appropriation to fund the Contract at the time of Contract award. However, if the CITY shall appropriate funds for any successive years, the CITY'S maximum liability shall not exceed the extent of such appropriation, subject to the terms and conditions of this Contract.

THE CONTRACTOR'S RESPONSIBILITIES

23. CONTRACTOR'S OBLIGATIONS

Only competent workers shall be employed on the Work. Any worker, at the journey level or above, employed on the Work shall have a current license or certificate as required for the type of Work being performed, issued by the Department of Building and Safety of the City of Los Angeles and any such other organization as required.

Any person or subcontractor employed who is found by the PROJECT MANAGER AND/OR INSPECTOR to be incompetent, disorderly or otherwise objectionable, or who fails or refuses to perform Work properly, acceptably and as directed shall be immediately removed from the Work by the CONTRACTOR and not be reemployed on the Work.

The CONTRACTOR, at its sole cost and expense, shall perform all labor and services and furnish all the materials, tools, and appliances, except as hereinafter otherwise definitely provided, necessary or proper for performing and completing the Work required, in the manner and within the time stipulated in these specifications. The CONTRACTOR shall furnish, erect, maintain, and remove the construction plant and such temporary works as may be required. If, at any time before the commencement or during the progress of the Work or any part of it, the CONTRACTOR'S methods or appliances appear to the PROJECT MANAGER or the INSPECTOR to be unsafe, inefficient, or inadequate for securing the safety of the workers, the quality of the Work required, or the rate of progress stipulated, the PROJECT MANAGER or the INSPECTOR may order the CONTRACTOR to increase their safety and efficiency or to improve their character, and the CONTRACTOR shall comply with such orders at its own expense. Neither the making of such demands by the PROJECT MANAGER nor the failure to make such demands shall relieve the CONTRACTOR of its obligation to secure the safe conduct of the Work, the quality of Work required, nor the rate of progress stipulated in the Contract. The CONTRACTOR shall be fully responsible for the safety, efficiency, and adequacy of its plant, appliances, and methods, and for any damage which may result from their failure or their improper construction, maintenance, or operation. All of the labor and materials shall be performed and furnished strictly pursuant to and in conformity with the Contract Documents, the lines and grades and other directions of the PROJECT

MANAGER or the INSPECTOR as given from time to time during the progress of the Work under the terms of the Contract, and in accordance with working drawings to be furnished from time to time as provided herein. The CONTRACTOR shall complete the entire Work to the satisfaction of the PROJECT MANAGER and INSPECTOR and in accordance with the Specifications and drawings herein mentioned, at the prices fixed in the Contract.

Where articles or materials are especially manufactured or fabricated for delivery under these specifications, the CONTRACTOR shall at all times employ such workforce, plant, materials, and tools as will be sufficient to complete the performance of the Contract and every part thereof within the time limits stipulated herein. If the CONTRACTOR fails to employ sufficient workforce, plant, materials, tools, or to maintain adequate progress, the PROJECT MANAGER may require an increase in progress at any point or points or a modification of plans and procedure in such a manner as to accelerate the Work. Failure to adequately staff the project shall be just cause for the CITY to terminate the Contract.

24. CONTRACTOR'S REPRESENTATIVE AT THE SITE

A technically qualified and English-speaking project representative shall be designated in writing as the CONTRACTOR'S representative at the job site, who shall supervise the Work and shall provide competent supervision of the Work until its completion. The CONTRACTOR'S project representative shall be assigned full time and exclusively to this project. Alternate representatives with qualifications equal to or better than the previous representative may be designated. The CONTRACTOR'S representatives shall have at least five (5) years of verifiable experience as the person primarily responsible for supervision of the Work on projects of the same or similar size and nature as this project. Within five (5) days after the Notice of Award the CONTRACTOR shall provide a statement to the PROJECT MANAGER with the following:

1. Identification and resume, showing the qualifications and experience of the CONTRACTOR'S representative and the alternate appointed to act in the place of the CONTRACTOR'S representative.
2. References of not less than two (2) previous projects on which the CONTRACTOR'S representative and the alternate had supervisory responsibility on a project of a similar nature and at least one-half or more of the cost of this project. Such references shall include names, addresses, and telephone numbers of owner representatives who worked on the project as well as project information such as project type, size, location and duration.

The PROJECT MANAGER reserves the right to disapprove any candidate named as the CONTRACTOR'S representative or alternate who fails to meet the provisions set forth herein. The PROJECT MANAGER reserve the right to remove, without any right to work on the project, either the CONTRACTOR'S representative or alternate, who in the sole opinion of the PROJECT MANAGER has demonstrated incompetence, lack of ability, or other unsuitability to perform supervision of the Work.

If the CONTRACTOR'S representative or alternate leave the employ of the CONTRACTOR, the CONTRACTOR will be required to replace the individual(s) and fulfill the requirements of this Article within fifteen (15) calendar days. In no event shall any Work proceed in the absence of an approved representative.

The CONTRACTOR'S representative or alternate shall have full authority to act on behalf of the CONTRACTOR, including, but not limited to final approval of Change Orders and Supplemental Agreements. All directions given by the PROJECT MANAGER to said representative or alternate shall be considered as having been given to the CONTRACTOR. Such instructions given by the PROJECT MANAGER to the CONTRACTOR'S representative or alternate will be confirmed in writing. All instructions and directions given by the PROJECT MANAGER or the INSPECTOR will be limited to matters properly falling within the PROJECT MANAGER'S or the INSPECTOR'S authority as specified in AUTHORITY OF THE RECREATION AND PARK COMMISSION, PROJECT MANAGER AND INSPECTOR of these General Conditions.

The CONTRACTOR'S representative or alternate shall be present at the site of the Work at all times while Work under the Contract is in progress. Failure to observe this requirement shall constitute suspension of the Work by the CONTRACTOR, until such time as said representative or alternate is again present at the site, and no payment will be allowed for any Work performed in the absence of said representative or alternate. Work performed in violation of these provisions shall be removed and reconstructed, re-fabricated, or reinstalled under

the required supervision. No extensions of time will be granted, nor will additional payment be allowed for any costs to the CONTRACTOR for slowdown, delays, idled equipment, or any other costs incurred by the CONTRACTOR as the direct or indirect result of such suspension.

Whenever the Work is defined as being suspended under the provisions of this Article, any such suspension in excess of ten (10) calendar days shall constitute just cause for the CITY to terminate the Contract under the provisions of TERMINATION OF CONTRACT BY CITY (CONTRACTOR DEFAULT) of these General Conditions.

25. FAMILIARITY WITH PLANS AND SPECIFICATIONS

It shall be the responsibility of the CONTRACTOR to be thoroughly familiar with all details of the Project, including the Work of CONTRACTOR'S forces and all Subcontractors. The CONTRACTOR shall call the following to the attention of both the PROJECT MANAGER and the INSPECTOR in writing within twenty-four (24) hours of discovery, before any Work is performed:

1. Errors and omissions in the Plans and Specifications;
2. Work on the Plans or in the Specifications which, if so constructed, would result in a conflict or interference with other Work or the Work of other trades, including the location of fixtures and equipment;
3. Existing improvements visible at the job site, for which no existing disposition is made on the Plans or in the Specifications but which could reasonably be assumed to interfere with the satisfactory completion of the improvements contemplated by the Plans and Specifications.

Failure to notify shall constitute a waiver by the CONTRACTOR of any claim for delay or other damages occasioned by such defect. If the CONTRACTOR proceeds with the Work without instructions from the PROJECT MANAGER, the incorrect Work shall be removed and corrections made to comply with the PROJECT MANAGER'S instructions, at no cost to the CITY. The requirements of this Article are applicable to typographical errors in the Specifications and notational errors on the Plans where ambiguity or inadequate description exists.

26. JOB CONDITIONS

The CONTRACTOR shall visit the job site as soon as practicable after award of the Contract and ascertain all conditions affecting necessary procedure and sequencing of Work operations in the execution of the Work, including condition of available roads and streets, or clearances, restrictions and other limitations affecting transportation and ingress and egress to the job site. The CONTRACTOR shall determine the nature and types of Work to be performed and shall be responsible for all Work to be accomplished.

The CONTRACTOR shall enter the job site as noted in Article 4, SITE SECURITY of the General Requirements. The CONTRACTOR will be restricted to the immediate Work areas on the job site and shall in no case go beyond the Work limits noted on the drawings or as otherwise directed by the PROJECT MANAGER. The job site shall be enclosed with a temporary chain link fence and gates which shall be removed upon completion of the Work. The CONTRACTOR shall confine all operations of the contracted Work to the boundaries of the job site(s) and shall not interfere with CITY personnel and CITY operations or the Work of other contractors working on or near the site.

CONTRACTOR'S employee access to the job site by private vehicles is prohibited.

No vehicle is allowed in the facility or on the job site except delivery trucks and CONTRACTOR'S identified vehicles and equipment. It shall be the CONTRACTOR'S sole responsibility to arrange and pay for offsite employee parking and transportation, if necessary, so as not to affect the availability of public parking on the grounds of the facility or park site. The CONTRACTOR shall fully cooperate with all authorities on the job site and other contractors not related to the Work of this Contract who might be at the job site and shall comply with all regulations in force at the job site.

27. RESPONSIBILITY FOR SITE

The CONTRACTOR shall be in full charge of and be responsible for the job site and the construction Work of this Contract, subject to the directions of the PROJECT MANAGER or the INSPECTOR. Article 33, INTERFACE/COORDINATION REQUIREMENTS of the General Requirements describes interfaces with other

contractors working on the job site. No other operations of any nature shall be performed except as specifically authorized in the Contract Documents or as authorized by the PROJECT MANAGER.

The CONTRACTOR shall exercise care not to damage improvements and adjacent land. The CONTRACTOR shall correct any damage caused within seventy-two (72) hours by restoring the land and improvements damaged to their original condition and shall indemnify and hold the CITY harmless for any such damage as specified in INDEMNIFICATION of these General Conditions.

28. WORKMANSHIP AND MATERIALS

All materials, parts and equipment furnished by the CONTRACTOR for the Work shall be new, high grade and free from defects. Materials and Work quality shall be subject to the INSPECTOR'S approval.

29. INJURY AND ILLNESS PREVENTION - SAFETY MEASURES

Safety is the responsibility of the CONTRACTOR. The CONTRACTOR shall observe and comply with the safety provisions of all applicable laws, building and construction codes, safety and health regulations of the California Code of Regulations, and with applicable CITY Safety Policies.

If a Work procedure or condition exists that is a violation of said safety standards, the PROJECT MANAGER or INSPECTOR may order the CONTRACTOR to comply with said safety provisions, and the CONTRACTOR shall comply with such orders at its own expense. If the CONTRACTOR fails to act promptly, the PROJECT MANAGER or INSPECTOR is authorized to suspend the Work. Failure of the PROJECT MANAGER or the INSPECTOR to make such demands shall not relieve the CONTRACTOR of its obligations to secure the safe conduct of the Work.

In the event of an emergency constituting an immediate hazard to the health or safety of the public or CITY employees, property, or licensee, the CITY may undertake, at the CONTRACTOR'S sole expense, without prior notice, all Work necessary to correct such hazardous conditions when it was caused by Work of the CONTRACTOR not being in accordance with the requirements of this Contract.

First aid facilities and supplies shall be kept and maintained by the CONTRACTOR at the site of the Work. The CONTRACTOR shall cause all persons within the construction area to wear protective helmets. In addition, all employees of the CONTRACTOR and its Subcontractors shall be provided with, and required to use, personal protective and life saving equipment set forth in California Construction Safety Orders and the OSHA Safety and Health Standards for Construction.

30. PROTECTION OF PERSONS AND PROPERTY AND RESTORATION OF EXISTING IMPROVEMENTS

The CONTRACTOR shall not destroy, remove, or otherwise disturb any existing survey monuments or reference points without authorization from the PROJECT MANAGER. No pavement breaking or excavation shall be started until all survey monuments or other reference points that will be disturbed by the construction operations have been properly referenced by the PROJECT MANAGER. It shall be the CONTRACTOR'S responsibility to notify the PROJECT MANAGER and the INSPECTOR of the time and location that Work will be done. Such notification shall be sufficiently in advance of construction so that there will be no delay due to waiting for survey points to be satisfactorily referenced for restoration. All survey monuments or reference points disturbed, without authorization by the PROJECT MANAGER, shall be accurately restored by the CITY at the CONTRACTOR'S sole expense after all street or roadway resurfacing has been completed.

All paved areas including asphaltic concrete beams cut or damaged as a result of construction shall be replaced with similar materials and of equal thickness to match the existing adjacent undisturbed areas, except where specific resurfacing requirements have been called for in the Contract Documents or in the requirements of the agency issuing the permit. All temporary and permanent pavement shall conform to the requirements of the affected pavement owner. All pavement which is subject to partial removal shall be neatly saw cut in straight lines.

In order to obtain a satisfactory junction with adjacent surfaces, the CONTRACTOR shall saw cut back and trim the edge so as to provide a clean, sound, vertical joint before permanent replacement of an excavated or damaged portion of pavement. Damaged edges of pavement along excavations and elsewhere shall be trimmed

back by saw cutting in straight lines. All pavement restoration and other facilities restoration shall be constructed to finish grades compatible with adjacent undisturbed pavement.

Where sidewalks have been removed for purposes of construction, the CONTRACTOR shall place suitable temporary sidewalks, properly protected, promptly after backfilling and shall maintain them in satisfactory condition until the final restoration thereof has been made.

All utilities encountered along the line of the Work shall be maintained continuously in service during all the operations under the Contract, unless other arrangements satisfactory to the PROJECT MANAGER are made. Utilities shall include, but not be limited to, all above or below-ground conduit, pipes, ducts, cables, and appurtenances associated with oil, gas, water, steam, irrigation, process, sewer, storm drain, wastewater, air, electrical, power, instrumentation, communication, telephone, cable, TV, and lighting systems, whether or not owned by the CITY.

The CONTRACTOR shall protect all existing utilities and improvements not designated for removal. Necessary potholing shall be accomplished at the CONTRACTOR'S expense. The CONTRACTOR shall determine the exact locations and depths of all utilities indicated on the drawings. The CONTRACTOR shall make exploratory excavations of all utilities. All such exploratory excavations shall be performed as soon as practicable after award of the Contract and in any event, a sufficient time in advance of construction to avoid possible delays to the CONTRACTOR'S Work. When such exploratory excavations show the utility location as indicated on the drawings to be in error, the CONTRACTOR shall so notify the INSPECTOR and the PROJECT MANAGER. The CONTRACTOR should not rely upon plan designation of location of underground utilities. The number of exploratory excavations and extent of potholing required shall be that number which is sufficient to determine the alignment and grade of the utility. No costs shall be allowed for such Work except those included in the CONTRACTOR'S proposal.

Prior to any excavation in the vicinity of any existing underground facilities, the CONTRACTOR shall notify the INSPECTOR and the PROJECT MANAGER, and the respective authorities representing the owners or agencies responsible for such facilities, not less than three (3) working days, nor more than five (5) working days, of their intention to begin excavation. The CONTRACTOR shall make arrangements for and provide access such that a representative of said owners or agencies may be present during such Work.

Where the proper completion of the Work requires the temporary or permanent removal and/or relocation of an existing utility or other improvement which is shown on the drawings, the CONTRACTOR shall at its own expense, remove and, without unnecessary delay, temporarily replace or relocate such utility or improvement to a place and in a manner as directed by the PROJECT MANAGER, and the owner of the facility. In all cases of such temporary removal or relocation, restoration to former location shall be accomplished by the CONTRACTOR in a manner that will restore or replace the utility or improvement as nearly as possible to its former locations and to as good or better condition than found prior to removal. When utilities that are to be removed are encountered within the area of operations, the CONTRACTOR shall notify the PROJECT MANAGER not less than fifteen (15) days in advance for necessary measures to be taken to prevent interruption of service.

The CONTRACTOR shall notify the PROJECT MANAGER thirty (30) calendar days in advance of any proposed connection, and shall notify the PROJECT MANAGER and the INSPECTOR twenty-four (24) hours prior to the actual connection, to any existing utility.

Any utility or improvement which is damaged by the CONTRACTOR shall be immediately repaired at the CONTRACTOR'S expense, to a condition equal to, or better than, the condition it was in prior to such damage or temporary relocation. If the CONTRACTOR fails or refuses to promptly repair the utility or improvement, the CITY may perform the necessary Work at the CONTRACTOR'S expense and no time extension shall be allowed to the CONTRACTOR. The CONTRACTOR is not relieved of provisions of this Article even in the event such damage occurs after backfilling or is not discovered until after completion of backfilling.

All repairs to a damaged improvement shall be inspected and approved by the INSPECTOR and an authorized representative of the improvement owner before being concealed by backfill or other Work. In case of damage, which in the opinion of the PROJECT MANAGER or the INSPECTOR, threatens the safety of persons or property, the CONTRACTOR shall immediately make all repairs necessary for removal of the hazard. Should

the CONTRACTOR fail to promptly take all necessary action, the CITY has the option to remove any hazard resulting

from damages caused by the CONTRACTOR at the CONTRACTOR'S expense without waiving any other rights the CITY may have, and no time extension will be allowed to the CONTRACTOR.

In the event that the CONTRACTOR damages any existing utilities that are not shown on the drawings or the locations of which are not made known to the CONTRACTOR prior to excavation, the CONTRACTOR shall immediately notify the INSPECTOR and take all measures necessary to prevent further damage. The CONTRACTOR shall then immediately make a written report to the PROJECT MANAGER and shall make repairs as directed by the PROJECT MANAGER. Payment for this extra Work will be made pursuant to the provisions contained in Article 27, PAYMENT FOR CHANGES AND EXTRA WORK of the General Requirements.

Notwithstanding that an existing utility or substructure is not shown on the original Plans and Specifications, if the existence and location thereof was made known to the CONTRACTOR prior to excavation, the utility or substructure constitutes an existing known condition, and the CONTRACTOR is responsible for protecting the utility or substructure.

Damage to a utility known to the CONTRACTOR shall be repaired at the CONTRACTOR'S expense.

31. NON-CONFORMING WORK

Except as set forth in this Article, all non-conforming Work and materials, in place or not, shall be removed immediately from the site or corrected to conform to all requirements of the Contract Documents, by the CONTRACTOR, at the sole expense of the CONTRACTOR.

If the CONTRACTOR fails to remove, replace or correct any non-conforming Work or materials within seventy two (72) hours of discovery, the PROJECT MANAGER may cause such Work or materials to be removed and replaced. Such removal and replacement shall be at the sole expense of the CONTRACTOR and all such cost shall be deducted from any amounts that are due or may become due to the CONTRACTOR.

Failure of the INSPECTOR or the PROJECT MANAGER to notify the CONTRACTOR of any non-conforming Work shall not constitute acceptance of any non-conforming Work. The CONTRACTOR'S obligation to remove, replace or correct any non-conforming Work, whenever discovered, shall continue to the end of the guaranty-warranty period provided for in Article 16, GUARANTY-WARRANTY of the General Requirements. The CITY reserves and retains all rights and remedies at law against the CONTRACTOR and their Surety for correction of any and all latent defects discovered after the guaranty-warranty period.

The Contract Documents may be modified for the purpose of allowing non-conforming Work to become acceptable in lieu of the CONTRACTOR'S obligation to remove and replace all such non-conforming Work. Such modification shall be effective only upon the written agreement of the CONTRACTOR and the PROJECT MANAGER. Such written agreement shall be issued as a Change Order, which shall include all of the following provisions.

1. A statement that the Work as constructed is non-conforming Work.
2. The specifications by which the non-conforming Work will be made to conform to the requirements of the Contract Documents.
3. A statement that all modifications to the non-conforming Work shall be at the sole expense of the CONTRACTOR.
4. A statement that the CONTRACTOR waives and releases any and all claims against the CITY, including time and impacts, in any way whatsoever related to the non-conforming Work, the modification of such non-conforming Work, and the time to negotiate such a modification.
5. The amount representing the value of the Work specified in the Contract Documents less the value of the Work as constructed, as a credit to the CITY, which shall be deducted from the amount of the Contract.

No Work shall proceed which shall make the non-conforming Work more costly to correct nor to modify such non-conforming Work until the PROJECT MANAGER and the CONTRACTOR execute such a Change Order. The PROJECT MANAGER may grant permission, in response to a written request from the CONTRACTOR, to proceed with the Work before finalization of such a Change Order, if they find the request to be in the best interest of the CITY.

Any delays or impacts arising on the Work as a result of construction or delivery of non-conforming Work or materials shall be at the CONTRACTOR'S sole expense, regardless of whether the Work ultimately becomes the subject of a Change Order, and no time extension shall be allowed to the CONTRACTOR.

Acceptance by the INSPECTOR of such previous non-conforming Work, after execution of the Change Order, does not act to waive or otherwise negate the CONTRACTOR'S obligations to guarantee such Work as set forth in Article 16, GUARANTY-WARRANTY of the General Requirements.

Failure of the CONTRACTOR to comply with the requirements of this Article shall constitute default of the Contract by the CONTRACTOR and the CITY may terminate the Contract as provided for in TERMINATION OF CONTRACT BY CITY (CONTRACTOR DEFAULT).

32. SUBCONTRACTORS AND SUB-SUBCONTRACTORS (Revised as of 2/12/2016)

The Contractor shall perform on the site and with its own organization not less than thirty (30%) of the total Contract Price, unless a different percentage is designated on Schedule "A" SUBCONTRACTORS AND SUPPLIERS in the Instructions to Bidders, page 16. Any items designated "specialty items" in the Bid Proposal may be performed by subcontract and the amount of all such "specialty items" may be deducted from the Contract Price before computing the amount of Work required to be performed by the Contractor with its own organization. The dollar value included in the percentage performed by the Contractor shall include the value of labor, materials and equipment to be incorporated or used in the Work and directly purchased by the Contractor and shall not include the value of Work, including labor, materials and equipment, incorporated or used in the Work, performed or provided by Subcontractors.

Bidders must list all Subcontractors in the Bid, regardless of the dollar amount of the work to be performed, if the Bidder wishes to have the Subcontract amount credited toward meeting the MBE/WBE/SBE/EBE/DVBE/OBE levels of participation of the Project. Subcontractors added to the project following acceptance of the Bid and award of the Project will not be credited toward meeting the MBE/WBE/SBE/EBE/DVBE/OBE levels of participation for this Project.

Listed vendors and/or Suppliers will be limited to 60% of their listed dollar value toward achieving the anticipated MBE/WBE/SBE/EBE/DVBE/OBE levels of participation for this Project, unless the vendor and/or Supplier manufactures or substantially alters the materials/supplies.

The designated percentage of the total Contract Price the Contractor is to perform may not be reduced below that level by the addition of Subcontractor’s added after Award of the Project.

The Inspector, acting on behalf of the Board of Recreation and Park Commissioners, will be responsible for approval of all Subcontractors, whether Bid-listed or not, and all Sub-subcontractors employed on the Project.

The Contractor must list in the original bid each Subcontractor who will perform Work or render services in an amount in excess of one-half of 1 percent of the Contractor’s total Bid or $10,000.00, whichever is greater.

Subletting or Subcontracting of any portion of the Work in excess of one-half of 1 percent of the Contractor’s original total Bid or $10,000.00, whichever is greater, for which no Subcontractor was designated in the original Bid shall only be permitted in cases of public emergency or necessity, and then only after a finding reduced to writing as a public record of the Inspector setting forth the facts constituting the emergency or necessity.

If the Contractor fails to specify a Subcontractor, or if the Contractor specifies more than one Subcontractor for the same portion of Work to be performed under the Contract in excess of one-half of 1 percent of the Contractor's total original Bid or $10,000.00, whichever is greater, the Contractor agrees that it is fully qualified to perform that portion of Work itself, and that it shall perform that portion itself.

The Contractor shall set forth in its Bid the following: The name, location of the place of business, telephone number, California State Contractor's License Number and dollar amount of each Subcontractor who will perform Work, labor, service, supply specifically fabricated materials or equipment in an amount in excess of one-half of 1 percent of the Contractor's total Bid, or $10,000.00, whichever is greater.

The Contractor shall list only one Subcontractor for each portion of Work as defined by the Contractor in its Bid.

Acceptance by the Board of Recreation and Park Commissioners of its Bid is dependent upon each Bid listed Subcontractor, and all subsequently approved additional Subcontractors, performing the dollar value of Work listed or approved. Any reduction, increase, or other change to any Subcontract amount without prior approval by Board of Recreation and Park Commissioners is considered an Unauthorized Subcontractor Substitution and is subject to a penalty of ten (10) percent of the Subcontract amount, whether Bid-listed or not. A Subcontract dollar value increased or reduced as the result of a Change Order issued by the Engineer to add or delete from the original scope of Work shall not be subject to a penalty for an Unauthorized Subcontract Substitution.

Acceptance by the Board of Recreation and Park Commissioners of its Bid shall not entitle Subcontractors to recognition for any direct or contractual relationship with the City, nor shall it constitute approval of the use of any materials other than those specified.

The Contractor shall be responsible for all acts of all Subcontractors at all tiers. The Contractor shall coordinate all work performed by subcontractors in the interest of the City.

All Subcontractors who will be working on the Project shall be approved in writing by the Inspector prior to beginning Work, regardless of the dollar amount of Work to be performed, and whether or not they were listed in the original Bid.

Requests for approval of all Subcontractors, or request for substitution of a Subcontractor, shall be made in writing to the Inspector located at the Public Works Building, 1149 S. Broadway, 3rd Floor, Los Angeles, CA, 90015, and said request shall contain the following information for each Subcontractor:

1) Project Name
2) Project Work Order Number
3) Subcontractor's Name
4) Subcontractor's Address
5) Subcontractor's Phone Number
6) Subcontractor's Status (WBE, MBE, SBE, EBE, DVBE, OBE)
7) Subcontractor's State of California Contractor License Number
8) Subcontractor's City Business Tax Registration Certificate Number (BTRC)
9) Dollar amount of Subcontract work to be performed
10) Description of Subcontract work to be performed

Failure to provide any of the information listed will result in denial of approval until such time as the information is provided.

Failure to obtain approval of the Inspector prior to each Subcontractor performing Work on the Project may result in suspension of Work by that Subcontractor, removal of Work performed by unapproved Subcontractors, assessment of penalties, and possible sanctions against the Contractor.

Additional Subcontractors may be added after the time of original Bid. The value of Work to be performed by additional Subcontractors may not be greater than one-half of 1 percent of the Contractor's original total Bid or ten thousand dollars ($10,000.00), whichever is greater, unless the Subcontractor will be performing Work added by Change Order causing changes or deviations from the original Contract.

The Contractor shall provide the dollar amount of Work to be performed in all requests for additional Subcontractors. Failure to specify a dollar amount of Work to be performed will result in denial of additional Subcontractors until such time as the amount is provided.

Failure of the Contractor to request and obtain approval for a reduction in either a Bid-listed Subcontract amount or the Subcontract amount of a Subcontract added after the original Bid shall result in a penalty of ten percent of the Subcontract amount.

A Contractor whose Bid is accepted may not:

1) Substitute any person as Subcontractor in place of a Subcontractor listed in the original Bid, except that the Inspector, acting on behalf of the Board of Recreation and Park Commissioners, may consent to the substitution of another Subcontractor for one of the following situations:

A) When the Subcontractor listed in the original Bid or proposal after having had a reasonable opportunity to do so fails or refuses to execute a written contract, when that written contract, based upon the general terms, conditions, plans and specifications for the project involved or the terms of that Subcontractor's written bid, is presented to the subcontractor by the Contractor.

B) When the listed Subcontractor becomes bankrupt or insolvent.

C) When the listed Subcontractor fails or refuses to perform its subcontract.

D) When the listed Subcontractor fails or refuses to meet the bond requirements of the Contractor as set forth herein.

E) When the Contractor demonstrates to the Inspector's satisfaction that the name of the Subcontractor was listed as a result of an inadvertent clerical error.

F) When the listed Subcontractor is not licensed pursuant to the State of California Contractor's License Law.

G) When the listed Subcontractor refuses to obtain a City of Los Angeles Business Tax Receipt Certificate (BTRC).

H) When the Inspector concurs with the Contractor that the Work being performed by the listed Subcontractor is unsatisfactory and not in substantial accordance with the Contract Documents, or the listed Subcontractor is delaying or disrupting the progress of the work.

I) When the listed Subcontractor fails to submit an Affirmative Action Plan acceptable to the Inspector.

J) When the Board of Recreation and Park Commissioners determines that a listed Subcontractor is not a responsible contractor.

2) Permit a Subcontract to be voluntarily assigned or transferred or allow it to be performed by anyone other than the original Subcontractor listed in the original Bid, without the consent of the Inspector.

3) Other than in the performance of Change Orders causing changes or deviations from the original Contract, sublet or Subcontract any portion of the Work in excess of one half of 1 percent of the Contractor's total Bid as to which its original Bid did not designate a Subcontractor.

4) Reduce the dollar amount of a Bid-listed Subcontract without the written approval of the Inspector.

A request for substitution of any Subcontractor, whether Bid-listed or not, must be made in writing to the Inspector and must include letter(s) of explanation as to the reason for the requested substitution.

It is considered a substitution if anyone other than the Bid-listed and/or approved Subcontractor(s), including the Contractor, performs any portion of the Work designated to be performed by said Subcontractor.

Failure to obtain approval for a Subcontractor substitution may result in rejection of the affected Work, penalties assessed for failure to obtain approval, and possible sanctions by the City.

All substitutions of Subcontractors, whether MBE/WBE/SBE/EBE/DVBE/OBE or not, shall be approved in writing by the Board of Recreation and Park Commissioners prior to any Work being performed by the substituting Subcontractor.

The Contractor shall conduct a Business Inclusion Program Outreach prior to approval of any requested Subcontractor substitution, regardless of the status (MBE/WBE/SBE/EBE/DVBE/OBE) of the contractor being substituted for. For MBE/WBE/SBE/EBE/DVBE/OBE Subcontractor substitution requests, the Contractor shall comply with the Business Inclusion Program Outreach requirements of Pages 15-15R of the Instructions to Bidders (Volume I). The Business Inclusion Program Outreach for any requested Subcontractor substitution must be reviewed and approved by the Special Research and Investigation Section of the General Services Division of the Bureau of Contract Administration, whether the Subcontractor was Bid listed or approved after the Award of the Project.

There shall be no decrease in dollar value of Work to be performed by Subcontractors approved as a substitute for a Bid-listed Subcontractor without a change in scope of the Work to be performed by the originally Bid-listed Subcontractor. Written evidence of a change of scope must be provided by the Engineer prior to approval of a change in dollar value of a Bid-listed Subcontractor.

Prior to approval of the Contractor's request for substitution, the Inspector shall give notice in writing to the Subcontractor affected by the Contractor's request to substitute and of the reasons for the request. The notice shall be served by certified or registered mail to the last known address of the Subcontractor. The listed Subcontractor who has been so notified shall have five (5) Workdays within which to submit written objections to the substitution. Failure to file these written objections within five (5) Workdays of notification shall constitute the listed Subcontractor's consent to the substitution. Notification by the Inspector may be made by phone in lieu of written notification via certified or registered mail if agreed to by the listed Subcontractor and followed by written request. Upon notification by phone, the listed Subcontractor may file written objections within five (5) days of notification.

If written objections are filed, the Inspector shall give notice of at least five (5) Workdays to the listed Subcontractor of a hearing on the Contractor's request for substitution.

The Contractor, as a condition to assert a claim of Inadvertent Clerical Error in the listing of a Subcontractor, shall within two Workdays after the time of the original Bid opening by the Board of Recreation and Park Commissioners give written notice to the Inspector and the Board of Recreation and Park Commissioners and copies of such notice to both the Subcontractor he claims to have listed in error and the intended Subcontractor

who had bid to the Contractor prior to Bid opening.

Written notice of an Inadvertent Clerical Error shall be forwarded within two (2) days after the time of the original Bid opening by every Contractor claiming such an error. Failure to submit such notice within the time prescribed shall make any such subsequent claim of Inadvertent Clerical Error invalid.

Any listed Subcontractor who has been notified by the Contractor of an Inadvertent Clerical Error shall be allowed six (6) Workdays from the time of the Bid opening to submit to the Inspector and to the Contractor written objection to the Contractor's claim of Inadvertent Clerical Error. Failure of such listed Subcontractor to file such written notice within the six (6) Workdays shall constitute agreement that an advertent clerical error was made.

The Inspector shall, in the absence of compelling reasons to the contrary, consent to the requested substitution based on an Inadvertent Clerical Error if:

1) The Contractor, the Subcontractor listed in error, and the intended Subcontractor each submit an affidavit to the Inspector along any additional information as the parties may wish to submit that an Inadvertent Clerical Error was in fact made, provided that the affidavits from each of the three parties are filed within eight (8) Workdays from the time of the original Bid opening, or

2) If such affidavits are filed by both the Contractor and the intended Subcontractor within eight days of the original Bid opening but the Subcontractor whom the Contractor claims to have listed in error does not submit within six (6) Workdays, to the Inspector and to the Contractor, written objection to the Contractor's claim of Inadvertent Clerical Error as provided in this article.

   If such affidavits are filed by both the Contractor and the intended Subcontractor but the listed Subcontractor has, within six (6) Workdays from the time of the original Bid opening, submitted to the Inspector and to the Contractor written objection to the Contractor's claim of Inadvertent Clerical Error, the Inspector shall investigate the claims of all parties and schedule a public hearing before the Board of Recreation and Park Commissioners to determine the validity of such claims. Any determination shall be based on the facts contained in the declarations submitted under penalty of perjury by all three parties and supported by testimony given to the Board of Recreation and Park Commissioners. The Board of Recreation and Park Commissioners may, on its motion or that of any other party, admit testimony of other Contractors, any Bid registries or depositories, or any other party in possession of facts, which may have a bearing on the decision of the Board of Recreation and Park Commissioners. The findings of the Board of Recreation and Park Commissioners shall be final.

33. RESPONSIBILITY OF CONTRACTOR TO ACT IN EMERGENCY

In case of an emergency that threatens loss of or damage to property or injury to persons, the CONTRACTOR shall act, without instructions from the CITY, as the situation may warrant. The CONTRACTOR shall immediately inform the PROJECT MANAGER and the INSPECTOR of the emergency action taken. Any claim shall be submitted to the PROJECT MANAGER. If practical the amount of compensation, if any, shall be determined by agreement prior to the issuance of a Change Order. However, if the emergency is created or aggravated by the CONTRACTOR, it shall be liable for the resulting damages. If the CONTRACTOR fails to take the necessary action as required by such an emergency the CITY may assign another CONTRACTOR or use its own forces to perform the emergency Work at the CONTRACTOR'S sole expense.

34. ASSIGNMENT

The CONTRACTOR shall not assign, transfer, convey or otherwise dispose of this Contract or any of the proceeds there under unless written consent of the CITY has been obtained. No right under this Contract or claim for any proceeds due or to become due hereunder shall be asserted against the CITY, or persons acting for the CITY, by reason of any so-called assignment, transfer or conveyance of this Contract or any part thereof unless such assignment, transfer or conveyance has been authorized by the written consent of the CITY. The

instrument of assignment, transfer or conveyance shall contain a clause subordinating the claim of the assignee, transfer or conveyor to all prior liens for services rendered or materials supplied for the execution of the Work.

35. INDEPENDENT CONTRACTOR

The CONTRACTOR represents that it is fully experienced and properly qualified to perform the class of Work required for the CONTRACT and that it is properly licensed, equipped, organized and financed to perform the Work. The CONTRACTOR shall be an independent contractor. The CONTRACTOR is not an agent of the CITY in the performance of the CONTRACT, and shall maintain complete control over its employees and its Subcontractors and Suppliers of any tier. Nothing contained in the CONTRACT or any Subcontract awarded by the CONTRACTOR shall create any relationship between any Subcontractor and the CITY. The CONTRACTOR shall perform the Work in accordance with its own methods, in compliance with the terms of the CONTRACT.

INDEMNIFICATION AND INSURANCE REQUIREMENTS

36. INDEMNIFICATION

Except for the active negligence or willful misconduct of the CITY, the CONTRACTOR undertakes and agrees to defend, indemnify and hold harmless, through legal counsel acceptable to the CITY, the CITY, and any and all of the CITY'S Boards, Officers, Agents, Employees, Assigns, and Successors in Interest from and against all suits and causes of action, claims, losses, demands and expenses, including, but not limited to, attorney's fees and cost of litigation, damage or liability of any nature whatsoever, arising out of or related to the performance or nonperformance by CONTRACTOR or its Subcontractors, Sub-Subcontractors, or Suppliers, of any tier, of any portion of the construction of the Project, including but not limited to CONTRACTOR'S negligent acts, errors, omissions, breach of contract, breach of warranty (express or implied), or willful misconduct.

It is agreed that such defense and indemnity shall extend to the CITY'S PROJECT MANAGER, Architect/Engineer or other Design Consultant providing services under written agreement with the CITY covering any portion of the Project. Provided, however, that the Design Consultant shall be solely responsible for the enforcement of any request made by said Consultant for indemnification or defense by the CONTRACTOR. It is further provided that the CITY shall have no liability whatsoever for any failure of the CONTRACTOR to comply with any request from the Consultant for indemnity or defense.

It is further agreed that the defense and indemnity obligations of the CONTRACTOR under this Article shall not extend to the liability of the Design Consultant or its agents, employees or subconsultants, arising as a result of such indemnitee's own active negligence, errors or omissions or from (1) the preparation or approval of maps, Plans, opinions, reports, surveys, change orders, designs or Specifications, or (2) the giving of or failure to give directions or instructions by the indemnitee provided that such giving or failure to give is the primary cause of the dame or injury.

37. INSURANCE

A. GENERAL

During the term of this Contract and without limiting the CONTRACTOR's indemnification of the CITY, the CONTRACTOR shall provide and maintain at its own expense, insurance having the limits customarily carried and actually arranged by the CONTRACTOR but not less than the amounts and types listed on the Insurance Requirements Form in Volume 1 of these Contract Documents, covering its operations hereunder subject to the following conditions as they may variously apply:

1. ADDITIONAL INSURED/ADDITIONAL INTEREST/LOSS PAYEE

The CITY, it's Recreation and Park Commissions, Officers, Agents, Employees and Design Consultant shall be included as:

a. Additional Insureds in all required General Liability and property insurance and Additional Interests in all required Automobile Liability insurance.

b. Named Insureds in all required Owners and Contractors Protective Liability insurance policies.

c. Loss Payee As Its Interest May Appear in all required property, fidelity or Surety coverages.

d. Listing of other entities as additional insures may be required for specific projects due to their funding source (such as, Prop A funded projects require that Los Angeles County be listed as an additional insured).

The CITY and other interests listed above need not be named on Workers' Compensation/Employer's Liability, Professional Errors and Omissions and Second-party Legal Liability coverages (such as Garage Keepers' Legal).

2. INSURANCE APPROVAL

All insurance required hereunder shall conform to the CITY requirements established by Charter, ordinance or policy. Evidence of insurance shall be submitted to the Department's Risk Control Coordinator and approved by the City Attorney prior to commencement of any Work or tenancy under this Contract in accordance with the Los Angeles Administrative Code.

3. ALTERNATIVE PROGRAMS

Alternative Risk Financing mechanisms such as Risk Retention Groups, Risk Purchasing Groups, off-shore carriers and captive insurance programs are subject to review of their financial statements by the CITY before an approval can be granted by the City Attorney.

4. ADMITTED CARRIER/LICENSED CALIFORNIA BROKER

Insurance shall be obtained from brokers or carriers authorized to transact insurance business in California. Surplus lines insurance from carriers who are not admitted in California must be submitted through a California-licensed broker or agent.

Surplus lines coverage must also contain a Service of Suite provision whereby the underwriters will submit as necessary to any court of competent jurisdiction in California and agree that all matters arising there under will be determined in accordance with the law and practice of such court. It must further give the name and address of the underwriter's agent for service of process located within California or must nominate the California Insurance Commissioner as such agent.

5. PRIORITY OF COVERAGE

The CONTRACTOR's insurance shall not call on the CITY's program for contributions.

6. CANCELLATION/REDUCTION IN COVERAGE NOTICE

With respect to the interest of the CITY, if an insurance company elects to cancel insurance before the stated expiration date, or declines to renew in the case of a continuous policy, or materially reduces the coverage period by changing the retroactive date (if any), or the extended discovery period (if any), or reduces the stated limits other than by impairment of an aggregate limit, or materially reduces the scope of coverage which affects the CITY's interest, the company will provide the CITY at least thirty (30) calendar days prior written of such election. Notice will be made by receipted delivery addressed as follows: CITY ATTORNEY, INSURANCE AND BONDS, 1240 City Hall East, 200 NORTH MAIN STREET, LOS ANGELES, CA 90012-4168. It is understood, however, that such notice to the CITY shall not affect the company's right to give a lesser notice to the Named Insured in the event of nonpayment of premium. (L.A. Admin. Code Section 11.54).

7. ACCEPTABLE EVIDENCE

The appropriate CITY Special Endorsement forms, contained in Volume 1 of these Contract Documents, are the preferred form of evidence of insurance. Alternatively, the CONTRACTOR may submit two (2) certified copies of the policy or other evidence acceptable to the City Attorney containing language which complies with subparagraphs 1) through 6) above.

With respect to Professional Liability insurance, either a signed copy of the Policy Declarations Page or a letter from the CONTRACTOR's insurance broker certifying coverage, together with a thirty (30) day cancellation notice endorsement in favor of the CITY as specified in subparagraph 6) will satisfy this requirement.

8. SEPARATION OF INSUREDS

Except with respect to the insurance company's limits of liability, each liability insurance policy shall apply separately to each insured against whom a claim or suit is brought. The inclusion of any person or organization as an insured shall not affect any right which such person or organization would have as a claimant if not so included.

9. RENEWAL

Once the insurance has been approved by the CITY, evidence of renewal of an expiring policy may be submitted on a manually signed renewal endorsement or certificate form. If the policy or carrier has changed, however, new evidence as specified in paragraphs 1) through 8) above, must be submitted.

B. AGGREGATE LIMITS/REDUCTION IN COVERAGE

If any of the required insurance coverages contain aggregate limits, or apply to other operations or tenancy of the CONTRACTOR not related to this Contract, the CONTRACTOR shall give the CITY prompt, written notice of any incident, occurrence, claim, settlement or judgement against such insurance which in the CONTRACTOR's best judgement may diminish the protection such insurance affords the CITY. Further, the CONTRACTOR shall immediately take all reasonable and available steps to restore such aggregate limits or shall provide other insurance protection for such aggregate limits. The CITY may, at its option, specify a minimum acceptable aggregate for each line of coverage required.

The CONTRACTOR shall not make any substantial reductions in scope of coverage (e.g., elimination of contractual liability or reduction of discovery period) which may affect the CITY's protection without the CITY's prior written consent.

C. SELF-INSURANCE AND SELF-INSURED RETENTIONS

Self-insurance programs and self-insured retention in insurance policies are subject to separate approval by the CITY upon review of evidence of the CONTRACTOR's financial capacity to respond. Additionally, such programs or retention must provide the CITY with at least the same protection from liability and defense of suits as would be afforded by first-dollar insurance.

D. MODIFICATION OF COVERAGE

The CITY reserves the right at any time during the term of this Contract to change the amounts and types of insurance required hereunder by giving the CONTRACTOR ninety (90) calendar days advance written notice of such change. If such change should result in substantial additional cost to the CONTRACTOR, the CITY agrees to negotiate additional compensation.

E. FAILURE TO PROCURE INSURANCE

The required coverage and limits are subject to availability on the open market at reasonable cost as determined by the CITY. Non-availability or non-affordability must be documented by a letter from the CONTRACTOR'S insurance broker or agent indicating a good faith effort to procure the required insurance and showing, as a minimum, the names of the insurance carriers and the declinations or quotations received from each.

Within the foregoing constraints, the CONTRACTOR'S failure to procure or maintain required insurance or a self-insurance program during the entire term of this Contract shall constitute a material breach of this Contract under which the CITY may immediately suspend or terminate this Contract or, at its discretion, procure or renew such insurance to protect the CITY'S interests and pay any and all premiums in connection therewith, and recover all monies so paid from the CONTRACTOR.

F. UNDERLYING INSURANCE

The CONTRACTOR shall be responsible for requiring indemnification and insurance as it deems appropriate from its consultants, agents and Subcontractors, if any, to protect the CONTRACTOR's and the CITY'S interests, and for ensuring that such persons comply with any applicable insurance statutes. The CONTRACTOR is encouraged to seek professional advice in this regard.

G. WORKERS' COMPENSATION

By signing this Contract, the CONTRACTOR hereby certifies that it is aware of the provisions of Section 3700 *et seq.*, of the Labor Code which require every employer to be insured against liability for Workers' Compensation or to undertake self-insurance in accordance with the provisions of that Code, and that it will comply with such provisions at all such times as they may apply during the performance of the Work pursuant to this Contract.

A waiver of subrogation in favor of the CITY will be required when Work is performed on CITY premises under hazardous conditions.

H. ALL RISK BUILDER'S RISK/INSTALLATION FLOATER

During the course of construction, the CONTRACTOR shall secure and maintain an All Risk Builder's Risk Insurance policy covering loss, damage or destruction of property, including materials in transit and stored on and off site, in an amount equal to the value of the construction and materials on hand.

An Installation Risk or "Floater" Policy, written to cover only specific types of equipment during construction, may be provided to cover damage to Work or high valued equipment or materials.

Coverage shall remain in force until the Work is completed and accepted by the CITY. Acceptable evidence of coverage shall be in the form of an endorsement to the policy which names the CITY as an additional named insured and as Loss Payee As Its Interest May Appear.

I. TYPICAL COVERAGES REQUIRED

The coverages required in A above shall be at least as broad as:

1. General Liability: Insurance Services Office Commercial General Liability coverage (Occurrence Form CG 00 01).
2. Automobile Liability: Insurance Services Office Form Number CA 00 01 (Ed. 1/87) covering Automobile Liability, code 1 (any auto).
3. Professional Liability: If applicable, errors and omissions liability appropriate to the consultant's profession, with a discovery period of not less than twelve (12) months after completion of Work or termination of Contract.

J. TYPICAL LIMITS OF LIABILITY

Unless otherwise specified in Form Gen. 146/IR, the CONTRACTOR shall maintain limits no less than:

1. General Liability: $2,000,000 per occurrence for bodily injury, personal injury and property damage. If Commercial General Liability or other form with a general aggregate limit is used, either the general aggregate shall apply separately to this project/location or the general aggregate limit shall be twice the required occurrence limit.
2. Automobile Liability: $1,000,000 per accident for bodily injury and property damage, combined or equivalent in split limits.
3. Employer's Liability: $1,000,000 per accident for bodily injury or disease.
4. Professional Liability: $1,000,000 per occurrence.

K. CONTRACT BONDS

Before the execution of the Contract by the RECREATION AND PARK COMMISSION, the bidder shall file with the RECREATION AND PARK COMMISSION Surety bonds satisfactory to the RECREATION AND PARK COMMISSION in the amounts and for purposes noted below. Bonds shall be duly executed by a responsible corporate Surety, authorized to issue such bonds in the State of California and secured through an authorized agent with an office in California. Bonds shall be issued by a Surety who is listed in the latest revision of U.S. Department of Treasury Circular 570, is authorized to issue bonds in California, and whose bonding limitation shown in said circular is sufficient to provide bonds in the amount required by the Contract. The Bidder shall pay all bond premiums, costs, and incidentals. On Contracts estimated by the PROJECT MANAGER to be less than $2 million, bonds may be obtained from an insurance company with a Certificate of Authority from the California Insurance Commissioner authorizing the company to write Surety insurance within the State of California.

Each bond shall be signed by both the Bidder and the Surety, and the signature of the authorized agent of the Surety shall be notarized.

The Bidder shall provide two good and sufficient surety bonds. The "Payment Bond" (Material and Labor Bond) shall be for not less than one hundred percent (100%) of the Contract price, to satisfy claims of material suppliers and of mechanics and laborers employed by it on the Work. The bond shall be maintained by the CONTRACTOR in full force and effect until the Work is accepted by the RECREATION AND PARK COMMISSION, and until all claims for materials and labor are paid, and shall otherwise comply with the California Civil Code.

The "Performance Bond" shall be for one hundred percent (100%) of the Contract price to guaranty faithful performance of all Work, within the time period prescribed, in a manner satisfactory to the RECREATION AND PARK COMMISSION, and that all materials and Workmanship will be free from original or developed defects, and comply with requirements and guaranty specified in Article 16, GUARANTY-WARRANTY of the General Requirements.

Should any Surety at any time be unsatisfactory to the RECREATION AND PARK COMMISSION, notice will be given the CONTRACTOR to that effect. No further payments shall be deemed due or will be made under the contract until a new Surety shall qualify and be accepted by the RECREATION AND PARK COMMISSION.

Changes in the Work, or extensions of time, made pursuant to the Contract, shall in no way release the CONTRACTOR or Surety from its obligations. Notice of such changes or extensions shall be waived by the Surety. In addition to the bonds detailed above, the CONTRACTOR shall provide a guarantee bond as detailed in Article 16, GUARANTY-WARRANTY of the General Requirements.

38. SERVICE OF NOTICE

The delivering of any notice, instruction, claim or protest, or other written communication, personally to the CONTRACTOR or the CONTRACTOR'S representative or to the PROJECT MANAGER, or to the City Clerk of the CITY shall constitute service therefore upon the CONTRACTOR, the PROJECT MANAGER, or the CITY, respectively.

The depositing of a post-paid (Registered Mail) wrapper directed to the official address of the CONTRACTOR, the PROJECT MANAGER, or the CITY in any post office, of any notice, instruction, claim or protest, or written communication, shall be deemed sufficient service thereof upon the CONTRACTOR, the PROJECT MANAGER, or the CITY, respectively, and the date of said service shall be the day following the date of postmark.

The official address of the CONTRACTOR shall be the address given in the accepted bid or such other address as the CONTRACTOR may subsequently designate in writing either to the PROJECT MANAGER or to the CITY. The official name and address of the PROJECT MANAGER and the CITY will be supplied to the CONTRACTOR after the award.

39. AGENT TO ACCEPT SERVICE

The CONTRACTOR shall maintain within Los Angeles County a duly authorized agent as identified in the Article entitled SERVICE OF NOTICE to accept service of legal process on its behalf, and shall keep the CITY advised

of such agent's name and address during the duration of the CONTRACT and for three (3) years after the Final Payment, or as long as the CONTRACTOR has warranty obligations under Article 16, GUARANTY-WARRANTY of General Requirements, whichever period terminates later. In the event that no such duly authorized agent is on file with the CITY, the CONTRACTOR agrees that the Secretary of State of the State of California shall be the Contractor's agent for service of legal process.

PROGRESS OF WORK

40. TEMPORARY SUSPENSION OF WORK

If the Work of the Contract is suspended or delayed, the CONTRACTOR shall so notify the PROJECT MANAGER in writing within twenty-four (24) hours after the start thereof. If the CONTRACTOR is entitled to reimbursement for such suspension or delay, as specified hereinafter, the CONTRACTOR shall submit a completely detailed statement of the costs thereof, to the PROJECT MANAGER, within twenty (20) calendar days after the termination thereof. Failure to submit such statement of costs or notification within the time specified shall be deemed a waiver of any claims for delay or damages or both by the CONTRACTOR.

If the Work of the Contract is suspended or delayed through no fault of the CITY, all expenses and losses shall be borne by the CONTRACTOR.

If the Work of the Contract is suspended or delayed by an act of the CITY, or by failure of the CITY to furnish required information, and the CONTRACTOR thereby incurs expenses or sustains losses which could not have been avoided by the judicious handling of forces and equipment, and if by a diligent prosecution of the Work the CONTRACTOR could not have completed the Work before such suspension, the CONTRACTOR will be paid such amount as the RECREATION AND PARK COMMISSION may find to be a fair and reasonable compensation for such part of the CONTRACTOR'S actual loss. In no case shall any compensation be made to cover any loss other than actual cash paid for wages, rental of equipment, and materials used in protection of the Work, all of which must be supported by satisfactory written evidence. Such wages shall not include the wages or salary of any individual not necessary for protection of the Work. The CONTRACTOR shall not be entitled to any mark-up for overhead or profit on damages or for extended duration.

The CONTRACTOR shall maintain complete and accurate daily records of all costs due to delay, clearly distinguishing them from the costs of other portions of the Work, and shall submit a detailed written report of such costs to the PROJECT MANAGER within twenty (20) calendar days of incurring the delay. Failure to comply shall result in waiver by the CONTRACTOR to any claims for additional payment and schedule change. In addition, the CONTRACTOR shall submit evidence of any cause of delay specified herein if it has not already done so.

As soon as practicable, following receipt of such report and evidence, if required, the PROJECT MANAGER will determine the nature and extent of such costs and will, if the PROJECT MANAGER finds that payment is due, issue a Change Order therefore, subject to the provisions in Article 27, PAYMENT FOR CHANGES AND EXTRA WORK of the General Requirements. If the PROJECT MANAGER determines that payment is not due, the CONTRACTOR will be so advised in writing. Should the CONTRACTOR disagree with such finding, CONTRACTOR may submit a notice of protest to the PROJECT MANAGER as provided in CLAIMS AND PROTESTS in these General Conditions. The CONTRACTOR shall provide the PROJECT MANAGER with access to its daily cost records or certified copies thereof as requested. All such records shall be retained by the CONTRACTOR and open to inspection and audit by the CITY and the PROJECT MANAGER'S authorized representatives. Except for the additional compensation provided herein before, the CONTRACTOR shall have no claim for damage or compensation for any delay or hindrance whether or not contemplated by the Contract.

41. UNAVOIDABLE DELAY

Should the CONTRACTOR be obstructed or delayed or completion of the Work from causes beyond its control and without its fault or negligence, and solely due to acts of God, acts of government in its sovereign capacity, riots, insurrections, wars, fires, floods, earthquakes, tidal waves, epidemics, quarantine restrictions, industry-wide strikes, freight embargoes, or unusually severe weather, it shall be entitled to a noncompensable extension of time.

The CONTRACTOR shall only be entitled to a noncompensable extension of time for Unavoidable delay in the Work which negatively impacts the critical path of the approved project schedule, and causes the Work of the project to extend beyond the approved Contract Completion date.

The CONTRACTOR shall be entitled to a noncompensable time extension only if it notifies the PROJECT MANAGER immediately at the time the CONTRACTOR is prevented from proceeding with the Work and follows with written notification of the causes of the delay within five (5) calendar days from the beginning of any delay. Also, the CONTRACTOR shall notify the PROJECT MANAGER immediately at the end of the delay and follow up with written notification of the cessation of delay within five (5) calendar days from the end of the delay.

Any claim for a time extension shall be made in writing within twenty (20) calendar days after the conclusion of the delay. The PROJECT MANAGER shall ascertain the facts and the extent of the delay and extend the time for completing the Work if, in his/her judgement, the findings of fact justify such an extension. The PROJECT MANAGER'S decision shall be final and conclusive, subject only to appeal as provided by CLAIMS AND PROTESTS of these General Conditions.

42. ARCHAEOLOGICAL AND PALEONTOLOGICAL DISCOVERIES

If discovery is made of items of archaeological or paleontological interest, the CONTRACTOR shall immediately cease excavation in the area of discovery and shall not continue until ordered by the PROJECT MANAGER. When resumed, excavation operations within the area of discovery shall be as directed by the PROJECT MANAGER.

Discoveries which may be encountered may include, but not be limited to, dwelling sites, stone implements or other artifacts, animal bones, human bones and fossils. The CONTRACTOR shall be entitled to an extension of time and compensation in accordance with the provision of TEMPORARY SUSPENSION OF WORK of these General Conditions.

43. OTHER CONTRACTS

The CITY may perform other Work related to the Project at the site by the CITY'S own forces, have other Work performed by utility owners or let other direct contracts therefore which shall contain General Conditions similar to these. If such other Work to be performed was not noted in the Contract Documents, written notice thereof will be given to the CONTRACTOR prior to starting any such other Work; and, if the CONTRACTOR believes that such performance will involve additional expense to the CONTRACTOR or requires additional time and the parties are unable to agree as the extent thereof, the CONTRACTOR may make a claim therefore as provided under CLAIMS AND PROTESTS of these General Conditions.

The CONTRACTOR shall afford each utility owner and other contractor who is a party to such a direct contract (or the CITY, if the CITY is performing the additional Work with the CITY'S employees) proper and safe access to the site and a reasonable opportunity for the introduction and storage of materials and equipment and the execution of such Work, and shall properly connect and coordinate the Work with theirs. The CONTRACTOR shall do all cutting, fitting and patching of the Work that may be required to make its several parts come together properly and integrate with such other Work. The CONTRACTOR shall not endanger any Work of others by cutting, excavating or otherwise altering their Work and will only cut or alter their Work with the written consent of the PROJECT MANAGER and the others whose Work will be affected. The duties and responsibilities of the CONTRACTOR under this Article are for the benefit of such utility owners and other contractors to the extent that there are comparable provisions for the benefit of the CONTRACTOR in said direct contracts between the CITY and such utility owners and other contractors.

If any part of the CONTRACTOR'S Work depends upon proper execution or results of the Work of any such other contractor or utility owner or the CITY, the CONTRACTOR shall inspect and promptly report to the PROJECT MANAGER in writing any delays, defects or deficiencies in such Work that renders it unavailable or unsuitable for such proper execution and results. The CONTRACTOR'S failure to do so will constitute an acceptance of the other Work as fit and proper for integration with the CONTRACTOR'S Work except for latent or nonapparent defects and deficiencies in the other Work.

44. TERMINATION OF CONTRACT BY CITY (CONTRACTOR NOT AT FAULT)

The CONTRACT may be terminated, in whole or in part, at any time, by the CITY, at its sole discretion, without cause and for the CITY'S convenience. Such termination will be accomplished by delivery of a notice of Termination to the CONTRACTOR, specifying the extent to which performance of the Work under the CONTRACT or portion of the CONTRACT shall be terminated and the date upon which such termination shall become effective.

After receipt of a Notice of Termination, except as otherwise directed by the CITY the CONTRACTOR shall:

1. Stop Work under the CONTRACT on the date and to the extent specified in the Notice of Termination.

2. Notify the CITY in writing of all outstanding orders, Subcontracts and contracts entered into by CONTRACTOR for performance of the Work, including the (i) name and address of the vendor, supplier or Subcontractor; (ii) a copy of the complete contract, order or Subcontract; (iii) an accounting of the Work performed and compensation earned by the vendor, supplier or Subcontractor, and (iv) such other information as the CITY may request to assist it in determining whether to terminate or accept assignment of the order, Subcontract or contract.

3. Upon written notice by CITY, terminate all Subcontracts, orders and contracts, of any tier, related to the performance of the Work that the CITY determines shall be terminated and not assigned.

4. Place no further orders or Subcontracts for Goods or services, except as may be necessary for completion of that portion of the Work that has not been terminated.

5. Settle outstanding liabilities and claims arising out of such termination of orders and Subcontracts, with the Acceptance of the CITY if required (which Acceptance shall be final for the purposes of this Article). Assign to the CITY in the manner, at the times, and to the extent directed by the CITY all of the rights, titles, and interests of the CONTRACTOR under such orders, contracts and Subcontracts so terminated.

6. Transfer title and deliver to the CITY in the manner, at the times and to the extent directed by it, the:

    a. Fabricated or unfabricated parts, Work in process, completed Work, supplies, and other Goods procured as a part of, or acquired in connection with the performance of the Work terminated; and

    b. Completed or partially completed plans, drawings, information and other items that would have been required (per the Technical Specifications) to be furnished to the CITY if the Contract had been completed.

7. Use its best efforts to sell the property of the types referred to above in the manner, at the times, to the extent, and at the price(s) directed or authorized by the CITY, providing that the:

    a. CONTRACTOR is not required to extend credit to any purchaser;

    b. CONTRACTOR may acquire any such property under the prescribed conditions; and/or proceeds of any such transfer or disposition are applied or otherwise credited to reduce payments made by the CITY to the CONTRACTOR under the CONTRACT.

8. Take any action that may be necessary, or that the CITY may direct, for the protection and preservation of the property related to the CONTRACT that is in the possession of the CONTRACTOR and in which the CITY has or may acquire an interest.

9. Complete performance of that portion of the Work that has not been terminated by the Notice of Termination, as applicable and in accordance with the CONTRACT.

After receipt of a Notice of Termination for the CITY's convenience, the CONTRACTOR shall submit its termination claim to the CITY requesting payment of such sums as are permitted under the terms of this Article, in the form and with the certification(s) prescribed by the CITY for Claims and Protests. Such Claim shall be

submitted promptly but in no event later than six months from the effective date of termination, unless one or more extensions are granted in writing by the CITY upon written request by the CONTRACTOR during such six month period or authorized extension thereof. However, the CITY may receive and act upon any termination claim at any time after the six month period or any extension thereof, if it determines that the facts justify such action. Upon failure of the CONTRACTOR to submit its termination claim within the time specified, the CITY will determine the amount due the Contractor, if any, on the basis of information available, and will pay the CONTRACTOR the amount so determined. Such determination shall be final and binding and payment shall be in full settlement for the Work performed under the CONTRACT.

Subject to the provisions of this Article, the CONTRACTOR and the CITY may agree upon the total or partial amount to be paid to the CONTRACTOR by reason of the total of or partial termination pursuant to this Article. The agreed upon amount shall under no circumstances include any sum for lost profits on the terminated portion of the Work or for consequential damages, of any kind. If agreement is reached, the CONTRACT will be amended by Modification accordingly and the CONTRACTOR will be paid the agreed upon amount.

In the event of failure of the CONTRACTOR and the CITY to agree on the total amount to be paid the CONTRACTOR by reason of the termination of Work pursuant to this Article, the CITY will pay the CONTRACTOR the amounts determined by the City as follows, exclusive of any amounts agreed upon in accordance with the preceding Paragraph:

The CONTRACTOR'S actual cost for the Work properly performed by the CONTRACTOR as of the date of termination, including a 5% allowance for profit on such costs; plus, the reasonable cost of preserving and protecting property; plus other reasonable costs incidental to the termination of the Work under the CONTRACT, including expense incurred to determine the amounts due; provided however, that the maximum payable or paid for any portion of the completed Work shall not exceed the values listed in the corresponding bid item of Schedule of Values.

The total sum to be payable or paid to the CONTRACTOR, exclusive of the settlement amounts described in the Paragraph immediately above, shall not exceed the total CONTRACT Price less the:

1. Payments made previously by CITY for the Work; plus
2. A prorated portion of the total CONTRACT Price for the terminated portion of the Work as determined by the PROJECT MANAGER.

Except for normal spoilage and to the extent that the CITY will have otherwise expressly assumed the risk of loss, the fair value (as determined by the CITY) of property that is destroyed, lost, stolen, or damaged (so as to become undeliverable to the CITY or other buyer as described above) shall be excluded from the amounts paid to the CONTRACTOR.

In arriving at the amount due the CONTRACTOR under this Article, a deduction shall be made for the following:

1. Any claim that the CITY may have against the CONTRACTOR in connection with the CONTRACT; and
2. The agreed upon price for and/or proceeds from the sale of Goods or other items acquired or sold by the CONTRACTOR that have not been otherwise recovered by or credited to the CITY.

Under such terms and conditions as it may prescribe and at its sole discretion, the CITY may make partial payments against costs incurred by the CONTRACTOR in connection with terminated portion of the CONTRACT whenever the CITY decides that the aggregate of such payments is within the amount to which the CONTRACTOR is entitled hereunder. If the total of such payments is in excess of the amount finally agreed upon or determined to be due under this Article, such excess shall be payable by the CONTRACTOR or to the CITY upon demand together with interest at a rate equal to that set forth in California Code of Civil Procedure, Section 685.010.

Under no circumstances shall the CONTRACTOR be entitled to anticipatory or unearned profits or consequential damages as a result of a termination of partial termination under this Article, or for any other termination by the CITY. The payment to the Contractor determined in accordance with this Article shall constitute the exclusive remedy of the CONTRACTOR for termination hereunder.

Anything contained in the CONTRACT to the contrary notwithstanding, a termination under this Article shall not waive any right or claim to damages that the CITY may have; the CITY may pursue any clause of action that it may have by law or under the CONTRACT; and shall not relieve CONTRACTOR of its warranty obligations with respect to any Work performed prior to such termination.

If the termination hereunder is only for a part of the Work, the Contract Price shall be reduced by the amount of the Contract Price applicable to the portion of the Work, which is terminated, including overhead and profit, on the basis of one or more of the following:

1. Unit prices stated in the CONTRACT or agreed upon by the CITY and the CONTRACTOR.
2. A lump sum determined by the PROJECT MANAGER, based on the estimate costs including overhead and profit of the terminated portions of the Work.

45. TERMINATION OF CONTRACT BY CITY (CONTRACTOR DEFAULT)

In the event of conduct by the CONTRACTOR which is determined by the PROJECT MANAGER or the to constitute default, the CITY may either suspend the Work under the provisions of TEMPORARY SUSPENSION OF WORK of these General Conditions or, upon ten (10) calendar days' written notice to the CONTRACTOR, terminate the Contract as provided herein. Default by the CONTRACTOR shall occur whenever it shall declare bankruptcy; become insolvent or assign its assets for the benefit of its creditors; fail to provide materials, equipment, or workmanship meeting the requirements of the Specifications; disregard or violate provisions of the Contract Documents or the PROJECT MANAGER's instructions; fail to prosecute the Work according to the approved progress schedule; or fail to provide a qualified representative, competent workers or Subcontractors. Upon request, the RECREATION AND PARK COMMISSION will provide the CONTRACTOR a hearing by the RECREATION AND PARK COMMISSION to contest the recommendation of the PROJECT MANAGER as to default by the CONTRACTOR.

In the event the Contract is terminated pursuant to this Article, the CITY may take possession of the Work and of all materials, tools, equipment, and property of the CONTRACTOR, which have been provided in connection with the Work, and may complete the Work by whatever method or means the CITY may select. The unpaid balance of the Contract cost for completing the Contract Work shall be used to complete the Work in accordance with the Contract Documents. If cost of completing the Work exceeds the unpaid balance, the CONTRACTOR shall pay the excess amount to the CITY. If such cost is less than the unpaid balance, the CONTRACTOR shall not have claim to the difference except to such extent as may be necessary, in the opinion of the PROJECT MANAGER, to reimburse the CONTRACTOR or the CONTRACTOR'S sureties for any unpaid expense properly incurred for materials, tools, equipment, property, and labor devoted to the prosecution of the Work, or which the CITY shall have received the benefit. In computing such expenses, as it relates to equipment and property, the salvage value at completion of Work shall be deducted from the salvage value at the time the contract was terminated, and the difference shall be considered as an expense. If after termination for failure of the CONTRACTOR to fulfill contractual obligations (CONTRACTOR Default), it is determined by a Court of competent jurisdiction that the CONTRACTOR had not failed to fulfill contractual obligations, the termination shall be deemed to have been for the convenience of the CITY. In such an event, adjustment of the Contract price shall be made as provided in TERMINATION OF CONTRACT BY CITY (CONTRACTOR NOT AT FAULT) of these General Conditions.

46. PRE-FINAL INSPECTION

Approximately two weeks before completion of the Work, the contractor will schedule a Pre-final Inspection to be attended by the Bureau of Contract Administration Inspector, the Project Manager, the Contractor and invited parties associated with the Project. At this time, a list of items requiring correction or completion before the Final Inspection will be compiled. In addition, at this time the Contractor shall arrange for the delivery of manufacturers' data, manuals, and operating instructions and keys to the appropriate Department of Recreation and Parks personnel.

47. FINAL INSPECTION

Approximately seven (7) days prior to completion of the Work, the Contractor shall first notify the Bureau of Contract Administration Inspector and then the Project Manager that he desires a Final Inspection of the Project.

During this inspection, which will be arranged as soon as possible, the Inspector, the Project Manager, the Contractor and other parties concerned with contractual requirements will compile a Final Inspection Correction List, incorporating all items of work and corrections required to complete the Project. This list must be completed within thirty (30) days of Final Inspection, or a new Final Inspection will be held and a new Final Inspection Correction List compiled.

48. PARTIAL ACCEPTANCE

The CITY shall have the right to utilize or place into service any item of equipment or other usable portion of the Work prior to completion of the entire project. Whenever the CITY plans to exercise said right, the CONTRACTOR will be notified in writing by the CITY, identifying the specific portion or portions of the Work to be so utilized or otherwise placed into service. Following inspection by the Bureau of Contract Administration's Final Inspector and establishment of a Final Inspection Correction List, a Statement of Partial Completion will be issued.

It shall be understood by the CONTRACTOR that until a Statement of Partial Completion is issued, all responsibility for care and maintenance of all items or portions of the Work to be placed in use shall be borne by the CONTRACTOR. Upon issuance of a Statement of Partial Completion, the CITY will accept responsibility for the protection and maintenance of all such items or portions of the Work described in the written notice, and it is further understood that the manufacturer's warranties of any affected equipment will commence not later than the date for commencement of the warranties indicated on the Statement of Partial Completion. However, the CONTRACTOR shall retain full responsibility for satisfactory operation of the total project and the CONTRACTOR'S guarantee period shall commence only after the final acceptance of the Contract by the RECREATION AND PARK COMMISSION. Such guarantee of total systems operation shall include that portion or portions previously placed into beneficial use by the CITY.

The issuance of a Statement of Partial Completion for any part of the Work shall not relieve the CONTRACTOR of its obligation to promptly remedy any omissions and latent or unnoticed defects in the Work covered by the Statement of Partial Completion. The CITY shall have the right to restrict the CONTRACTOR'S use of the occupied portion of the Work but shall allow the CONTRACTOR reasonable access to complete or correct items required by the Contract Documents.

The CITY may, if the Work is progressing satisfactorily, release part of the retention on portions of the Work for which a Statement of Partial Completion has been issued, provided that the following conditions have been met:

1. Partial final inspection corrections have been completed to the satisfaction of the INSPECTOR;
2. The CONTRACTOR submits a written request for release of retention which includes a verifiable valuation of the identified portions of the Work covered by the Statement of Partial Completion;
3. Impacted Subcontractors, major suppliers and the CONTRACTOR's Surety all agree in writing to release of retention;
4. If any minor corrections remain which do not directly affect operations or maintenance then twice the values of the remaining cleanup items shall be retained on each request for release; and
5. The CONTRACTOR signs a Change Order which specifically states the value of the retention being released.

The PROJECT MANAGER shall issue a no-change-in-contract-cost Change Order reflecting the Work for which a Statement of Partial Completion has been issued and the amount of the retention to be released. This Change Order shall authorize reduction of the retention on the next payment.

49. FINAL ACCEPTANCE

When all Work has been completed on the entire project, the CONTRACTOR shall notify the INSPECTOR and the PROJECT MANAGER in writing and request a final inspection by the INSPECTOR. The inspection conducted by the Final Inspector will include the CONTRACTOR and major Subcontractors' representatives. The CONTRACTOR shall promptly and diligently correct all items on the Final Inspection Correction List. The correction list Work will be reinspected until all Work is complete. If deemed necessary by the PROJECT

MANAGER, a deductive Change Order may be issued for twice the value of final correction list items remaining to be corrected to attain completion, and permit the acceptance of the Contract by the RECREATION AND PARK COMMISSION.

Final payment to the CONTRACTOR is made following action by the RECREATION AND PARK COMMISSION that formally adopts the recommendation of the PROJECT MANAGER to accept the Contract. Said action by the RECREATION AND PARK COMMISSION establishes the following:

1. The start date of the CONTRACTOR'S material and workmanship warranty/guarantee for the total project.
2. The start date of any equipment or material warranties for which the "warranty clock" had not started.

50. LIQUIDATED DAMAGES

Time is of the essence in completing the Work required by the Contract. If the CONTRACTOR fails or refuses to complete the Work or any part thereof within the time fixed by the terms of the Contract, or any approved extension thereof, the actual damage to the CITY due to the delay will be difficult or impossible to determine. In lieu thereof, the CONTRACTOR shall pay to the CITY, as fixed and agreed, liquidated damages for each calendar day of delay in completion, the sum of **$1,800.00 per day**. The CONTRACTOR shall be liable for the amount thereof. The CITY reserves the right, however, to terminate the CONTRACTOR's completing the Work, charging against the CONTRACTOR and its sureties any excess cost occasioned the CITY thereby, together with liquidated damages accruing until such time as the CITY may reasonably complete the Work.

Permitting the CONTRACTOR to continue and complete the Work, or any portion thereof, after the time fixed herein for completion, or after the expiration of any extensions of said time, shall in no way operate as a waiver on the part of the CITY of any of its rights under the Contract.

51. COMPENSATION FOR DELAY, DISRUPTION, AND UNANTICIPATED OVERHEAD

Notwithstanding anything to the contrary in the Contract Documents, CONTRACTOR agrees the provisions of this Article, set forth CONTRACTOR'S sole and exclusive rights to compensation for costs, expenses or damages, of any kind, arising from or relating to (i) delay, disruption, hindrance, interference, schedule compression, and the impact, ripple or cumulative effect thereof; or (ii) additional supervision, administration, excess, extended or extraordinary overhead, loss of productivity, or similar costs, expenses or damages incurred as a result of or related to extras, changes, additions or deletions in the Work, errors, omissions, conflicts or ambiguities in the Contract Documents, suspensions of the Work, acts or omissions of CITY or its representatives, agents, contractors or consultants, Differing Site Conditions, or other unforeseen circumstances, of any kind.

CONTRACTOR shall not be entitled to, and hereby conclusively waives, any right to recovery of compensation, costs, expenses or damages for delays, disruptions, hindrances or interferences (including without limitation interruption of schedules, extended, excess or extraordinary field and indirect overhead costs, loss of productivity and the impact, ripple or cumulative effect on other Work) that are the result of Unavoidable Delays or which are caused by the acts or omissions of CONTRACTOR or of its SUBCONTRACTORS, of any tier.

CONTRACTOR'S rights to recovery of compensation, costs, expenses and damages for delay, disruption, hindrance and interference (including without limitation interruption of schedules, extended, excess and extraordinary field and indirect overhead costs, loss of productivity and the impact, ripple or cumulative effect on other Work) that are the result of extras, changes, additions or deletions in the Work for which CONTRACTOR is entitled to an adjustment of the Contract Price as set forth in CHANGES AND EXTRA WORK of these General Conditions and shall constitute the sole, exclusive and complete compensation that the CITY is obligated to pay CONTRACTOR for all such costs, expenses and damages incurred by CONTRACTOR and its SUBCONTRACTORS, of every tier.

Time extension in calendar days will be granted only if delays are caused by unforeseen events beyond the control of both the CONTRACTOR and the City. Such delays will entitle the CONTRACTOR to an extension of time as provided herein, but the CONTRACTOR shall not be entitled to damages or additional payment due to

such delays. War, government regulations, labor disputes, strikes (when not brought solely against the CONTRACTOR, its subcontractors or material suppliers), fires, floods, adverse weather necessitating cessation of work, other similar action of the elements, inability to obtain materials, equipment or labor, required "extra work", or other specific reasons as may be further described in the specifications may constitute such a delay.

No extension of time will be granted for a delay caused by the inability to obtain materials unless the CONTRACTOR furnishes to the Project Manager documentary proof of the inability to obtain such materials in a timely manner in accordance with the sequence of the CONTRACTOR'S operations and the approved construction schedule.

The amount of time given to the CONTRACTOR is limited to the amount of time the Project is directly impacted by the above described delays. Direct impact means no other project work can proceed.

The CONTRACTOR may be compensated for delays caused solely by the failure of the City to furnish necessary rights-of-way, failure to deliver materials shown in the CONTRACTOR Documents to be furnished by the City, or for the suspension of the work by the City for its own convenience or benefit. If compensable delays could not have been avoided by the judicious handling of forces, equipment or plant, there shall be paid to the CONTRACTOR such amount as the General Manager may find to be fair and reasonable compensation for such part of the CONTRACTOR'S actual loss as was unavoidable.

If the CONTRACTOR desires payment for a delay as specified above or an extension of time, it shall, within thirty (30) days after the beginning of the delay, file with the General Manager a written request and report as to the cause and extent of the delay. The request of payment or extension must be made at least fifteen (15) days before the specified completion date, so as to allow for appropriate investigation. Failure by the CONTRACTOR to file these items within the times specified will be considered grounds for refusal by the City to consider such a request.

Any and all extensions of time granted under the Provisions of these Specifications shall not release the sureties on the bonds accompanying the Contract for the work required herein. The bonds shall remain in full force and effect until the discharge of the Contract.

CHANGES TO THE CONTRACT

52. CHANGES AND EXTRA WORK

The PROJECT MANAGER may, at any time, with or without notice to the Sureties, by written order designated or indicated to be a Change Order, order performance of extra work or make any change, addition or deletion in the Work, including but not limited to changes in the Specifications including Plans and Designs; in the time, method or manner of performance of the Work; in the CITY furnished facilities, equipment, materials, services, or site; or directing acceleration in the performance of the Work.

Upon receipt of such Change Order, the CONTRACTOR shall promptly proceed with the Work covered thereby, which shall be performed in accordance with the provisions of the Contract Documents except as otherwise specifically provided.

In the event that CONTRACTOR receives any written order or direction by the CITY, PROJECT MANAGER that is not so designated or indicated to be a Change Order, but which CONTRACTOR believes to constitute an extra, change, addition or deletion in the Work, then CONTRACTOR shall, prior to performance of any Work related thereto, give written confirmation notice to the PROJECT MANAGER confirming CONTRACTOR'S belief that such order or direction is believed to be a Change Order within one (1) working day of CONTRACTOR'S receipt of such order or direction.

CONTRACTOR conclusively waives any right to additional compensation, costs, expenses, damages or extension of time associated with an extra, change, addition or deletion to the Work that is performed by CONTRACTOR without either (i) a written order signed by the CITY, PROJECT MANAGER designated or indicated to be a Change Order and any change, addition or deletion, or (ii) a written confirmation notice issued by CONTRACTOR in accordance with the provisions of this Article.

Should a change be required and it is not feasible to delay construction of that portion of the Work until such time as a regular Change Order can be issued, and the estimated increase in Contract cost does not exceed

the amount which can be authorized by the PROJECT MANAGER, an Emergency Change Authorization, in writing, will be issued in the field by the PROJECT MANAGER, and the CONTRACTOR shall then proceed with the Work without delay. Such Emergency Change Authorization shall be followed by a subsequent regular Change Order.

Except as provided in this Article, no order, Statement, or conduct of the PROJECT MANAGER shall be treated as a change under this Article or shall entitle the CONTRACTOR to an adjustment in the Contract Price or Contract Completion Date.

If any change under this Article causes an increase or decrease in the CONTRACTOR'S cost or the time required to perform any part of the Work under this Contract, whether or not said costs or time are specified by any order, the PROJECT MANAGER will make an adjustment to the Contract Price and modify the Contract in writing. Except for claims based on defective Specifications, no claim for any change under this Article shall be allowed for any costs incurred more than twenty (20) calendar days before the CONTRACTOR gives written notice as required. Except as otherwise provided in the Contract Documents, in the case of defective specifications for which the PROJECT MANAGER is responsible, the adjustment shall include any increased cost the CONTRACTOR reasonably incurred in attempting to comply with those defective specifications.

If the CONTRACTOR intends to assert a claim for an adjustment in the Contract Price under this Article, it must, within twenty (20) calendar days after receipt of a written Change Order or the furnishing of a written confirmation notice as hereinbefore specified, submit a written statement to the PROJECT MANAGER setting forth the general nature and monetary extent of such claim and all factual grounds therefor. The CONTRACTOR may include the statement of claim in the written notice as hereinbefore specified. Failure to comply with the twenty (20) calendar day notice requirement shall be deemed a waiver of claims by the CONTRACTOR.

No adjustment shall be made under this Article for any suspension, delay, interruption, change or any other cause, to the extent that an adjustment is provided for or excluded under any other provision of the Contract.

Recovery of compensation, costs, expenses or damages resulting from delay, disruption, hindrance, or interference in the performance of the Work (including without limitation interruption of schedules, extended, excess or extraordinary field overhead and indirect overhead costs, loss of productivity and the impact, ripple or cumulative effect on other Work), shall not be permitted, and all rights thereto are conclusively waived by CONTRACTOR, except to the extent allowed by COMPENSATION FOR DELAY, DISRUPTION AND UNANTICIPATE OVERHEAD of these General Conditions.

No claim by the CONTRACTOR shall be allowed if the claim is made after final payment under this Contract.

53. DIFFERING SITE CONDITIONS

The following provisions shall apply only in the event that there is not a Geotechnical Baseline Report for the Project. If a Geotechnical Baseline Report is so identified, then the provisions of this Article shall not apply and the CONTRACTOR'S rights arising from Differing Site Conditions shall be governed solely by the provisions of the General Requirements pertaining to the CONTRACTOR'S rights in the event of Differing Site Conditions.

Upon discovery and before further disturbance of any unforeseen conditions, the CONTRACTOR shall immediately notify the INSPECTOR and the PROJECT MANAGER, followed by a written notice to the PROJECT MANAGER within twenty-four (24) hours of subsurface or latent physical conditions at the site differing materially from those indicated in the Contract Documents; or unknown physical conditions at the site, of an unusual nature, differing materially from those ordinarily encountered and generally recognized as inherent in the Work of the character provided for in this Contract; or materially differing from that represented in the Contract Documents which the CONTRACTOR believes may be hazardous waste, as defined in the California Health and Safety Code, that is required to be removed to a Class I, Class II or Class III disposal site in accordance with provisions of existing law.

The PROJECT MANAGER shall promptly investigate the conditions. If the PROJECT MANAGER finds that conditions materially differ and will cause an increase or decrease in the CONTRACTOR'S cost or the time required to perform any part of the Work under this contract, whether or not changed as a result of such conditions, the PROJECT MANAGER shall, make an adjustment in the Contract Price by Modification to the Contract in writing.

If the CONTRACTOR intends to seek an adjustment to the Contract Price or Contract Completion Date based upon this Article, it must, within twenty (20) calendar days after it first discovered or should have discovered in the exercise diligence and extreme care the existence of Differing Site Conditions, submit a written statement setting forth a detailed cost breakdown in the form required by Article 27, PAYMENT FOR CHANGES AND EXTRA WORK of the General Requirements, setting forth the basis of CONTRACTOR'S calculation of the costs saved or, detailed information demonstrating the effect on the CONTRACTOR'S schedule of performance in the same manner as required by the Contract Documents for obtaining approval of extensions of time, identification of the Escrow Bid Documents that formed the basis of the CONTRACTOR'S bid estimate to perform the Work affected by such conditions, and a complete and detailed explanation of the factual basis for the request.

Failure by CONTRACTOR to strictly comply with the requirements of this Article concerning the timing and content of any notice of Differing Site Conditions or of any request for adjustment in Contract Price or Contract Completion Date based on Differing Site Conditions shall be deemed waiver of any claim by the CONTRACTOR for increase in the Contract Price or extension of the Contract Completion Date by reason of such conditions.

CONTRACTOR'S right to compensation for (i) delay, disruption, hindrance, interference, schedule compression, and the impact, ripple or cumulative effect thereof; or (ii) additional supervision, administration, excess, extended or extraordinary overhead, loss of productivity, or similar costs, expenses or damages incurred as a result of or related to any Claim based on Differing Site Conditions shall be limited to such sums as are allowable under COMPENSATION FOR DELAY, DISRUPTION, AND UNANTICIPATED OVERHEAD of these General Conditions.

No claim by the CONTRACTOR for an adjustment hereunder be allowed if asserted after final payment under this Contract.

LEGAL REQUIREMENTS

54. CLAIMS AND PROTESTS

A Claim or Protest that involves an extra, change, addition or deletion to the Work as set forth in CHANGES AND EXTRA WORK of these General Conditions shall arise upon issuance of a final decision of the PROJECT MANAGER denying, in whole or in part, a request for adjustment in the Contract Price or Contract Completion Date; provided however, that failure to comply with the requirements of CHANGES AND EXTRA WORK of these General Conditions shall be conclusively deemed to constitute grounds to deny such Claim or Protest.

A Claim or Protest that does not involve an extra, change, addition or deletion to the may be asserted only if the CONTRACTOR shall immediately and prior to performing the Work affected thereby give written notice to the PROJECT MANAGER of such circumstances and of CONTRACTOR'S intention to file a Claim or Protest based thereon. Unless otherwise directed by the PROJECT MANAGER the CONTRACTOR shall proceed without delay to perform the Work and to conform to any order, instruction, or decision of the PROJECT MANAGER with respect thereto.

The CONTRACTOR shall, within twenty (20) calendar days after it first knew, or in the exercise of diligence and extreme care should have known, of the circumstances giving rise to the Claim or Protest, file a written Claim or Protest with the PROJECT MANAGER, stating in detail all objections, grounds and reasons therefore. The CONTRACTOR shall, upon instruction by the PROJECT MANAGER provide, within ten (10) days or such other time as agreed to between the PROJECT MANAGER, the INSPECTOR, and the CONTRACTOR, any and all documents, records or other materials identified by the PROJECT MANAGER as necessary for the resolution of the CONTRACTOR's Claim or Protest.

Claims or Protests seeking time extensions shall be accompanied by such documentation as is required by Article 18, CONTRACTOR'S CONSTRUCTION SCHEDULE AND REPORTS of the General Requirements. Claims or Protests seeking recovery of compensation or adjustments to the CONTRACT PRICE, whether or not based on extras, changes, additions or deletions to the Work, shall be in the form of Change Order Cost Quotations prepared in accordance with and subject to all of the requirements of Article 27, PAYMENT FOR CHANGES AND EXTRA WORK of the General Requirements, including without limitation the prohibition on use of total cost and modified total cost methodologies.

CONTRACTOR waives all rights to assert any claims or seek any relief in the form of extensions of time or recovery of additional compensation, costs, expenses, damages from the CITY that are not presented as a Claim or Protest in the manner specified and within the time stated herein. CONTRACTOR further hereby agrees that in the interest of avoiding the additional expense and potential inequity of piecemeal resolution of Claims or Protests, all decisions by PROJECT MANAGER shall be final and binding not only as to all matters asserted in the Claim or Protest, but also as to all matters (including without limitation all rights to extensions of time and recovery of extra compensation, costs, expenses and damages) not asserted in the Claim or Protest that were known to CONTRACTOR, or that could have been reasonably discovered by CONTRACTOR in the exercise of diligence and extreme care, at the time of submission of the Claim or Protest and that are in any way related to the subject matter of the Claim or Protest. All orders, instructions and decisions of the PROJECT MANAGER will be limited to matters properly falling within their respective authority as specified in AUTHORITY OF THE RECREATION AND PARK COMMISSION, PROJECT MANAGER AND INSPECTOR of these General Conditions.

The CONTRACTOR will be informed of the PROJECT MANAGER's decision within thirty (30) days after the CONTRACTOR last submits data pertinent to the protest previously mentioned. In the case of a Claim or Protest that involves an extra, change, addition or deletion to the Work as set forth in CHANGES AND EXTRA WORK of these General Conditions, if the Contractor accepts the decision of the PROJECT MANAGER, then the CONTRACTOR and CITY shall enter into a Change Order adjusting the Contract Price and Contract Completion Date in accordance with such decision. In the case of a Claim or Protest does not involve an extra, change, addition or deletion to the Work as set forth in CHANGES AND EXTRA WORK of these General Conditions and the CONTRACTOR accepts the decision of the PROJECT MANAGER, then the CONTRACTOR and CITY shall enter into a Modification of the Contract setting forth the terms of the decision and, if appropriate, its effect on the Contract Price or Contract Completion Date. If the CONTRACTOR does not accept the decision of the PROJECT MANAGER, then further appeal of the PROJECT MANAGER's or the decision must be made to the RECREATION AND PARK COMMISSION in writing within twenty (20) calendar days after receipt of the PROJECT MANAGER's decision. The RECREATION AND PARK COMMISSION shall afford the CONTRACTOR an opportunity to be heard and to offer evidence in support of its appeal. All determinations of the RECREATION AND PARK COMMISSION with respect to Claims or Protests shall be final and binding.

In all matters concerning the validity, interpretation, performance, effect or otherwise of the Contract, the Federal regulations (if and to the extent expressly incorporated by reference in the Contract Documents), the laws of the State of California, and the Charter of the City of Los Angeles shall govern and be applicable. Pending final disposition of a protest, the CONTRACTOR shall proceed diligently with the performance of the Contract and in accordance with the previously mentioned decision.

Any Claim or Protest, including without limitation any Claim or Protest filed on behalf of or having its source in a claim by Subcontractor, Sub-Subcontractor, or Supplier, at any tier, which the CONTRACTOR chooses to make to the CITY, shall be accompanied by the certification language set forth below signed by a responsible managing officer of the CONTRACTOR'S organization, who has the authority to sign Subcontracts or Purchase Orders on behalf of the CONTRACTOR, and who has personally investigated and confirmed the truth and accuracy of the matters set forth in such certification. Submission of certification in accordance herewith is a condition precedent to the CITY's consideration of or decision on the Claim or Protest and to the filing and maintenance of any legal action or proceeding to enforce or recover monies under such Claim or Protest. Failure to submit such a certification along with the Claim or Protest, shall result in the Claim or Protest being returned to the CONTRACTOR without any decision and shall waive the CONTRACTOR's right to pursue the Claim or Protest either on its own behalf or on behalf of such Subcontractor or Supplier.

I hereby certify under penalty of perjury that I am a managing officer of (CONTRACTOR'S name) and that I have reviewed this Claim or Protest presented herewith on CONTRACTOR'S behalf and/or on behalf of (Subcontractor's/Supplier's name(s)) and that the following statements are true and correct:

1. The facts alleged in or that form the basis for the Claim or Protest are true and accurate; and,

2. CONTRACTOR does not know of any facts or circumstances, not alleged in the Claim or Protest, that by reason of their not being alleged render any fact or statement alleged in the Claim or Protest materially misleading; and,

3. CONTRACTOR has, with respect to any request for money or damages alleged in or that forms the basis for the Claim or Protest, reviewed the job cost records (including those maintained by CONTRACTOR and by any Subcontractor or Supplier, of any tier, that is asserting all or any portion of the Claim or Protest) and confirmed with mathematical certainty that the losses or damages suffered by CONTRACTOR and /or such Subcontractor or Supplier were in fact suffered in the amounts and for the reasons alleged in the Claim or Protest; and,

4. CONTRACTOR has, with respect to any request for extension of time or claim of delay, disruption, hindrance or interference alleged in or that forms the basis for the Claim or Protest, reviewed the job schedules (including those maintained by CONTRACTOR and by any Subcontractor or Supplier, of any tier, that is asserting all or any portion of the Claim or Protest) and confirmed on an event-by-event basis that the delays or disruption suffered by CONTRACTOR and /or such Subcontractor or Supplier were in fact experienced for the durations, in the manner, and with the consequent effects on the time and/or sequence of performance of the Work, as alleged in the Claim or Protest; and,

5. CONTRACTOR has not received payment from CITY for, nor has CONTRACTOR previously released CITY from, any portion of the Claim or Protest.

Signature: _____

Name: _____

Title: _____

Company: _____

Date: _____

No Claim or Protest by the CONTRACTOR shall be allowed if made after final payment under this Contract.

55. COMMENCEMENT OF STATUTE OF LIMITATIONS

Unless otherwise provided in this Contract, all claims, counterclaims, disputes and other matters in question between the CITY and the CONTRACTOR arising out of or relating to this Contract or the breach of it will be decided by a Court of competent jurisdiction. It is understood that this Contract is executed and to be performed within the City and County of Los Angeles.

Any applicable statute of limitations shall commence to run and any alleged cause of action by the CONTRACTOR against the CITY arising out of or related to the Project shall be deemed to have accrued in any and all events no later than 30 days after CONTRACTOR'S submittal of its last application for progress payment.

56. GOVERNING LAW

The terms and conditions of this Contract shall be construed and interpreted under, and all respective rights and duties shall be governed by, the laws of the State of California. Wherever applicable each provision of these Contract Documents shall be interpreted in such a manner as to be effective and valid under applicable law, but if any provision of these Contract Documents shall be prohibited by or invalid under applicable law, such provision shall be ineffective to the extent of such prohibition or invalidity, without invalidating the remainder of such provision or the remaining provisions of these Contract Documents.

57. VENUE

This Contract will be executed and performed within the City and County of Los Angeles, California.

58. NO WAIVER OF RIGHTS

Neither the inspection by the CITY, nor any order by the CITY for payment of money, nor any payment for or acceptance of the whole or any part of the Work by the CITY, nor any extension of time, nor any possession taken by the CITY, shall operate as a waiver of any provision of this Contract, or any power herein reserved to the CITY, or any right to damages herein provided, nor shall any waiver of any breach in this Contract be held to be a waiver of any other or subsequent breach.

59. ACCEPTANCE OF FINAL PAYMENT CONSTITUTES RELEASE

The acceptance by the CONTRACTOR of final payment shall release the CITY, the PROJECT MANAGER, the INSPECTOR, their officers, agents, representatives, or employees, as representatives of the CITY, from all claims and all liability to the CONTRACTOR for all things done or furnished in connection with the Work and every act of the CITY relating to or arising out of the Work.

60. PATENTS AND COPYRIGHTS

The CONTRACTOR shall include in its bid the patent fees or royalties on any patented article or process which may be furnished or used in the Work. The CONTRACTOR shall indemnify and hold the CITY harmless from any legal action that may be brought for infringement of patents. The CONTRACTOR'S attention is directed to "Notice of Patents, Data, and Copyright Regulations" of the Federal Labor Standards.

The CONTRACTOR shall bear all costs arising from the use of patented goods and /or processes used on and/or incorporated into the Work. When use of these goods and/or processes are judged to be an infringement and their use is banned, the Contractor, at its own expense, shall, with concurrence of the PROJECT MANAGER, do one of the following:

1. Secure for the CITY the right to continue using goods and/or processes by suspension of the injunction or by procuring a license(s);
2. replace said goods and/or processes with non-infringing goods and /or processes;
3. modify said goods and/or processes so that they become non-infringing; or
4. remove said goods and/or processes and refund the sum paid therefore without prejudice to any other rights of the CITY.

The preceding Subarticle shall not apply to any goods manufactured to the detailed design of the CITY contained in the Contract Documents.

61. PUBLIC RECORDS ACT

All records, documents, plans, specifications and all other information relating to the conduct of the CITY's business, including information submitted by the CONTRACTOR, shall become the exclusive property of the CITY and except as provided by law shall be deemed public records. Said information shall be subject to the provisions of the California Public Records Act (Government Code Sections 6250 *et seq.*).

Under no circumstances, will the CITY be responsible or liable to the CONTRACTOR, submitter or any other party for the disclosure of any records or information submitted to the CITY, regardless of whether such records or information are labeled "TRADE SECRET", "CONFIDENTIAL", or "PROPRIETARY" (or words to similar effect) and regardless of, whether the disclosure is required by law or a court order or occurs through inadvertence, mistake, or negligence on the part of the CITY or its officers, employees, and/or contractors.

The CITY will not advise as to the nature or content of documents entitled to protection from disclosure under the California Public Records Act", including interpretations of the Act or the definition of "Trade Secret". The submitting party shall be solely responsible for all determinations made under the Act, and where appropriate for clearly and prominently marking each and every page or sheet of information with "TRADE SECRET", "CONFIDENTIAL", or "PROPRIETARY". Each submitting party is advised to contact its own legal counsel concerning the California Public Records Act and its applicability to the submitting party's own circumstances.

In the event of litigation concerning the disclosure of any information submitted by the submitting party, the CITY's sole involvement will be as a stake holder, retaining the information until otherwise ordered by a court. The submitting party, at its sole expense and risk, shall be responsible for any and all fees and costs for prosecuting or defending any action concerning the information, and shall indemnify and hold the CITY harmless from all costs and expenses including attorneys' fees, in connection with such action.

RESEDA SKATING FACILITY

II. GENERAL REQUIREMENTS

W.O. No. E170121D

Department of
Recreation and Parks

CONTENTS
GENERAL REQUIREMENTS

Article **Page**

	GENERAL	1
1.	ABBREVIATIONS AND REFERENCE STANDARDS	1
	CONTRACT DOCUMENTS	4
2.	ISSUANCE OF PLANS AND SPECIFICATIONS **(revised as of 03/21/14)**	4
3.	DIVISIONS OF SPECIFICATIONS	4
	THE CONTRACTOR'S RESPONSIBILITIES	4
4.	SITE SECURITY	4
5.	ENVIRONMENTAL CONTROL AND MITIGATION	5
6.	MOBILIZATION	9
7.	REMOVAL, CLEANUP, AND DEMOBILIZATION	11
8.	RECORD DRAWINGS	10
9.	EXCAVATION SHORING, FORMS, AND FALSEWORK	11
10.	SUBMITTALS	12
11.	SUBSTITUTIONS AND "OR EQUAL" SUBMITTAL	13
	MATERIALS, EQUIPMENT, AND APPLIANCES	14
12.	SURVEYING	14
13.	SITE INVESTIGATION	15
14.	INSPECTION OF THE WORK	15
15.	SAMPLING, TESTING AND FABRICATION INSPECTION	16
16.	GUARANTY/WARRANTY	18
17.	STORAGE OF MATERIALS AND EQUIPMENT	19
	PROGRESS OF THE WORK	19
18.	CONSTRUCTION SCHEDULE AND COMMENCEMENT OF WORK	19
19.	WORK BY CITY OR OTHERS	22
	PAYMENT FOR WORK	22
20.	PARTIAL PAYMENTS **(Revised as of 02/12/16)**	22
21.	PAYMENT FOR MOBILIZATION	24
22.	PAY ITEM DEFINITIONS	25
23.	SCHEDULE OF VALUES	26
24.	NOTICE TO WITHHOLD AND/OR STOP NOTICE	26
25.	FINAL PAYMENT	27
26.	CHANGE ORDER REQUESTS	27
27.	PAYMENT FOR CHANGES AND EXTRA WORK	27
28.	PRICE REDUCTION FOR DEFECTIVE COST OR PRICING DATA	34
29.	PAYMENT FOR MATERIALS OR EQUIPMENT DELIVERED AND STORED ON THE JOB	35

CONTENTS
GENERAL REQUIREMENTS

Article **Page**

30. PAYMENT FOR MATERIALS OR EQUIPMENT STORED OFF THE JOBSITE 36
31. PAYMENT FOR PERMITS 37
32. AUDIT AND ACCESS TO RECORDS 37
MISCELLANEOUS 38
33. INTERFACE/COORDINATION REQUIREMENTS 38
34. PROGRESS PHOTOGRAPHS 39
35. COMMUNITY RELATIONS 39
36. PROJECT CLOSEOUT 39
ATTACHMENTS 1
ATTACHMENT TO GENERAL REQUIREMENTS ARTICLE 27 1
CHANGE ORDER COST QUOTATION FORM 2

GENERAL

1. ABBREVIATIONS AND REFERENCE STANDARDS

A. ABBREVIATIONS

Wherever the following abbreviations are used they shall have the meanings indicated:

AASHTO	American Association of State Highway and Transportation Officials
ACI	American Concrete Institute
AGA	American Gas Association
AGMA	American Gear Manufacturers' Association
AI	The Asphalt Institute
AISC	American Institute of Steel Construction
AISI	American Iron & Steel Institute
AITC	American Institute of Timber Construction
AMCA	Air Moving and Conditioning Association
ANSI	American National Standards Institute
APA	American Plywood Association
API	American Petroleum Institute
AREA	American Railway Engineering Association
ASCE	American Society of Civil Engineers
ASHRAE	American Society of Heating, Refrigerating, and Air Conditioning Engineers
ASME	American Society of Mechanical Engineers
ASQC	American Society for Quality Control
ASTM	American Society for Testing and Materials
AWPA	American Wood Preservers Institute
AWS	American Welding Society
AWWA	American Water Works Association
CBM	Certified Ballast Manufacturers
CRS	Concrete Reinforcement and Steel Institute
EPA	Environmental Protection Agency
ETL	Department of Building & Safety Electrical Test Laboratory
FCI	Fluid Control Institute, Inc.
ICBO	International Conference of Building Officials
ICEA	Insulated Cable Engineers Association
IEEE	Institute of Electrical and Electronics Engineers
IPCEA	Insulated Power Cable Engineers Association
ISA	Instrument Society of America
LABC	City of Los Angeles Building Code
NAAMM	National Architectural Association of Metal Manufacturers
NEC	National Electrical Code
NECA	National Electrical Contractors Association

NEMA	National Electrical Manufacturers Association
NOAA	National Oceanic and Atmospheric Administration (Dept. of Commerce)
OSHA	Occupational Safety and Health Administration (Dept. of Labor)
PCA	Portland Cement Association
RCSC	Research Council on Structural Connections of the Engineering Foundation
SAMA	Scientific Apparatus Manufacturer's Association
SSPWC	Standard Specifications for Public Works Construction
SWRCB	State Water Resources Control Board
UBC	Uniform Building Code, International Conference of Building Officials
UL	Underwriters Laboratories, Inc.
USGS	United States Geological Survey
WATCH	Work Area Traffic Control Handbook
WCLIB	West Coast Lumber Inspection Bureau
WCRSI	Western Concrete Reinforcing Steel Institute
WRI	Wire Reinforcement Institute
WWPA	Western Wood Products Association

B. REFERENCE STANDARDS

1. APPLICABLE PUBLICATIONS - Whenever in these Specifications references are made to published specifications, codes, standards, or other requirements, it shall be understood that wherever no date is specified, only the latest specifications, standards, or requirements of the respective issuing agencies which have been published as of the date that the Work is advertised for bids shall apply; except to the extent that said standards or requirements may be in conflict with applicable laws, ordinances or governing codes. No requirements set forth herein or shown on the Drawings shall be waived because of any provision of, or omission from, said standards or requirements.

2. SPECIALISTS' ASSIGNMENTS - In certain instances, specification text requires (or implies) that specific Work is to be assigned to specialists or expert entities, which must be engaged for the performance of that Work. Such assignments shall be recognized as special requirements over which the CONTRACTOR has no choice or option. These requirements shall not be interpreted so as to conflict with the enforcement of building codes and similar regulations governing the Work; also they are not intended to interfere with local union jurisdiction settlements and similar conventions. Such assignments are intended to establish which party or entity involved in a specific unit of Work is recognized as "expert" for the indicated construction processes or operations. Nevertheless, the final responsibility for fulfillment of the entire set of Contract requirements remains with the CONTRACTOR.

3. CODES AND SAFETY STANDARDS - Without limiting the generality of other requirements of the Specifications, Work specified herein shall conform to or exceed the applicable requirements of the following Codes and Safety Standards.

   a. Applicable Codes:

      - City of Los Angeles Building Code
      - City of Los Angeles Mechanical Code
      - City of Los Angeles Plumbing Code
      - City of Los Angeles Fire Code
      - City of Los Angeles Electrical Code

   b. References herein to "Building Code" shall mean City of Los Angeles Building Code. Similarly references to "Mechanical Code," "Plumbing Code," "Fire Code," and "Electric Code" shall mean City of Los Angeles Mechanical Code, City of Los Angeles Plumbing Code, City of Los Angeles Fire Code and City of Los Angeles Electric Code respectively.

   c. Applicable Safety Standards:

      - OSHA Regulations for Construction
      - OSHA Standards
      - Cal-OSHA

   d. References herein to "OSHA Regulations for Construction" shall mean Title 29, Part 1926, Construction Safety and Health Regulations, Code of Federal Regulations (OSHA), including all changes and amendments thereto.

   e. References herein to "OSHA Standards" shall mean Title 29, Part 1910, Occupational Safety and Health Standards, Code of Federal Regulations (OSHA), including all changes and amendments thereto.

   f. References herein to "Cal-OSHA" shall mean State of California, Department of Industrial

Relations, as amended to date, and all changes and amendments thereto which are effective as of the date of construction.

g. The latest edition of the codes as approved and adopted for use by the CITY as of the date of award shall apply to the Work herein, including all addenda, modifications, amendments, or other lawful changes thereto.

4. STANDARD SPECIFICATIONS - References in the Contract Documents to "Standard Specifications" shall mean the Standard Specifications for Public Works Construction (SSPWC), including all current supplements, addenda, and revisions thereof, except that the provisions therein for measurement and payment shall not apply.

5. STANDARD PLANS - References herein to "Standard Plans" shall mean the Standard Plans issued by the City of Los Angeles which drawings are hereby incorporated in and made a part of these Contract Documents, and copies of which are available for a fee.

6. CONFLICT BETWEEN CODES, SAFETY STANDARDS, REFERENCE STANDARDS, DRAWINGS AND OTHER CONTRACT DOCUMENTS - In case of conflict between codes, reference standards, drawings and other Contract Documents, the most stringent requirements shall govern. Conflicts shall be brought to the attention of the PROJECT MANAGER for clarification and directions prior to ordering or providing any materials or labor. The CONTRACTOR shall bid for the most stringent requirements.

CONTRACT DOCUMENTS

2. ISSUANCE OF PLANS AND SPECIFICATIONS

A. Unless otherwise provided in the Contract Documents, the PROJECT MANAGER will furnish to the CONTRACTOR TEN (10) sets each of the Plans, Specifications and, Geotechnical Report without charge. Additional sets desired by the CONTRACTOR or Subcontractors will be furnished upon request, but at the CONTRACTOR's expense.

B. Drawings, Specifications, Special Provisions, and copies thereof are the property of the CITY. They are not to be used on other work. Necessary bid documents will be available to prospective bidders. Bidders will be issued plans and specifications for a fee. This fee is stated in the "Notice Inviting Bids" of the Contract Documents.

C. Standard Plans for the CITY, which are noted on the drawings, are available for a fee. Also see the City of Los Angeles, Bureau of Engineering Web pages for Standard Plans at http://eng.lacity.org/techdocs/stdplans.

3. DIVISIONS OF SPECIFICATIONS

The specifications are arranged into the Construction Specifications Institute (CSI) sixteen (16) Division format with an additional Division 17 for Instrumentation and Controls (if applicable).

A. The organization of the Specifications into divisions, sections, parts, and paragraphs shall not control or limit the CONTRACTOR in dividing the Work among Subcontractors of any tier. The CONTRACTOR shall be solely responsible for all subcontract arrangements of Work regardless of the organization of the specifications.

B. Titles of Specification sections and paragraphs are for convenience of reference only, and do not form a part of the Specifications.

THE CONTRACTOR'S RESPONSIBILITIES

4. SITE SECURITY

A. In addition to the responsibilities specified in other Articles of these Requirements, and the General Conditions, the CONTRACTOR shall be responsible for the security of all its construction equipment, materials, tools, facilities, and vehicles (personal, private, or contractual) while performing the Work of this Contract. This requirement shall be effective twenty-four (24) hours per day for the duration of the Contract. CONTRACTOR shall familiarize themselves with the location of the job site and scan the premises by means necessary to protect the property, including but not limited to, provision of fencing, guards, security system or other means as necessary.

5. ENVIRONMENTAL CONTROL AND MITIGATION

A. CONTROL

1. Fugitive Dust and Smoke Control:

Comply with the requirements of Title 8, California Code of Regulations, concerning handling of asbestos dust.

a. Criteria for Fugitive Dust - Detailed descriptions and explanations of specific impact mitigation measures are contained in South Coast Air Quality Management District (SCAQMD) Rules and Regulations (Rule 403, Limitation on Fugitive Dust Emissions). Key features of mitigation options described are as follows:

i. Do not cause or allow emissions of fugitive dust from any transport, handling, construction or storage activity to remain visible in atmosphere beyond property line of the emission source.

ii. Take precautions to minimize fugitive dust emissions from operations involving demolition, excavation, grading, clearing of land and disposal of solid waste. Utilizes at least one Reasonably Available Control Measure (RACM) for each potential source of fugitive dust. Do not cause or allow particulate matter to exceed 50 mg/m^3 when determined as difference between upwind and downwind samples collected on high volume particulate matter samplers or other EPA approved equivalent method for PM-10 monitoring at the property line for a five hour period during the time of active operations.

iii. Take precautions to prevent visible particulate matter from being deposited upon public roadways as a direct result of their operations. Precautions include, removal of particulate matter from equipment before movement to paved streets or prompt removal of material from paved streets onto which such material has been deposited.

b. As a minimum - Use the following procedures and techniques:

i. Cover loads of materials, debris and soil transported from construction sites. Trim or remove loose material from loads before leaving Project.

ii. Daily or more frequently, if necessary, water down and sweep adjacent streets and sidewalks that have construction vehicles carrying debris and excavated materials.

iii. Establish regular cycles and locations for cleaning trucks that haul soil from site.

iv. Water down construction sites whenever required to suppress dust, particularly during handling of excavation soil or debris or during demolition.

v. If conveyors are used, cover all transfer points along conveyor system moving soil. Minimize drop height to the stockpile. Provide a sprinkler system that will apply water to soil before it drops to stockpile.

vi. Any adapted measures developed by SCAQMD on Best Available Control Measures (BACM) for Fugitive Dust and Rule 403 will be incorporated into the site operations for Fugitive Dust Control.

vii. Burning of wastes is prohibited. Remove scrap and waste material and dispose of in accordance with laws, codes, regulations, ordinances and permits.

viii. Use construction equipment designed and equipped to prevent or control air pollution in conformance with most restrictive regulations of EPA, State and local authorities. Maintain evidence of such design and equipment and make available for inspection by Authority or its designee.

ix. Establish and maintain records of routine maintenance program for internal combustion engine powered vehicles and equipment used on Project. Keep records available for inspection by Authority or its designee.

x. Comply with the requirements of Title 8, California Code of Regulations, concerning handling of asbestos dust.

xi. Implement Fugitive Dust Measures listed in tables 1 and 2 of SCAQMD Rule 403 and perform record keeping in accordance with Sections (e)(1) of said rule. Make records available to Authority or its designee for inspection.

2. Rubbish Control

a. Through all phases of construction, including suspension of Work and until final acceptance of the Project, keep the site of the Work and other areas used by it in a neat and clean condition, and free from an accumulation of rubbish and debris. Dispose of rubbish and waste materials of any nature occurring at the worksite and establish regular intervals of collection and disposal of such materials and waste. Keep CONTRACTOR haul roads free from dirt, rubbish, and unnecessary obstructions resulting from its operations. Take care to prevent spillage on haul routes. Remove such spillage immediately and clean the area. Confine equipment and material storage to areas approved by the PROJECT MANAGER. Dispose of rubbish and surplus materials off the construction site, at the CONTRACTOR's expense, in accordance with local codes and ordinances governing locations and methods of disposal, and in conformance with all applicable safety laws, and the requirements of the OSHA Safety and Health Standards for Construction. Include cleanup cost in the CONTRACTOR's Bid.

3. Sanitation

a. Fixed or portable chemical toilets shall be provided for the use of the CONTRACTOR's employees. These accommodations shall be maintained in a neat and sanitary condition. Toilets at construction job sites shall conform to the requirements of Title 8, California Code of Regulations.

b. Wastewater conveyance and disposal shall not be interrupted. Should the CONTRACTOR disrupt existing sewer facilities, sewage shall be conveyed in closed conduits and disposed of in a sanitary sewer system. Sewage shall not be permitted to flow in trenches or be covered by backfill. Establish a regular schedule for collection of sanitary and organic waste. Dispose of wastes and refuse from sanitary facilities provided by the CONTRACTOR or organic material wastes from any other source related to the CONTRACTOR's operations away from the site in a manner satisfactory to the INSPECTOR and in accordance with laws and regulations pertaining thereto. Dispose of such wastes at the CONTRACTOR's expense.

4. Chemicals

The following paragraph does not relieve the CONTRACTOR from its responsibility for obtaining

prior approval from the PROJECT MANAGER for chemical usage when otherwise required.

a. Provide four (4) copies of the MSDS to the PROJECT MANAGER for all chemicals used during Project construction or furnished for Project operation, prior to bringing them on site, whether soil conditioning agents, lubricants, defoliant, soil sterilant, herbicide, pesticide, disinfectant, polymer, soil conditioning agents, lubricants, reactant, or of other classification, which shall show approval of either the U.S. Environmental Protection Agency or the U.S. Department of Agriculture. Use of all such chemicals and disposal of residues shall be in strict accordance with the printed instructions of the manufacturer.

5. Odor Control

a. The CONTRACTOR shall furnish all labor, materials, and equipment required and shall carry out effective measures wherever and as often as necessary to prevent the discharge of a nuisance odor from its operation into the atmosphere in such quantity as will violate the regulations of any legally constituted authority. During construction, the CONTRACTOR shall notify the PROJECT MANAGER and the INSPECTOR at least forty-eight (48) hours in advance when potential odor-causing activities are scheduled for construction.

6. Noise and Vibration - Comply with requirements of CITY noise ordinances and mitigation specified below.

a. Lighting – Shield worksite lighting to prevent disturbance to adjacent properties.

B. MITIGATION

1. General

a. The CONTRACTOR shall mitigate the adverse environmental impacts associated with the Work of the Contract. The CONTRACTOR shall indemnify and hold harmless the CITY from any and all fines, penalties or damages incurred by the CITY for violation of any environmental mitigation measures or permit caused by the CONTRACTOR's failure to comply with environmental mitigation measures of this Article. The measures that the CONTRACTOR shall take to mitigate environmental impacts include, but are not limited to the following:

b. The CONTRACTOR, a minimum of thirty (30) days prior to beginning Work on each new major activity, shall submit a written plan to the PROJECT MANAGER, detailing how the environmental impacts for the activity shall be mitigated. The plan shall include, at a minimum:

i. Anticipated site conditions;

ii. Equipment to be utilized;

iii. Means and methods of construction;

iv. Impacts likely to occur;

v. Mitigation methods to be employed.

2. Storm Water Pollution Control

a. Comply with the State General Construction Activity Storm Water Permit.

b. Minimum Water Quality Protection Requirements – The Contractor is required to meet the following minimum standards of good housekeeping:

i. Eroded sediments and other pollutants must be retained on site and may not be transported from the site via sheet flow, swales, area drains, natural drainage, or wind.

ii. Stockpiles of earth and other construction-related materials must be protected from being transported from the site by wind or water.

iii. Fuels, oils, solvents, and other toxic materials must be stored in accordance with their listing and are not to contaminate the soil nor the surface waters. All approved toxic storage containers are to be protected from the weather. Spills must be cleaned up immediately and disposed of in a proper manner. Spills may not be washed into the drainage system.

iv. Excess or waste concrete may not be washed into the public way or any drainage system. Provisions shall be made to retain concrete wastes on-site until they can be appropriately disposed of or recycled.

v. Trash and construction-related solid wastes must be deposited into a covered receptacle to prevent contamination of rainwater and dispersal by wind.

vi. Sediments and other materials may not be tracked from the site by vehicle traffic. The construction entrance roadways must e stabilized so as to inhibit sediments from being deposited into the public ways. Accidental depositions must be swept immediately and my not be washed down by rain or by any other means.

c. Wet Weather Erosion Control Plan (WWECP) – Pursuant to Section 61.02 of the LAMC, whenever it appears that the construction site will have grading between October 1 and April 15, the Contractor shall submit a WWECP to the Project Manager for approval within 30 days after award of contract or get approval 30 days prior to the beginning of the rainy season, whichever is longer. Note: Guidance on preparing the WWECP can be found in the Development Best Management Practices Handbook – Part A, Construction Activities adopted by the Board of Public Works on August 2, 1999, as authorized by Section 64.72 of the Los Angeles Municipal Code. This handbook can be obtained at cost at the public/permit counters of the Bureau of Engineering.

d. The Contractor shall file a “Notice of Intent” (NOI) with the State Water Resources Control Board to comply with the California General Construction Activity Stormwater Permit (NPDES No. CAS000002) and prepare and implement a Stormwater Pollution Prevention Plan (SWPP). Whenever the CONTRACTOR is required to get any type of permit from the Department of Building and Safety (DBAS), the CONTRACTOR shall show a Waste Discharge Identification Number (WDID) to the DBAS as proof of submittal of the NOI. If the CONTRACTOR does not need any type of permit from the DBAS, the CONTRACTOR shall show the WDID to the PROJECT MANAGER.

3. Noise and Vibration

a. General

i. The Work specified in this Article consists of eliminating excessive noise and vibration generated by construction activities, complying with applicable noise regulations and specifications requirements, monitoring and reporting noise and vibration measurements.

ii. Use equipment with effective noise-suppression devices and employ other noise control measures such as enclosures and noise barriers necessary to meet the noise limits specified and to protect the public. Schedule and conduct operations in a manor that will minimize, to the greatest extent feasible, the disturbance to the public in areas adjacent to the construction activities and to occupants of buildings in the vicinity of the construction activities.

iii. Noncompliance Corrective Action – If, at any time prior to or during the construction, complaints are received from the public, the PROJECT MANAGER shall direct the CONTRACTOR to undertake immediate corrective action through equipment modification, additional noise abatement equipment or a change in operating procedures.

b. Construction Vibration

i. Ground-borne vibrations from equipment may have the potential of causing an impact to the existing structure. The CONTRACTOR shall mitigate and/or repair any damage caused by vibration.

6. MOBILIZATION

A. GENERAL

Mobilization shall include, but not be limited to, the following items, all as required for the proper performance and completion of the work:

1. Obtaining all permits, insurance, and bonds.
2. Moving onto the job-site all CONTRACTOR's plant and equipment as required.
3. Erecting temporary buildings and other construction facilities.
4. Installing temporary construction power and wiring.
5. Establishing fire protection system for its temporary facilities.
6. Developing construction water supply.
7. Providing field office trailers for the CONTRACTOR AND INSPECTOR, complete with all specified furnishings and utility services, including telephones.
8. Providing connections to onsite sanitary facilities as specified.
9. Providing for potable water facilities as specified. This includes a means by which all on site contractor, subcontractor or supplier personnel can wash their hands with soap.
10. Arranging for and erection of CONTRACTOR's work and storage yards and sheds.
11. Submittal of all required Subcontractor insurance certificates and bonds.
12. Posting all CAL-OSHA required notices and establishment of safety programs.
13. Have the CONTRACTOR's representative at the job site full time.
14. Furnishing of Construction Schedule, Bid Breakdown and Submittal Schedules.

B. TEMPORARY CONSTRUCTION UTILITIES AND WORKSITE FACILITIES

The Contractor shall provide the following worksite facilities, as indicated below:

Yes (1) The Contractor shall provide adequate sanitary conveniences for use of persons employed on the work. These conveniences shall be properly secluded from public observation and maintained in a neat and sanitary condition in the manner and places required by the Project Manager. The use of these conveniences shall be strictly enforced, and they shall be maintained at all times until completion of the work, when they shall be removed from the premised and the area left clean and free from any nuisance. They shall also comply with all applicable laws, ordinances and regulations pertaining to the public health and sanitation of dwelling and camps.

Wastewater shall not be interrupted. Should the Contractor disrupt existing sewer facilities, sewage shall be conveyed in closed conduits and disposed of in a sanitary sewer system. Sewage shall not be permitted to flow in trenches or be covered by backfill.

Yes (2) The Contractor shall provide the power and light needed for construction until permanent meter

installation is completed. The Contractor shall make all necessary arrangements with the City Department of Water and Power; assume all costs; and make and remove all connections to power facilities as necessary for required tests.

Yes (3) The Contractor shall provide the water needed for construction until permanent meter installation is completed. The Contractor shall make all necessary arrangements with the City Department of Water and Power; assume all costs; and make and remove all connections to water facilities as necessary for required tests.

Yes (4) The Contractor shall provide the gas needed for construction until permanent meter installation is completed. The Contractor shall make all necessary arrangements with the Gas Company; assume all costs; and make and remove all connections to gas facilities as necessary for required tests.

Yes (5) The Contractor shall provide a temporary shed on the site for the safe storage of his material and equipment. The floor shall be weathertight with a wood floor above grade. The shed shall be removed upon completion of the work or by order of the General Manager.

Yes (6) The Contractor shall provide an office for the Inspector for the entire period of construction or until the General Manager orders its removal. The office, to be located as the General Manager directs, shall be weathertight and have not less than 100 square feet floor area; screened windows that open in opposite walls; a door with latch set and hasp for padlocking; a built in counter of sufficient size for a full set of job blue prints with a drawer for filing 9" x 12" folders; a stool and a plan rack for drawings; an electric heater, a 12" electric fan and electric lights.

Yes (7) The Contractor shall provide a job telephone for the use of City personnel only. The Contractor shall make all necessary arrangements with the telephone company; assume all costs and pay for all calls. The telephone is to be located so that it is easily accessible from the job office and provided with an outside extension bell.

Yes (8) The Contractor shall maintain temporary drainage to keep excavations, pits and trenches free of water accumulation, by pumping if necessary. The Contractor shall protect against damage caused by water backing up in sewers and drains.

Yes (9) The Contractor shall exercise every reasonable precautions to protect channels, storm drains and bodies of water from pollution; and shall conduct and schedule construction operations so as to minimize or avoid muddying and silting of said channels, drains and waters. Water pollution control work shall consist of constructing any facilities which may be required to prevent, control and abate water pollution.

The Project Manager, authorized representative of the General Manager, in charge of this project is:

David Wang at (213) 485-2134

All correspondence should be addressed to the Project Manager at [Note new address as of 03/29/12]:

Department of Public Works, Bureau of Engineering
Architectural Division
1149 S. Broadway, Suite 830,
Los Angeles, California 90015

7. REMOVAL, CLEANUP, AND DEMOBILIZATION

A. Upon completion of the contracted Work, remove all CONTRACTOR tools, materials and other articles from the CITY's property. Should the CONTRACTOR fail to take prompt action to this end, the CITY at its option and without waiver of such other rights as it may have, on thirty (30) calendar days notice, may treat them as abandoned property. Sweep floors broom clean, clean exterior and interior surfaces and windows and remove rubbish and debris resulting from the contracted Work and maintain the job site in a clean, orderly and safe condition at all times until completion of the physical Work and written Notice of Partial Acceptance. Failure to comply with this requirement shall be grounds for the CITY to assess clean-up costs in the amount of 5% of the mobilization cost.

8. RECORD DRAWINGS

A. Record Drawings are full size drawings (Plans) which are marked up during construction to delineate the actual in-place constructed conditions. Record Drawings shall be provided by the CONTRACTOR for this Project. Requirements for Record Drawings as specified elsewhere shall supplement the requirements specified herein.

B. Record Drawings shall include all changes in the plans including those issued as Change Orders, Plan Clarifications, Addenda, Notice to Bidders, responses to Requests for Information, Jobsite Memos, and any additional details needed for the construction of the Project but not shown on the plans. Substructures encountered while excavating that are left in place shall be located by survey, to the satisfaction of the PROJECT MANAGER, shown, and identified on the Record Drawings. Substructures, including but not limited to concrete structures, electrical conduit and duct banks, drains and sanitary sewer pipelines, process piping, water lines, etc, whose installed location differs from that shown on the original plans shall be precisely located by survey to the satisfaction of the PROJECT MANAGER and recorded on the as-built drawings before backfilling.

C. Mark Record Drawings with red ink or chemical fluid on one (1) set of full size prints to produce a record of the complete installation. Prepare additional drawings that may be required to indicate record conditions on 24" x 36" paper. Additions to Contract Drawings shall employ and use drafting standards, which are consistent with the drafting standards, used in the Contract Drawings.

D. Keep Record Drawings on the job and update during construction and make available for the PROJECT MANAGER'S inspection and copying at all times. The PROJECT MANAGER will review the Record Drawings before submittal of monthly payment requests. If in the opinion of the PROJECT MANAGER, the Record Drawings are not current, approval of the monthly payment may be withheld until the drawings are made current. Submit a signed certification with each monthly payment request stating that the Record Drawings are current and accurate as of the date of the payment request.

E. Where the plans are diagrammatic or lacking precise details, produce dimensioned full size sheets as the Record Drawings. For installations outside of structures, the locations shall be given by coordinates and elevations. Where substructures are encased in concrete, the outside dimensions of the encasement shall also be given.

F. In the case of those drawings which depict the detail requirements for equipment to be assembled and wired in the factory, the Record Drawings shall be updated by indicating those portions which are superseded by final Shop Drawings and by including appropriate reference information describing the Shop Drawings by manufacturer, drawing and revision numbers.

G. At the completion of the Work and after final inspection, copy the Record Drawing (as installed) data, using red ink, onto a new set of high quality prints provided by the CITY. Certify to the completeness and accuracy of the "as installed" information indicated on the prints with its signature. Then deliver as a submittal to the PROJECT MANAGER for review and approval both the field developed prints and the final signed prints as a condition precedent to the CITY'S release of any retained funds.

9. EXCAVATION SHORING, FORMS, AND FALSEWORK

A. Whenever Work under the Contract involves trench excavation five (5) feet or more in depth, or any kind of shoring, design and prepare plans for the required shoring, bracing, and sloping. In addition to the Division 2 specified requirements, submit plans and calculations to the PROJECT MANAGER in advance of excavation to ensure workers' protection from the hazard of caving ground during the excavation. If such plan varies from the shoring system standards established by the Cal-OSHA Construction Safety Orders, the plan shall be prepared by a California registered civil or structural PROJECT MANAGER employed by the CONTRACTOR, and include all costs therefore in the price named in the Contract for completion of the Work as set forth in the Contract Documents. Nothing in this Article shall be deemed to allow the use of a shoring, sloping, or other protective system less effective than that required by the Construction Safety Orders. Nothing in this Article shall be construed to impose liability on the CITY, PROJECT MANAGER, INSPECTOR, or any of their officers, agents, representatives, or employees.

B. Secure approval, in advance, from authorities concerned for the use of any bridges proposed by it for public use. Temporary bridges shall be clearly posted as to load limit, with signs and posting conforming to current requirements set forth in the Traffic Manual published by the California Department of Transportation, covering "signs". This manual shall also apply to the street closures, barricades, detours, lights, and other safety devices required.

C. Comply fully with the requirements of the Cal-OSHA Construction Safety Orders, regarding the design of forms, false work, and shoring for concrete placement, and the inspection of same before placement of concrete. Where the Construction Safety Orders requires the services of a civil PROJECT MANAGER registered in the State of California to approve design calculations and Working Drawings of the false work or shoring system, to inspect such system prior to placement of concrete, employ a registered civil PROJECT MANAGER for these purposes, and all costs therefore shall be included in the price named in the Contract for completion of the Work as set forth in the Contract Documents.

D. No Work under this Article shall start until the PROJECT MANAGER has accepted the plans and the CONTRACTOR has obtained permits required and furnished a copy to the PROJECT MANAGER.

10. SUBMITTALS

A. Furnish a schedule and list of required submittals to the PROJECT MANAGER, in accordance to CONTRACTOR'S CONSTRUCTION SCHEDULE AND REPORTS of these General Requirements, including required submittals by Subcontractors.

B. Wherever called for in these specifications or on the plans, or where required by the PROJECT MANAGER, furnish to the PROJECT MANAGER for review 10 copies of each submittal. The term "submittal" as used herein shall be understood to include detail design calculations, design drawings, Shop Drawings, Working Drawings fabrication and installation drawings, erection drawings, lists, graphs, operating instructions, catalog sheets, data sheets, samples, and similar items. Unless otherwise required, Submit said submittals to the PROJECT MANAGER at a time sufficiently early (see paragraph F. below) to allow review of same by the PROJECT MANAGER and to accommodate the rate of construction progress required under the Contract without delaying the Contract Work and with due regard for the possibility of resubmittals. Submittals shall be in English.

C. Design or Shop Drawings or other submittal shall be accompanied by the standard "CONTRACTOR's SUBMITTAL TRANSMITTAL" form. A submittal not accompanied by such a form, or where all applicable items on the form are not completed, or are incorrectly completed, may be returned, at the PROJECT MANAGER'S discretion, for resubmittal.

D. Normally, a separate transmittal form shall be used for each specific item or class of material or equipment for which a submittal is required. Transmittal of a submittal of various items using a single transmittal form will be permitted only when the items taken together constitute a manufacturer's "package" or are so functionally related that expediency indicates a review of the group or package as a whole. A multiple-page submittal shall be collated into sets, and each set shall be stapled or bound, as appropriate, prior to transmittal to the PROJECT MANAGER.

E. Shop Drawings shall show in detail the size, sections, and dimensions of all the member(s); the arrangement and construction of all connections and joints; all holes, straps, and other fittings required for attaching Work; and other pertinent details. When required, PROJECT ENGINEERING computations shall be submitted. Be responsible for delivering reviewed copies of Shop Drawings to all others whose Work is dependent thereon. Maintain at the site of the Project, a complete file of approved Shop Drawings and manufacturers' data for this Project, at all times.

F. Except as may otherwise be provided herein, the PROJECT MANAGER will make a reasonable attempt to return prints of each submittal to the CONTRACTOR, with its comments noted thereon, within 30 calendar days following their receipt by the PROJECT MANAGER. It is considered reasonable that the

CONTRACTOR shall make a complete and acceptable submittal to the PROJECT MANAGER by the second submission of a submittal item. The CITY reserves the right to withhold moneys due the CONTRACTOR to cover additional costs of the PROJECT MANAGER's review beyond the third submittal. Submittal will be returned to the CONTRACTOR with one of three (3) markings:

G. If three (3) copies of a submittal are returned to the CONTRACTOR marked "NO EXCEPTIONS TAKEN/PROCEED," formal revision and resubmission of said submittal will not be required.

H. If three (3) copies of a submittal are returned to the CONTRACTOR marked "MAKE CORRECTIONS NOTED/PROCEED CONDITIONALLY," formal revision and resubmission of said submittal will not be required.

I. If one (1) copy of a submittal is returned to the CONTRACTOR marked "REJECTED-RESUBMIT/DO NOT PROCEED," revise said submittal and resubmit TEN (10) copies of said revised submittal to the PROJECT MANAGER.

J. Work for which Shop Drawings are required shall be performed in accordance with the reviewed and approved copies. Fabrication of an item shall not commence before the PROJECT MANAGER has reviewed the pertinent submittal and returned the copies to the CONTRACTOR marked either "NO EXCEPTIONS TAKEN/PROCEED," or "MAKE CORRECTIONS NOTED/PROCEED CONDITIONALLY." Revisions indicated on submittals shall be considered as changes necessary to meet the requirements of the Contract Documents and shall not be taken as the basis for claims for extra Work.

K. CONTRACTOR submittals shall be carefully reviewed by an authorized representative of the CONTRACTOR prior to submission to the PROJECT MANAGER. Each submittal shall be dated, signed, and certified by the CONTRACTOR as being correct and in strict conformance with the Contract Documents. No consideration for review by the PROJECT MANAGER of any CONTRACTOR submittal will be made for any items that have not been so certified by the CONTRACTOR. Non-certified submittals will be returned to the CONTRACTOR without action taken by the PROJECT MANAGER, and any delays caused thereby shall be the total responsibility of the CONTRACTOR.

L. The PROJECT MANAGER's review of CONTRACTOR submittal shall not relieve the CONTRACTOR of the entire responsibility for the correctness of details and dimensions and conformance to the specifications. Assume all responsibility and risk for any misfits due to any errors in the submittal. Any fabrication or other Work performed in advance of the receipt of accepted submittals shall be entirely at the CONTRACTOR's risk and expense. Be responsible for the dimensions and the design of adequate connections and details.

11. SUBSTITUTIONS AND "OR EQUAL" SUBMITTAL

A. Make "Or Equal" submittals within thirty (30) calendar days after issuance of Notice-to-Proceed. A request or submittal received after the specified period will be considered as NOT EQUAL to that so specified and will be processed as a substitution described hereinafter.

B. Clearly identify manufacturers' data submitted to the PROJECT MANAGER for review and acceptance each proposed substitute with the corresponding Contract Drawing detail and Specification section. If the PROJECT MANAGER decides to accept for use in the Project a material, process or article which is not the equal of that specified, make substitution in the manner described in Article 52 CHANGES AND EXTRA WORK of the General Conditions, with a credit to the CITY for the difference in value.

C. The PROJECT MANAGER will determine whether the material offered is equivalent to that specified. Any revision to structures, piping, mechanical, electrical, instrumentation, or any other Work made necessary by such substitution must be approved by the PROJECT MANAGER, and the entire cost both direct and indirect of these revisions shall be borne by the CONTRACTOR.

D. Materials, processes, or articles may be requested as a substitution by the CONTRACTOR, in lieu of that

specified, under the following conditions:

1. Submit in writing and in the manner described in SUBMITTAL of these General Requirements.

2. Submit thirty (30) calendar days before starting the Work, as established by the PROJECT MANAGER, so as not to cause any delay in completion of the Project. No other request will be considered after expiration of the period specified, except that in exceptional cases where it is determined to be in the best interest of the CITY, as approved by the PROJECT MANAGER.

3. Agree to pay for all PROJECT ENGINEERING and design services, if required, to make changes and adjustments in material and Work of trades directly or indirectly affected by the substitute, to the satisfaction of the PROJECT MANAGER, at no cost to the CITY.

4. All requests for substitution shall be made through the CONTRACTOR. Submissions by the CONTRACTOR shall imply the CONTRACTOR's approval of such substitution.

5. No requests for substitutions will be considered during the bidding period.

6. Furnish adequate data with each request for approval of a substitute to enable the PROJECT MANAGER to evaluate the proposed substitution.

MATERIALS, EQUIPMENT, AND APPLIANCES

12. SURVEYING

A. DEFINITIONS

1. CONTRACTOR's Surveyor - Shall be a registered (licensed) Land Surveyor or Registered Civil Engineer authorized to practice land surveying by the State of California in compliance with Business and Professions Code Section 8700, *et. Seq*. cited as the Land Surveyor's Act.

2. Construction Stakes - Durable markers that will maintain elevations, station, and offset for the duration of use as reference markers for construction.

3. Surveying - Described in Section 8726 of the Land Surveyor's Act.

4. Survey Manual - City of Los Angeles, Bureau of PROJECT ENGINEERING Manual, Part J – Survey.

B. SURVEY SERVICES

1. The CONTRACTOR's Surveyor shall comply with State Law and the latest edition of the Standard Specifications for Public Works Construction, "Green Book", and its supplement.

   a. The contractor shall employ the Contractor's Surveyor.

   b. All work shall utilize CCS 83, Zone 5, and NAVD 88 control systems.

   c. CONTRACTOR's Surveyor to utilize horizontal & vertical control provided by PROJECT MANAGER and referenced on drawings.

   d. Work shall conform to the lines, elevations, and grades shown on the plans.

   e. CONTRACTOR's Surveyor shall notify the PROJECT MANAGER, in writing, of all material discrepancies between existing survey control and the current Work. Any material discrepancies shall be resolved prior to start of construction.

   f. During progress of construction, CONTRACTOR's Surveyor to provide surveying services as necessary, or as requested by PROJECT MANAGER or INSPECTOR, to assure construction complies with Contract Documents.

g. CONTRACTOR's Surveyor shall fulfill duties of "PROJECT MANAGER" described in Standard Specifications for Public Works Section 2.9, Surveying, except that the City forces shall be notified 7 days prior to the CONTRACTOR disturbing any street centerline control monuments so they can be preserved by City forces.

2. Safety - CONTRACTOR's Surveyor shall conform to recommended safety standards for all Work, as set forth in the latest edition of Work Area Traffic Control Handbook (WATCH) adopted by the City of Los Angeles Board of Public Works. Compliance with the Confined Space Regulations in the California Code or Regulations, Title 8, Section 5157 of the Cal/OSHA Safety Orders is mandatory.

C. CONSTRUCTION SURVEYS:

1. Conform to Survey Manual Part J, Section J 600 of Bureau of PROJECT MANAGER.

2. CONTRACTOR's Surveyor - Provide all reference stakes and form checks necessary for construction and inspection of improvements. Document construction staking in survey field notes as described in Part C.4 in this Article. Staking may include, but is not limited to - removals, joins, rough grade, slope, utilities, storm drain, sewer, curb, walk, paving, wall, tunnels, building stakes and other staking necessary for construction and inspection.

3. Form Checks - CONTRACTOR's Surveyor to check forms where durable points may be disturbed, removed, or is impractical to be used to verify the design location. Record measured location in survey field notes as described in Part C.4 in this Article. Notify PROJECT MANAGER of all variations from plan locations.

4. Staking Interval and Offset Lines - Staking intervals shall be in accordance with Survey Manual, Figure J 615.225A. CONTRACTOR's Surveyor to set stake lines at an offset distance from the improvement to ensure proper grade, station and alignment.

5. Utility Stakes - CONTRACTOR's Surveyor shall provide stakes for utilities, public or private, which require location or relocation unless PROJECT MANAGER states otherwise.

13. SITE INVESTIGATION

A. Before beginning the Work, inspect related and appurtenant Work and report in writing to the PROJECT MANAGER conditions which will prevent proper completion of the Work. Except as provided for in Article 53, DIFFERING SITE CONDITIONS, of the General Conditions, failure to report any such conditions shall constitute acceptance of all site conditions, and required removal, repair, or replacement caused by unsuitable conditions shall be performed by the CONTRACTOR at its sole cost and expense without any adjustment in the Contract Price or extension of the Contract Completion Date.

14. INSPECTION OF THE WORK

A. Whenever the CONTRACTOR intends to carry on the Work of this Contract on a Saturday, Sunday, or holiday, or more than two eight (8) hours a day shifts on Monday through Friday, or any variation in the time of the workday as set forth in the GENERAL CONDITIONS, length of the workday and work week, notification shall be given to the INSPECTOR and the PROJECT MANAGER of such intention at least forty-eight (48) hours in advance so that inspection may be arranged. No Work shall be allowed during these times without the approval of the INSPECTOR and no demolition will be permitted on Saturdays, Sundays, or holidays without the prior approval of the Board. All CITY inspection required by the CONTRACTOR on holidays, weekends and overtime for the sole convenience of the CONTRACTOR shall be accomplished at the sole expense of the CONTRACTOR by issuance of a deductive Change Order.

B. Conduct the Work under the general observation of the PROJECT MANAGER and be subject to inspection by the INSPECTOR to ensure compliance with the requirements of the Contract Documents. Such inspection may include mill, Plant, shop or field inspection, as required. The INSPECTOR shall be permitted access to all parts of the Work, including Plants where materials or equipment are manufactured or

fabricated. Materials and articles furnished by the CONTRACTOR shall be subject to inspection, and no materials or articles shall be used in the Work until they have been inspected and accepted by the INSPECTOR.

C. Do not backfill, bury, cast concrete, hide or otherwise cover Work until it has been inspected by the INSPECTOR, and other Agencies from which a permit is required. Whenever the CONTRACTOR is ready to backfill, bury, cast in concrete, hide, or otherwise cover any Work under the Contract, notify the INSPECTOR not less than forty-eight (48) hours in advance to request inspection before beginning such Work of covering. Failure of the CONTRACTOR to notify the INSPECTOR at least forty-eight (48) hours in advance of such inspections will be cause for the INSPECTOR to require a sufficient delay in the progress of Work to allow time for such inspections and any remedial or corrective Work required, and costs of such delays, including its effect upon other portions of the Work, shall be borne by the CONTRACTOR. Work so covered in the absence of inspection shall be subject to uncovering at the sole expense of the CONTRACTOR. Where uninspected Work cannot be uncovered, such as in concrete cast over reinforcing steel, such Work shall be subject to demolition, removal, and reconstruction under proper inspection, and no additional payment will be allowed therefore.

D. The presence of the PROJECT MANAGER or the INSPECTOR, shall not relieve the CONTRACTOR of the responsibility for the proper execution of the Work in accordance with all requirements of the Contract Documents. Compliance is a duty of the CONTRACTOR, and said duty shall not be avoided by any act or omission on the part of the PROJECT MANAGER or the INSPECTOR. If the CONTRACTOR fails to replace any defective or damaged Work or material after reasonable notice, the INSPECTOR may cause such Work or materials to be replaced. The replacement shall be deducted from the amount to be paid to the CONTRACTOR, otherwise the CONTRACTOR shall pay the CITY if there remains insufficient or no amount to be paid by the CITY to the CONTRACTOR.

E. The INSPECTOR will have the right, at all times and places, to reject any articles or materials to be furnished hereunder which, in any respect, fail to meet the requirements of these specifications, regardless of whether the defects in such articles or materials are detected at the point of manufacture or after completion of the Work at the site. If the INSPECTOR, through an oversight or otherwise, has not rejected materials or Work which is defective or which is contrary to the specifications, such material, no matter in what stage or condition of manufacture, delivery, or erection, may be rejected by the INSPECTOR upon discovery. Promptly remove rejected articles or materials from the site of the Work after notification of rejection. Costs of removal and replacement of rejected articles or materials as specified herein shall be borne by the CONTRACTOR.

F. At the completion of Work, after completion of all corrections, a final inspection will be made by the INSPECTOR, the PROJECT MANAGER, and the CONTRACTOR, as applicable. The INSPECTOR will provide a Final Inspection Correction List itemizing all Work necessary to complete the Project satisfactorily.

15. SAMPLING, TESTING AND FABRICATION INSPECTION

A. GENERAL

1. Materials and fabricated articles furnished by the CONTRACTOR may be subject to inspection and testing and no materials or fabricated articles shall be incorporated into the Work until they have been accepted by the INSPECTOR. The CONTRACTOR shall ensure that all items requiring shop inspection are inspected at their source as required by the CONTRACT.

2. Fabrication may be subject to inspection by the INSPECTOR, to ensure strict compliance with the requirements of the Contract Documents. Such inspection may include mill, plant, shop or field inspection, as required. The PROJECT MANAGER or INSPECTOR shall be permitted access to all parts of the Work, including Plants where materials or equipment are manufactured or fabricated. When a third party inspector is approved, meetings may be scheduled with the PROJECT MANAGER or INSPECTOR at the manufacturing facility to review the progress of the Work and the

inspection activities.

3. Fabricate items using Shop Drawings that have been submitted to the PROJECT MANAGER and approved in accordance with SUBMITTALS of the GENERAL REQUIREMENTS. Provide shop inspection on materials and/or equipment so designated on the CONTRACTOR's approved Shop Drawings.

4. Material which is subject to or requires shop inspection and arrives at the job site without inspection by the INSPECTOR will be rejected by the INSPECTOR and shall be removed from the job site by the CONTRACTOR at the CONTRACTOR's sole expense.

B. SAMPLES AND TEST SPECIMENS

1. CONTRACTOR shall obtain, perform and pay for all testing. Testing shall be performed at a certified laboratory approved by the PROJECT MANAGER.

2. Samples and test specimens required under these specifications shall be furnished, prepared for testing, and delivered, to the approved testing laboratory at no cost to the CITY.

3. In addition to any other inspection or quality assurance provisions that may be specified, the PROJECT MANAGER or the INSPECTOR shall have the right to independently select, test, and analyze, at the expense of the CITY, additional test specimens of any or all of the materials to be used. Whenever any portion of the Work fails to meet the requirements of the specifications as shown by the results of independent testing or investigation all costs of such independent inspection and investigation, and all costs of removal, correction, and reconstruction or repair of any such Work shall be borne solely by the CONTRACTOR.

4. When the manufacturer, fabricator, supplier, or subcontractor provides the results of tests from samples taken at the mill, factory, or warehouse, the PROJECT MANAGER or INSPECTOR will accept the test reports provided the following conditions are met:

   a. The Testing Agency was approved by the PROJECT MANAGER or INSPECTOR prior to performing the tests, and that all necessary certifications were valid at the time the tests were performed.

   b. The tests were performed in conformity with the specifications for the specified materials or items.

   c. The reports are made in the form of an affidavit specified hereinafter.

5. Whenever the approved independent testing laboratory or inspector takes samples of materials other than at the site, the deliveries to the site of materials represented by such samples shall be identified as specified for the specific material. The results of such tests shall be reported to the INSPECTOR in the form of affidavits attested to by the testing agency. Such affidavits shall furnish the following information with respect to the material sampled:

   a. Manufacturer's name and brand.

   b. Place of sampling.

   c. Sufficient information to identify the lot, group, bin, or silo from which the samples were taken.

   d. Amount of material in the lot sampled.

   e. Statement that the material has passed the requirements.

   f. Notarized signature and title of the person making the affidavit and the date of execution of the affidavit.

6. THIRD PARTY INSPECTION REQUIREMENTS

   a. The proposed third party inspection and/or testing company must gain approval by the PROJECT MANAGER after award. Obtain this approval before producing any material or

manufacturing any product or equipment. The approved inspection and/or testing agency shall not sublet or assign its Work to any other agency.

b. Comply with requirements as identified in the CONTRACT.

c. The Work and activities of the third party inspection and/or testing agency shall be monitored by the INSPECTOR during meetings to ensure compliance with the Contract Documents.

7. THIRD PARTY TESTING AND INSPECTION LABORATORY APPROVAL PROCEDURES

a. The PROJECT MANAGER will approve third party inspection and/or testing agencies/laboratories.

b. Requests for approval of a third party inspection agency and/or test laboratory shall be in writing from the CONTRACTOR to the PROJECT MANAGER.

c. The letter requesting approval of a third party test laboratory and/or private inspection agency shall contain all of the following information:

i. Complete title of Project.

ii. Project Work order number.

iii. Name of proposed testing laboratory or inspection agency.

iv. Address and telephone number of proposed testing laboratory/inspection agency.

v. Contact person at proposed testing laboratory/inspection agency.

d. The PROJECT MANAGER will notify the CONTRACTOR by letter if the testing laboratory/inspection agency has been approved.

16. GUARANTY/WARRANTY

A. The CONTRACTOR shall and does hereby warrant and guaranty that Work executed under this Contract will be free from defects of materials and workmanship for a period of one (1) year from the date of final acceptance of the Project by the Recreation and Park Commission, except certain specific items of Work, materials and equipment requiring a guaranty or warranty for a greater period of time as hereinafter specified. In the event, that portions of the Work are sufficiently complete to allow use or occupancy by the CITY in the manner and for the purposes intended prior to final completion and acceptance of the Project, the guarantee period for those portions will commence on the date shown on the Statement of Partial Completion.

B. The CONTRACTOR hereby agrees to indemnify and save harmless the CITY, and their officers, agents and employees against and from all claims and liability arising from damage and injury due to said defects. The CONTRACTOR shall repair or replace, at no cost to the CITY, any and all such defective Work and all other Work damaged thereby, which becomes defective during the term of the above-mentioned guaranties and warranties.

C. Within thirty (30) calendar days prior to completion of all Work the CONTRACTOR shall submit to the PROJECT MANAGER original copies of all manufacturers guaranties covering all supplied and installed equipment and, where applicable, systems.

D. In addition to the requirements of Contract Bonds, of the General Conditions, it shall be understood that the Surety for the faithful performance bond, submitted in conformance with the terms of the Contract for this Project, is liable on its bond for all obligations of the CONTRACTOR including guaranty provisions.

E. The CONTRACTOR shall, within twenty-four (24) hours of notice from the PROJECT MANAGER of any Work not in accordance with the requirements of the Contract, or any defects in the Work, commence and prosecute with due diligence all work necessary to fulfill the terms of this Article and to complete the Work within a period of time as approved by the PROJECT MANAGER. In the event of failure by the

CONTRACTOR and/or its surety to respond to the notice or to complete the Work required by this Article within the time specified, the CITY shall proceed to have such Work done at the CONTRACTOR's expense. The CONTRACTOR or its Surety shall promptly reimburse the CITY all direct and indirect cost associated with performing this Work.

17. STORAGE OF MATERIALS AND EQUIPMENT

A. Store and protect materials and equipment in accordance with the manufacturer's instructions, with seals and labels intact and legible. Exercise measures necessary to ensure preservation of the quality, quantity, and fitness of the materials or equipment and perform the manufacturers recommended maintenance of the material or equipment. Absorb any and all cost incurred to store, protect, and maintain the materials and equipment without modification to the Contract Amount.

B. Do not store construction materials in streets, roads, or highways for more than 5 days after unloading. Materials or equipment not installed or used in construction within 5 days after unloading shall be stored elsewhere by the Contractor at its expense unless authorized additional storage time.

C. Do not store construction equipment at the worksite before its actual use on the Work, nor after use for more than 5 days after it is no longer needed.

D. Excavated material, except that which is to be used as backfill in the adjacent trench within three days shall not be stored in public streets unless otherwise permitted. Remove excess material after placing backfill from the site immediately.

PROGRESS OF THE WORK

18. CONSTRUCTION SCHEDULE AND COMMENCEMENT OF WORK

A. After notification of award and prior to start of any work, the Contractor shall submit its Schedule of Values to the Project Manager for review and approval. Upon approval of the Schedule of Values, and prior to start of any contract work, other than mobilization, the Contractor shall submit its Baseline Schedule to the Project Manager for acceptance. The Baseline Schedule shall be based on the approved Schedule of Values. The approved Schedule of Values work items shall be the basis for the construction elements for the accepted Baseline Schedule and the Monthly Billing items. As a minimum the Baseline Schedule shall indicate the work plan of all specifications sections. The Baseline Schedule shall include, but is not limited to: all items noted on I.2.a. through I.2.f. and I.2.h. through I.2.o. The Baseline Schedule shall recognize the protection, removal, or relocation of utilities and how they affect construction. The Baseline Schedule shall also reflect completion of all work under the Contract within the specified time and in accordance with the Specifications.

Unless otherwise provided, the Contract time shall commence as indicated in the Notice-to-Proceed letter. The Work shall start within 10 days thereafter, and be diligently prosecuted to completion within the time provided in the Specifications or as modified through change order.

Upon acceptance of the Baseline Schedule by the Project Manager, the Contractor shall maintain a copy of the accepted schedule in the jobsite office, recording thereon progress of the work at the end of each calendar week.

B. Methodology: The Baseline Schedule and all Updated Progress/Recovery Construction Schedules (UPRS) shall be in the form of a Critical Path Method schedule showing chronological relationship of all activities of the project. The principles and definitions of the terms used herein shall be as set forth in the Associated General Contractor’s publication “As-Planned CPM Schedule - Handbook”, latest edition. To the extent there are any conflicts between the Associated General Contractor’s publication and the Specifications, the Specifications shall govern. The Contractor shall utilize Primavera Sure-Trak 3.0 or Microsoft Project 2000 as the computer program for formatting the Baseline Schedule, and subsequent updated schedules.

C. The Contractor shall have the right to complete the job in advance of the scheduled completion date and within the allowable days allotted for the project. In the event that the Contractor elects to finish the project in advance, a Change Order shall be issued to reflect reduced duration and revised completion date. The

Contractor shall not be entitled to any additional compensation for early project completion.

D. A schedule showing the Work completed in less than the Contract Time, which has been accepted by Owner and amended by Change Order, shall be considered to have Project Float. The Project Float is the time between the scheduled completion of the Work and Contract Substantial Completion. Project Float is a resource available to both City and Contractor. No compensation shall be due to the Contractor for use of this float time by either party.

E. Float Ownership: Neither City nor Contractor owns float. The Project owns the float. As such, liability for delay of any Substantial Completion date rests with the party whose actions, last in time, actually cause delay to a Substantial Completion date.

F. The Contractor shall forward to the General Manager, along with the monthly Request for Payment, the Updated Schedule, referred to in Section B of this Article, indicating the progress of any part of the work not up to Baseline Schedule, stating the existing status, cause of delay, impact of change orders and approximate time of completion.

G. If the Contractor should fall behind the progress schedule by more than one month, the Contractor must provide the General Manager with an Updated Progress/Recovery Schedule (UPRS). Failure to comply with the full requirements of this Article shall be cause for withholding all future progress payments until full compliance. Failure to provide more than 2 consecutive Updated Schedules or UPRS shall constitute grounds for cancellation of the project.

H. The Department reserves the right to request a two-week “look ahead” schedules if the Department determines that the submitted UPRS does not reflect the as-built condition, manpower utilization or sequential progress necessary to fulfill the intent of the UPRS.

I. Network Details:

1. The Schedule shall include time-scaled network diagram, based on working days, as well as tabulations. It shall be constructed to show the order in which the Contractor proposed to carry out the Work, to indicate restrictions of access and to show availability of work areas, and availability and use of manpower, materials and equipment. The Contractor shall utilize the Schedule in planning, scheduling, coordinating, and performing the Work under the Contract (including activities of Subcontractors, equipment venders, and Suppliers). Provide the Project Manager with written confirmation of the concurrence of listed trade Subcontractors and Suppliers with the Schedule. Major trade Subcontractors and Suppliers shall approve the Schedule before they are submitted.

2. The Schedule shall provide the Project Manager and Inspector with a tool to monitor and follow the progress of all phases of the Work. The Schedule submitted to the Project Manager shall comply with all limits imposed by the scope of Work, and with all constraints, restraints or sequences included in the Contact. The degree of detail shall include factors to the satisfaction of the Project Manager, including, but not limited to:

a. Physical breakdown of the Project including estimated starting and completion dates of activities.

b. Float Time.

c. Contract milestones and completion dates, building occupancy date, constraints, restraints, sequences of Work shown in the Contract, the maintenance period and the final completion date. Durations shall be in calendar day.

d. Type of Work to be performed, and the sequences.

e. Purchases, submittals, submittal reviews, manufacturing, tests, delivery, and installation activities for all major materials and equipment.

f. Deliveries of City furnished equipment and/or materials in accordance with the dates or schedule windows of such items set forth in the Contractor furnished by the Project Manager,

or items to be salvaged and delivered to the City.

g. Preparation, submittal and approval of Shop Drawings and material samples showing a thirty (30) day minimum time specified for the Project Manager's review of normal or routine submittals. A forty (40) day review time for all major submittals and the same time frame shall be allowed for at least one (1) re-submittal on all major submittals.

h. Impact of Change Orders issued to the Contract.

i. Approvals required by regulatory agencies or other third parties.

j. Plans for all subcontract Work.

k. Access to and availability of Work areas including all anticipated shutdowns.

l. Identification of linkage between preceding, concurrent and follow-on Sub- contractors and utilities that are shown on the Plans or called out in the Specifications.

m. Actual tests, submission of test reports, and approval of test results.

n. Training and classes required under the Contract.

o. Pre-Final and Final Inspection punch lists and final cleanup, allow time for preparation of the punch lists.

p. Clearly identify any manpower, material, or equipment restrictions, as well as any activity requiring unusual shift Work, specified overtime, or Work at times other than regular days or hours.

3. Durations of the labor, equipment, and materials required to perform each activity shall be based on a normal work day unless otherwise approved by the Project Manager.

4. Critical or near critical paths resulting from the use of manpower or equipment restraints shall be kept to a minimum. Near critical paths shall be defined as those paths having fifteen (15) working days or less of total float as shown on the accepted Baseline Schedule.

5. Time scale shall show a continuous flow of information from left to right. The critical path shall be clearly and graphically identified on the schedule.

J. SCHEDULE REPORTS

1. The Schedule submitted to the Project Manager shall include the time scaled network diagram. Network diagrams shall be based on early start and early finish dates of activities shown and any related calculations generated by the scheduling program which describes the events and activities depicted.

K. APPROVAL OF BASELINE SCHEDULE

1. Acceptance Process:

2. The Project Manager will accept or reject, in writing, the Contractor's submission within fourteen (14) days after receipt of required information. The Construction Schedule, once accepted, becomes the Baseline Schedule which shall be used for monitoring and evaluating all facets of Contract performance, including, but not limited to: payment progress, changes, and delays.

3. Revise the Schedule, periodically per B, F, G, and H of this Article.

L. REVISIONS TO ACCEPTED BASELINE SCHEDULE

1. No change to the accepted Baseline Schedule shall be made without the prior written approval of the Project Manager.

M. UPDATES TO ACCEPTED BASELINE SCHEDULE AND PROGRESS PAYMENTS

1. Updated Schedules or UPRS:

a. See Section F of this Article.

b. The Update Report shall show the activities or portions of activities completed during the reporting period and their total value as the basis for the Contractor's monthly request for payment. Payments made pursuant to Partial Payments of these General Requirements will be based on the total value of such activities completed or partially completed after verification by the Inspector. The report shall state the percentage of the Work actually complete as of the report date.

N. RESPONSIBILITY FOR COMPLETION

1. Whenever it becomes apparent from the Updated Schedule or UPRS that phasing, milestone, constraint, restraint, or Contract completion dates will not be met, the Contractor shall execute some or all of the following remedial actions:

a. Increase construction manpower in such quantities and crafts as necessary to eliminate the backlog of Work.

b. Increase the number of working hours per shift, shifts per working day, working days per week, the amount of construction equipment, or any combination of the foregoing to eliminate the backlog or Work. Contractor shall be responsible for all additional costs associated in having the Inspector present at the job site for all periods in excess of the basic work day.

c. Reschedule the Work in conformance with the Specification requirements.

2. Before implementing any of the above actions, the Contractor shall notify and obtain written approval from the Project Manager.

3. Under no circumstances will the addition of equipment or construction forces, increasing the working hours or any other method, manner, or procedure to return to the contractually required completion date be considered justification for a Change Order or be treated as acceleration where the need for a UPRS has been caused by the Contractor and/or its Subcontractors or Suppliers, at any tier.

4. The Project Manager may elect to withhold progress payments until the Contractor's progress indicates that the milestone date(s) and/or the Contract completion date will be met.

19. WORK BY CITY OR OTHERS

A. Be responsible for ascertaining the nature and extent of any simultaneous, collateral and essential work by others. The CITY, its employees and contractors, and others, shall have the right to operate within or adjacent to the worksite to perform such Work.

B. The CITY, the CONTRACTOR, and each of such employees, contractors and others, shall coordinate their operations and cooperate to hold interference to a minimum.

C. Include in its Bid all costs involved as a result of coordinating its Work with others. The CONTRACTOR shall not be entitled to additional compensation from the CITY for damages resulting from such simultaneous, collateral and essential Work. The CONTRACTOR's coordinating efforts shall include redeployment of his Work forces to other parts of the Work.

PAYMENT FOR WORK

20. PARTIAL PAYMENTS (Revised as of 02/12/16)

A. Unless otherwise prescribed by law, three (3) working days prior to the last work day of each month, or other such date mutually agreed upon by the CONTRACTOR and the INSPECTOR, the CONTRACTOR shall prepare and submit to the INSPECTOR, an estimate of the cumulative amount and value of acceptable Work performed by the CONTRACTOR at the jobsite up to that date. Said amount shall also include the value of all acceptable materials and equipment for the Contract that have been delivered and suitably stored but not yet used in the Work, subject to the requirements of PAYMENTS FOR MATERIALS OR EQUIPMENT DELIVERED AND STORED ON THE JOBSITE and PAYMENT FOR MATERIALS OR

EQUIPMENT STORED OFF THE JOBSITE of these General Requirements.

B. Payments for undelivered, specifically manufactured equipment to be incorporated into the Work, excluding "off the shelf " or catalog items, will be made when all of the following conditions exist:

1. The equipment must be specifically designated in the Technical Specifications for partial payment prior to delivery.

2. The equipment to be specifically manufactured for the Project could neither be readily utilized on nor diverted to another job, and,

3. A fabrication period of more than six (6) months is anticipated,

C. Upon verification and approval by the INSPECTOR, such estimate shall be processed by the INSPECTOR in accordance with the provisions of the California Public Contracts Code.

D. The CITY may retain a portion of the amount otherwise due to the CONTRACTOR, as follows:

1. Retention of **five percent (5%)** will be held on the original Contract value on each approved payment claim until the amount paid of the original Contract equals fifty percent (50%). The CITY may then, at its sole discretion discontinue further retention on the original Contract value for all subsequently approved payment claims.

2. At any time during the course of the Contract, the CITY may, at its sole discretion, reinstate the **five percent (5%)** retention.

3. Additional deductions will be made from each monthly payment request for amounts due the CITY as follows:

a. Equipment or materials furnished by the CITY.

b. Services rendered to the CONTRACTOR by the CITY.

c. Amounts due the CITY for liquidated damages or penalties under the terms of the Contract.

d. Amounts required to be deducted by federal, state, or local governmental authority or other provisions of these Contract Documents.

E. From the balance thus determined will be deducted the amount of all previous payments, and the remainder shall constitute the monthly payment due the CONTRACTOR. Within thirty (30) calendar days after receipt of the INSPECTOR's recommendation by the Department of the monthly payment due the CONTRACTOR and subject to the deductions provided, herein, the CITY will pay the amount found due.

F. On lump-sum items the INSPECTOR's estimate of the monthly payment due the CONTRACTOR will not be required to be made by strict measurement, and an approximate estimate will suffice.

G. The monthly payments may be withheld or reduced, for the following reasons:

1. If the CONTRACTOR is not diligently or efficiently complying with the express intent of the Contract.

2. If there are unresolved Notices of Non-Compliance.

3. If Technical Manuals are not submitted.

4. If Record Drawings are not kept up-to-date.

5. If progress photographs are not submitted, and

6. If construction schedules are not submitted in accordance with these General Requirements.

7. The CONTRACTOR shall promptly submit the following in response to requests by the INSPECTOR:

8. Information and records necessary to determine the cost of the Work for purposes of estimating monthly payment.

9. Itemized statements, in a form satisfactory to the INSPECTOR, of the actual cost of all acceptable

materials delivered by the CONTRACTOR to the site.

H. The making of any payment to the CONTRACTOR shall not relieve the CONTRACTOR from contractual obligations. These payments shall not be construed as the transfer of ownership of any equipment or materials to the CITY.

I. Responsibility of ownership shall remain with the CONTRACTOR who shall be obligated to store, protect, repair, replace, rebuild or otherwise restore any fully or partially completed Work or structure for which payment has been made. The CONTRACTOR shall replace any materials or equipment required to be provided under the Contract that may be damaged, lost, stolen, or otherwise degraded in any way prior to acceptance of the Work under the Contract.

J. At its own expense, the CONTRACTOR has the option, to substitute for any money being withheld by the CITY, securities equivalent to the amount being withheld. Securities eligible for such substitution are bank or savings and loans certificates of deposit or such securities eligible for investment pursuant to California Government Code. Any such security or securities so substituted for monies withheld, shall be owned by the CONTRACTOR who shall receive earned interest.

K. Such security shall, at the request and expense of the CONTRACTOR, be deposited with CITY or with a State or Federally Chartered Bank as the escrow agent who shall pay such monies to the CONTRACTOR upon notification by the CITY that payment can be made. Such notification will be given at the expiration of sixty (60) calendar days from the date of acceptance of the Work by the Board, or as prescribed by law, provided, however, that there will be a continued retention of necessary securities to cover such amounts as are required by law to be withheld by properly executed and filed notices to stop payment, or as may be authorized by the Contract to be further retained.

L. Any escrow agreement entered into pursuant to this provision shall contain as a minimum, the following provisions - the amount of securities to be deposited; the terms and conditions of conversion to cash in case of the default of the CONTRACTOR; and the termination of the escrow upon completion of the Contract and the other requirements as herein above provided.

21. PAYMENT FOR MOBILIZATION

A. General Mobilization

1. Payment for general mobilization shall be limited to those items of Work described in MOBILIZATION, of these General Requirements.

2. The CONTRACTOR shall submit to the PROJECT MANAGER for approval a breakdown of the amount established for mobilization. The payment for each item of mobilization will be made when that item of mobilization has been completed and as specified below:

3. When the monthly partial payment estimate of the amount earned, not including the amount earned for mobilization, is five percent (5%) or more of the original Contract amount, the total amount earned for mobilization may be up to fifty percent (50%) of the Contract item price for mobilization or five percent (5%) of the original Contract amount, whichever is less will be included in the said estimate for payment.

4. When the monthly partial payment estimate of the amount earned, not including the amount earned for mobilization, is ten percent (10%) or more of the original Contract amount, the total amount earned for mobilization may be up to seventy-five (75%) of the Contract item price for mobilization or seven point five percent (7.5%) of the original Contract amount, whichever is less will be included in the said estimate for payment.

5. When the monthly partial payment estimate of the amount earned, not including the amount earned for mobilization, is twenty percent (20%) or more of the original Contract amount, the total amount earned for mobilization may be up to ninety-five percent (95%) of the Contract item price for mobilization or nine point five percent (9.5%) of the original Contract amount, whichever is less will be included in the said estimate for payment.

6. When the monthly partial payment estimate of the amount earned, not including the amount earned for mobilization, is fifty percent (50%) or more of the original Contract amount, the total amount earned for mobilization may be up to one hundred percent (100%) of the Contract item price for mobilization or ten percent (10%) of the original Contract amount, whichever is less will be included in the said estimate for payment.

7. After acceptance of the Contract by the BOARD, the amount, if any, of the Contract item price for mobilization in excess of ten percent (10%) of the original Contract amount will be included for payment in the final monthly payment.

8. The Contract lump sum price paid for mobilization shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the Work involved in mobilization as specified herein.

9. The adjustment provisions in PAYMENT FOR CHANGES AND EXTRA WORK of these General Requirements, and the retention of funds provisions of PARTIAL PAYMENTS of these General Requirements shall not apply to the Contract lump sum item for Mobilization.

10. When other Contract items are adjusted as provided in PAYMENT FOR CHANGES AND EXTRA WORK of these General Requirements, if the costs applicable to such item of Work include mobilization costs, such mobilization costs will be deemed to have been recovered by the CONTRACTOR by the payments made for mobilization and will be excluded from consideration in determining compensation under said Article.

11. When the Contract does not include a Contract pay item for mobilization as specified above, full compensation for any necessary mobilization required shall be considered as included in the prices paid for the various Contract items of Work involved and no additional compensation will be allowed.

22. PAY ITEM DEFINITIONS

This Article describes methods of measurement and payment for lump sum and unit priced items listed on the Schedule of Work and Prices, contained in the Contract Proposal.

A. The Contractor shall not take advantage of any apparent error or omission on the Drawings or Specifications, and the PROJECT MANAGER shall be permitted to make corrections and interpretations as may be deemed necessary for fulfillment of the intent of the Contract Documents.

B. All portions of the Work are either in an applicable allowance, lump sum, or unit price item listed on the schedule of Work and Prices. Work for which there is not a separate item will be considered incidental to the contract and no additional compensation shall be allowed.

C. ALLOWANCES

1. Fixed allowances may have been allocated to the Schedule of Work and Prices for certain items of work. Requirements for each Allowance Item are specified below or a reference is given to the General Requirements article that describes the work. Allowance item work is to be performed only as directed by the PROJECT MANAGER. Unless otherwise noted, Allowances will be paid on a time and materials basis in accordance with Section C, PARTIAL PAYMENTS of these General Requirements.

2. If allowance items are not executed or are only partially executed or the allowance for any item is not expended or partially expended, then a deductive change order shall be issued for the amount that is not expended. If, however, these items are over expended then an appropriate change order shall be executed in accordance with, PAYMENT FOR CHANGES AND EXTRA WORK, of these General Requirements.

D. LUMP SUM ITEMS:

1. Payment of the lump sum items established in the contractor's Bid under the various line items in the Bid Form shall be full compensation for all labor, materials, and equipment required to furnish, install,

construct, and test the Work covered under the lump sum bid item.

2. Payment for the lump sum items established in the Contractor's Bid shall also fully compensate the Contractor for any other work which is not specified or shown, but which is necessary to complete the Work.

3. Payments for Lump Sum Work other than Mobilization will be based upon physical progress for each activity in accordance with the breakdown of the Lump Sum prices agreed to in the Schedule of Values.

E. UNIT PRICE ITEMS:

1. Payment for all work shall be in accordance with the unit price bid items in the schedule of Work and Prices and shall be full compensation for all labor, materials, and equipment required to furnish, install, construct and test the Work covered under the unit price bid item. Work for which there is not a price schedule item will be considered incidental to the Work and no additional compensation shall be allowed.

2. Payment will be made only for the actual quantities of work performed in compliance with the Drawings and Specifications. The Contractor will receive reimbursement equal to the approved quantity times applicable unit price.

23. SCHEDULE OF VALUES

A. The Schedule of Values will be used as a basis for determining progress payments on a lump sum Contract or any designated lump sum bid item. The Schedule of Values shall be a schedule of cost loaded construction activities equal, in total, to the lump sum bid and shall be in such form and sufficient detail to correctly represent a reasonable apportionment of the lump sum. Prior to submitting an invoice for payment, the CONTRACTOR shall have submitted a detailed Schedule of Values and obtained approval from the PROJECT MANAGER.

B. Each lump sum bid item on the Schedule of Work and Prices as set forth in the Bid must be broken down separately. The breakdown of each lump sum bid item must cover the cost of construction required by the plans and specifications for that item. The sum of the values for the construction activities, within a bid item must equal the total amount bid for that item.

C. Each activity in the Schedule of Values shall delineate one construction activity. For example, the placement of concrete between construction joints, the construction of an electrical duct bank or pipeline between points A & B. The costing for each activity should include all costs for the labor and materials or equipment required to complete the activity. For example, concrete construction activities should include all costs for the forming, placing of reinforcement, placing concrete and curing. The cost for pipeline construction activities should include materials, equipment and installation including pipeline supports or thrust blocks. The excavation and backfill for a pipeline or structure may be separate activities. No non-construction activity shall be cost loaded.

24. NOTICE TO WITHHOLD AND/OR STOP NOTICE

A. When a "Notice to Withhold" or "Stop Notice" is served upon the CITY, or the BOARD, pursuant to the lien statutes of the State of California, to withhold sufficient funds from payments to the CONTRACTOR in support of a claim resulting from default by the CONTRACTOR in payment for labor or materials used in prosecution of the Contract, the CITY shall withhold from payment due the CONTRACTOR an amount of money equal to the amount of the claim stated in the "Notice to Withhold" or "Stop Notice," and an additional amount equal to twenty-five percent (25%) of the amount of said claim, to defray the costs of litigation in the event of court action on the claim, for a total withholding of one and one quarter times the stated amount of the claim. At the discretion of the CITY, the CITY may allow the CONTRACTOR to file with the CITY the bond referred to in the Civil Code of the State of California after which said monies will not be withheld on account of such "Notice to Withhold" or "Stop Notice."

B. In the event the Contract is terminated for CONTRACTOR default, any funds due the CONTRACTOR and

retained by the CITY in accordance with PARTIAL PAYMENTS of these General Requirements, shall become the property of the CITY to the extent necessary to repay to the CITY any excess in the Contract price above the cost of the Work completed at the time of termination. After issuance of notice to discontinue Work, no further payments will be made to the CONTRACTOR for the Work covered by the notice until completion of Work and final settlement has been made.

25. FINAL PAYMENT

A. Final payment to the CONTRACTOR is made following action by the BOARD that formally adopts the recommendation of the PROJECT MANAGER to accept the Contract.

B. After acceptance of the Work by the BOARD and not more than sixty (60) calendar days after filing Notice of Completion, the CITY will make final payment to the CONTRACTOR of the amount remaining after deducting all prior payments and all amounts to be kept or retained under the provisions of the Contract, including the following items:

1. Liquidated damages, as applicable;

2. Lien claims or Stop Notices filed on behalf of suppliers, Subcontractors, and labor performed in connection with the Project; except, that upon submittal of a Stop Notice Release Bond issued by an approved Surety Company executed in favor of the CONTRACTOR, the CITY will release such portion of the retainage funds to said CONTRACTOR that is being held solely to cover Stop Notice Claims.

3. No claim of the CONTRACTOR under this Article shall be allowed unless the CONTRACTOR has given the required written notice. Nor shall a claim by the CONTRACTOR for an equitable adjustment hereunder be allowed if asserted after final payment under this Contract.

26. CHANGE ORDER REQUESTS

A. The CONTRACTOR's quotations for preliminary change orders for extras, changes, additions, or deletions to the Work as described in Article 52 CHANGES AND EXTRA WORK of the General Conditions shall be submitted to the PROJECT MANAGER, in writing, on the Change Order Cost Quotation Form provided by the PROJECT MANAGER, and in conformance with the requirements of PAYMENT FOR CHANGES AND EXTRA WORK of these General Requirements. Examples of these forms are bound at the end of these General Requirements. The quotation shall be firm for a period of not less than sixty (60) calendar days from the date of receipt of the quotation by the PROJECT MANAGER. Submit its written cost quotation and Time Impact Analysis not later than two (2) weeks after being requested to provide such quotation, unless the PROJECT MANAGER allows more time. Delays in submitting quotations beyond the two (2) weeks set forth herein, which cause a delay in the issuance of a Change Order or a delay to the completion date of the Project, shall not be cause for a claim or a time extension under the Contract.

B. The PROJECT MANAGER's request for quotation on a preliminary change shall not be considered authorization to proceed with the changed Work prior to the issuance of a formal Change Order, unless directed otherwise in writing by the PROJECT MANAGER, nor shall such request constitute justification for a delay to the existing Work or a time extension under the Contract.

27. PAYMENT FOR CHANGES AND EXTRA WORK

Payment to the CONTRACTOR, or credit to the CITY, for any extra, change addition or deletion to the Work under the Contract, or settlement of any claim under the Contract, covered by any Change Order, shall be determined by the methods set forth herein. The PROJECT MANAGER may change the plans and specifications, character of the Work, or quantity of Work provided the total arithmetic dollar value of all such changes, both additive and deductive, does not exceed twenty-five percent (25%) of the Contract price. Should it become necessary to exceed this limitation, the change shall be by written Supplemental Agreement between the CONTRACTOR and the CITY, which shall be executed by a Change Order.

A. LUMP SUM

A total sum for the changed Work may be mutually determined by the PROJECT MANAGER and the

CONTRACTOR. The CONTRACTOR shall furnish a breakdown of the costs satisfactory to the PROJECT MANAGER, of the proposed lump sum, in complete accordance with C through J of this Article. Such lump sum costs shall be full and final compensation as described in D of this Article. All cost proposals for lump sum Change Orders shall be presented in accordance with C through J of this Article.

B. COST REIMBURSEMENT (TIME AND MATERIALS) WORK

The costs of all changed Work submitted under the cost reimbursement (time and materials) method shall be formulated in accordance with the provisions of C through J of this Article.

Additionally, if the method or amount of payment cannot be agreed upon prior to the beginning of the Work, the PROJECT MANAGER may issue a unilateral Change Order in the amount determined reasonable by the PROJECT MANAGER for the changed Work and direct the CONTRACTOR to proceed with the changed Work or the PROJECT MANAGER may direct in writing that the Work be done on a cost reimbursement (time and materials) basis, and the CONTRACTOR shall provide all labor, equipment, and materials necessary to complete the Work in a satisfactory manner and within a reasonable period of time. For Work performed, payment shall be made for the documented actual cost, in accordance with the following provisions.

1. Labor, up to and including general foremen, who are directly assigned to the changed Work. Employees identified as superintendents shall not be charged as labor on changed Work, but shall be covered under overhead costs. These costs shall include actual documented payroll costs including wages, payroll taxes as established by law (i.e., FICA, Federal and State Unemployment Taxes), fringe benefits as established by negotiated labor agreements, and any insurance costs (such as Worker's Compensation and General Liability Insurance but shall not include Automobile Liability Insurance, OCIP coverage, or any other insurance costs which are provided for in B.6 below which are currently assessed against labor costs. A detailed breakdown of the subcomponents of labor costs, by all crafts shall be submitted to the PROJECT MANAGER, by the CONTRACTOR and all SUBCONTRACTORS, for approval, as part of the documentation of labor costs, within forty-five (45) days after issuance of the Notice to Proceed. No other subcomponents of labor costs shall be considered, unless approved in writing by the PROJECT MANAGER.

2. Materials - The cost of materials used in performing the changed Work will be the cost, including sales tax, to the purchaser, whether CONTRACTOR, Subcontractor or other forces, from the supplier thereof, except as the following are applicable:

    a. Cash or trade discounts available to the purchaser shall be credited to the CITY notwithstanding the fact that such discounts may not have been taken by the CONTRACTOR.

    b. For materials secured by other than a direct purchase and direct billing to the purchaser, the cost will be deemed to be the price paid to the actual supplier as determined by the PROJECT MANAGER. Markup, except for actual costs incurred in the handling of such materials, will not be allowed.

    c. Payment for materials from sources owned wholly or in part by the purchaser shall not exceed the price paid by the purchaser for similar materials from said sources on Contract items or the current wholesale price for such materials delivered to the job site, whichever price is lower.

    d. If, in the opinion of the PROJECT MANAGER, the cost of materials is excessive, or the CONTRACTOR does not furnish satisfactory evidence of the cost of such materials, then the cost shall be deemed to be the lowest current wholesale price for the quantity concerned, delivered to the job site less cash or trade discount. The CITY reserves the right to furnish materials for the Work and no claim shall be made by the CONTRACTOR for costs and profit on such materials.

    e. For the purposes of this Article, a "Supplier" is defined as any person or persons, firm or business, who supplies materials, of construction and/or permanent equipment, but who does

not perform any portion of the Work of the Contract on site, for the CONTRACTOR, except that labor or labor supervision which may be required by some manufacturers as part of their equipment installation for warranty or other purposes.

3. EQUIPMENT COSTS, including ownership, lease or rental costs, as well as operating costs, for individual equipment units whose replacement value is in excess of $1,000. Transportation and set up costs shall be included, but only if the equipment is imported to the worksite solely to perform Work on the changed Work included in the Change Order and the CONTRACTOR can demonstrate that the changed Work cannot or could not be performed economically with equipment already at the site. Equipment costs shall be determined in accordance with the requirements set forth in H of this Article.

4. SUBCONTRACTOR COSTS, provided that such costs are direct costs to the CONTRACTOR for performing the changed Work as set forth in E of this Article.

5. BOND COSTS on the incremental change in the value of the Contract shall be determined and paid for as set forth in I.1 of this Article.

6. INSURANCE COSTS (other than labor insurance or OCIP coverage) shall be determined and paid for as set forth in I.2 of this Article.

C. GENERAL

1. It is the intent of the CITY to settle all Change Orders full and final at the time the Change Order is issued. Therefore, the following paragraph will be incorporated, in writing, on all Change Orders.

> "The compensation (time and cost) set forth in a Change Order comprises the total compensation due the CONTRACTOR, all Subcontractors, and all Suppliers, for the Work or change defined in the Change Order, including impact on unchanged Work. By signing the Change Order, the CONTRACTOR acknowledges and agrees on its behalf and on the behalf of all Subcontractors, and all Suppliers, that the stipulated compensation includes payment for all Work contained in the Change Order, plus all payment for the interruption of schedules, extended field overhead costs, delay, and all impact, ripple effect or cumulative impact on all other Work under this Contract. The signing of the Change Order indicates that the Change Order constitutes full mutual accord and satisfaction for the change, and that the time and/or cost under the Change Order constitutes the total adjustment to price or time or performance owed the CONTRACTOR, all Subcontractors, and all Suppliers as a result of the change. The CONTRACTOR, on behalf of himself, all Subcontractors, and all Suppliers, agrees to waive all rights, without exception or reservation of any kind whatsoever, to file any further claim related to this Change Order. No further claim or request for adjustment of any type, excepting only bond and insurance cost as set forth in these General Requirements of the Contract Documents for any reasonably foreseeable cause shall arise out of or as a result of this Change Order or the impact of this Change Order on the remainder of the Work under this Contract."

2. Costs which shall not be paid in Change Orders under this Contract include, but are not limited to, interest costs of any type; claim preparation or filing costs; legal expenses; the costs of preparing or reviewing proposed Change Orders or Change Order proposals; lost revenue; lost profits; lost income or earnings; rescheduling costs; costs of idled equipment when such equipment is not at the site or has not yet been employed on the Work; lost earnings or interest on unpaid retainage; claims consulting costs; and the costs of corporate officer or staff visiting the site; any compensation due to the fluctuation of foreign currency conversion or exchange rates; loss of other business; changes in taxes or increased tax rates of any kind or any costs identified as unallowable under the provisions of the Federal Acquisition Regulations.

3. Extensions of time shall be based solely upon the effect of delays to the Work as a whole. Extensions of time shall not be granted for delays to the Work, unless the CONTRACTOR can clearly

demonstrate, through analysis of the current updated schedule, that the delay to the Work as a whole arose or will arise from causes other than normal weather, beyond the control and without fault or negligence of the CONTRACTOR, or any Subcontractor, at any tier, and that such delays did or will, in fact, delay the progress of the Work as a whole. The CONTRACTOR shall not be entitled to a time extension unless it submits a Time Impact Analysis which is a calculation of the extent of the delay to the end date of the Work and which shows that the Work has been or will be extended beyond the current Contract completion date. A Time Impact Analysis is an estimating procedure which utilizes the networking techniques (fragnets) and a written analysis of the facts associated with the alleged delay to demonstrate the effect of the alleged delay on the critical path of the schedule. A "fragnet" is defined as a sequence of new activities and/or activity revisions that are proposed to be added to the existing current updated schedule to demonstrate (mathematically and graphically) the influence of the alleged delay on the end date of the Work and shall be the sole method for incorporating delays and impacts into the schedule. The objective of a Time Impact Analysis is to pinpoint, isolate, and quantify all time impact associated with a specific issue and determine its time relationship to past or current delays. Time extensions shall not be allowed for delays to parts of the Work that are not on the critical path of the currently approved monthly updated Project Schedule. Time extensions shall not be granted, nor delay damages of any kind whatsoever paid to the CONTRACTOR, until all available float, slack, or contingency time on the Project is used and the end date of the Work is moved beyond the current, adjusted Contract completion date.

4. The CONTRACTOR'S Cost Breakdowns submitted under the lump sum method described in paragraph A and its Change Order Quotations submitted under the cost reimbursement (time and materials) method described in paragraph B (including without limitation requests for cost reimbursement for delay, disruption, hindrance and interference associated with extras, changes, additions or deletions) shall be itemized in a manner that, with mathematical certainty and without reliance upon probabilities or inferences, segregates the direct, actual reimbursable costs associated with each individual extra, change, addition, deletion and (on an event-by-event basis) each individual delay or disruption event. Such Change Order Cost Quotations shall not be based, in whole or in part, upon any methodology (such as "total cost" or "modified total cost" methodologies) that purports to calculate the CONTRACTOR'S additional costs of performance of the extra, change, addition or deletion (including without limitation the additional costs of delay, disruption or other impact) based on the difference between CONTRACTOR'S total actual Project or line item costs (with or without fee) and its original bid estimate for the Project or any original bid estimate line item. In connection with the foregoing, CONTRACTOR represents and warrants that it has the ability to generate and maintain complete and accurate cost accounting records that will reflect:

   a. The actual costs incurred or saved for each individual item of extra work, change, addition, deletion (including without limitation any costs of associated delay, disruption, interference, hindrance and the cumulative impact of each extra, change, addition, deletion on other parts of the Work); and,

   b. On an event-by-event basis, the effect of each delay or disruption that forms the basis of each request for extension of time, regardless of their scope, number, complexity, cumulative effect, or time of issuance or occurrence.

5. Except as provided in Article 51, COMPENSATION FOR DELAY, DISRUPTION, UNANTICIPATED OVERHEAD of the General Conditions, CONTRACTOR shall have no right to recovery of any compensation, costs, expenses or damages resulting from delay, disruption, interference, or hindrance in the performance of the Work (including without limitation interruption of schedules, excess or extraordinary extended field and indirect overhead costs, loss of productivity and the impact, ripple or cumulative effect on other Work).

6. CONTRACTOR waives any claim or rights and remedies based on abandonment, quantum merit, rescission or other similar legal theory by reason of any of the following circumstances, which the CONTRACTOR acknowledges and agrees are within the reasonable contemplation of the parties:

a. Extras, changes, additions and deletions to the Work after execution of the CONTRACT and issued from time to time throughout the period of construction, regardless of their scope, number, cumulative value, or complexity, to correct errors, omissions, conflicts, and ambiguities in the Contract Documents, or to implement discretionary changes the scope of Work requested by the CITY;

b. The issuance and performance of extras, changes, additions and deletions in a manner that is not in sequence with the as-built or as-planned progress of the Work;

c. Changes due to Differing Site Conditions;

d. Suspensions of the Work or parts thereof, or limitations on access to portions or all of the Work, for the convenience of CITY or in the interests of the Project;

e. Delay or disruption to the Work due to failure of the CITY, PROJECT MANAGER or INSPECTOR to timely perform any contractual obligation.

D. OVERHEAD COSTS

To the costs under Paragraphs C.1., C.2., and C.3., above, an added fixed fee to provide compensation for all overhead costs shall be allowed as established in Paragraph E.1 below. This overhead rate is not applicable to the costs under Paragraphs C.4. through C.6. above.

The overhead rates determined in Paragraphs 1 and 2 below shall be applied to all additive and deductive Change Orders, of this Article.

1. GENERAL AND ADMINISTRATIVE OVERHEAD RATE:

a. An allowance of eight percent (8%) for overhead costs will be allowed to the CONTRACTOR, only when CONTRACTOR uses its own organization to perform a part of the Work under the Change Order based upon the value of labor, material and construction equipment required to accomplish said part of the change Paragraphs C.1., C.2., and C.3.

b. An allowance of twelve percent (12%) for overhead costs will be allowed to the Subcontractors (at any tier), only when Subcontractors use their own organization to perform a part of the Work under the Change Order, based upon the value of labor, material, and construction equipment required to accomplish said part of the change Paragraphs C.1., C.2.,and C.3.

c. Overhead percentages shall be considered to include all insurance costs other than specifically mentioned in this Article, all field and office supervisors and assistants, all onsite project administration, security costs, the cost of small tools and consumables, incidental job burdens, and all general home office expenses and no separate allowance will be made therefore. Assistants to field and office supervisors include all clerical, stenographic, and general office help. Incidental job burdens include, but are not necessarily limited to, office equipment and supplies, temporary toilets, telephone and conformance to OSHA requirements. Items such as, but not necessarily limited to, review and coordination, estimating, PROJECT MANAGER, scheduling, and expediting relative to Change Orders, and updating and furnishing Record Drawings to incorporate changes, are associated with field and office supervision and are considered to be included in the CONTRACTOR's overhead percentage set forth herein.

d. For those Change Orders with both additive and deductive costs, the overhead rate shall be determined by the net amount of the additive and deductive work.

E. SUBCONTRACTOR COSTS

1. Where Work under the Change Order is performed in whole or in part by a Subcontractor, at any tier, the cost of the Change Order shall include the cost to the Subcontractor. Subcontractor's costs shall be presented in strict accordance with A., B., and C., above, and D. through J. as applicable.

2. An additional fixed fee of six percent (6%) based upon the sum of the costs of all Subcontractors, at

any tier, involved in the Work of the Change Order, shall be allowed to the CONTRACTOR for profit and General and Administrative Overhead Costs. An additional fixed fee of six percent (6%) shall be allowed to first tier Subcontractors for profit and General and Administrative Overhead costs for any Work involved in the Change Order that is performed by Sub-subcontractors. No additional fixed fee shall be allowed for Change Order Work performed by Subcontractors to Sub-subcontractors, at any tier.

F. PROFIT

To the costs of C.1., C.2., and C.3., above, plus applicable overhead costs from D.1.a. or D.2.b., if a SUBCONTRACTOR at any tier above, an added fixed fee for Profit shall be allowed as established herein.

1. An allowance of ten percent (10%) for Profit for the party performing the Work under the Change Order, shall be included on all Change Orders that are negotiated full and final in advance of any changed Work being performed.

2. An allowance of five percent (5%) for Profit for the party performing the Work under the Change Order shall be included on all Change Orders where any portion of the Work is performed before the Change Order is executed full and final by both the PROJECT MANAGER and the CONTRACTOR.

3. No added fixed fee for Profit shall be allowed for any cost other than those costs under C.1., C.2., and C.3., of this Article, if Subcontractor at any tier above. No fixed fee for profit shall be allowed on the costs of C.4., C.5., C.6., or F of this Article.

4. On Change Orders with both additive and deductive cost components, the profit allowance on net additive Change Orders shall be based on the Change Order amount after overhead rates have been added. The profit allowance shall be as set forth in Paragraphs 1 and 2 above as applicable. No profit allowance shall be included for net deductive Change Orders.

G. CITY FURNISHED MATERIALS AND EQUIPMENT

The CITY reserves the right to furnish such materials and equipment as it deems expedient, and the CONTRACTOR shall have no claim for profit or overhead on the cost of such materials and equipment.

H. EQUIPMENT COSTS

Full rental costs for rental or leased equipment shall not exceed the rates as set forth in the Rental Rate Blue Book (the Blue Book) published by Dataquest, Inc., Palo Alto, California, as adjusted to the regional area of the Work under this Contract. Owned equipment costs shall not exceed the rates listed in the Cost Reference Guide (the CRG) for Construction Equipment, published by Dataquest, Inc., Palo Alto, California. The most recent published edition in effect at the commencement of actual equipment use shall be used.

1. RENTED OR LEASED EQUIPMENT

a. For equipment rented or leased (including lease with purchase option) in arm's length transactions from outside vendors, the CONTRACTOR shall be paid the actual invoiced, rented or leased rates provided that the invoiced lease or rental rates do not exceed the rates set forth in the Blue Book. Arm's length rental or lease transactions are those in which the firm involved in rental or lease of such equipment is not associated with, owned by, have common management, directorship, facilities, or stockholders with the firm renting the equipment. Submittal by a CONTRACTOR of a rental or leased invoice from the lessor will be prima facie proof of compliance with the above. However, such invoices are not conclusive proof; if questioned, the burden of proof remains with the CONTRACTOR. In no event shall the leased equipment rate billed to the CITY be at rates exceeding those prescribed in the following table:

Actual Usage (Change Order & Contract Work Combined	Blue Book Payment Category

Less than 8 hours	Hourly Rate
8 or more hours but less than 7 days	Daily Rate
7 or more days but less than 30 days	Weekly Rate
30 calendar days or more	Monthly Rate

b. When in Use:

Actual equipment use time documented by the INSPECTOR or PROJECT MANAGER shall be the basis that the equipment was utilized on the changed Work and paid for under the Change Order. In addition to the lease or rental rate, equipment operating costs shall not exceed the estimated hourly operating rate as set forth in the Blue Book. The hours of operation shall be based upon actual equipment usage on the changed Work as recorded by the INSPECTOR or PROJECT MANAGER. For multiple shift Work sequences, the allowable equipment rate shall not exceed fifty percent (50%) of the base rate, for second or third shifts.

c. When Idle:

Idle equipment is equipment on site and necessary to perform the Work under the change but not in actual use due solely to the impact of the changed Work. Equipment operating costs due to idle time, documented by the INSPECTOR or PROJECT MANAGER, shall be paid at the rate determined in Paragraph I above. Idle time shall include a reasonable time allowance to and from the Project site.

2. OWNED AND OTHER EQUIPMENT

a. Equipment rates for owned equipment or equipment provided in other than arm's length transactions will not exceed the total hourly costs as set forth in the Cost Reference Guide. Adjustments to the listed rates provided for under the section of the Cost Reference entitled "Cost and Production Formulas" shall not be allowed. Except as noted herein below, this equipment hourly rate plus the estimated operating cost per hour from the Cost Reference Guide will be paid for each hour the equipment actually performs Work on the changed Work. Daily records listing the equipment units and their respective operators, identification code, and actual usage on the Work under the Change Order, as certified at the end of each Work day (or work shift if the Work is being performed in multiple work shift sequence) by the INSPECTOR or PROJECT MANAGER shall be the record upon which actual equipment use shall be based. For multiple shift Work sequences, the allowable equipment rate shall not exceed the hourly depreciation and operating costs listed in the Cost Reference Guide, for second or third shifts. It is agreed that this rate shall represent payment in full for all the CONTRACTOR's direct costs.

b. When Idle:

Equipment necessary to be on the site to complete the Work, but not in actual use due solely to the impact of the changed Work, shall not exceed fifty percent (50%) of the hourly rates identified in the "Ownership" column under the heading "Hourly Operating and Overhaul Expenses" set forth in the Cost Reference Guide, provided that its presence and necessity on the site has been documented by the INSPECTOR or PROJECT MANAGER, and further provided that the equipment was idled solely by actions of the CITY. Idle equipment time will only be paid as a function of delays specifically directed or caused by the CITY's actions. In no event shall the idle time claimed in a day for a particular piece of equipment exceed the normal Work schedule established for the Project - usually eight (8) hours per day or forty (40) hours per week, and excluding Saturdays, Sundays, and holidays. For multiple shift Work sequence, the allowable idle equipment rate shall not exceed fifty percent (50%) of the hourly depreciation costs listed in the Cost Reference Guide, for second or third shifts. It is agreed that this rate shall represent payment in full for all the CONTRACTOR's direct costs.

3. EQUIPMENT HAULAGE AND SET UP COSTS

a. Documented and actual equipment haulage and set up costs shall be paid for, if applicable as set forth in C of this Article.

4. OTHER EQUIPMENT COST GUIDES

a. In the event that a piece of equipment used on a Change Order is not listed in the Blue Book or the CRG, costs may be derived from the Associated General CONTRACTOR's of America Equipment Ownership Guide, the Associated Equipment Dealers Guide, or the Equipment Rate Guide published by the U.S. Army Corps of PROJECT MANAGERs as adjusted appropriately for the type of Work and use and the regional area of the Work under this Contract.

I. BONDS AND INSURANCE COSTS

1. Bond premium adjustment, consequent upon the Change Orders issued by the PROJECT MANAGER, shall be paid at the time of completion of the Work and will not be included in individual Change Orders. Additional bond costs on the incremental value of all Change Orders issued under the Contract shall be paid for through issuance of a separate Change Order upon receipt, by the PROJECT MANAGER, or a fully paid invoice from the CONTRACTOR's and Subcontractor's sureties. No allowances for overhead or profit shall be included in such separate Change Order.

2. Insurance costs, other than insurance assessed on labor costs, consequent upon the Change Orders issued by the PROJECT MANAGER, shall be paid for by the PROJECT MANAGER at the time of completion of the Work and will not be included in individual Change Orders. Additional insurance costs on the incremental value of all Change Orders issued under the Contract shall be paid through issuance of a separate Change Order upon receipt of a fully paid invoice from the CONTRACTOR's and Subcontractor's insurance carriers. On Contracts where the duration exceeds 365 calendar days from Notice to Proceed, the CONTRACTOR and its Subcontractors will be allowed to submit such fully paid invoices at the end of every year after issuance of the Notice to Proceed, and again at the end of the Project.

J. RECORDS

1. The CONTRACTOR's records shall make clear the distinction between the direct costs of Work paid for under the Change Order and the costs of the base scope Work under the Contract. Furnish the INSPECTOR with daily report sheets in duplicate of each day's cost reimbursement Work no later than the working day following execution of said Work. The daily report sheets shall itemize the materials and equipment used in the Work. The daily report sheets shall provide for identification and classification of workers; the hourly rates of pay and hours worked; and the size, type, identification number, and hours operated for each piece of equipment. The Daily Report sheets shall itemize the materials used in the Work.

2. Substantiate material charges by copies of vendor's invoices. Submit such invoices with the daily report sheets or, if not available at that time, submit with subsequent daily report sheets. Sign daily report sheets by the CONTRACTOR or his authorized agent and the INSPECTOR at the time of submittal.

3. On a weekly basis submit to the PROJECT MANAGER an approximate accounting of the Contract expended on the cost reimbursement Work to date and an estimate of the Impact to the time of performance of Work.

28. PRICE REDUCTION FOR DEFECTIVE COST OR PRICING DATA

A. If the PROJECT MANAGER determines that any price, including profit or fee, negotiated in connection with any Change Order under this contract, or any cost reimbursable under this Contract, was increased because:

1. The CONTRACTOR furnished cost or pricing data which was not accurate, complete, and current as certified in the CONTRACTOR's Certificate of Current cost or Pricing Data;

2. A Subcontractor or prospective Subcontractor furnished cost or pricing data was submitted in support of a subcontract cost estimate furnished by the CONTRACTOR but which was not accurate, complete, and current as of the date certified in the CONTRACTOR's Certificate of Current Cost or Pricing Data.

3. The CONTRACTOR or a Subcontractor or prospective Subcontractor, at any tier, furnished any data not within paragraph 1 or 2 above, which was not accurate as submitted;

then price shall be reduced accordingly and the Contract shall be modified in writing as may be necessary to reflect such reduction. However, any reduction in the Contract price due to defective subcontract data of a perspective Subcontractor, when the subcontract was not subsequently awarded to such Subcontractor, will be limited to the amount (plus applicable overhead and profit allowances) by which the actual subcontract or actual cost to the CONTRACTOR if there was no Subcontract, was less than the prospective subcontract cost estimate submitted by the CONTRACTOR; provided that the actual subcontract price was not affected by defective cost or pricing data.

B. The following certification from the CONTRACTOR is required to be provided on all Change Order quotations or requests for adjustment in excess of $10,000.

1. CERTIFICATION OF CURRENT COST AND PRICING DATA.

2. This is to certify that, to the best of my knowledge and belief, cost or pricing data submitted in writing, or specifically identified in writing if actual submission of the data is impracticable, to the CITY in support of [CONTRACTOR is to insert appropriate identification such as Change Order quotation, proposal quotation, price adjustment, etc.] are accurate, complete, and current as of [CONTRACTOR to insert date].

CONTRACT NO.: _____

PROPOSED CHANGE ORDER NO.: _____

FIRM: _____

NAME: _____

TITLE: _____

DATE: _____

SIGNATURE: _____

29. PAYMENT FOR MATERIALS OR EQUIPMENT DELIVERED AND STORED ON THE JOB

A. Partial payment for materials or equipment delivered to the worksite and stored shall be subject to the following conditions:

1. Payment will not be made for any materials or equipment unless each individual piece of the material or equipment becomes a permanent part of the Work and has a value of more than $5,000.

2. The material or equipment is required by the specifications, and is specifically manufactured for the Project and could not readily be utilized or diverted to another job.

3. The CONTRACTOR shall provide secure storage facilities as required in STORAGE OF MATERIALS AND EQUIPMENT of these General Requirements.

4. No payment will be made for living or perishable Plant material, or for degradable materials such as rock, sand, cement, or for reinforcing steel, miscellaneous piping, off the shelf and catalog items,

and similar items of construction, until they are incorporated into the Work.

5. The payment for the materials or equipment shall not exceed ninety-five percent (95%) of the invoice cost. The amount paid shall not exceed the total amount of the bid item less an amount estimated for installation.

6. Include cost loaded activities for the materials and equipment, for which payment will be requested, in the Schedule of Values. The CONTRACTOR shall provide all documentation necessary to establish the cost of the materials or equipment.

7. Suppliers, fabricators, or manufacturers who intend to furnish materials or equipment to the CITY must file a notice with the CITY in accordance with the State of California lien laws.

8. Each supplier, fabricator or manufacturer shall file a list, with the INSPECTOR, indicating the materials or equipment to be furnished to the Project. They shall also provide a notarized declaration from their company indicating the employees authorized to sign an unconditional release for the company. The persons signing the declaration and the unconditional release shall be identified by name and title.

9. Each request for payment shall include a notarized Unconditional Release, which conforms to the California Civil Code. The release shall be signed by an authorized employee identified in the corporate declaration. The request shall include the suppliers invoice for the materials or equipment.

10. Absorb costs incurred to meet the requirements of this Article without modification to the Contract amount.

30. PAYMENT FOR MATERIALS OR EQUIPMENT STORED OFF THE JOBSITE

A. Partial payment for materials or equipment stored off the jobsite shall be subject to the following conditions:

1. Payment will not be made for any materials or equipment unless each individual piece of the material or equipment becomes a permanent part of the Work and has a value of more than $5,000, unless otherwise approved by the city.

2. The materials or equipment is required by the specifications, and is specifically manufactured for the Project and could not readily be utilized or diverted to another job.

3. No payment will be made for living or perishable Plant material, or for degradable materials such as rock, sand, cement, or for reinforcing steel, miscellaneous piping, off the shelf and catalog items, or similar items, until they are incorporated into the Work.

4. Payment for the materials or equipment stored shall not exceed sixty percent (60%) of the invoice cost of the materials or equipment. Percent of the invoice paid shall be at the discretion of the CITY. The amount paid shall not exceed the total amount of the bid item less an amount estimated for installation.

5. Include cost loaded activities for the materials and equipment, for which payment will be requested, in the Schedule of Values. Provide documentation necessary to establish the cost of the materials or equipment.

6. Suppliers, fabricators, or manufacturers who intend to furnish materials or equipment to the CITY must file a notice with the CITY in accordance with the State of California lien laws.

7. Each supplier, fabricator or manufacturer shall file a list, with the INSPECTOR, indicating the materials or equipment to be furnished to the Project. They shall also provide a notarized declaration from their company indicating the employees authorized to sign an unconditional release for the company. The persons signing the declaration and the unconditional release shall be identified by name and title.

8. Each request for payment shall include a notarized Unconditional Release, which conforms to the California Civil Code. The release shall be signed by an authorized employee identified in the

corporate declaration. The request shall include the suppliers invoice for the materials or equipment.

9. Store the materials and equipment as required in STORAGE OF MATERIALS AND EQUIPMENT of these General Requirements, in a bonded warehouse or facility approved by the INSPECTOR. The storage site shall be located within 50 miles of the geographic limits of the CITY. The materials and equipment shall be physically segregated from all other materials or equipment within the facility and shall be identified as being the "PROPERTY OF THE CITY OF LOS ANGELES". Exercise measures necessary to ensure preservation of the quality, quantity, and fitness of such materials or equipment and perform the manufacturers recommended maintenance of the materials or equipment. Inspect the materials and equipment, and submit a monthly written report to the INSPECTOR listing the equipment stored, results of their inspection, and the maintenance performed.

10. Grant the INSPECTOR and the PROJECT MANAGER access to the storage facility at any time and assist the INSPECTOR and the PROJECT MANAGER in conducting a full view, piece by piece, inventory of all such material or equipment.

11. Provide additional insurance necessary to insure the materials or equipment against loss of damage. The insurance provided shall be provided as stated in Article 37, INSURANCE of the General Conditions. The insurance shall cover the material or equipment, while stored at the approved site, while in transit to the project site, while being off-loaded at the site and until the material or equipment is incorporated into the Work and the Contract is accepted by the BOARD.

12. Be responsible for damage to, defects therein, misfabrication thereof, or loss of the materials or equipment.

13. Be responsible for any resulting Project delays or consequential damages as if the CONTRACTOR were the owner of the material or equipment until it is incorporated in the Work and accepted by the CITY.

14. Absorb any and all cost incurred to meet the requirements of this Article without modification in the Contract amount.

15. Present the storage arrangements in writing and sign a Security Agreement, which shall be submitted to the INSPECTOR for approval by the CITY ATTORNEY. This agreement shall set forth the terms of ownership, storage and insurance necessary to insure the material or equipment against damage or loss.

31. PAYMENT FOR PERMITS

See PAYMENT FOR MOBILIZATION of these General Requirements.

32. AUDIT AND ACCESS TO RECORDS

A. Maintain books, records, documents and other evidence directly pertinent to performance of Work under this Contract in accordance with generally accepted accounting principles and practices consistently applied. Also maintain the financial information and data used by the CONTRACTOR in the preparation or support of cost submissions required for this Contract, or any Modifications or claims, and a copy of the cost summary submitted to the CITY. The CITY authorized representatives shall have access, at all times during normal business hours, to such books, records, documents and other evidence for the purpose of inspection, audit and copying. Provide proper facilities for such access and inspection.

B. Agree to make A through G of this Article applicable to this Contract and Modifications or claims affecting the Contract price. Agree to include A through G of this Article in all his contracts and all tier Subcontracts in excess of $5,000, and to make A through G of this Article applicable to Modifications and claims related to Project performance.

C. Audits conducted under this Article shall be in accordance with generally accepted auditing standards and established procedures and guidelines of the reviewing or audit agency.

D. Agree to the disclosure of information and reports resulting from access to records under A and B of this

Article, to the CITY and affected agencies.

E. Records under A and B of this Article shall be maintained and made available during performance of Work under this Contract until final payment, or until settlement of all disputes, claims, or litigation, whichever occurs later. In addition, those records which relate to any portion of this Contract, to any Modification, to any dispute, to litigation, to the settlement of claims arising out of such performance, or to costs or items to which an audit exception has been taken, shall be maintained and made available until final payment or until final resolution of such dispute, litigation, claim or exception, whichever occurs later.

F. This right of access Article applies to financial records pertaining to this Contract and all Contract Modifications. In addition this right of access applies to all records pertaining to all contracts, contract modifications, and contract amendments:

1. To the extent the records pertain directly to Contract performance;

2. If there is any indication that fraud, gross abuse or corrupt practices may be involved; or

3. If the Contract is terminated for default or for convenience.

G. Access to records is not limited to the required retention periods. The authorized representatives designated in A of this Article shall have access to records at any reasonable time for as long as the records are maintained.

H. Provided that CITY has made demand for access or audit pursuant to this Article, CONTRACTOR's compliance with provisions A through G of this Article shall be a condition precedent to maintenance of any legal action or proceeding by the CONTRACTOR against the CITY and to CONTRACTOR's right to Progress or Final Payment. Without limitation to the foregoing or to any other provisions for withholding set forth in the Contract Documents, CITY shall have the right, in its sole discretion and in addition to any right of withholding of retention, to further withhold from any payment to CONTRACTOR a sum of up to ten percent (10%) of the total amount set forth in CONTRACTOR's current, unpaid Application(s) for Payment, until CONTRACTOR has complied with any outstanding and unsatisfied request by CITY for audits under this Article. Upon CONTRACTOR's compliance with this Article, any monies withheld pursuant to this Paragraph solely due to CONTRACTOR's failure to permit an audit requested by CITY shall be released to CONTRACTOR.

I. CONTRACTOR hereby consents and agrees that any failure by CONTRACTOR to provide access to records as provided in A through G of this Article shall be specifically enforceable by issuance of a preliminary and/or permanent mandatory injunction by a court of competent jurisdiction based on affidavits submitted to such court, without the necessity of oral testimony, to compel CONTRACTOR to permit access and inspection of the records or to require delivery of the records to CITY for inspection.

MISCELLANEOUS

33. INTERFACE/COORDINATION REQUIREMENTS

A. Vehicular and pedestrian traffic adjacent to the laydown area and/or within the jobsite must be maintained. If an existing street in the CONTRACTOR's work area is to be demolished or obstructed, the CONTRACTOR shall be responsible for providing access through or around the effected area, including signs, barricades, and lights, as approved by the PROJECT MANAGER and any local agencies having jurisdiction over any public access areas. The CONTRACTOR shall follow WATCH standards and City of Los Angeles Department of Transportation Worksite Traffic Control Plans for all traffic, including a minimum traffic lane dimensions for vehicles and pedestrians.

B. The CONTRACTOR shall not park any vehicles, including concrete, hauling and delivery trucks, in any street at any time unless approved by the PROJECT MANAGER. Access must be maintained at all times for emergencies, sampling, equipment operations, maintenance and like items.

C. Before altering any vehicular or pedestrian access, the CONTRACTOR shall notify the PROJECT MANAGER thirty (30) days in advance on forms provided by the PROJECT MANAGER. The CONTRACTOR shall then request the alteration on forms provided by the PROJECT MANAGER. Requests

shall include reasons for the alteration, times, boundary limits, special safety measures, proposed traffic rerouting with widths of such route, and a map detailing the above. Such requests shall be submitted to the PROJECT MANAGER not less than fifteen (15) days before the requested date of the access alteration. If any of the information changes, an additional fifteen (15) days may be required after the changes are brought to the attention of the PROJECT MANAGER. Approval when granted, will always be conditional. Final approval of the request, including date and time, will be given three (3) days in advance. The CITY retains the right to ticket and impound vehicles blocking traffic.

34. PROGRESS PHOTOGRAPHS

A. As directed by the PROJECT MANAGER, take a minimum of 4 views of each Project worksite location, at 14 days intervals during the entire period of Contract Work. Take the first photographs before start of construction operations at the jobsite. Take the final photographs when all Contract Work has been completed and accepted by the CITY regardless of time intervals since previous photographs were taken. View locations shall be as directed by the PROJECT MANAGER.

B. Provide 4, 8-inch by 10-inch color prints of each photograph on double weight glossy paper with each monthly progress report. Clearly label each print with the name of the job, view location, date of exposure and CONTRACTOR's name. Photographs and prints shall be of professional quality.

C. Submittal of progress photographs shall be a condition precedent to the making of the monthly payments.

35. COMMUNITY RELATIONS

A. The contractor shall cooperate with the City in conducting a public relations program for the project. The program will provide information to address concerns and complaints and to promote a positive project image. Contractor cooperation shall include the following:

1. The Project Manager shall attend public meetings, when requested by the PROJECT MANAGER.

2. Provide safe access for on-site community meetings and tours, on average twice per month per work site. Tours will be conducted by the PROJECT MANAGER and will be coordinated with the Contractor to limit interference with the work.

3. Do not provide any information directly to the public or news media without approval of the PROJECT MANAGER.

36. PROJECT CLOSEOUT

A. CLOSEOUT TIMETABLE

The CONTRACTOR shall establish dates for equipment testing and acceptance periods (as required under the Contract). Such dates shall be established not less than one week prior to beginning any of the foregoing items, to allow the CITY, the PROJECT MANAGER, and their authorized representatives sufficient time to schedule attendance at such activities.

B. FINAL SUBMITTALS

1. The CONTRACTOR, prior to requesting final payment, shall obtain and submit the following items to the PROJECT MANAGER.

a. Written guarantees, where required.

b. Technical manuals and instructions.

c. Maintenance stock items; spare parts; special tools.

d. Completed record drawings.

e. Certificates of inspection and acceptance by local governing agencies having jurisdiction.

f. Releases from all parties who are entitled to claims against the subject project, property, or

improvement pursuant to the provisions of law.

C. FINAL CLEANUP

The CONTRACTOR shall perform all tasks specified in REMOVAL, CLEANUP, AND DEMOBILIZATION of these General Requirements.

D. MAINTENANCE AND GUARANTEE

1. The CONTRACTOR shall make all repairs and replacements promptly upon receipt of written order from the PROJECT MANAGER. If the CONTRACTOR fails to make such repairs or replacements promptly, the PROJECT MANAGER reserves the right to do the work and the CONTRACTOR and his surety shall be liable to the CITY for the cost thereof.

2. Replacement of earth fill or backfill, where it has settled below the required finish elevations, shall be considered as a part of such required repair work, and any repair or resurfacing constructed by the CONTRACTOR which becomes necessary by reason of such settlement shall likewise be considered as a part of such required repair work.

E. BOND

1. The CONTRACTOR shall provide a bond to guarantee performance of the provisions contained in Article 31 and Article 37 (Paragraph K) of the General Conditions, Article 24 of these General Requirements, Paragraph D of this Article.

ATTACHMENTS

ATTACHMENT TO GENERAL REQUIREMENTS ARTICLE 27

CHANGE ORDER COST QUOTATION FORM **DATE __/__/2021**

Estimate Summary for Prime CONTRACTOR Total Costs

W.O. _____ C.O. _____ CONTRACT #_____

ESTIMATOR_____P.E._____

		LABOR PER General Requirements 27		
		Journeyman **Supervision**		
		_____ MH **_____ MH**	**$**	
	2)	**MATERIALS (and Other Taxables)**		
		Including Sales Tax	**$**	
	3)	**EQUIPMENT(Rented, Leased, and/or OWNED)**		
		Blue Book and/or CRG, including Sales Tax if applicable	**$**	
SUBTOTAL	**(A)**	**_____ 1) + 2) + 3)**		**$**
	4)	**G and A OH per General Requirements 27**		
		Show calculations on separate sheet	**$**	
SUBTOTAL	**(B)**	**_____ (A) + 4)**		**$**
	5)	**PROFIT_____% x Line (B)**		
		Per General Requirements 27	**$**	
SUBTOTAL	**(C)**	**_____ (B) + 5)**		**$**
	6)	**SUBCONTRACTS (All Subcontractors)**	**$**	
	7)	**FIXED FEE FOR ALL SUBS 6%**		
		Per General Requirements 27	**$**	
SUBTOTAL	**(D)**	**_____ (C + 6) + 7)**		**$**
	8)	**FIELD OFFICE OVERHEAD:**		
		$ _____ X _____ DAYS		
		Exclude if not required	**$**	
	9)	**SCHEDULING COSTS ($200 Max.)**		
		Exclude if not required	**$**	
SUBTOTAL	**(E)**	**_____ (D) + 8) + 9)**		**$**
	10)	**IMPACT COST, per General Requirements 27**		
		Show calculations on separate sheet	**$**	
GRAND TOTAL		**_____ (E) +10)**		**$**

CHANGE ORDER COST QUOTATION FORM

Estimate Summary for Prime CONTRACTOR Total Costs **DATE __/__/2021**

W.O._____ C.O. _____ CONTRACT #_____

ESTIMATOR _____ P.E._____

		LABOR PER General Requirements 27 **Journeyman Supervision** **_____ MH _____ MH**	**$**	
	2)	**MATERIALS (and Other Taxables)** **Including Sales Tax**	**$**	
	3)	**EQUIPMENT(Rented, Leased, and/or OWNED)** **Blue Book and/or CRG, including Sales Tax if applicable**	**$**	
SUBTOTAL	**(A)**	**_____ 1) + 2) + 3)**		**$**
	4)	**G and A OH per General Requirements 27** **Show calculations on separate sheet**	**$**	
SUBTOTAL	**(B)**	**_____ (A) + 4)**		**$**
	5)	**PROFIT _____% x Line (B)** **Per General Requirements 27**	**$**	
SUBTOTAL	**(C)**	**_____ (B) + 5)**		**$**
	6)	**SUBCONTRACTS (ALL SUB-SUBS)**	**$**	
	7)	**FIXED FEE FOR ALL SUB-SUBS 6%** **Per General Requirements 27**	**$**	
SUBTOTAL	**(D)**	**_____ (C + 6) + 7)**		**$**
	8)	**FIELD OFFICE OVERHEAD:** **$ _____ X _____ DAYS** **Exclude if not required**	**$**	
SUBTOTAL	**(E)**	**_____ (D) + 8)**		**$**
		IMPACT COST, per General Requirements 27 **Show calculations on separate sheet**	**$**	
GRAND TOTAL		**FOR SUBCONTRACTOR (E) + 9)** **To Line 6) of Prime CONTRACTOR'S Summary**		**$**

RESEDA SKATING FACILITY

III. SUPPLEMENTAL GENERAL REQUIREMENTS

W.O. No. E170121D

Department of
Recreation and Parks

Reseda Ice Skating and Roller Rink Project

18210 Sherman Way, Reseda, CA 91335

RAP Project Numbers. PRJ21167, PRJ21326 BOE Work Order No. E170121F

INSTRUCTIONS TO BIDDERS

February 7, 2021

BID DOCUMENTS:

1. This “Instructions to Bidders” (1 page).
2. Plan set (230 sheets).
3. Geotechnical Engineering Report (72 pages), dated August 28, 2019
4. Supplemental Geotechnical Engineering Report (26 pages), dated December 21, 2020
5. Los Angeles Department of Building & Safety Geology & Soils Report Approval Letter (5 pages), dated March 25, 2021.

CONTRACT WORK DESCRIPTION:

The project will consist of an Ice Hockey/Ice Skating Building and outdoor roller skating park on two lots separated by alley.

The back lot has Ice rink building which holds a 85 x 200 regulation size ice surface with Ice room, dasher boards and glass placed on top of the dasher board. Score boards, netting, indoor & outdoor lighting, Mechanical & Electrical Room, Ice Resurfacer Room, Lockers Rooms, ADA compliant Restrooms, Exterior Façade and Signage, Office Space, Skate Rental Area, Prop Shop, and Skate Shop, all with in a Single Story Membrane Structure and CMU structure. All electrical and mechanical piping to support the all the electrical, office and mechanical and ice equipment to make the facility operational.

Sewer main line and Sewer connection work to be install with a require Bonded Sewer contractor.

The front lot to include Outdoor Skate Park, Fences, Landscape Area, Fire Lane, 2 parking spaces, Electrical Equipment and Low impact Development system etc.

CONSTRUCTION PERIOD: 460 Calendar Days

MAINTENANCE PERIOD: 180 Calendar Days

TOTAL CONTRACT TIME: 640 Calendar Days

SPECIAL REQUIREMENTS:

1. Contractor shall coordinate with other city vendors who may be performing other work at the site during construction, including but not limited to:.
   - DWP water and electrical meter installation and service connections.
   - Sewer connection.
2. Contractor shall coordinate with the Department of Building & Safety to schedule and obtain all necessary inspections and approvals and all related fees.
   - The membrane structure of the building shall be deferred submittal plan listed basis of design/performance criteria listed on A0.30, A36 If Alternative system than the one specified in the plans is used for pavilion a supplemental permit and plan check will be required and all modifications will need approval of structural engineer and Architect of Record is required, All cost related to the modification and schedule impacts are to be included in base bid.
   - Fire Detection & Voice Alarm Communication System Design
   - Fire Sprinkler System Design (NFPA 13)
   - Storefront/Curtain Wall Engineering –
   - Fence (DESIGN INTENT PER 01/ A8.32)
   - Sewer Mainline and Connection
3. Contractor will provide warrantee for the minimum of one year on all equipment and workmanship from the date of issuance of the Building and Safety Certificate Of Occupancy.
4. Contractor shall provide temporary construction fence at work areas.
5. Contractor to provide equipment and staff for the ground breaking ceremony.
6. Contractor will only have the identified lots as construction area any additional space require for the construction will be the contractor responsibility.
7. Contractor shall install the Department of Recreation and Parks construction at the site during contrition. Details of the sign will be provided in the addendum.

RESEDA SKATING FACILITY

IV. TECHNICAL SPECIFICATIONS

W.O. No. E170121D

Department of
Recreation and Parks

SECTION 03 10 00

CONCRETE FORMWORK

PART 1 - GENERAL

1.1 THE REQUIREMENT

A The CONTRACTOR shall furnish all materials for concrete formwork, bracing, shoring, and supports and shall design and construct all falsework and scaffolding, all in accordance with the provisions of the Contract Documents.

B. DEFINITIONS

1. Exposed Concrete: All concrete that is visible in the finished work, including concrete to be painted.

2. Unexposed Concrete: All other concrete that is concealed in the finished work, including plastered surfaces and attic and utility spaces.

1.2 REFERENCE SPECIFICATIONS, CODES, AND STANDARDS

A. Comply with the reference standards and Standard Specifications as specified in the GENERAL REQUIREMENTS.

B. Comply with the current provisions of the following Codes and Standards, as applicable:

1 Government Standards:

PS 1	U.S. Product Standard for Concrete Forms, Class I
PS 20	American Lumber Softwood Standard
CSS	Caltrans Standard Specifications

2 Commercial Standards:

ACI 347	Recommended Practice for Concrete Formwork
ACI 117	Standard Tolerances for Concrete Construction and Materials

1.3 CONTRACTOR SUBMITTALS

A. Submittals shall be made in accordance with the GENERAL REQUIREMENTS.

B. The following submittals and specific information shall be provided.

1. Falsework Calculations and Drawings: The CONTRACTOR shall comply with all the latest applicable Sections of the Division of Industrial Safety, Construction Safety Orders. For all falsework or vertical shoring installations where the height of the falsework or vertical shoring, as measured from the top of the sills to the soffit of the superstructure, exceeds 14 feet, or where individual horizontal span lengths exceed 16 feet, or where provision for vehicular, pedestrian, or railroad traffic through falsework or vertical shoring is made, Plans and Calculations shall be prepared and signed by a Civil Engineer, registered in the State of California. A copy of the falsework plan or shoring layout shall be available on the job site at all times. The Engineer who designed the falsework or vertical shoring shall personally inspect such work and provide a written certification that the work conforms to the design.

Scaffolding Calculations and Drawings: Scaffolding shall be defined in accordance with and shall conform to the Construction Safety Orders of the Division of Industrial Safety. If scaffolding is constructed for this project over or adjacent to traffic, or suspended from the traveled way, the Contractor shall submit to the Engineer working drawings for scaffolding systems. The scaffolding manufacturer's name, address, and phone number shall be shown on the working drawings. The working drawings, details and calculations for the scaffolding shall be stamped and signed by an engineer who is registered as a Civil Engineer in the State of California. In addition, prior to submitting the working drawings to the Engineer, the working drawings shall be stamped and signed by an independent reviewer who is registered as a Civil Engineer in the State of California. The independent reviewer shall not be employed by the same entity preparing the working drawings.

2. The CONTRACTOR shall, in accordance with the requirements in GENERAL REQUIREMENTS file with the City detailed plans of the falsework and scaffolding proposed to be used. Such plans and calculations shall be in sufficient detail to indicate the general layout, pattern layout, dimensioned to precisely locate grooves, form panel jointing, and similar features. The submittal shall also include sizes of members, anticipated stresses, grade of materials to be used, and typical soil conditions.

   a. Form Release Compound
   b. Form Ties and Spreaders
   c. Installation Instructions

1.4 QUALITY ASSURANCE

A. Tolerances: The variation from established grade or lines shall not exceed 1/4-inch in 10 feet and there shall be no offsets or visible waviness in the finished surface. All other tolerances shall be within the tolerances specified in ACI 117, unless noted otherwise.

B. Laborers: Use adequate number of skilled laborers who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

C. Prior to construction of formwork for concrete beams and slabs above grade, Contractor shall conduct a meeting at the site to determine and define all cambers required for the project. ENGINEER, Contractor and Contractor's formwork installer shall be in attendance at this meeting.

D. Engage a licensed surveyor to verify that work is within specified tolerances. Surveyor shall report in writing to the ENGINEER, with copy to Contractor, certifying work as acceptable or indicating deviations from allowable tolerances.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials for forms in timely manner to ensure uninterrupted progress.

B. Store materials by methods that prevent damage and permit ready access for inspection and identification.

PART 2 - PRODUCTS

2.1 GENERAL

A. Except as otherwise expressly accepted by the ENGINEER, all lumber brought on the job site for use as forms, shoring, or bracing shall be new material. All forms shall be smooth surface forms and shall be of the following materials:

Walls	-	Steel or plywood panel
Columns	-	Steel, plywood or fiber glass
Roof, floor, deck and soffit	-	Plywood, Steel Panels
All other work	-	Steel panels, plywood or tongue and groove lumber

2.2 FORM AND FALSEWORK MATERIALS

A. Materials for concrete forms, formwork, and falsework shall conform to the following requirements:

1. Lumber shall be Douglas Fir or Southern Pine, construction grade or better, in conformance with U.S. Product Standard PS20.

2. Plywood for concrete formwork shall be new, waterproof, synthetic resin bonded, exterior type Douglas Fir or Southern Pine plywood manufactured especially for concrete formwork and shall conform to the requirements of PS 1 for Concrete Forms, Class I, and shall be edge sealed.

3. Form materials shall be metal, wood, plywood, or other material approved by the ENGINEER that will not adversely affect the concrete and will facilitate placement of concrete to the shape, form, line, and grade shown. Metal forms shall be an approved type that will accomplish such results.

   Forms for exposed exterior concrete surfaces shall be American Plywood Association (APA) High Density Overlay (HDO) Plyform Class I Ext. 48" X 96" X 3/4" minimum thickness.

   Forms for other concrete surfaces shall be American Plywood Association (APA) Douglas Fir B-B Plyform Class I Exterior PS 1, 3/4-inch minimum thickness.

4. Coated Form Plywood: For exposed painted concrete, plastic overlaid plywood of grade specified above, factory coated with a form coating and release agent equal to “Noxcrete”.

5. Tube forms: [Sonoco “Seamless Sonotubes”, Alton Building Products “Sleek Seamless Standard Wall”], or equal, type leaving no marks in concrete, 1-piece lengths for full required height.

B. Unless otherwise shown, exterior corners in exposed concrete members shall be provided with 3/4-inch chamfers. Re-entrant corners in concrete members shall not have fillets unless otherwise shown.

C. Forms and falsework to support the roof and elevated floor slabs shall be designed for the total dead load, and a minimum construction live load of 30 psf .

D. Forms proposed for use at bridges shall comply with Caltrans Standard Specification Section 51.

2.3 FORM TIES

A. Form ties with integral waterstops shall be provided with a plastic cone or other suitable means for forming a conical hole to insure that the form tie may be broken off back of the face of the concrete. The maximum diameter of removable cones for rod ties, or of other removable form-tie fasteners having a circular cross-section, shall not exceed 1-1/2-inches; and all such fasteners shall be such as to leave holes of regular shape for reaming.

B. Form ties for water-retaining structures shall have integral waterstops. Removable taper ties may be used except for water bearing structures, when approved by the ENGINEER. A preformed neoprene or polyurethane tapered plug sized to seat at the center of the wall shall be inserted in the hole left by the removal of the taper tie.

2.4 FORM RELEASE COMPOUND

A. Form release compound shall be non-staining clear coating free from oil, silicone, wax, and not grain-raising, Use [“Nox-crete Form coating” by Nox Crete, “Formshield” by Euclid Chemical Company, “Burke Bio Release” by Edoco, or “Cast-Off” by Sonneborn], or an approved equal. Where form liners are used, provide form compound recommended by form liner manufacturer. However, regardless of product use, provide form compound that is VOC compliant for the area used.

2.5 EARTH FORMS

A. Unless otherwise indicated or required, concrete for footings and pile caps may be placed directly against vertical excavated surfaces, provided the material will stand without caving, that minimum reinforcing steel clearances are maintained, and suitable provisions are taken to prevent raveling of top edges or sloughing of loose material from walls of excavation. Sides of excavation shall be made with a neat cut and the width made as indicated. Concrete which is exposed to view on exterior shall be formed to maintained depth of 6 inches below finished grade.

PART 3 - EXECUTION

3.1 GENERAL

A. Forms to confine the concrete and shape it to the required lines shall be used wherever necessary. The CONTRACTOR shall assume full responsibility for the adequate design of all forms, and any forms which are unsafe or inadequate in any respect shall promptly be removed from the WORK and replaced at the CONTRACTOR's expense. A sufficient number of forms of each kind shall be provided to permit the required rate of progress to be maintained. The design and inspection of concrete forms, falsework, and shoring shall comply with applicable local, state and Federal regulations. Plumb and string lines shall be properly installed before concrete placement and shall be maintained during placement. Such lines shall be used by CONTRACTOR's personnel and by the INSPECTOR and shall be in sufficient number and properly installed. During concrete placement, the CONTRACTOR shall continually monitor plumb and string line form positions and immediately correct deficiencies.

B. Concrete forms shall conform to the shape, lines, and dimensions of members as called for on the Drawings, and shall be substantial, free from surface defects, and sufficiently tight to prevent leakage. Forms shall be properly braced or tied together to maintain their position and shape under a load of freshly-placed concrete. If adequate foundation for shores cannot be secured, trussed supports shall be provided.

C. Camber: Place suitable jacks, wedges, or similar means to induce camber and to correct settlement in forms before and during concrete placing. Camber shall be as determined in pre-installation meeting specified above. In general, formwork shall be capable of accommodating camber of 1/8" per 10' of span plus 1/4".

3.2 FORM DESIGN

A. All forms shall be true in every respect to the required shape and size, shall conform to the established alignment and grade, and shall be of sufficient strength and rigidity to maintain their position and shape under the loads and operations incident to placing and vibrating the concrete. Suitable and effective means shall be provided on all forms for holding adjacent edges and ends of panels and sections tightly together and in accurate alignment so as to prevent the formation of ridges, fins, offsets, or similar surface defects in the finished concrete. Plywood, 3/4-inch and greater in thickness, may be fastened directly to studding if the studs are spaced close enough to prevent visible deflection marks in the concrete. The forms shall be tight so as to prevent the loss of water, cement and fines during placing and vibrating of the concrete. Specifically, the bottom of wall forms that rest on concrete footings or slabs shall be provided with a gasket to prevent loss of fines and paste during placement and vibration of concrete. Such gasket may be a 1- to 1-1/2-inch diameter polyethylene rod held in position to the underside of the wall form. Adequate clean-out holes shall be provided at the bottom of each lift of forms. The size, number, and location of such clean-outs shall be as acceptable to the INSPECTOR.

B. Actual form design shall conform to ACI 347.

C. For concrete mixes characterized as self-consolidating concrete, high performance concrete, or known to contain components that can potentially extend the plastic state of the concrete, the forms shall be designed to sustain the resulting hydrostatic pressure for the total pour height or pressure head for that day of pour, whichever is more. For such mixes, appropriate set-time tests shall be conducted in preparation of the mix design and this information made available to the form designer.

D. Forms proposed for use at bridges shall comply with Caltrans Standard Specification Section 51-1.

3.3 CONSTRUCTION

A. Vertical Surfaces: All vertical surfaces of concrete members shall be formed, except where placement of the concrete against the ground is shown. Not less than 1-inch of concrete shall be added to the thickness of the concrete member as shown where concrete is permitted to be placed against trimmed ground in lieu of forms. Such permission will be granted only for members of comparatively limited height and where the character of the ground is such that it can be trimmed to the required lines and will stand securely without caving or sloughing until the concrete has been placed.

B. Construction Joints: Concrete construction joints will not be permitted at locations other than those shown or specified, except as may be acceptable to the ENGINEER. When a second lift is placed on hardened concrete, special precautions shall be taken in the way of the number, location, and tightening of ties at the top of the old lift and bottom of the new to prevent any unsatisfactory effect whatsoever on the concrete. Pipe stubs and anchor bolts shall be set in the forms where required.

C. Provide for openings, offsets, keyways, recesses, moldings, reglets, chamfers, blocking, screeds, bulkheads, anchorages, inserts and other features as required. Fill form joints to produce smooth surfaces, intersections, and arrises. Use polymer foam or equivalent

fillers at joints and where forms abut or overlap existing concrete to prevent leakage of mortar.

D. Set embedded piping and rough hardware in forms to be embedded in concrete in a manner so that the required strength of the structure will not be reduced.

E. Apply form release compound on formwork in accordance with manufacturer's instructions prior to placing of reinforcing steel, anchorages, and embedded items.

F. Construct forms suitable for removal without hammering or prying against and damaging the concrete.

G. Openings in Forms: Provide as required to facilitate cleaning and inspection. Close such openings immediately after cleaning and before placement of concrete. Provide air relief holes in formed top surfaces of concrete elements as required.

H. Form Ties:

1. Embedded Ties: Holes left by the removal of form tie cones shall be clean and rough before being filled with mortar as specified for "Finish of Concrete Surfaces" in Section 033000, "Cast-in-Place Concrete". Wire ties for holding forms will not be permitted. No form-tying device or part thereof, other than metal, shall be left embedded in the concrete. Ties shall not be removed in such manner as to leave a hole extending through the interior of the concrete members. The use of snap-ties which cause spalling of the concrete upon form stripping or tie removal will not be permitted. If steel panel forms are used, rubber grommets shall be provided where the ties pass through the form in order to prevent loss of cement paste. Where metal rods extending through the concrete are used to support or to strengthen forms, the rods shall remain embedded and shall terminate not less than 1-inch back from the formed face or faces of the concrete.

2. Removable Ties: Where taper ties are approved for use in non water bearing structures, the larger end of the taper tie shall be on the wet side of walls in water retaining structures. After the taper tie is removed, the hole shall be thoroughly cleaned and roughened for bond. A precast neoprene or polyurethane tapered plug shall be located at the wall centerline. The hole shall be completely filled with non-shrink grout for water bearing and below-grade walls. The hole shall be completely filled with non-shrink or regular cement grout for above-grade walls which are dry on both sides. Exposed faces of walls shall have the outer 2-inches of the exposed face filled with a cement grout which shall match the color and texture of the surrounding wall surface.

I. Coordination:

1. Provide slots, openings, chases, recesses, grounds, nailers and screeds required by other trades and subsequent work.

2. Ensure that conduit, pipes, sleeves, anchors, hangers and ties are secured in forms before concrete is placed.

3.4 REUSE OF FORMS

A. Forms may be reused only if in good condition and only if acceptable to the INSPECTOR. Light sanding between uses will be required wherever necessary to obtain uniform surface texture on all exposed concrete surfaces. Exposed concrete surfaces are defined as surfaces which are permanently exposed to view. In the case of forms for

the inside wall surfaces of water retaining structures, unused tie rod holes in forms shall be covered with metal caps or shall be filled by other methods acceptable to the INSPECTOR.

3.5 REMOVAL OF FORMS

A. Careful procedures for the removal of forms shall be strictly followed, and this work shall be done with care so as to avoid damage the concrete. No heavy loading on green concrete will be permitted. The period of time for formwork removal shall be in accordance with ACI 318, Chapter 6 and Section 303-1.4 of Standard Specifications and as follows:

1. Do not remove formwork until concrete has attained sufficient strength to support its own weight and all superimposed loads including construction loads and to permit form and falsework removal with complete safety.

2. In the case of concrete members subject to bending stresses, where the member relies upon forms for vertical support, forms shall remain in place until test cylinders attain a minimum comprehensive strength of 75 percent of the 28-day strength specified in Section 033000, "Cast in-Place Concrete", provided, that no forms shall be disturbed or removed under individual panel or unit before the concrete in the adjacent panel or unit has attained 75 percent of the specified 28-day strength and has been in place for a minimum of 7 days.

3. Forms for roofs and elevated slabs shall remain in place a minimum of 10 days after concrete has been placed.

4. Forms for all vertical walls and columns shall remain in place at least 3 days after the concrete has been placed.

5. Formwork removal shall also be subject to the curing requirements of section 033000 of these specifications and as authorized by the ENGINEER.

6. Reshore structural members as specified below because of design requirements or construction conditions to permit successive construction.

B. The time required to establish said strength shall be determined by the ENGINEER based on test cylinders made for this purpose from the concrete placed and in accordance with ACI 318 and the curing requirements of section 033000. If the time so determined is more than the minimum time specified above, then that time shall be used as the minimum length of time. Forms for all parts of the WORK not specifically mentioned herein shall remain in place for periods of time as determined by the ENGINEER.

3.6 FORMWORK TOLERANCES

A. Deflection: Limit deflection of forming surfaces from concrete pressure to L/240.

B. Finish Lines: Position formwork to maintain hardened concrete finish lines within following permissible deviations.

1. Variation from Plumb:

In 10'-0"	1/4” max.
In any story or 20'-0"	3/8” max.

	In 40'-0" or more	3/4” max.

2. Variation from Level or Grades Indicated

In 10'-0"	1/4” max.
In any bay or 20'-0" maximum	3/8”
In 40'-0" or more	3/4” max.

C. Building Lines: Variation of linear building lines from established position in plan and related position of columns, walls and partitions:

1.	In any bay or 10'-0" maximum	1/2”
2.	In 40'-0" or more	1”

D. Slab Openings: Variations in size and location of sleeves and slab openings shall not exceed 1/4”.

3.7 MAINTENANCE OF FORMS

A. Forms shall be maintained at all times in good condition, particularly as to size, shape, strength, rigidity, tightness, and smoothness of surface. Forms, when in place, shall conform to the established alignment and grades. Before concrete is placed, the forms shall be thoroughly cleaned. The form surfaces shall be treated with a nonstaining mineral oil or other lubricant acceptable to the ENGINEER. Any excess lubricant shall be satisfactorily removed before placing the concrete. Where field oiling of forms is required, the CONTRACTOR shall perform the oiling at least two weeks in advance of their use. Care shall be exercised to keep oil off the surfaces of steel reinforcement and other metal items to be embedded in concrete.

3.8 FALSEWORK

A. The CONTRACTOR shall be responsible for the design, engineering, construction, maintenance, and safety of all falsework, including staging, walkways, forms, ladders, and similar appurtenances, which shall equal or exceed the applicable requirements of the provisions of the OSHA Safety and Health Standards for Construction, the requirements of the Construction Safety Orders of the California Division of Industrial Safety, and the requirements specified herein.

B. All falsework shall be designed and constructed to provide the necessary rigidity and to support the loads. Falsework for the support of a superstructure shall be designed to support the loads that would be imposed if the entire superstructure were placed at one time.

C. Falsework shall be placed upon a solid footing, safe against undermining, and protected from softening. When the falsework is supported on timber piles, the maximum calculated pile loading shall not exceed 20 tons. When falsework is supported on any portion of the structure which is already constructed, the load imposed by the falsework shall be spread, distributed, and braced in such a way as to avoid any possibility of damage to the structure.

D. Reshoring:

1. Minimum reshoring with falsework shall consist of not less than half the full required falsework added under the last placed floor over which full falsework is to be placed for the next floor above. Leave reshoring in place for at least 10 days after the floor above is placed, but in no case remove falsework until the next concrete placing has attained a compressive strength equal to 75% of that required for the 28 days age as determined by controlled test cylinders.

2. Maintain a form and falsework removal record.

E. Falsework proposed for use at bridges shall comply with Caltrans Standard Specification Section 51.

END OF SECTION

SECTION 03 20 00

REINFORCEMENT STEEL

PART 1 - GENERAL

1.1 THE REQUIREMENT

A. The CONTRACTOR shall furnish, fabricate, and place all concrete reinforcement steel, welded wire fabric, couplers, and concrete inserts for use in reinforced concrete and masonry construction and shall perform all appurtenant work, including all the wires, clips, supports, chairs, spacers, and other accessories, all in accordance with the Contract Documents.

1.2 REFERENCE SPECIFICATIONS, CODES, AND STANDARDS

A. Comply with the reference standards of the GENERAL REQUIREMENTS.

B. Comply with the current provisions of the following Codes and Standards, as applicable:

1. Commercial Standards:

ACI 315	Details and Detailing of Concrete Reinforcement.
ACI 318	Building Code Requirements for Reinforced Concrete.
ACI 350	Code Requirements for Environmental Engineering Concrete Structures.
ACI 530	Building Code Requirements & Specifications for Masonry Structures
WRI	Manual of Standard Practice for Welded Wire Fabric.
AWS D1.4	Structural Welding Code - Reinforcing Steel.
ASTM A 82	Specification for Steel Wire, Plain, for Concrete Reinforcement.
ASTM A 185	Specification for Welded Steel Wire Fabric For Concrete Reinforcement.
ASTM A 497	Welded Deformed Steel Wire Fabric for Concrete Reinforcement.
ASTM A 615	Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement.
ASTM A 706	Low-alloy Deformed Steel Bars for Concrete Reinforcement
ASTM A 775	Specifications for Epoxy Coated Bar Reinforcement
ASTM A 884	Specifications for Epoxy Coated Wire Reinforcement
CRSI	Manual of Standard Practice

CRSI Recommended Practice for Placing Bar Supports, Specifications and Nomenclature

CRSI Recommended Practice for Placing Reinforcing Bars

2. Government Standards:

CSS Caltrans Standard Specifications.

1.3 CONTRACTOR SUBMITTALS

A. Submittals shall be made in accordance with the GENERAL REQUIREMENTS.

B. The following submittals and specific information shall be provided.

1. The CONTRACTOR shall furnish shop bending diagrams, placing lists, splice lengths and location, and drawings of all reinforcement steel prior to fabrication in accordance with GENERAL REQUIREMENTS, only if the reinforcing details differ from that shown on the plans.

2. Details of the concrete reinforcement steel and concrete inserts shall be submitted by the CONTRACTOR at the earliest possible date after receipt by the CONTRACTOR of the Notice to Proceed. Said details of reinforcement steel for fabrication and erection shall conform to ACI 315 and the requirements specified and shown. The shop bending diagrams shall show the actual lengths of bars, to the nearest inch measured to the intersection of the extensions (tangents for bars of circular cross section) of the outside surface. The shop drawings shall include bar placement diagrams which clearly indicate the dimensions of each bar splice.

3. Where mechanical couplers are required or permitted to splice reinforcement steel, the CONTRACTOR shall submit Los Angeles City Department of Building and Safety's Research Report approval and manufacturer's literature which contains instructions and recommendations for installation for each type of coupler used; certified test reports which verify the load capacity of each type and size of coupler used; and shop drawings which show the location of each coupler with details of how it is to be installed in the formwork.

4. If reinforcement steel is required or permitted to be spliced by welding at any location, the CONTRACTOR shall submit mill test reports which shall contain the information necessary for the determination of the carbon equivalent as specified in AWS D1.4. The CONTRACTOR shall submit a written welding procedure for each type of weld for each size of bar which is to be spliced by welding; merely a statement that AWS procedures will be followed is not acceptable.

1.4 QUALITY ASSURANCE

A. If reinforcement steel is welded at any location, the CONTRACTOR shall submit certifications of procedure qualifications for each welding procedure used and certification of welder qualifications, for each welding procedure, and for each welder performing the work. Such certification and qualifications shall be as required by the City of El Segundo.

B. The CONTRACTOR shall provide samples of each type of weld used in the work in a quantity and of dimensions adequate for testing. At the discretion of the INSPECTOR, radiographic testing of direct butt welds will be performed. The CONTRACTOR shall provide assistance necessary to facilitate testing. The CONTRACTOR shall repair any weld which fails to meet the requirements of AWS D1.4. The costs of testing will be paid

by the CITY; except, the costs of all tests which fail to meet specified requirements shall be paid by the CONTRACTOR.

C. The CONTRACTOR shall provide to the INSPECTOR written identification of reinforcement steel by manufacturer's heat number and mil certification, and the fabricator's release number and type from the point of fabrication to the place of final incorporation of the rebar into the work.

1.5 MARKING AND SHIPPING

A. Tag bundled bars with identification, and transport and store so as not to damage any material. Use metal tags indicating size, length and other marking shown on placement drawings. Maintain tags after bundles are broken.

PART 2 - PRODUCTS

2.1 REINFORCEMENT STEEL

A. All reinforcement steel for all cast-in-place reinforced concrete construction shall conform to the following requirements:

1. Bar reinforcement shall conform to the requirements of ASTM A615, Grade 60 Billet Steel Reinforcement with supplementary requirement S-1, and ASTM A706 for rebars subject to welding, or as otherwise shown.

2. Bar reinforcement for wall boundary elements, special moment frames, or when subject to welding, shall conform to ASTM A706, unless noted otherwise.

3. Welded wire fabric reinforcement shall conform to the requirements of ASTM A185. Welded wire fabric shall be furnished in flat sheets only.

4. Spiral reinforcement may be cold-drawn steel wire conforming to the requirements of ASTM A82, when approved by the ENGINEER.

5. All reinforcements shall be shop fabricated. Bending of reinforcing in the field will not be allowed.

6. Epoxy coated reinforcing steel shall conform to the requirements of ASTM A775 and A884, and shall be used where indicated on the drawing.

7. Reinforcement with any of the following defects will not be acceptable and be immediately removed from the site:

a. Bar lengths, depths, and/or bends exceeding the specified fabrication tolerances.

b. Bends or kinks not shown on the Drawings

c. Bars with reduced cross-section due to excessive rusting or other cause.

B. Accessories:

1. Accessories shall include all necessary chairs, slab bolsters, concrete blocks, tie wires, dips, supports, spacers, and other devices to position reinforcement during concrete placement. Slab bolsters shall have gray plastic-coated legs.

2. Concrete blocks (dobies), used to support and position reinforcement steel, shall have the same or higher compressive strength as specified for the concrete in

which it is located. Where the concrete blocks are used on concrete surfaces exposed to view, the color and texture of the concrete blocks shall match that required for the finished surface. Wire ties shall be embedded in concrete block bar supports.

3. Use bar supports complying with CRSI recommendations, unless otherwise shown on the Contract Drawings.

4. Do not use wood, brick, or other non-complying material.

5. For slabs on grade, use supports with sand plates or horizontal runners where base material will not support chair legs.

6. For exposed-to-view completed concrete surfaces, where legs of supports are in contact with forms, provide supports with either hot-dip galvanized or plastic-protected legs. CONTRACTOR's selection subject to the ENGINEER's approval.

2.2 MECHANICAL COUPLERS

A. Mechanical couplers shall comply with the applicable Department of Building and Safety's Research Report. Location of the Mechanical Couplers shall be approved by the ENGINEER. The couplers shall develop a tensile strength which exceeds 125 percent of the yield strength of the reinforcement bars being spliced at each splice. CONTRACTOR to provide the required number of couplers and bars for testing in accordance with the Report

B. Where the type of coupler used is composed of more than one component, all components required for a complete splice shall be supplied. This shall apply to all mechanical splices, including those splices intended for future connections.

C. The reinforcement steel and coupler used shall be compatible for obtaining the required strength of the connection. Clearance and coverage requirements shall be maintained at all times.

D. Couplers which are located at a joint face shall be a type which can be set either flush or recessed from the face as shown. The couplers shall be sealed during concrete placement to completely eliminate concrete or cement paste from entering. After the concrete is placed, couplers intended for future connections shall be plugged and sealed to prevent any contact with water or other corrosive materials. Threaded couplers shall be plugged with plastic plugs which have an O-ring seal.

E. Hot-forged sleeve-type couplers shall not be used.

2.3 WELDED SPLICES

~~A.~~ Welded splices shall be provided where shown and where approved by the ENGINEER. All welded splices of reinforcement steel shall develop a tensile strength which exceeds 125 percent of the yield strength of the reinforcement bars which are connected. Provide two samples of each bar size for testing. When welding is to be done in the field, provide field prepared samples. Preparation shall be made by welder actually preparing the production run.

B. All materials required to conform the welded splices to the requirements of AWS D1.4 shall be provided.

C. All welding shall be performed by City of Los Angeles certified welders. All shop welding shall be performed at shops of a City of Los Angeles approved fabricator.

PART 3 - EXECUTION

3.1 GENERAL

A. All reinforcement steel, welded wire fabric, couplers, and accessories shall be fabricated, and placed in accordance with the requirements of the City of El Segundo Building Code, CRSI Recommended Practices and Manual, and WRI, and the supplementary requirements specified herein.

3.2 FABRICATION

A. General: Reinforcement steel shall be accurately formed to the dimensions and shapes shown, and the fabricating details shall be prepared in accordance with ACI 315 and ACI 318 or ACI 350 (as applicable), except as modified by the Drawings. Bars shall be bent cold.

B. The CONTRACTOR shall fabricate reinforcement bars for structures in accordance with bending diagrams, placing lists, and placing drawings. Said drawings, diagrams, and lists shall be prepared by the CONTRACTOR as specified under GENERAL REQUIREMENTS.

C. Fabricating Tolerances: Bars used for concrete reinforcement shall meet the following requirements for fabricating tolerances:

1. Sheared length: ± 1 inch

2. Depth of truss bars: + 0, - 1/2 inch

3. Stirrups, ties, and spirals: ± 1/2 inch

4. All other bends: ± 1 inch

3.3 PLACING

A. Placing: Reinforcement steel shall be accurately positioned as shown, and shall be supported and wired together to prevent displacement, using annealed iron wire ties or suitable clips at intersections. All reinforcement steel shall be supported using approved accessories and chairs which are strong and rigid enough to prevent any displacement of the reinforcement steel and shall comply with the applicable Department of Building and Safety's Research Report. Where concrete is to be placed on the ground, supporting concrete blocks (or dobies) shall be used, in sufficient numbers to support the bars without settlement, but in no case shall such support be continuous. All concrete blocks used to support reinforcement steel shall be tied to the steel with wire ties which are embedded in the blocks. Use care not to damage vapor barriers where they occur.

B. The portions of all accessories in contact with the formwork shall be made of concrete, plastic, or steel coated with a 1/8-inch minimum thickness of plastic which extends at least 1/2-inch from the concrete surface. Plastic shall be gray in color.

C. Tie wires shall be bent away from the forms in order to provide the specified concrete coverage.

D. Bars additional to those shown which may be found necessary or desirable by the CONTRACTOR for the purpose of securing reinforcement in position shall be provided by the CONTRACTOR at its own expense.

E. Placing Tolerances: Unless otherwise specified, reinforcement placing tolerances shall be within the limits specified in Section 7.5 of ACI 318 except where in conflict with the requirements of the City of El Segundo Building Code.

F. Bars may be moved as necessary to avoid interference with other reinforcement steel, conduits, or embedded items. If bars are moved more than one bar diameter, or enough to exceed the above tolerances, the resulting arrangement of bars shall be reviewed and accepted by the ENGINEER.

G. Welded wire fabric reinforcement placed over horizontal forms shall be supported on slab bolsters having gray, plastic-coated standard type legs as specified in Paragraph B herein. Slab bolsters shall be spaced not less than 30 inches on centers, shall extend continuously across the entire width of the reinforcement mat, and shall support the reinforcement mat in the plane shown.

H. Welded wire fabric placed over the ground shall be supported on wired concrete blocks (dobies) spaced not more than 3 feet on centers in any direction. The construction practice of placing welded wire fabric on the ground and hooking into place in the freshly placed concrete shall not be used.

3.4 SPACING OF BARS

A. Spacing of reinforcement shall comply with ACI 318 requirements.

3.5 SPLICING

A. General: Reinforcement bar splices shall only be used at locations shown. When it is necessary to splice reinforcement at points other than where shown, the character of the splice and location shall reqiure acceptance of the ENGINEER.

B. Splices of Reinforcement: The length of lap for reinforcement bars, unless otherwise shown shall be in accordance with ACI 318, Section 12.15.1 for a class B splice. Stagger splices in horizontal wall bars at least 48” longitudinal in alternate bars and opposite faces.

C. Laps of welded wire fabric shall be in accordance with the ACI 318. Adjoining sheets shall be securely tied together with No. 14 tie wire, one tie for each 2 running feet. Wires shall be staggered and tied in such a manner that they cannot slip.

D. Splices in column spiral reinforcement, when necessary, shall be made by welding or by a lap of 1-1/2 turns.

E. Mechanical couplers: Install in accordance with the approved submittal.

F. Bending or Straightening: Reinforcement shall not be straightened or rebent in a manner which will injure the material. Bars with kinks or bends not shown shall not be used. All bars shall be bent cold, unless otherwise permitted by the ENGINEER. No bars partially embedded in concrete shall be field-bent except as shown or specifically permitted by the ENGINEER.

3.6 CLEANING AND PROTECTION

A. The surfaces of all reinforcement steel and other metalwork to be in contact with concrete shall be thoroughly cleaned of all dirt, grease, loose scale and rust, grout, mortar and other foreign substances immediately before the concrete is placed. Where there is delay in depositing concrete, reinforcement shall be reinspected and, if necessary recleaned. Bars with reduced cross-section due to excessive rusting or other cause will

not be acceptable for use and shall be replaced by the CONTRACTOR at no additional cost to the Owner.

3.7 FIELD QUALITY CONTROL

A. Inspection: Secure inspection and acceptance from INSPECTOR before concrete is placed. Make arrangements in advance for geotechnical inspection of foundations, continuous inspection as required, and/or structural observation by the designated registered design professional prior to concrete placement.

END OF SECTION

SECTION 03 25 00

CONCRETE ACCESSORIES

PART 1 - GENERAL

1.1 THE REQUIREMENT

A. The CONTRACTOR shall furnish all tools, equipment, materials, and supplies to install all concrete accessories to complete the Work including cast-in-place anchor bolts (also known as anchor rods), epoxy grouted anchor bolts or dowels and, expansion or adhesive anchors, in accordance with the requirements of the Contract Documents.

1.2 REFERENCE SPECIFICATIONS, CODES, AND STANDARDS

A. Comply with the reference standards and Standard Specifications of the GENERAL REQUIREMENTS.

B. Comply with the current provisions of the following Codes and Standards, as applicable.

1. Commercial Standards:

AISC	Code of Standard Practice for Steel Buildings and Bridges
AISC	Specifications for the Design, Fabrication and Erection of Structural Steel for Buildings
ASTM A 36	Specifications for Carbon Structural Steel
ASTM A 153	Specifications for Zinc Coating (Hot Dip) on Iron and Steel Hardware
ASTM A 193	Specifications for Alloy-Steel and Stainless Steel Bolting Materials for High-Temperature Service
ASTM A 194	Specifications for Carbon and Alloy Steel Nuts for Bolts for High-Pressure and High-Temperature Service
ASTM A 307	Specifications for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength
ASTM A 449	Specifications for Quenched and Tempered Steel Bolts and Studs
ASTM A 615	Specifications for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement
ASTM B 633	Specifications for Electrodeposited Coatings of Zinc on Iron and Steel
ASTM B 695	Specifications for Coatings of Zinc Mechanically Deposited on Iron and Steel
ASTM F 436	Specifications for Hardened Steel Washers
ASTM F 1554	Standard Specification for Anchor Bolts, Steel, 36, 55, and 105-ksi Yield Strength

1.3 CONTRACTOR SUBMITTALS

A. Submittals shall be made in accordance with the GENERAL REQUIREMENTS.

B. The following submittals and specific information shall be provided.

1. High Strength Anchor Bolts: The CONTRACTOR shall provide mill certificates and certified compliance with ASTM F 1554; A 449 with F 436.

2. The CONTRACTOR shall submit shop drawings for all welded or fabricated items for use as anchors.

3. The CONTRACTOR shall submit catalog cuts and manufacturer's recommendations, with applicable City of Los Angeles Research Reports, for all expansion and adhesive anchors, and anti-seize thread lubricants.

PART 2 - PRODUCTS

2.1 GENERAL

A. Anchor Size: Anchor size shall be as specified or shown on plans.

B. Anchor Material:

1. Water-containment or sanitary structures, immersion service, or exposed exterior locations: Stainless steel.

2. Other locations: Galvanized steel as permitted by the corresponding ASTM except as listed in the contract drawings.

C. Anchor Length: Sufficient to extend through the nut(s) and not more than 1/4 inch beyond the nut when exposed while meeting the required embedment as indicated on the contract drawings or as required by the associated Los Angeles Department of Building and Safety's Research Report.

2.2 ANCHOR GRADES

A. Anchor Bolts and Nuts:

1. High Strength: ASTM F 1554 Grade 105; A 449, galvanized. Provide with corresponding galvanized hardened washers.

2. Stainless steel: ASTM A 193 and A 194, Type 316N, Grade 8MN.

3. Unspecified: ASTM F 1554 Grade 36; A 36 or A 307, galvanized.

4. Galvanizing: Hot dipped as required per ASTM F 1554; 1.25 ounces per square foot per ASTM A 153 or B 633; When protected from the atmosphere, moisture and sewage gases, ASTM B 695 is also acceptable.

5. Other Coatings: None; As specified in the contract drawings.

B. Flat Washers: Same material and finish as nut and bolt. For high strength bolts, use ASTM F 1554; F 436.

C. Anti-Seize Thread Lubricant for use with stainless steel anchors:

1. Jet-Lube "Nikal"

2. Never-Seez "Pure Nickel Special"
3. Permatex "Nickel Anti-Seize"
4. Or an approved equal.

D. Reinforcing Steel Dowels: ASTM A 615, Grade 60. Same diameter as spliced rebar, or #4 minimum.

E. Expansion and Adhesive Anchors: Use only anchor types and styles with Research Report approval by the Los Angeles Department of Building and Safety.

1. Simpson Strong-tie “Wedge All”
2. Hilti "Kwik-Bolt II"
3. Phillips "Red Head"
4. Or an approved equal.

PART 3 - EXECUTION

3.1 PROJECT CONDITIONS

A. Examine the areas and conditions under which the work will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until detrimental conditions are corrected.

3.2 CAST-IN-PLACE ANCHOR BOLTS

A. Provide templates or other means to ensure accurate placement. Provide sufficient threads to allow for a nut to be placed on the concrete side of the template.

B. Anchor bolts shall be clean and free of all coatings which may impair bonding with concrete.

C. Provide two nuts and a washer with each anchor bolt. Provide an additional locknut when indicated on the Drawings.

D. High Strength Bolts: Install such that ASTM Grade markings are visible after casting into concrete.

3.3 EPOXY-GROUTED ANCHOR BOLTS OR DOWELS

A. Provide templates or other means to ensure accurate placement.

B. Anchor bolts or dowels shall be clean and free of all coatings which may impair bonding with epoxy.

C. Provide two nuts and a washer with each anchor bolt. Provide an additional locknut when indicated on the Drawings.

D. High Strength Bolts: Install such that ASTM Grade markings are visible after casting into concrete.

E. Do not disturb bolt or dowel until epoxy grout has cured and reached full strength.

3.4 EXPANSION AND ADHESIVE ANCHORS

A. Install per Los Angeles Department of Building and Safety Approved Research Report and manufacturer's recommendations, whichever is more restrictive. Provide nuts and washers of same material and finish as anchor body.

3.5 STAINLESS STEEL ANCHORS

A. After installation of stainless steel anchor bolts or expansion anchors, lubricate threads before fastening.

END OF SECTION

SECTION 03 29 00

JOINTS IN CONCRETE

PART 1 - GENERAL

1.1 THE REQUIREMENT

A. The CONTRACTOR shall construct all joints and bearing pads in concrete at the locations shown. Joints required in concrete structures are of various types and will be permitted only where shown, unless specifically accepted by the ENGINEER.

1.2 REFERENCE SPECIFICATIONS, CODES, AND STANDARDS

A. Comply with the reference standards of the GENERAL REQUIREMENTS.

B. Comply with the current provisions of the following Codes and Standards, as applicable:

1. Federal Specifications:

TT-S-0227E(3) Sealing Compound, elastomeric type, Multi-component for Caulking, Sealing, and Glazing Buildings and Other Structures).

2. U.S. Army Corps of Engineers Specifications:

CRD-C572

3. Other Government Standards:

CSS Caltrans Standard Specifications.

4. Commercial Standards:

ASTM C 920 Specification for Elastomeric Joint Sealants.

ASTM D 624 Test Method for Rubber Property -- Tear Resistance.

ASTM D 638 Test Method for Tensile Properties of Plastics.

ASTM D 746 Test Method for Brittleness Temperature of Plastics and Elastomers by Impact.

ASTM D 747 Test Method for Apparent Bending Modulus of Plastics by Means of a Cantilever Beam.

ASTM D 1751 Premolded Joint Filler

ASTM D 1752 Specification for Preformed Sponge Rubber and Cork Expansion Joint Fillers for Concrete Paving and Structural Construction.

ASTM D 2240 Test Method for Rubber Property -- Durometer Hardness.

1.3 TYPES OF JOINTS

A. Construction Joints: When fresh concrete is placed against a hardened concrete surface, the joint between the two pours is called a construction joint. Unless otherwise specified,

all joints in water bearing members shall be provided with a waterstop and sealant groove of the shape specified and as shown on the plans.

B. Contraction Joints: Contraction joints are similar to construction joints except that the fresh concrete shall not bond to the hardened surface of the first pour, which shall be coated with a bond breaker. The slab reinforcement shall be stopped 4-1/2 inches from the joint, unless noted otherwise; which is provided with a sleeve-type dowel, to allow shrinkage of the concrete of the second pour. Waterstop and sealant groove shall also be provided.

C. Expansion Joints: To allow the concrete to expand freely, a space is provided between the two pours, the joint shall be formed as shown on the plans. This space is obtained by placing a filler joint material against the first pour, which acts as a form for the second pour. Unless otherwise specified, all expansion joints in water bearing members shall be provided with an approved type waterstop.

Premolded expansion joint material shall be installed with the edge at the indicated distance below or back from finished concrete surface, and shall have a slightly tapered, dressed, and oiled wood strip secured to or placed at the edge thereof during concrete placement, which shall later be removed to form space for sealing material. The space so formed shall be filled with a joint sealant material as specified in the Paragraph in Part 2 entitled "Joint Sealant." In order to keep the two elements in line the joint shall be provided with a sleeve-type dowel as shown.

D. Control Joints (Weakened Plane): The function of the control joint is to provide a weaker plane in the concrete, where shrinkage cracks will probably occur. A groove, of the shape and dimensions as shown on the plans, is formed or saw-cut in the concrete and shall be filled with a joint sealant material as specified in the Paragraph in Part 2 entitled "Joint Sealant."

E. All other Joints, bearing devices, and elastomeric bearing pads for bridge structures shall comply with CSS Section 51.

1.4 CONTRACTOR SUBMITTALS

A. Submittals shall be made in accordance with GENERAL REQUIREMENTS.

B. The following submittals and specific information shall be provided.

1. Waterstops: Prior to use of the material required under this contract, qualification samples shall be submitted. Such samples shall consist of extruded or molded sections of each size or shape to be used. The material sample shall be representative of the material to be furnished under this contract. The balance of the material to be used under this contract shall not be produced until after the ENGINEER has reviewed and approved the qualification samples.

2. Joint Sealant: Prior to ordering the sealant material, the CONTRACTOR shall submit to the ENGINEER for review and approval, data to show compliance with the requirements of the Contract Documents. Certified test reports from the sealant manufacturer on the actual batch of material being supplied indicating compliance with the above requirements shall be furnished the ENGINEER before the sealant is used on the job.

3. Shipping Certification: The CONTRACTOR shall provide written certification from the manufacturer as an integral part of the shipping form, to show that all of the material shipped to this project meets or exceeds the physical property

requirements of the Contract Documents. Supplier certificates are not acceptable.

4. The CONTRACTOR shall submit placement shop drawings showing the location and type of all joints for each structure.

1.5 QUALITY ASSURANCE

A. Waterstop manufacturer shall demonstrate five years (minimum) continuous, successful experience in production of waterstops.

B. Waterstop Inspection: It is required that all waterstop field joints shall be subject to inspection, and no such work shall be scheduled or started without having made prior arrangements with the INSPECTOR to provide for the required inspections. Not less than 24 hours notice shall be provided to the INSPECTOR for scheduling such inspections.

C. All field joints in waterstops shall be free of misalignment, bubbles, inadequate bond, porosity, cracks, offsets, and other defects which would reduce the potential resistance of the material to water pressure at any point. All defective joints shall be replaced with material which shall pass said inspection, and all faulty material shall be removed from the site and disposed of by the CONTRACTOR at its own expense.

D. The following waterstop defects represent a partial list of defects which shall be grounds for rejection:

1. Offsets at joints greater than 1/16-inch or 15 percent of material thickness, at any point, whichever is less.

2. Exterior crack at joint, due to incomplete bond, which is deeper than 1/16-inch or 15 percent of material thickness, at any point, whichever is less.

3. Any combination of offset or exterior crack which will result in a net reduction in the cross section of the waterstop in excess of 1/16-inch or 15 percent of material thickness at any point, whichever is less.

4. Misalignment of joint which result in misalignment of the waterstop in excess of 1/2-inch in 10 feet.

5. Porosity in the welded joint as evidenced by visual inspection.

6. Bubbles or inadequate bonding.

E. Waterstop Samples: Prior to use of the waterstop material in the field, a sample of a fabricated metered cross and a tee constructed of each size or shape of material to be used shall be submitted to the ENGINEER for approval. These samples shall be fabricated so that the material and workmanship represent in all respects the fittings to be furnished under this contract. Field samples of fabricated fittings (crosses, tees, etc.) will be selected at random by the INSPECTOR for testing. When tested, they shall have a tensile strength across the joints equal to at least 600 psi.

F. Construction Joint Sealant: The CONTRACTOR shall prepare adhesion and cohesion test specimens as specified herein, at intervals of 5 working days while sealants are being installed.

G. The sealant material shall show no signs of adhesive or cohesive failure when tested in accordance with the following procedure in laboratory and field tests:

1. Sealant specimen shall be prepared between 2 concrete blocks (1-inch by 2-inch by 3-inch). Spacing between the blocks shall be 1/2-inch. Coated spacers (2-inch by 1-1/2-inch by 1/2-inch) shall be used to insure sealant cross-sections of 1/2-inch by 2 inches with a width of 1/2-inch.

2. Sealant shall be cast and cured according to manufacturer's recommendations except that curing period shall not exceed 24 hours.

3. Following curing period, the gap between blocks shall be widened to one inch. Spacers shall be used to maintain this gap for 24 hours prior to inspection for failure.

H. Store waterstops under tarps to protect from oil, dirt, and sunlight.

1.6 GUARANTEE

A. The CONTRACTOR shall provide a 5-year written guarantee of the entire sealant installation against faulty and/or incompatible materials and workmanship, together with a statement that it agrees to repair or replace, to the satisfaction of the CITY, at no additional cost to the CITY, any such defective areas which become evident within said 5-year guarantee period.

PART 2 - PRODUCTS

2.1 JOINT SEALANT

A. Joint sealant shall be polyurethane polymer designed for bonding to concrete which is continuously submerged in water.

B. Joint sealant material shall meet the following requirements:

Work Life	45 - 90 minutes
Time to Reach 20 Shore "A" Hardness (at 77 degrees F, 200 gr quantity)	24 hours, maximum
Ultimate Hardness	30 - 40 Shore "A"
Tensile Strength	250 psi, minimum
Ultimate Elongation	400 percent, minimum
Tear Resistance (Die C ASTM D 624) minimum	75 pounds per inch of thickness,
Color	Light Gray

For bridge structures, additional requirements of CSS Section 51 shall also apply.

C. All polyurethane sealants for waterstop joints in concrete shall conform to the following requirements:

1. Sealant shall be 2-part polyurethane with the physical properties of the cured sealant conforming to or exceeding the requirements of ASTM C 920 or Federal Specification TT-S-00227 E(3) for 2-part material, as applicable.

2. For vertical joints and overhead horizontal joints, only "non-sag" compounds shall be used; all such compounds shall conform to the requirements of ASTM C 920 Class B, or Federal Specification TT-S-0027 E(3), Type II.

3. For plane horizontal joints, the self-leveling compounds which meet the requirements of ASTM C 920 Class A, or Federal Specification TT-S-0027 E(3), Type I shall be used. For joints subject to either pedestrian or vehicular traffic, a compound providing non-tracking characteristics, and having a Shore "A" hardness range of 25 to 35, shall be used.

4. Primer materials, if recommended by the sealant manufacturer, shall conform to the printed recommendations of the sealant manufacturer.

D. All sealants, wherever shown, or required hereunder shall be Rubbercalk 2101-I or 270 as manufactured by Products Research Company; GS 102 or GS 1102 as manufactured by General Sealants Corp; or an approved equal. For sanitary structures mastic/sealant material shall be [Ram Nek Sealant by Henry Co.; Sika Flex 1A, Sikadur 51 NS by Sika Corp.

E. Sealants for non-waterstop joints in concrete shall conform to the requirements of Section 079000, "Joint Sealants". Mastic joint sealer shall be a material that does not contain evaporating solvents; that will tenaciously adhere to concrete surfaces; that will remain permanently resilient and pliable; that will not be affected by continuous presence of water and will not in any way contaminate potable water; and that will effectively seal the joints against moisture infiltration even when the joints are subject to movement due to expansion and contraction. The sealer shall be composed of special asphalts or similar materials blended with lubricating and plasticizing agents to form a tough, durable mastic substance containing no volatile oils or lubricants and shall be capable of meeting the test requirements set forth hereinafter, if testing is required by the ENGINEER.

2.2 PREFORMED JOINT FILLER

A. Preformed joint filler material shall be of the preformed non-extruding type joint filler constructed of cellular neoprene sponge rubber or polyurethane of firm texture. Bituminous fiber type will not be permitted. All non-extruding and resilient-type preformed expansion joint fillers shall conform to the requirements and tests set forth in ASTM D 1752 for Type I, except as otherwise specified herein.

B. Unless otherwise noted, preformed joint filler shall be a non-extruding, resilient, bituminous type conforming to the requirements of ASTM D 1751.

2.3 BACKING ROD

A. Backing rod shall be an extruded closed-cell, polyethylene foam rod. The material shall be compatible with the joint sealant material used and shall have a tensile strength of not less than 40 psi and a compression deflection of approximately 25 percent at 8 psi. The rod shall be 1/8-inch larger in diameter than the joint width except that a one-inch diameter rod shall be used for a 3/4-inch wide joint.

2.4 BOND BREAKER

A. Bond breaker shall be Super Bond Breaker as manufactured by Burke Company, San Mateo, California; Hunt Process 225-TU as manufactured by Hunt Process Co., Santa Fe Springs, California; Select Cure CRB as manufactured by Select Products Co., Upland, California; or an approved equal. It shall contain a fugitive dye so that areas of application will be readily distinguishable.

2.5 BEARING DEVICES AND ELASTOMERIC BEARING PADS

A. Bearing devices and elastomeric bearing pads shall comply with CSS Section 51.

PART 3 - EXECUTION

3.1 GENERAL

A. Unless otherwise shown, waterstops of the type specified herein shall be embedded in the concrete across joints as shown. All waterstops shall be fully continuous for the extent of the joint. Splices necessary to provide such continuity shall be accomplished in conformance to printed instructions of manufacturer of the waterstops. The CONTRACTOR shall take suitable precautions and means to support and protect the waterstops during the progress of the work and shall repair or replace at its own expense any waterstops damaged during the progress of the work. All waterstops shall be stored so as to permit free circulation of air around the waterstop material.

B. When any waterstop is installed in the concrete on one side of a joint, while the other half or portion of the waterstop remains exposed to the atmosphere for more than 2 days, suitable precautions shall be taken to shade and protect the exposed waterstop from direct rays of the sun during the entire exposure and until the exposed portion of the waterstop is embedded in concrete.

C. Construction Joint Sealant:

1. Construction joints in water-bearing floor slabs, and elsewhere as shown, shall be provided with tapered grooves which will be filled with construction joint sealant. The material used for forming the tapered grooves shall be left in the grooves until just before the grooves are cleaned and filled with joint sealant. After removing the forms from the grooves, all laitance and fins shall be removed, and the grooves shall be sand-blasted. The grooves shall be allowed to become thoroughly dry, after which they shall be blown out; immediately thereafter, they shall be primed and filled with the construction joint sealant. The primer used shall be supplied by the same manufacturer supplying the sealant. No sealant will be permitted to be used without a primer. Care shall be used to completely fill the sealant grooves. Areas designated to receive a sealant filler shall be thoroughly cleaned, as outlined for the tapered grooves, prior to application of the sealant.

2. Sealant application shall be in accordance with the manufacturer's printed instructions. The surfaces of the groove for the sealant shall not be coated. Concrete next to waterstops shall be placed in accordance with the requirements of Section 033000, Cast-in-Place Concrete.

3. The primer and sealant shall be placed strictly in accordance with the printed recommendations of the manufacturer, taking special care to properly mix the sealant prior to application. All sealant shall cure at least 7 days before the structure is filled with water.

4. All sealant shall be installed by a competent waterproofing specialty contractor who has a successful record of performance in similar installations. Before work is commenced, the crew doing the WORK shall be instructed as to the proper method of application by a representative of the sealant manufacturer.

5. Thorough, uniform mixing of 2-part, catalyst-cured materials is essential; special care shall be taken to properly mix the sealer before its application. Before any sealer is placed, the CONTRACTOR shall arrange to have the crew doing the

WORK carefully instructed as to the proper method of mixing and application by a representative of the sealant manufacturer.

6. Any joint sealant which after the manufacturer's recommended curing time for the job conditions of the WORK hereunder, fails to fully and properly cure shall be completely removed; the groove shall be thoroughly sandblasted to remove all traces of the uncured or partially cured sealant and primer, and shall be re-sealed with the specified joint sealant. All costs of such removal, joint treatment, re-sealing, and appurtenant work shall be at the expense of the CONTRACTOR.

END OF SECTION

SECTION 03 30 00

CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes cast-in-place concrete, including formwork, reinforcement, concrete materials, mixture design, placement procedures, and finishes.

B. Related Requirements:

1. Section 31 20 00 "Earth Moving" for drainage fill under slabs-on-grade.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. LEED Submittals:

1. Product Data for Credit MR 4: For products having recycled content, documentation indicating percentages by weight of postconsumer and preconsumer recycled content. Include statement indicating cost for each product having recycled content.

2. Product Certificates for Credit MR 5: For products and materials required to comply with requirements for regional materials, certificates indicating location of material manufacturer and point of extraction, harvest, or recovery for each raw material. Include statement indicating distance to Project, cost for each regional material, and fraction by weight that is considered regional.

3. Laboratory Test Reports for Credit IEQ 4.3: For liquid floor treatments and curing and sealing compounds, documentation indicating that products comply with the testing and product requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."

C. Design Mixtures: For each concrete mixture.

D. Steel Reinforcement Shop Drawings: Placing Drawings that detail fabrication, bending, and placement.

1.3 INFORMATIONAL SUBMITTALS

A. Material certificates.

B. Material test reports.

C. Formwork Shop Drawings: Prepared by or under the supervision of a qualified professional engineer, detailing fabrication, assembly, and support of formwork.

D. Floor surface flatness and levelness measurements indicating compliance with specified tolerances.

1.4 QUALITY ASSURANCE

A. Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C 94/C 94M requirements for production facilities and equipment.

1. Manufacturer certified according to NRMCA's "Certification of Ready Mixed Concrete Production Facilities."

B. Testing Agency Qualifications: An independent agency, acceptable to authorities having jurisdiction, qualified according to ASTM C 1077 and ASTM E 329 for testing indicated.

1. Submit Testing Agency certificate to structural engineer of record for review and approval.

1.5 PRECONSTRUCTION TESTING

A. Preconstruction Testing Service: Engage a qualified testing agency to perform preconstruction testing on concrete mixtures.

1.6 FIELD CONDITIONS

A. Cold-Weather Placement: Comply with ACI 306.1.

1. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in mixture designs.

B. Hot-Weather Placement: Comply with ACI 301 (ACI 301M).

PART 2 - PRODUCTS

2.1 CONCRETE, GENERAL

A. ACI Publications: Comply with the following unless modified by requirements in the Contract Documents:

1. ACI 301 (ACI 301M).
2. ACI 117 (ACI 117M).
3. ACI 347
4. ACI 304R-00

2.2 FORM-FACING MATERIALS

A. Smooth-Formed Finished Concrete: Form-facing panels that provide continuous, true, and smooth concrete surfaces. Furnish in largest practicable sizes to minimize number of joints.

B. Rough-Formed Finished Concrete: Plywood, lumber, metal, or another approved material. Provide lumber dressed on at least two edges and one side for tight fit.

2.3 STEEL REINFORCEMENT

A. Recycled Content of Steel Products: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 60 percent.

B. Reinforcing Bars: ASTM A 615/A 615M, Grade 60 (Grade 420), deformed.

C. Low-Alloy-Steel Reinforcing Bars: ASTM A 706/A 706M, deformed.

1. All foundation steel reinforcement shall be ASTM A 706, Grade 60.

D. Plain-Steel Welded-Wire Reinforcement: ASTM A 1064/A 1064M, plain, fabricated from as-drawn steel wire into flat sheets.

E. Deformed-Steel Welded-Wire Reinforcement: ASTM A 1064/A 1064M, flat sheet.

F. Galvanized-Steel Welded-Wire Reinforcement: ASTM A 1064/A 1064M, plain, fabricated from galvanized-steel wire into flat sheets.

G. Epoxy-Coated Welded-Wire Reinforcement: ASTM A 884/A 884M, Class A coated, Type 1, deformed steel.

H. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded-wire reinforcement in place. Manufacture bar supports from steel wire, plastic, or precast concrete according to CRSI's "Manual of Standard Practice."

2.4 SYNTHETIC MICRO-FIBERS

A. 100% virgin multifilament polypropylene fibers complying with ASTM C 1116/C 1116M. Available in ¼ inch (6 mm), ½ inch (13 mm), ¾ inch (19 mm), and multi-length blend (ML).

1. PSI Fiberstrand 100, Euclid Chemical Company
2. Crackstop M, Adfil
3. Micro 100, FRC Industries

2.5 CONCRETE MATERIALS

A. Regional Materials: Concrete shall be manufactured within 500 miles of Project site from aggregates and cementitious materials that have been extracted, harvested, or recovered, as well as manufactured, within 500 miles of Project site.

B. Cementitious Materials:

1. Portland Cement: ASTM C 150, Type I or Type II/V or as indicated on Drawings.
2. Fly Ash: ASTM C 618, Class F.
3. Slag Cement: ASTM C 989/C 989M, Grade 100 or 120.

C. Normal-Weight Aggregates: ASTM C 33/C 33M, graded.

1. Maximum Coarse-Aggregate Size: 3/4 inch (19 mm) nominal.
2. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.

D. Lightweight Aggregate: ASTM C 330/C 330M, 3/8-inch (10-mm) nominal maximum aggregate size.

E. Air-Entraining Admixture: ASTM C 260/C 260M.

F. Chemical Admixtures: Certified by manufacturer to be compatible with other admixtures and that do not contribute water-soluble chloride ions exceeding those permitted in hardened concrete. Do not use calcium chloride or admixtures containing calcium chloride.

1. Water-Reducing Admixture: ASTM C 494/C 494M, Type A.
2. Retarding Admixture: ASTM C 494/C 494M, Type B.
3. Water-Reducing and Retarding Admixture: ASTM C 494, Type D.
4. High-Range, Water-Reducing Admixture: ASTM C 494, Type F.

5. High-Range, Water-Reducing and Retarding Admixture: ASTM C 494, Type G.
6. Plasticizing and Retarding Admixture: ASTM C 1017/C 1017M, Type II.

G. Water: ASTM C 1602/C 1602M.

2.6 WATERSTOPS

A. Provide waterstops as required by manufacturers of below grade waterproofing membrane products in order to maintain specified warranties.

B. Provide all manufacturer's required adhesives and accessories as required to provide a complete and warranted installation.

C. Hydrophilic Waterstop Strips: Manufactured rectangular or trapezoidal strip, butyl rubber with sodium bentonite or other hydrophilic polymers, for adhesive bonding to concrete, 1/2 by 1 inch (13 by 25 mm).

1. Grace Construction Products Adcor ES

2.7 VAPOR RETARDERS

A. Sheet Vapor Retarder: ASTM E 1745, Class C. Include manufacturer's recommended adhesive or pressure-sensitive joint tape.

1. Reef Industries Griffolyn T-65

2.8 CURING MATERIALS

A. Evaporation Retarder: Waterborne, monomolecular film forming, manufactured for application to fresh concrete.

1. BASF Corporation, Dayton Superior, Euclid Chemical

B. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. (305 g/sq. m) when dry.

C. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.

D. Water: Potable.

E. Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B, dissipating.

1. BASF Corporation, Dayton Superior, Euclid Chemical

F. Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B, nondissipating, certified by curing compound manufacturer to not interfere with bonding of floor covering.

1. BASF Corporation, Dayton Superior, Euclid Chemical

G. Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B, 18 to 25 percent solids, nondissipating, certified by curing compound manufacturer to not interfere with bonding of floor covering.

1. BASF Corporation, Dayton Superior, Euclid Chemical

H. Clear, Solvent-Borne, Membrane-Forming Curing and Sealing Compound: ASTM C 1315, Type 1, Class A.

1. BASF Corporation, Dayton Superior, Euclid Chemical

2. Curing and sealing compounds shall comply with the testing and product requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."

I. Clear, Waterborne, Membrane-Forming Curing and Sealing Compound: ASTM C 1315, Type 1, Class A.

1. BASF Corporation, Dayton Superior, Euclid Chemical

2. Curing and sealing compounds shall comply with the testing and product requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."

2.9 RELATED MATERIALS

A. Expansion- and Isolation-Joint-Filler Strips: ASTM D 1751, asphalt-saturated cellulosic fiber or ASTM D 1752, cork or self-expanding cork.

2.10 CONCRETE MIXTURES, GENERAL

A. Prepare design mixtures for each type and strength of concrete, proportioned on the basis of laboratory trial mixture or field test data, or both, according to ACI 301 (ACI 301M) and ACI 304R-00.

B. Admixtures: Use admixtures according to manufacturer's written instructions.

1. Use water-reducing, high-range water-reducing, or plasticizing admixture in concrete, as required, for placement and workability.

2. Use water-reducing and -retarding admixture when required by high temperatures, low humidity, or other adverse placement conditions.

3. Use water-reducing admixture in pumped concrete, concrete for heavy-use industrial slabs and parking structure slabs, concrete required to be watertight, and concrete with a w/c ratio below 0.50.

2.11 CONCRETE MIXTURES FOR BUILDING ELEMENTS

A. Normal-Weight Concrete:

1. Minimum Compressive Strength: As indicated on Drawings at 28 days.

2. Maximum W/C Ratio: 0.45.

3. Slump Limit: max 9 inches (230 mm) for concrete with verified slump of 2 to 4 inches (50 to 100 mm) before adding high-range water-reducing admixture or plasticizing admixture, plus or minus 1 inch (25 mm).

4. Slump Limit: Min 2 inches (50 mm), max 4 inches (100 mm) for concrete without water-reducing or plasticizing admixtures, plus or minus 1 inch.

B. Concrete Over Metal Decking: Lightweight concrete.

1. Minimum Compressive Strength: As indicated on Drawings at 28 days.

2. Calculated Equilibrium Unit Weight: 110 lb/cu. ft. (1762 kg/cu. m), plus or minus 3 lb/cu. ft. (48.1 kg/cu. m) as determined by ASTM C 567/C 567M.

3. Slump Limit: 5 inches (125 mm), plus or minus 1 inch (25 mm).

C. Concrete Topping Slabs: Lightweight concrete.

1. Minimum Compressive Strength: As indicated on Drawings at 28 days.

2. Calculated Equilibrium Unit Weight: 110 lb/cu. ft. (1762 kg/cu. m), plus or minus 3 lb/cu. ft. (48.1 kg/cu. m) as determined by ASTM C 567/C 567M.

3. Slump Limit: 5 inches (125 mm), plus or minus 1 inch (25 mm).

4. Synthetic Micro-Fiber: Uniformly disperse in concrete mixture at manufacturer's recommended rate, but not less than a rate of 1.0 lb/cu. yd. (1.80 kg/cu. m).

2.12 FABRICATING REINFORCEMENT

A. Fabricate steel reinforcement according to CRSI's "Manual of Standard Practice."

2.13 CONCRETE MIXING

A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C 94/C 94M and ASTM C 1116/C 1116M, and furnish batch ticket information.

1. When air temperature is between 85 and 90 deg F (30 and 32 deg C), reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F (32 deg C), reduce mixing and delivery time to 60 minutes.

PART 3 - EXECUTION

3.1 FORMWORK INSTALLATION

A. Design, erect, shore, brace, and maintain formwork, according to ACI 301 (ACI 301M) and ACI 347, to support vertical, lateral, static, and dynamic loads, and construction loads that might be applied, until structure can support such loads.

B. Construct formwork so concrete members and structures are of size, shape, alignment, elevation, and position indicated, within tolerance limits of ACI 117 (ACI 117M).

C. Chamfer exterior corners and edges of permanently exposed concrete.

3.2 EMBEDDED ITEM INSTALLATION

A. Place and secure anchorage devices and other embedded items required for adjoining work that is attached to or supported by cast-in-place concrete. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.

3.3 VAPOR-RETARDER INSTALLATION

A. Sheet Vapor Retarders: Place, protect, and repair sheet vapor retarder according to ASTM E 1643 and manufacturer's written instructions.

1. Lap joints 6 inches (150 mm) and seal with manufacturer's recommended tape.

3.4 STEEL REINFORCEMENT INSTALLATION

A. General: Comply with CRSI's "Manual of Standard Practice" for fabricating, placing, and supporting reinforcement.

1. Do not cut or puncture vapor retarder. Repair damage and reseal vapor retarder before placing concrete.

3.5 JOINTS

A. General: Construct joints true to line with faces perpendicular to surface plane of concrete.

B. Construction Joints: Install so strength and appearance of concrete are not impaired, at locations indicated or as approved by Architect.

C. Contraction Joints in Slabs-on-Grade: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least one-fourth of concrete thickness as follows:

1. Grooved Joints: Form contraction joints after initial floating by grooving and finishing each edge of joint to a radius of 1/8 inch (3.2 mm). Repeat grooving of contraction joints after applying surface finishes. Eliminate groover tool marks on concrete surfaces.

2. Sawed Joints: Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch- (3.2-mm-) wide joints into concrete when cutting action does not tear, abrade, or otherwise damage surface and before concrete develops random contraction cracks.

D. Isolation Joints in Slabs-on-Grade: After removing formwork, install joint-filler strips at slab junctions with vertical surfaces, such as column pedestals, foundation walls, grade beams, and other locations, as indicated.

3.6 WATERSTOP INSTALLATION

A. Waterstops: Install in construction joints and at other locations indicated, according to manufacturer's written instructions.

3.7 CONCRETE PLACEMENT

A. Before placing concrete, verify that installation of formwork, reinforcement, and embedded items is complete and that required inspections are completed.

B. Deposit concrete continuously in one layer or in horizontal layers of such thickness that no new concrete is placed on concrete that has hardened enough to cause seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as indicated. Deposit concrete to avoid segregation.

1. Consolidate placed concrete with mechanical vibrating equipment according to ACI 301 (ACI 301M).

3.8 FINISHING FORMED SURFACES

A. Rough-Formed Finish: As-cast concrete texture imparted by form-facing material with tie holes and defects repaired and patched. Remove fins and other projections that exceed specified limits on formed-surface irregularities.

1. Apply to concrete surfaces not exposed to public view.

B. Smooth-Formed Finish: As-cast concrete texture imparted by form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams. Repair and patch tie holes and defects. Remove fins and other projections that exceed specified limits on formed-surface irregularities.

1. Apply to concrete surfaces exposed to public view, to receive a rubbed finish, or to be covered with a coating or covering material applied directly to concrete.

C. Rubbed Finish: Apply the following to smooth-formed-finished as-cast concrete where indicated:

1. Smooth-Rubbed Finish: Not later than one day after form removal, moisten concrete surfaces and rub with carborundum brick or another abrasive until producing a uniform color and texture. Do not apply cement grout other than that created by the rubbing process.

2. Grout-Cleaned Finish: Wet concrete surfaces and apply grout of a consistency of thick paint to coat surfaces and fill small holes. Mix 1 part portland cement to 1-1/2 parts fine sand with a 1:1 mixture of bonding admixture and water. Add white portland cement in amounts determined by trial patches, so color of dry grout matches adjacent surfaces. Scrub grout into voids and remove excess grout. When grout whitens, rub surface with clean burlap and keep surface damp by fog spray for at least 36 hours.

3. Cork-Floated Finish: Wet concrete surfaces and apply a stiff grout. Mix 1 part portland cement and 1 part fine sand with a 1:1 mixture of bonding agent and water. Add white portland cement in amounts determined by trial patches, so color of dry grout matches adjacent surfaces. Compress grout into voids by grinding surface. In a swirling motion, finish surface with a cork float.

D. Related Unformed Surfaces: At tops of walls, horizontal offsets, and similar unformed surfaces adjacent to formed surfaces, strike off smooth and finish with a texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces unless otherwise indicated.

3.9 FINISHING FLOORS AND SLABS

A. General: Comply with ACI 302.1R recommendations for screeding, restraightening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.

B. Scratch Finish: While still plastic, texture concrete surface that has been screeded and bull-floated or darbied. Use stiff brushes, brooms, or rakes to produce a profile amplitude of 1/4 inch (6 mm) in one direction.

1. Apply scratch finish to surfaces indicated.

C. Float Finish: Consolidate surface with power-driven floats or by hand floating if area is small or inaccessible to power-driven floats. Restraighten, cut down high spots, and fill low spots. Repeat float passes and restraightening until surface is left with a uniform, smooth, granular texture.

1. Apply float finish to surfaces indicated.

D. Trowel Finish: After applying float finish, apply first troweling and consolidate concrete by hand or power-driven trowel. Continue troweling passes and restraighten until surface is

free of trowel marks and uniform in texture and appearance. Grind smooth any surface defects that would telegraph through applied coatings or floor coverings.

1. Apply a trowel finish to surfaces indicated.

2. Finish and measure surface, so gap at any point between concrete surface and an unleveled, freestanding, 10-ft.- (3.05-m-) long straightedge resting on two high spots and placed anywhere on the surface does not exceed 3/16 inch (4.8 mm).

E. Trowel and Fine-Broom Finish: Apply a first trowel finish to surfaces indicated. While concrete is still plastic, slightly scarify surface with a fine broom.

1. Comply with flatness and levelness tolerances for trowel-finished floor surfaces.

F. Broom Finish: Apply a broom finish to exterior concrete platforms, steps, ramps, and elsewhere as indicated.

1. Immediately after float finishing, slightly roughen trafficked surface by brooming with fiber-bristle broom perpendicular to main traffic route. Coordinate required final finish with Architect before application.

3.10 CONCRETE PROTECTING AND CURING

A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection and ACI 301 (ACI 301M) for hot-weather protection during curing.

B. Evaporation Retarder: Apply evaporation retarder to unformed concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h (1 kg/sq. m x h) before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.

C. Formed Surfaces: Cure formed concrete surfaces, including underside of beams, supported slabs, and other similar surfaces. If forms remain during curing period, moist cure after loosening forms. If removing forms before end of curing period, continue curing for remainder of curing period.

D. Cure concrete according to ACI 308.1, by one or a combination of the following methods:

1. Moisture Curing: Keep surfaces continuously moist for not less than seven days.

2. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches (300 mm), and sealed by waterproof tape or adhesive. Cure for not less than seven days. Immediately repair any holes or tears during curing period, using cover material and waterproof tape.

3. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Maintain continuity of coating and repair damage during curing period.

a. Removal: After curing period has elapsed, remove curing compound without damaging concrete surfaces by method recommended by curing compound manufacturer unless manufacturer certifies curing compound does not interfere with bonding of floor covering used on Project.

4. Curing and Sealing Compound: Apply uniformly to floors and slabs indicated in a continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Repeat process 24 hours later and apply a second coat. Maintain continuity of coating and repair damage during curing period.

3.11 CONCRETE SURFACE REPAIRS

A. Defective Concrete: Repair and patch defective areas when approved by Architect. Remove and replace concrete that cannot be repaired and patched to Architect's approval.

3.12 FIELD QUALITY CONTROL

A. Special Inspections: Owner will engage a special inspector and qualified testing and inspecting agency to perform field tests and inspections and prepare test reports.

END OF SECTION

SECTION 03 30 20

UNDER SLAB VAPOR BARRIER / RETARDER

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes under slab vapor barrier/retarder for installation under concrete slabs on grade within enclosed spaces, whether indicated on Drawings or not.

1.3 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Samples: For vapor retarder.

C. Qualification Data: For Installer and manufacturer.

D. Material Certificates: For vapor retarders, signed by manufacturers:

E. Field quality-control test and inspection reports.

F. Minutes of preinstallation conference.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: A qualified installer who employs on Project personnel qualified to install vapor barrier/retarder.

B. Source Limitations: Obtain vapor barrier/retarder materials of the same brand from the same manufacturer's plant.

C. ACI Publications: Comply with the following unless modified by requirements in the Contract Documents: ACI 301, "Specification for Structural Concrete," Sections 1 through 5.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection: Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, products specified.

2.2 VAPOR RETARDERS

A. Plastic Vapor Retarder: ASTM E 1745, Class A. Include manufacturer's recommended adhesive or pressure-sensitive tape. Available Products:

1. Fortifiber Corporation; Moistop Ultra A.
2. Meadows, W.R., Inc.; Vapor Mat 15.
3. Stego Industries, LLC.; Stego Wrap 15-mil Class A.
4. Raven Industries Inc.; Vapor Block 15.
5. An approved equal.

B. Granular Fill: Clean mixture of crushed stone or crushed or uncrushed gravel; ASTM D 448, Size 57, with 100 percent passing a 1-1/2-inch sieve and 0 to 5 percent passing a No. 8 sieve.

C. Fine-Graded Granular Material: Clean mixture of crushed stone, crushed gravel, and manufactured or natural sand; ASTM D 448, Size 10, with 100 percent passing a 3/8-inch sieve, 10 to 30 percent passing a No. 100 sieve, and at least 5 percent passing No. 200 sieve; complying with deleterious substance limits of ASTM C 33 for fine aggregates.

PART 3 - EXECUTION

3.1 VAPOR RETARDERS

A. Plastic Vapor Retarders: Place, protect, and repair vapor retarders according to ASTM E 1643 and manufacturer's written instructions. Lap joints 6 inches and seal with manufacturer's recommended tape.

B. Granular Course: Cover vapor retarder with granular fill, moisten, and compact with mechanical equipment to elevation tolerances of plus 0 inch or minus 3/4 inch. Place and compact a 1/2-inch- thick layer of fine-graded granular material over granular fill.

3.2 FIELD QUALITY CONTROL

A. Testing and Inspecting: Contractor will engage a qualified testing and inspecting agency to perform field tests and inspections and prepare test reports.

B. Inspections: Installation of vapor barrier/retarder including sealing of joints and penetrations.

END OF SECTION

SECTION 03 30 53

SITE CONCRETE

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes: but is not limited to furnishing transportation, labor, materials, and equipment to install landscape curbs and miscellaneous concrete footings.

B. Related Sections:

1. Division 31 – Earthwork
2. Section 033000 – Cast-in-Place Concrete
3. Section 321400 – Paving Systems
4. Section 129300 – Site Furnishings
5. Division 26 – Electrical

1.3 REFERENCES

A. American Society for Testing and Materials (ASTM):

ASTM A82 Standard Specification for Steel Wire, Plain, for Concrete Reinforcement.

ASTM A615 Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement.

ASTM C33 Standard Specification for Concrete Aggregates.

ASTM C136 Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.

ASTM C150 Standard Specification for Portland Cement.

ASTM C260 Standard Specification for Air Entraining Admixtures for Concrete.

ASTM C309 Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete.

ASTM C494 Standard Specification for Chemical Admixtures for Concrete.

ASTM D1557 Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort.

ASTM C836 Standard Specification for High Solids Content, Cold-Liquid-Applied Elastomeric Waterproofing Membrane for Use With Separate Wearing Course.

ASTM C1017 Standard Specification for Chemical Admixtures for Use in Producing Flowing Concrete.

ASTM D1751 Standard Specification for Premolded Expansion Joint Filler for Concrete Paving

B. California Department of Transportation, CalTrans Standard Specifications, latest edition.

C. CAC - California Administrative Code, Title 24.

D. Portland Cement Association (PCA) publications:

1. "Finishing Concrete Slabs, Exposed Aggregate, Patterns, and Colors", IS206T.
2. "Sandblasting of Concrete Surfaces", IS180T.
3. "Color and Texture in Architectural Concrete", SP021.01A.
4. “Design and Control of Concrete Mixtures”.

E. American Concrete Institute (ACI):

1. ACI Manual of Concrete Practice.
2. ACI 301, "Specifications for Structural Concrete for Buildings".

F. Americans with Disabilities Act (ADA).

G. California Code of Regulations (CCR).

1.4 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Certificates:

1. Reinforcing Steel: Certificate of Compliance.

2. Concrete Mix Design: Ticket for each batch delivered showing mix identification: weight of cement, aggregate, water and admixtures, aggregate sizes and proportion, and air entrainment.

1.5 QUALITY ASSURANCE

A. Qualifications of Workers: All concrete work shall be done by experienced and skilled concrete workers with 3 years of experience applying specified colors and finishes under the supervision of an experienced concrete contractor.

1.6 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Deliver all products to the jobsite in such a manner that no damage occurs to the product.

B. Notify the Owner’s Authorized Representative 7 Calendar Days prior to the time of delivery.

C. Store materials and products in a dry and protected location. Protect from drying, breaking, rusting, deformation, staining, and moisture damage. Any cement delivered to job shall be packed in strong paper of jute bags with brand name and manufacturer’s name stamped thereon. Cement shall be stored under cover and should it become wet

or show signs of caking or deterioration of any kind, it shall be immediately removed from the site. Concrete materials shall be protected from contamination.

D. Brand of cement and source of aggregate or paving materials shall not be changed during course or work without prior written permission of the Owner's Authorized Representative.

1.7 EXISTING CONDITIONS AND UTILITIES

A. Contractor shall become familiar with existing site conditions, verify dimensions, and obtain other information as may be necessary for a complete installation.

Notify the Owner's Authorized Representative of unsatisfactory conditions prior to commencement of work.

B. Exercise care in excavating and working near existing utilities. Contractor shall be responsible for damages to utilities which are caused by Contractor's operations or neglect. Check existing utility drawings for existing utility locations.

C. Repair or replace existing improvements which are not designated for removal which are damaged or removed as a result of Contractor's operations. Repairs and replacements shall be equal to existing improvements, and shall match them in finish and dimension. Costs for protecting, removing, and restoring existing improvements shall be at Contractor's expense.

1.8 VERIFICATIONS OF DIMENSIONS AND QUANTITIES

A. Verify scaled dimensions and quantities prior to start of work.

B. Notify the Owner's Authorized Representative of discrepancies between Drawings and Specifications and actual job site conditions which would affect the execution of the installation work. Do not work in areas where discrepancies occur until instructed by the Owner's Authorized Representative.

1.9 COORDINATION

A. Contractor shall be responsible for sequencing the placement of concrete with finishes to facilitate finishing operations and minimize disturbance of existing surfaces.

B. Coordinate all items of other trades to be furnished and set in place. Coordinate proper installation of all accessories embedded in the concrete and for the provision of holes, openings and recesses necessary to the execution of the work of the other trades in ample time that progress of the work is not delayed.

PART - 2 PRODUCTS

2.1 COMPLIANCE

Comply with pertinent provisions of CAST-IN-PLACE CONCRETE Section 033000, for materials not specified herein necessary to perform the work of this Section.

2.2 PORTLAND CEMENT

Portland cement shall be Type II conforming to ASTM C150. Use one brand and source of cement throughout the entire length of the project.

2.3 FINE AGGREGATE

Conform to ASTM C33, clean, hard, durable sand free of silt, loam clay or other deleterious matter. Fine aggregate shall be from a single source and shall be like in visual appearance.

2.4 COARSE AGGREGATE

Coarse aggregate shall conform to ASTM C33. Size range shall be from 3/8-inch to 1-inch (0.95 cm to 2.54 cm). Coarse aggregate shall be from a single source and shall be like in visual appearance.

2.5 WATER

Water shall be free from deleterious materials such as oils, acids, and organic matter.

2.6 ADMIXTURES

A. Air Entrainments: Air entraining admixtures shall conform to ASTM C260.

B. Chemical Admixtures: Chemical admixtures shall conform to ASTM C494 and ASTM C1017.

C. Water Reducing Admixtures: Shall conform to ASTM C260, Type A and not contain more than 0.1 percent chloride ions.

1. Admixture shall conform to ASTM C494 and UBC Standard No. 26-9.

2. Colors: Concrete color additive per Materials Schedule on the Drawings as verified by favorably- reviewed samples and on-site mock-ups.

2.7 CONCRETE CURING COMPOUND

Liquid type membrane-forming curing compound complying with ASTM C309, Type 1, Class A. Moisture loss not more than 0.055 gram/square cm when applied at the rate of 200 sf/gallon (1.95 square meter per liter).

2.8 CONCRETE SEALER

As manufactured by HMK Stone Care Products, San Francisco, CA (415) 647-3086 or approved equal.

2.9 FORM MATERIAL

A. Steel or wood of size and strength to resist movement during concrete placement and to retain horizontal and vertical alignment until removal. All material shall be clean at the time that it is used.

B. Use flexible forms or laminated boards to form radius bends.

C. Form Release Agent: Colorless, non-staining, free from oils. Chemical agent shall not impair binding of paint or other proposed coatings.

D. Form Facing Materials:

1. All surfaces of sufficient strength to hold concrete in place and prevent leakage of water from forms.

2. Exposed vertical surfaces: A-Matte, Two0step MDO plywood made for forming by Simpson Timber Co., (206) 292-5000, or accepted equal. No wood-textured finish will be permitted on exposed concrete unless specified as such.

2.10 REINFORCING

A. Reinforcing Steel: Conform to ASTM A615 and be clean and free of any rust, dirt, grease or oils.

B. Smooth Dowels for Expansion Joints: ASTM A615, Grade 40 smooth, billet-steel bars, shop painted with iron-oxide zinc-chromate primer.

C. Tie Wire: 16 gauge plain cold-drawn steel conforming to ASTM A82 and free of any rust, dirt, grease or oils.

D. Supports for Reinforcement: Provide supports for reinforcement including bolsters, chairs, spacers and other devices for spacing, supporting and fastening reinforcing bars and welded wire mesh in place. For slabs on grade, use supports with sand plates or horizontal runners where base material will not support chair legs.

2.11 EXPANSION JOINT MATERIALS

A. Pre-molded isolation joint filler shall conform to ASTM D1751, size per plans non-extruding and bituminous type resilient filler, compatible with sealant and having a guide strip removable depth gauge.

B. Joint Sealant: ASTM C290, non-snag sealant, “Dynatred” by Pecora Corporation, (214) 278-8158 or “Sonolastic Sealant Two-Part” by Sonneborn, (415) 889-9899, or approved equal. Color to match adjacent paving.

C. Bond Breaker: Pressure-sensitive tape as recommended by sealant manufacturer to suit application.

D. Finishing Sand: “Finishing Sand” by SealGreen-ReUse Concrete Sealing Specialists, LLC, 913-681-3451 or approved equal. Color to match adjacent paving.

2.12 SLIP SHEET

40 Mil Polyvinyl Chloride (PVC) Sheet.

PART 3 – EXECUTION

3.1 EXAMINATION AND PREPARATION

A. Inspections: Verify that conditions are satisfactory for installation of paving and surfaces. Do not proceed with the work of this Section until unsatisfactory conditions have been corrected.

B. Acceptance: Do not install paving prior to acceptance by Owner’s Authorized Representative of area to receive such material.

C. Special Precautions: Guard against damaging existing pavements and planting where new paving is to be installed.

3.2 FORMWORK

A. Obtain approval from Owner's Authorized Representative of the subgrade, subbase, or base prior to placing forms and impervious compacted subgrade.

B. Do not use forms showing a variation of more than 1/8 inch in a 10- foot (0.31 cm in 300 cm) length from the plane of the top or face when tested with a straightedge.

C. Join forms neatly and tightly and stake securely with stakes in every pocket. Drive up fully all locking devices at form joints so as to produce a smooth fitting, rigid joint.

D. Maintain proper grade and alignment under all working conditions. Maintain base of forms directly in contact with the finished subgrade, base or subbase.

E. Assemble forms so that all construction joints appear only as shown on Drawings and as accepted by Owner's Authorized Representative. Incorporate all formwork joints into required reveal and expansion joints. No exposed form joints will be permitted.

F. Install form facings as required.

G. Clean and coat forms with form release compound before concrete is placed against them, each time they are used.

H. Do not remove forms from freshly placed concrete until the concrete has set for 12 hours.

3.3 PLACING CONCRETE REINFORCEMENT

Provide and place deformed bars or welded wire fabric as indicated on the Drawings, of size and quantity indicated; and per ACI Manual of Concrete Practice. Do not extend bars through expansion joints.

3.4 DESIGN OF MIXES AND PROPORTIONING

A. Proportioning and mixing of cement, aggregate, admixture and water to attain required plasticity and strength shall be in accordance with the current edition of the ACI Manual of Concrete Practice and the PCA "Design and Control of Concrete Mixtures".

B. Mix in admixtures of quantities specified in accordance with pigmented admixture manufacturer's instructions. Maintain consistent quantities throughout the job.

C. Proportions of concrete materials and water content for various grades of concrete shall be established by concrete mix designs made at expense of Owner by an approved testing laboratory to conform to concrete strengths specified herein. At least 5 days prior to beginning placing concrete, Owner's Authorized Representative shall be furnished with 2 copies of predetermined concrete mixes. No substitutes shall be made in materials used on work without approval of Testing Laboratory and Owner's Authorized Representative.

D. Minimum psi rating of landscape concrete paving shall be 4,000 psi (281 kg/cm) in 28 days. Concrete Slump: Two inch (5.08 cm) minimum, Four inch (10.16 cm) maximum. Maximum water-cement ratio: 8.75 gallons (32.81 liters) per sack of cement.

3.5 CONCRETE FINISH

A. Refer to Section 321400 Paving Systems for curb finishes to match adjacent paving.

3.6 JOINTING

A. Expansion Joints:

1. Provide joints at locations an intervals shown on the Drawings or as specified herein.

2. All expansion joint filler strips shall be installed vertically, and extend to the full depth and width of the work in which they are installed, and be constructed perpendicular to straight curb or radially to the line of the curb constructed on a curve. During placing and tamping of the concrete, the expansion joint shall be held rigidly and securely in proper position.

3. After curing period, carefully clean expansion joints and fill with joint compound as shown on the Drawings.

4. Do not permit spillage on paved surfaces or overflow from the joint.

5. Finishing Sand, it must be applied, broom swept, over fresh caulk while it is still sticky at the surface.

B. Control Joints, hand tooled:

Construction and contraction joints shall be located as indicated. Construction joints shall act as contraction joints. Where additional contraction joints are required to prevent shrinkage cracks, saw-cut these joints. All joints shall be straight and true to line. Mark-off lines or edges at formed construction joints shall be finished with a 1/4-inch (0.64 cm) radius curved edging tool, neat and true to line, uniform throughout.

3.7 PROTECTION AND CURING

A. Protect concrete against rapid drying and damage by rain or frost.

B. Keep concrete moist for at least 7 days. Protect with liquid curing compound, or a covering that will not stain nor discolor finished concrete surfaces. Obtain acceptance of proposed method prior to use.

C. Spraying: Spray concrete during the curing period as frequently as drying conditions may require.

D. Curing: Cure concrete in accordance with the ACI Manual of Concrete Practice. During curing period maintain concrete above 70 degrees F. (21.11 degrees C.) for at least 3 days or above 50 degrees F. (10 degrees C.) for at least 5 days.

E. Damage and Defacement: Protect all concrete work against damage and

3.8 SEALER APPLICATION

Apply Concrete Sealer in accordance with Manufacturer’s written instructions.

3.9 FIELD QUALITY CONTROL

A. Samples: Owner will select a qualified testing laboratory to take samples for testing during the course of the work as considered necessary.

B. Cost of testing will be paid for by the Contractor.

C. Rejected materials: Remove off the site all concrete below specified strength.

D. Cost of removal and retesting: Pay for full cost of removal of rejected concrete and its replacement with concrete if specified strength and retesting.

3.10 CLEANING

A. Upon completion of work, a final inspection for acceptance will be performed by the Owner's Authorized Representative.

B. Sweep concrete sidewalks and pavements, remove all rubbish, waste and debris resulting from this operation off-site or as directed by the Owner's Authorized Representative.

C. Wash concrete paving free of stains, discoloration, dirt and other foreign material immediately prior to final acceptance.

END OF SECTION

SECTION 03 37 00

CONCRETE CURING

PART1 - GENERAL

1.1 THE REQUIREMENT

A. The Contractor shall furnish all tools, equipment, materials, and supplies and shall perform all labor required to complete the work as indicated on the Drawings and specified herein.

B. This section covers the work necessary for the concrete curing requirements.

1.2 REFERENCE SPECIFICATIONS, CODES AND STANDARDS

A. Comply with the reference standards and Standard Specifications of the GENERAL REQUIREMENTS.

B. Comply with the current provisions of the following Codes and Standards, as applicable.

1. Federal Specifications:

UU-B-790A (Int.Amd. 1) Building Paper, Vegetable Fiber (Kraft, Waterproofed, Waterproofed, water Repellant and Fire Resistant)

2. Commercial Standards:

ACI 308	Standard Practice for Curing Concrete
ASTM C 156	Test Method for Water Retention by Concrete Curing Materials
ASTM C 171	Specifications for Sheet Materials for Concrete Curing
ASTM C 309	Specifications for Liquid Membrane-Forming Compounds for Curing Concrete

3. Government Standards:

CSS	Caltrans Standard Specifications

1.3 CONTRACTOR SUBMITTALS

A. Submittals shall be made in accordance with the GENERAL REQUIREMENTS.

1.4 QUALITY ASSURANCE

A. Quality Control Data:

1. Curing Compound: Manufacturer's Certification of Compliance, to include statement that product meets ASTM C 309, additional permeability requirement, and coverage.

2. Retardant For Exposed Aggregate Finish on Formed Surface: Manufacturer's Certification of Compliance including statement that product is suitable for and will meet job requirements.

3. Curing method, procedures and method of application to be used shall be in compliance with the requirements as specified herein.

PART 2 - PRODUCTS

2.1 CURING MATERIALS

A. Materials for curing concrete as specified herein shall conform to the Standard Specifications and the following requirements:

1. Polyethylene sheet for use as concrete curing blanket shall be white and conform to ASTM C 171. The loss of moisture when determined in accordance with the requirements of ASTM C 156 shall not exceed 0.055 grams per square centimeter of surface.

2. Polyethylene-coated waterproof paper sheeting for use as concrete curing blanket shall consist of white polyethylene sheeting free of visible defects, uniform in appearance, having a nominal thickness of 2 mils and permanently bonded to waterproof paper conforming to the requirements of Federal Specification UU-B-790A (Int. Amd. 1). The loss of moisture, when determined in accordance with the requirements of ASTM C 156, shall not exceed 0.055 gram per square centimeter of surface.

3. Polyethylene-coated burlap for use as concrete curing blanket shall conform to ASTM C 171. The loss of moisture, when determined in accordance with the requirements of ASTM C 156, shall not exceed 0.055 grams per square centimeter of surface.

4. Curing mats for use in Curing Method 6 as specified herein, shall be heavy shag rugs or carpets or cotton mats quilted at 4-inches on center. Curing mats shall weigh a minimum of 12 ounces per square yard when dry.

5. Evaporation retardant shall be a material such as Confilm as manufactured by Masterbuilders, Cleveland, OH; or an approved equal.

B. Curing Compound:

1. Curing compound shall consist of a liquid which, when applied to fresh concrete by means of a spray gun, will form an impervious membrane over the exposed surfaces of the concrete.

2. The membrane may be either asphaltic or paraffin derivatives to which other waterproofing materials may have been added. Concrete curing compounds shall be designated by type as follows:

Type 1 – Clear or translucent without dye

Type 1-D - Clear or translucent with red fugitive dye

Type 2 - White pigmented

Type 3 - Light gray pigmented

Type 4 - Black pigmented

3. Provide curing compound meeting requirements of ASTM C 309, with additional requirement that permeability not exceed 0.039 gm/square cm/72 hours, when tested in accordance with ASTM C 156 standards.

4. Provide evaporation retardant where required to prevent rapid evaporation of water from fresh exposed concrete.

5. When pigmented curing compounds are used, at the time of use, the compound shall be thoroughly mixed, with the pigment uniformly dispensed throughout the mixture.

6. Unless otherwise specified, Type 1-D curing compound shall be used, except that Type 2 shall be used for the top surface of bridge decks.

2.2 FLOOR HARDENER (SURFACE-APPLIED)

A. Floor hardener shall be a colorless, aqueous solution of zinc and/or magnesium fluosilicate.

B. Each gallon of fluosilicate solution shall contain minimum of 2 pounds of crystals.

C. All hardeners shall be furnished by the CONTRACTOR and shall be delivered ready mixed in sealed original containers bearing the manufacturer's name and product identification.

PART 3 - EXECUTION

3.1 CURING OF CONCRETE

A. The top surface of highway bridge decks shall be cured by both the curing compound method, and by the water method except that the curing compound shall be either Pigmented Curing Compound-Chlorinated Rubber Base Type (State Specification 8030-71D-04), or Pigmented Curing Compound Chlorinated Rubber Base white or Tinted (State Specification 8030-71D-05), or as directed by the Engineer.

3.2 CURING AND DAMPPROOFING METHODS

General: All concrete shall be cured for not less than 10 days after placing, in accordance with the methods specified herein for the different parts of the work, and described in detail in the following paragraphs. Curing concrete for bridge structures shall comply with Section 90-7 of the CSS.

Surface to be Cured or Dampproofed (except bridge structures)	Method
Unstripped forms	1
Wall sections with forms removed	6
Construction joints between footings and walls, and between floor slab and columns	2
Encasement concrete and thrust blocks	3
All concrete surfaces not specifically provided for elsewhere in this Paragraph	4
Floor slabs on grade	5
Roof and slabs not on grade	6
Floor slabs to be covered with resilient flooring	8
Exterior buried surfaces of roof slabs and basement walls	7
All liquid and water retaining structures	2

Method 1: Wooden forms shall be wetted immediately after concrete has been placed and shall be kept wet with water until removed. If steel forms are used the exposed concrete surfaces shall be kept continuously wet until the forms are removed. If forms are removed within 10 days of placing the concrete, curing shall be continued in accordance with Method 6, herein.

Method 2: The surface shall be covered with burlap mats which shall be kept wet with water for the duration of the curing period, until the concrete in the walls has been placed. No curing compound shall be applied to surfaces cured under Method 2.

Method 3: The surface shall be covered with moist earth not less than 4 hours, nor more than 24 hours, after the concrete is placed. Earthwork operations that may damage the concrete shall not begin until at least 7 days after placement of concrete.

Method 4: The surface shall be sprayed with a liquid curing compound.

1 Curing compound shall be applied in 2 coats according to the manufacturer's printed instructions. The direction of application of the second coat shall be perpendicular to the first. The second coat shall be applied when the first coat is dry to touch, but not to exceed 4 hours. Each coat shall be applied at a rate not more than 200 square feet per gallon and in such a manner as to cover the surface with a uniform film which will seal thoroughly.

2 Where the curing compound method is used, care shall be exercised to avoid damage to the seal during the curing period. The CONTRACTOR shall maintain and monitor the curing compound membrane for a minimum of 10 days. Should the seal be damaged or broken before the expiration of this curing period, the break shall be repaired immediately by the application of additional curing compound over the damaged portion.

3 Wherever curing compound may have been applied by mistake to surfaces against which concrete subsequently is to be placed and to which it is to adhere, said compound shall be entirely removed by wet sandblasting just prior to the placing of new concrete.

4 Application of the curing compound to the concrete shall commence as soon as the finished surface of the concrete reaches a uniformly damp appearance with no free water on the surface. Curing compound shall also be applied no later than 2 hours after removal of forms from contact with formed surfaces or after the placement of concrete on the subgrade. At any point, the application rate shall be within 50 square feet per gallon of the nominal rate and the average application rate shall be within 25 square feet per gallon of the nominal rate specified when tested in accordance with California Test 535.

5 Repairs required to be made to formed surfaces shall be made within the said 2-hour period; provided, however, that any such repairs which cannot be made within the said 2-hour period shall be delayed until after the curing compound has been applied. When repairs are to be made to an area on which curing compound has been applied, the area involved shall first be wet-sandblasted to remove the curing compound, following which repairs shall be made as specified herein.

6 At the time of use, pigmented curing compounds shall be maintained in a thoroughly mixed condition. Containers of curing compound shall remain air-tight when not in use.

7 The CONTRACTOR shall apply curing compound in the presence of the INSPECTOR. Curing compound shall be applied to form a continuous and uniform membrane.

Method 5: Immediately after the concrete has been screeded, it shall be treated with a liquid evaporation retardant. The retardant shall be used again after each work operation as necessary to prevent drying shrinkage cracks.

1. Immediately after each square foot of the concrete has been finished, it shall be given a coat of curing compound in accordance with Method 4, herein. Not less than one hour nor more than 4 hours after the coat of curing compound has been applied, the surface shall be wetted with water delivered through a fog nozzle, and concrete-curing blankets shall be placed on the slabs. The curing blankets shall be polyethylene sheet, polyethylene-coated waterproof paper sheeting or polyethylene-coated burlap. The blankets shall be laid with the edges butted together and with the joints between strips sealed with 2-inch wide strips of sealing tape or with edges lapped not less than 3-inches and fastened together with a waterproof cement to form a continuous watertight joint.

2. The curing blankets shall be left in place during the 10-day curing period and shall not be removed until after concrete for adjacent work has been placed. Should the curing blankets become torn or otherwise ineffective, the CONTRACTOR shall replace damaged sections. During the first 3 days of the curing period, no traffic of any nature and no depositing, temporary or otherwise, of any materials shall be permitted on the curing blankets. During the remainder of the curing period, foot traffic and temporary depositing of materials that impose light pressure will be permitted only on top of plywood sheets 5/8-inch minimum thickness, laid over the curing blanket. The CONTRACTOR shall add water under the curing blanket as often as necessary to maintain damp concrete surfaces at all times.

Method 6: Concrete slabs shall be treated with an evaporation retardant as specified in Method 5. The concrete shall be kept continuously wet by the application of water for a minimum period of at least 10 consecutive days beginning immediately after the concrete has been placed or forms removed. Heavy curing mats shall be used as a curing medium to retain the moisture during the curing period. The curing medium shall be weighted or otherwise held in place to prevent being dislodged by wind or any other causes. Until the concrete surface is covered with the curing medium the entire surface shall be kept damp by applying water using nozzles that atomize the flow so that the surface is not marred or washed. The curing blankets and concrete shall be kept continuously wet by the use of sprinklers or other means both during and after normal working hours. Immediately after the application of water has terminated at the end of the curing period, the curing medium shall be removed and curing compound immediately applied in accordance with Method 4, herein. The CONTRACTOR shall dispose of excess water from the curing operation to avoid damage to the work.

Method 7:

1. Method 6 shall be used for curing.

2. Immediately after completion of curing the surface shall be sprayed with a dampproofing agent consisting of an asphalt emulsion. Application shall be in 2 coats. The first coat shall be diluted to 1/2 strength by the addition of water and shall be sprayed on so as to provide a maximum coverage rate of 100 square feet per gallon of dilute solution. The second coat shall consist of an application of the specified material, undiluted, and shall be sprayed on so as to provide a

maximum coverage rate of 100 square feet per gallon. Dampproofing material shall be as specified herein.

3. As soon as the asphalt emulsion, applied as specified herein, has taken an initial set, the entire area thus coated shall be coated with whitewash. Any formula for mixing the whitewash may be used which produces a uniformly coated white surface and which so remains until placing of the backfill. Should the whitewash fail to remain on the surface until the backfill is placed, the CONTRACTOR shall apply additional whitewash.

Method 8: Floor slabs to be covered with resilient flooring shall be coated with an asphaltic membrane curing compound such as Hunt's Process Black, or an approved equal.

3.3 EVAPORATION RETARDANT APPLICATION PROTECTION

A. Spray onto surface of fresh concrete immediately after screeding to react with surface moisture.

B. Reapply after smoothing surface with a bull float to ensure continuous, compacted monomolecular layer until final finishing is completed.

C. After finishing, apply water curing as specified.

3.4 CLEAR HARDENER APPLICATION (SURFACE APPLIED)

A. Before application, thoroughly cure floors to receive hardener for minimum 28 days, keep clean, unpainted, free from membrane curing compounds, and dry with all work above them completed.

B. Do not use curing compounds where floor hardeners are specified. Use water curing only.

C. Apply hardener evenly, using three coats, allowing 24 hours between coats as follows:

1. First Coat: 1/3 strength, second coat 1/2 strength, and third coat 2/3 strength, mix with water.

2. Apply each coat so as to remain wet on surface for 15 minutes.

3. Apply approved hardeners in accordance with manufacturer's instructions.

4. After final coat is completed and dry, remove surplus hardener from surface by scrubbing and mopping with water.

END OF SECTION

SECTION 04 22 02

GLAZED AND PREFACED CONCRETE UNIT MASONRY

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Furnish and install glazed and prefaced concrete unit masonry including the following:

1. Concrete masonry units.

2. Reinforcing steel.

3. Mortar, grout and grouting. Use epoxy-based pointing mortar of the colors selected by the Architect.

4. Bolts, anchors, hardware, metal frames, and other insert items.

B. Masonry Standards Joint Committee (MSJC), the Masonry Society (TMS), American Concrete Institute (ACI) and American Society of Civil Engineers (ASCE).

1. TMS 602/ACI 530.1/ASCE 6 – Specification for Masonry Structures.

2. TMS 402/ACI 530/ASCE 5 – Building Code Requirements for Masonry Structures.

1.3 ACTION SUBMITTALS

A. Mix Design: Submit grout and mortar mix designs. Mix designs shall be signed and sealed by a Civil or Structural Engineer registered in the State of California.

B. Product Data: Submit manufacturer's Product Data for assembly components, materials, and accessories. Submit certificates and data assuring that the proposed materials meet the specified ASTM standards.

C. Samples: Submit Samples for each type of required masonry unit, including reinforcement and accessories.

D. Shop Drawings: Indicate wall reinforcement, splice locations and bending diagrams.

E. Admixtures: Additives and admixtures to mortar and grout shall not be used unless approved by the enforcing agency. Submit product data for any proposed admixture.

1.4 REGULATORY REQUIREMENTS

A. Perform the Work in accordance with CBC, Chapter 21A.

B. Comply with requirements of TMS 602.

1.5 QUALITY ASSURANCE

A. Comply with the requirements of Section 01 4523 - Testing and Inspection.

B. Concrete Masonry Units:

1. Notify the testing laboratory a minimum of 45 days in advance of installing concrete unit masonry, to allow for preconstruction testing of the units.

a. Units will be sampled and tested in accordance with ASTM C140 for compressive strength, absorption and moisture content.

b. Units will be sampled and tested in accordance with ASTM C426 for linear drying shrinkage.

2. The material testing laboratory shall receive concrete masonry unit specimens for testing from masonry unit manufacturer. Number of specimens shall be as indicated in referenced ASTM standard tests. Testing laboratory will perform and send test results to the ARCHITECT and Project Inspector.

C. Portland Cement: Submit certification from the cement manufacturer that the cement proposed for use on the project has been manufactured in accordance with ASTM C150. Certification shall include test results made on cement samples during production.

D. Mortar and Grout Tests: Prior to the beginning of masonry work, mortar and grout will be tested, unless prism tests will be performed as indicated below.

1. Mortar: Shall conform to ASTM C270 Table 2 for Type S mortar.

a. Provide qualifications of mortar as meeting ASTM C270 at the beginning of the job and whenever mix design is changed.

b. Mortars will be evaluated during preconstruction and tested during construction for proportioning or compressive strength in accordance to ASTM C780.

2. Grout: Shall conform to ASTM C476, and will be tested in accordance with ASTM C1019. Compressive strength shall equal or exceed specified compressive strength (f'm) at 28 days, but not less than 2,000 psi.

a. Ready-Mix Grout: Grout manufacturer shall furnish batch ticket information in accordance to ASTM C94.

E. Prism Test: The compressive strength of concrete masonry will be determined by the prism test method prior to the start of construction and during construction.

F. Masonry Core Testing: Core testing will be performed in accordance with CBC, Section 2105A.4.

G. Inspection During Installation: A special inspector will continuously observe the installation of reinforced masonry. The Project Inspector shall be responsible for monitoring the work of the special inspector and testing laboratories to ensure that the testing program is satisfactorily completed.

H. OWNER will be responsible for the costs of original tests and inspection.

1.6 DELIVERY, STORAGE AND HANDLING

A. Store units above grade on level platforms or pallets, in a dry location.

B. Store cementitious materials and aggregates in such a manner as to prevent deterioration or intrusion of foreign matter or moisture.

C. Handle units on pallets or flat bed barrows. Free discharge from conveyor units or transportation in mortar trays is not permitted.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Basis of Design (BOD): Products of the manufacturer named on the drawings were used to establish criteria effecting aesthetics and serviceability standards. Tests, inspection, and acceptance of substitutions will be based comparisons to BOD CMU. Subject to review of action submittals by the Architect for compliance with requirements, products of the following entities may be acceptable:

1. Angelus Block Co., Inc.
2. Orco Block Co.
3. Elliott Block Co.
4. Air Vol Block Co.

B. Glazed and Prefaced Concrete Unit Masonry: Provide a resinous glaze or facing, modular unit of the weight indicated on the drawings, and conforming to ASTM C90, hollow load-bearing concrete unit masonry. Masonry units shall meet the minimum compressive strength requirements of ASTM C90, or as indicated on project drawings, whichever is greater.

1. Concrete masonry unit sizes shall be as indicated on the drawings.

2. Provide open-end units at walls to be fully grouted.

3. Provide closed-end units at walls and at openings where ends will be exposed in finish Work; provide bond beam blocks where horizontal reinforcement is indicated.

4. Provide special shapes and accessory units at locations indicated on Drawings.

5. Provide units in colors as selected by the Architect and degree of gloss as indicated in the drawings.

6. Masonry unit shall have been cured for a minimum of 28 days.

7. Masonry unit shall have maximum liner shrinkage of 0.065 percent from saturated to oven dry.

C. Portland cement: ASTM C150, Type II, from one source.

D. Hydrated Lime: ASTM C207, Type S.

E. Aggregates: ASTM C144 for mortar and ASTM C404 for grout.

F. Mortar: ASTM C270, Type S, conforming to the property specifications of CBC Table 2103A.8 (2).

G. Grout: ASTM C476.

H. Admixture for Grout: Grout Aid, as manufactured by Sika Chemical Corp., or equal.

I. Epoxy Pointing Mortar: ASTM C395, epoxy-resin-based material formulated for use as pointing mortar for glazed or pre-faced masonry units (and approved for such use by manufacturer of units); in color indicated or, if not otherwise indicated, as selected by Architect from manufacturer's colors.

J. Water: Clean, potable, free from substances deleterious to mortar, grout or reinforcement.

K. Reinforcing Steel: Provide and install reinforcing steel in accordance with Section 03 2000 - Concrete Reinforcing.

L. Cleaning Materials: Sure Klean No. 600 detergent by ProSoCo.

M. Miscellaneous Materials: As required to complete the Work.

N. Anchor Bolts: Shall be hex headed bolts conforming to ASTM A307 Grade A with the dimensions of the hex head conforming to ANSI/ASME B18.2.1.

3.1 EXAMINATION

A. Discard units with cracks or other defects not complying with requirements of ASTM C 90.

3.2 CONSTRUCTION

A. Construct per applicable provisions of CBC and TMS 602.

B. Conform to TMS 602 for hot and cold weather masonry construction.

3.3 MORTAR AND GROUT MIXING

A. Mortar: Shall provide a minimum strength of 1,800 psi.

B. Grout: Shall provide a minimum strength of 2,000 psi or as indicated in the drawings, whichever is higher. Grout space requirements for coarse and fine grouts shall be per Table 7 of TMS 602. Add Sika Chemical Corp. Grout Aid per manufacturer’s instructions.

C. Measurements: Measure in calibrated devices that can be checked at any time.

1. Add water for workable consistency.

2. Shovel measurements are not permitted.

D. Mixing: Mix in accordance to TMS 602.

1. Mortar: Mix cementitious materials and aggregates between three and five minutes in a mechanically operated mixer. Mix dry ingredients with a sufficient amount of water to provide a workable mix. Batches of less than one sack of cement, and fractional sack batches are not permitted.

2. Factory Blended Mortar: Mix in accordance with manufacturer’s recommendations.

3. Grout: Add sufficient water for a workable mix that will flow into all voids of the masonry without separation or segregation. Grout slump shall be between 8 and 11 inches.

E. Re-tempering Time Limit: Use mortar within 2 ½ hours after mixing. Discard any mortar that has been mixed longer or that has begun to set. If necessary re-temper within this time limit, by replacing only water lost due to evaporation and by thoroughly remixing.

3.4 INSTALLATION OF MASONRY UNITS

A. Workmanship: Install masonry plumb and true to line with straight level joints of uniform thickness. Comply with TMS 602 tolerances. Maintain masonry clean during and after installation.

1. Lay-out and incorporate embedded hardware items.

2. Assist other trades with built-in items, which require cutting and fitting of masonry.

3. Cut block units with a diamond saw or carborundum wheel. Trowel or chisel cutting is not permitted.

4. Keep cavities clear of droppings and debris. Remove droppings prior to grouting.

B. Reinforcing Steel: Install as indicated on Drawings. Except as otherwise indicated, install reinforcement in accordance with standards of Concrete Reinforcing Steel Institute and to requirements specified in Section 03 2000 - Concrete Reinforcing. Do not splice vertical reinforcement except where indicated on the Drawings.

C. Shoring: Provide temporary shoring for lintels with sufficient strength to carry load without deflecting. Remove temporary shoring not less than 28 days after masonry has been installed.

D. Block Installation: Clean dirt and dust from surfaces before installation. Do not wet masonry units.

1. Foundation preparation: Clean top surface of concrete foundation of dirt, projections and laitance before starting masonry construction. Wet saw cutting of units immediately prior to laying is permitted.

2. Install masonry with mortar to required joint thickness. Install blocks with 3/8-inch mortar bed. Fill head joints solid, install tightly to adjoining units. Provide 3/8-inch joint thickness.

a. Hold racking to a minimum.

b. No toothing is permitted.

c. If it becomes necessary to move a unit after it has been installed, remove the unit, discard the mortar, and install the unit in fresh mortar.

3. Anchor Bolts: Provide 1/2-inch minimum grout space between bolts and masonry.

4. Bond: Unless otherwise indicated, install units in common running bond.

5. Finish Joint Treatment: Unless otherwise indicated, cut both interior and exterior joints flush, and tool slightly concave to a dense, uniform surface.

6. Grouting: Unless noted otherwise on Drawings, completely fill cells with grout.

E. Steel Door Frames:

1. Locate door frames accurately, install plumb, Set frames to floor with powder driven or expansion anchors to floor surface and brace in position before start of masonry installation.

a. Frames are specified to be furnished with adjustable anchors.

b. Fill interior of frames solid with mortar or grout as walls are constructed.

2. Provide temporary wood spreaders from jamb to jamb and from head to floor to ensure that jambs do not bow-in, distort from a straight line, or deflect from superimposed loads during construction.

3.5 GROUTING

A. Prior to grouting all cells shall be cleaned so that all spaces to be filled with grout do not contain mortar projections greater than 1/4 inch, loose mortar or foreign material.

B. Grout materials and water contents shall be controlled to provide adequate fluidity for placement without segregation of the constituents, and shall be mixed thoroughly. Reinforcement shall be properly positioned and solidly embedded in the grout.

C. The grouting of any section of wall shall be completed in one day with no interruptions greater than one hour.

D. Between grout pours, a horizontal control joint shall be formed by stopping all wythes at the same elevation and with the grout stopping at 1 ½ inches below a mortar joint, except at the top of the wall. Where bond beams occur, the grout pour shall be stopped a minimum of ½ inch below the top of the masonry.

3.6 LOW-LIFT GROUTING FOR HOLLOW MASONRY UNITS

A. Grouting shall meet the requirements of CBC Section 2104A.1.3.

B. After mortar joints have set, cells are cleaned of mortar and debris, and reinforcement is installed and inspected, grout cells in 4-foot maximum lifts. Horizontal and vertical reinforcement shall be held in place within permitted tolerances by suitable devices.

C. Grout may be installed by pump, tremie or bucket, using hoppers to avoid spilling on exposed surfaces.

D. All grout shall be consolidated and reconsolidated with a mechanical vibrator after placing so as to completely fill all voids and to consolidate the grout. Grouted walls shall be solid and without voids.

3.7 HIGH-LIFT GROUTING OPTION FOR HOLLOW MASONRY UNITS

A. Grouting shall meet the requirements of CBC Section 2104A.1.3 and DSA IR 21-2.

B. High-lift grouting shall apply only to cell sizes available with 8 inch and wider block units. This method is subject to approval of the Division of the State Architect (DSA).

C. Provide bond beam units, inverted for start course, and omit alternate blocks or remove entire face shell of every other unit to allow access to all cells on bottom course for cleanouts.

D. Plug each cleanout by setting a face shell in mortar into opening and securely bracing it in place to prevent displacement. If masonry is not exposed in finish Work, cleanouts may be formed.

E. Grouting: Grouting shall be done in a continuous pour in lifts not exceeding 5-foot in height. The grouting of any section of a wall between control barriers shall be completed in one day, with no interruptions greater than one hour.

F. Consolidating: Grout shall be consolidated by mechanical vibration only, and shall be reconsolidated after excess moisture has been absorbed, but before plasticity is lost. Vibrating of reinforcing steel is not permitted.

3.8 CURING

A. Remove efflorescence, stains, debris, excess grout, and foreign matter.

B. During curing, or for any other purpose, do not saturate masonry with water.

3.9 PARGE COAT

A. Apply parge coat to the earth side of surfaces that are to receive waterproofing.

B. A Portland cement and sand mix (1:3.5 by volume) or Type S mortar may be used for the parge coat.

C. Parging should be applied to damp (not saturated) concrete masonry in two 1/4 inch thick layers. The first coat should be roughened when partially set, hardened for 24 hours, and then moistened before second coat is applied. The second coat should be trowelled to a smooth, dense surface.

D. The parge coat should be beveled at the top to form a wash, and thickened at the bottom to form a cove between the base of the wall and the top of footing.

3.10 CLEANING

A. At completion of masonry Work, remove misplaced mortar, grout or other foreign substances, and clean surfaces which will be exposed in finish Work with specified cleaner, or with clean water and stiff fiber brushes.

B. Remove rubbish, debris, and waste materials and legally dispose of off the Project site.

3.11 PROTECTION

A. Protect the Work of this section until Substantial Completion.

END OF SECTION

SECTION 04 22 18

PRECAST CONCRETE SIMULATED STONE CAPS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Furnish and install precast concrete simulated stone capsas indicated on the drawings and specified.

1.3 ACTION SUBMITTALS

A. Product Data: Submit the manufacturer’s printed narratives and specifications. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.

B. Shop Drawings: Submit dimensioned drawings. Show fabrication and installation details for cast stone caps and sills. Include dimensions, details of reinforcement and anchorages if any, and indication of finished faces.

C. Samples for Initial Selection: Submit printed graphics or physical samples of stone caps and sills.

D. Full-Size Samples: Submit For each element color, texture, and shape of stone elements.

1. Make available for Architect's review at Project site or at manufacturing plant, if acceptable to Architect.

2. Make Samples from materials to be used for caps and sills used on Project immediately before beginning production of caps and sills for Project.

3. Approved Samples may be installed in the Work.

PART 2 - PRODUCTS

2.1 PRECAST CONCRETE SIMULATED STONE CAPS

A. Subject to review of action submittals for compliance with specified requirements, precast elements shall be the products of one of the following (or equal):

1. Pacific Stone Design Inc.
2. Ventura Cast Tone Inc.
3. Sandstone Designs Inc.
4. Caststone Designs Inc.
5. Stone Magic
6. California Cast Stone
7. Architectural Cast Stone

B. Precast elements shall be of customized dimensions and profiles. Units shall simulate natural quarried stone and replicate the texture of historical designs expressed classical cast stone architectural products.

C. General: Comply with ASTM C 1364.

D. Color Pigment: ASTM C 979, synthetic mineral-oxide pigments or colored water-reducing admixtures; color stable, free of carbon black, nonfading, and resistant to lime and other alkalis.

E. Admixtures: Use only admixtures specified or approved in writing by Architect.

1. Do not use admixtures that contain more than 0.1 percent water-soluble chloride ions by mass of cementitious materials. Do not use admixtures containing calcium chloride.

2. Use only admixtures that are certified by manufacturer to be compatible with cement and other admixtures used.

F. Reinforcement: Deformed steel bars complying with ASTM A 615/A 615M, Grade 60. Use galvanized or epoxy-coated reinforcement when covered with less than 1-1/2 inches of cast stone material.

G. Embedded Anchors and Other Inserts: Fabricated from stainless steel complying with ASTM A 240, ASTM A 276, or ASTM A 666, Type 304.

H. Stone Element Colors and Textures: As selected by Architect from manufacturer's full range of products.

1. As selected by the Architect to resemble natural stone as closely as practicable.

PART 3 - EXECUTION

3.1 SETTING STONE CAPS WITH SEALANT-FILLED JOINTS

A. Set stone caps and sills as indicated on Drawings and as recommended by the product manufacturer. Set caps and sills accurately in locations indicated with edges and faces aligned according to established relationships and indicated tolerances.

1. Install anchors, supports, fasteners, and other attachments indicated or necessary to secure caps and sills in place.

2. Shim and adjust anchors, supports, and accessories to set cast stone in locations indicated with uniform joints.

B. Fill anchor holes with sealant.

1. Where dowel holes occur at pressure-relieving joints, provide compressible material at ends of dowels.

C. Set cast stone supported on clip or continuous angles on resilient setting shims. Use material of thickness required to maintain uniform joint widths. Hold shims back from face of cast stone a distance at least equal to width of joint.

D. Keep joints free of mortar and other rigid materials. Remove temporary shims and spacers from joints after anchors and supports are secured in place and cast stone caps

and sills are anchored. Do not begin sealant installation until temporary shims and spacers are removed.

E. Prime cast stone surfaces to receive sealant and install compressible backer rod in joints before applying sealant unless otherwise indicated.

F. Prepare and apply sealant of type and at locations indicated to comply with the requirements of the product manufacturer.

3.2 ADJUSTING AND CLEANING

A. Remove and replace stained and otherwise damaged caps and sills and caps and sills not matching approved Samples. Cast stone may be repaired if methods and results are approved by Architect.

B. Replace stone caps and sills in a manner that results in cast stone matching approved Samples, complying with other requirements, and showing no evidence of replacement.

END OF SECTION

SECTION 04 23 00

REINFORCED HOLLOW UNIT MASONRY

PART 1 - GENERAL

1.1 THE REQUIREMENT

A. The CONTRACTOR shall furnish all tools, equipment, materials, and supplies and shall perform all labor required to complete the reinforced hollow unit masonry work as indicated on the Drawings and specified herein.

B. The CONTRACTOR alone shall be fully responsible for the design, strength, safety and adequacy of all shoring, bracing and all methods of construction, and for the strength, consistency, finish and general quality of masonry.

1.2 REFERENCE SPECIFICATIONS, CODES AND STANDARDS

A. Comply with the applicable reference specifications as specified in the GENERAL REQUIREMENTS.

B. Comply with the current provisions of the following Codes and Standards:

1. Commercial Standards:

MSJC Code	Masonry Standards Joint Committee's Building Code Requirements and Specifications for Masonry Structures
ASTM C 33	Standard Specification for Concrete Aggregates
ASTM C 67	Standard Test Methods for Sampling and Testing Brick and Structural Clay Tile
ASTM C 90	Standard Specification for Loadbearing Concrete Masonry Units
ASTM C 140	Standard Test Methods for Sampling and Testing Concrete Masonry Units and Related Units
ASTM C 144	Standard Specification for Aggregate for Masonry Mortar
ASTM C 150	Standard Specification for Portland Cement
ASTM C 207	Standard Specification for Hydrated Lime for Masonry Purposes
ASTM C 331	Standard Specification for Lightweight Aggregates for Concrete Masonry Units
ASTM C 404	Standard Specification for Aggregates for Masonry Grout
ASTM C 476	Standard Specification for Grout for Masonry
ASTM C 652	Specification for Hollow Brick (Hollow Masonry Unit Made from Clay or Shale)

ASTM C 744 Standard Specification for Prefaced Concrete and Calcium Silicate Masonry Units

ASTM C 1314 Standard Test Method for Compressive Strength of Masonry Prisms

1.3 CONTRACTOR SUBMITTALS

A. Submittals shall be made in accordance with the GENERAL REQUIREMENTS.

B. The following submittals and specific information shall be provided.

1. Manufacturer's Literature: Submit information illustrating the horizontal joint reinforcement and preformed control joint materials proposed for use.

2. Sample Panel: Lay up a sample panel for each type of masonry at the site to show the approved bond and method of finishing joints. Sample panels shall be at least 4-feet high and at least 4-feet long, and shall remain intact after approval until acceptance of the permanent masonry work and then shall be removed by the CONTRACTOR. The accepted sample panels shall serve as a basis of color, texture, and workmanship for acceptance of the permanent construction.

3. Bar Reinforcement Submittal shall include placing plans, wall elevations, bending diagrams, cutting lists, and other information so as to completely and unambiguously define and establish the location, spacing, size, length, bending, shape, splicing, and all other pertinent information as required. Drawings shall show grades of reinforcing steel. Wall reinforcing shall be detailed on wall elevations, each Shop Drawing shall show splice length for every size and type of bar used.

4. Manufacturer's Certificate: Provide manufacturer's certificate(s) for the masonry units specified herein, before delivering concrete block units to the jobsite.

1.4 QUALITY ASSURANCE

A. Tolerances for concrete block masonry:

1. Walls shall be plumb and straight and in level courses. Walls that are not plumb and straight shall be removed and reconstructed. The maximum permissible variation from plumb of the wall and corner, or of a line of joints in the wall shall be 1/16-inch per foot of height, 1/4" in 10'; 3/8" in any story or 20' maximum; or 1/2" in 40'.

2. Maximum variation from level or indicated elevations: 1/4" in any bay or 20'; 1/2" in 40'.

3. The maximum permissible variation from a horizontal line along the base of the wall or for lines of horizontal joints shall be 1/16-inch per block, 1/4-inch per 50-feet of wall with proportionately greater tolerance for longer walls up to 2-inch in the total length of wall.

B. Interior surfaces shall be maintained in the plane described above and the dimension tolerances of the units shall be taken up on exterior surfaces.

C. Mockups: Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for materials and execution.

1. Build mockups for each type of exposed masonry construction in sizes approximately 48 inches long by 36 inches high by full thickness of the wall.

    a. Include a sealant-filled joint at least 16 inches long in each mockup.

2. Protect accepted mockups form the elements with weather-resistant membrane.

3. Approval of mockup is for color, texture, and blending of masonry units, relationship of mortar and sealant colors to masonry unit colors, tooling of joints, and aesthetic qualities of workmanship.

    a. Approval of mockups is also for other material and construction qualities specifically approved by Architect in writing.

    b. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.

4. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.5 HANDLING

A. Ship, handle and store concrete blocks to avoid chipping, cracking or damaging them. Concrete block with spalled corners may be used provided the damaged corners are concealed in the finished work. Do not use damaged concrete block at exposed locations.

B. Store concrete blocks in a dry, well ventilated space, under cover and off the ground, to prevent their getting wet.

PART 2 - PRODUCTS

2.1 MASONRY UNITS

A General:

1. At the time of delivery to the work site the units shall conform to the physical requirements specified herein. Units shall be of size shown on Drawings. Provide or cut special shapes for corners, jambs, lintels, and other areas shown or required. Special units shall match color and texture of standard units. Where masonry units are placed so that the end of a unit is exposed, such as at a corner or intersection, the end of that block shall have the surface to match the color or texture of the sides of the other units.

2 All units shall match color and texture of standard unit samples. Units shall be sound, dry, clean, free of cracks, and shall have reached the specified moisture content and compressive strength prior to placing in the structure.

3 Where units are to be used in exposed wall construction, the face or faces that are to be exposed shall be free of chips, cracks, discoloration, or other defects when viewed from 10 feet, except that not more than 5 percent of the units may have slight cracks or small chips not larger than 1 inch in any dimension. Vertical cells to be grouted in all units covered under this Specification shall have vertical alignment sufficient to maintain a clear, unobstructed continuous vertical cell measuring not less than 2-inch by 3-inch.

4 The color of the units shall be uniformly grey and the surface shall be fine-textured on all exposed surfaces.

C. Hollow Concrete Masonry Units (CMU):

1 Hollow concrete masonry units shall be normal weight, ASTM C90, Type I, in accordance with the latest City of Los Angeles Building Code.

2 The manufacturer shall certify that the masonry units meet all requirements of the latest City of Los Angeles Building Code, including the moisture content and linear shrinkage requirements for intermediate conditions.

2.2 CEMENT

A. Portland Cement: All cement to be used or furnished shall be ASTM C150 Type II low alkali portland cement conforming to the latest City of Los Angeles Building Code.

B. Masonry Cement: The use of masonry cement is not permitted.

C. Mortar Cement: All mortar cement to be used or furnished shall conform to the latest City of Los Angeles Building Code.

D. The CONTRACTOR shall furnish a Certificate of Compliance signed by the manufacturer identifying the cement and stating that the cement complies with these requirements. Supporting test data shall be furnished when requested by the ENGINEER or the INSPECTOR.

E. Cement shall be delivered in original unopened bags that shall be plainly marked with the manufacturer=s name or brand, cement type, weight, and ASTM Designation.

F. All cement delivered to the job site shall be stored in a manner to protect against contamination or moisture. Should any cement become contaminated or otherwise become unsuitable for use, the INSPECTOR may reject it and require that it be immediately removed from the site.

G. Unidentifiable bags shall be immediately removed from the site and shall not be incorporated into the work.

H. All cement used on this project for any individual structure shall be of the same brand and type unless otherwise accepted in writing by the ENGINEER. Cement shall be stored in such a manner as to permit ready access for the purpose of inspection and sampling, and suitably protected against contamination or moisture. Should any cement delivered show evidence of contamination or be otherwise unsuitable, the INSPECTOR may reject it and require that it be removed from the site.

2.3 LIME

A Hydrated lime for masonry purposes shall conform to the requirements of the latest City of Los Angeles Building Code.

B Lime putty shall be made from Type S hydrated lime and shall conform to ASTM C207. Putty made from Type S shall have a plasticity figure of not less than 200 when tested commencing within 30 minutes after mixing with water.

D The CONTRACTOR shall furnish Manufacturer=s Certification identifying the lime and stating that the lime complies with these requirements.

2.4 AGGREGATES

A Hollow Concrete Units: Aggregates for hollow concrete units shall conform to ASTM C33 and ASTM C331 or shall be blended from aggregates conforming to these Specifications. Use the same type or types of aggregate throughout the project unless otherwise indicated or written permission is received from the ENGINEER.

B Mortar: Aggregate for mortar shall conform to ASTM C144.

C Grout: Aggregate for grout shall conform to ASTM C404.

2.5 WATER

A Water shall not contain deleterious substances. Water shall not contain an amount of impurities that will cause a change in the time of setting of portland cement of more than 25 percent nor a reduction in relative mortar strength at 7 and 28 days of more than 10 percent compared to results obtained with distilled water.

B Water shall not contain more than 1,000 ppm of chlorides calculated as Cl, nor more than 1,000 ppm of sulfates calculated as SO4.

2.6 MORTAR

A Mortar shall conform to the latest City of Los Angeles Building Code.

B Mortar shall be “Type M” and consist of a mixture of cementitious materials and aggregate to which sufficient water and approved additives, if any, have been added to achieve a workable, plastic consistency.

C Mortar shall be proportioned in accordance with the latest City of Los Angeles Building Code. Mortar shall attain a minimum compressive strength of 2,500 psi in 28 days.

D. Mix mortar by placing one-half of water and aggregate in a power operated mixer, then add cement, lime, admixture (when approved), and the remainder of aggregate and water. Mix mortar mechanically for not less than three minutes after all ingredients have been placed in the mixer.

E. All mortar incorporated in this project shall be tested in accordance with the latest City of Los Angeles Building Code.

2.7 MORTAR ADMIXTURE

A Additives and admixtures to mortar shall not be used unless approved in writing by the ENGINEER.

B When approved for use, mortar admixture shall be Hydrophobe 31, manufactured by W.R. Grace and Company; or an approved equal.

C Quantity of admixture per mortar batch shall be in accordance with manufacturer's recommendations and as approved by the ENGINEER.

D. Coloring pigments are to be only in quantities approved by the ENGINEER. Color shall be as selected by the ENGINEER.

2.8 GROUT

A Grout shall conform to the latest City of Los Angeles Building Code.

B Grout shall consist of a mixture of cementitious materials and aggregate to which water has been added such that the mixture will flow without segregation of its constituents. Use pea gravel in grout spaces where least cell or wythe dimension is 4-inches or more.

C Grout shall have a minimum compressive strength of 2,000 pounds per square inch.

D Water content of grout shall be adjusted to provide proper workability and to enable the proposed placement under existing field conditions, without segregation. Slump to range between 8 and 10 inches. Field adjustment of water content shall be approved by the INSPECTOR.

E Grout mixture shall be proportioned in accordance with the latest City of Los Angeles Building Code and approved by the ENGINEER.

F. Mix grout by placing one-half of water and aggregate in a power operated mixer, then add cement, lime, admixture, and the remainder of aggregate and water. Mix grout mechanically for not less than three minutes after all ingredients have been placed in the mixer.

2.9 GROUT ADMIXTURE

A Grout admixture shall be Sika Grout Aid, Type II, manufactured by Sika Chemical Corporation; Grout Aid GA-II, manufactured by concrete Emulsions; or an approved equal.

B Antifreeze liquid, chloride salts or other such substances shall not be used in mortar or grout.

C Air-entraining substances shall not be used in grout unless tests are conducted to determine compliance with the latest City of Los Angeles Building Code.

D For coloring grout, only pure mineral oxide, carbon black or synthetic colors may be used as approved by the ENGINEER. Carbon black shall be limited to a maximum of 3 percent of the weight of the cement.

2.10 JOINT REINFORCEMENT

A Prefabricated joint reinforcement for masonry wall shall have at least one cross wire of at least No. 9 gage steel for each 2 square feet of wall area. The vertical spacing of the joint reinforcement shall not exceed 16 inches. The longitudinal wires shall be thoroughly embedded in the bed joint mortar. The joint reinforcement shall engage all wythes.

B Wire joint reinforcement used as principal reinforcement in hollow unit construction shall be continuous between supports unless splices are made by lapping in accordance with the latest City of Los Angeles Building Code.

C Side wires shall be deformed and shall conform to the latest City of Los Angeles Building Code.

2.11 PREFORMED CONTROL JOINT

A. Joint material shall be a solid rubber extrusion such as regular Rapid Control Joint, manufactured by Dur-O-Wall National Company, Cedar Rapids, IA; Sonneborn Control Joint, manufactured by Sonneborn-Contech Company, Oakland, CA; or an approved equal.

2.12 CLEANING AGENT:

A. Concrete block cleaner shall be "Sure Klean No. 600 Detergent" by PROSOCO, Inc., "Doex Chemical Cleaner" by National Chemsearch Corp., or an approved equal.

PART 3 - EXECUTION

3.1 GENERAL

A. Masonry shall be constructed according to the provisions of this section.

B. Masonry materials shall be stored so that at the time of use the materials are clean and structurally suitable for the intended use. Materials shall be stored in a manner such that deterioration or intrusion of foreign materials is prevented and that the material will be capable of meeting applicable requirements at the time of mixing.

C. All metal reinforcement shall be free from loose rust and other coatings that would inhibit reinforcing bond, unless otherwise indicated.

D. Concrete masonry units shall not be wetted unless otherwise approved in writing by the ENGINEER.

E. Where no bond pattern is shown, the wall shall be laid up in straight uniform course with regular running bond with alternate header joints in vertical alignment.

F. Mortar or grout mixed at the jobsite shall be mixed in a mechanical mixer. Hand mixing of small amounts of mortar is permitted with approval of the INSPECTOR. Dry mixes for mortar and grout which are blended in the factory and mixed at the jobsite shall be mixed in mechanical mixers until workable, but not to exceed 10 minutes.

G. Where stack bond is indicated on the Plans, approved metal ties shall be provided horizontally at 24 inches on centers (maximum)

H. Mortar may not be retempered. Mortar or grout which has hardened or stiffened due to hydration of the cement shall not be used.

I. In no case shall mortar be used more than two and one-half hours after water has been added to the dry ingredients at the job site.

J. In no case shall grout be used more than one and one-half hours after water has been added to the dry ingredients at the job site.

K. All concrete masonry block shall be laid in running bond.

L. All concrete masonry block shall be reinforced and anchored in the manner indicated on the contract drawings and as herein specified.

M. Hollow unit masonry shall cure for a minimum of 24 hours prior to grouting.

N. Saw cut concrete block neatly and accurately as necessary to provide openings for the work of other trades, with diamond or abrasive saws to produce straight, sharp edges without spalling or other defects, and of sizes required to maintain uniform joint widths.

O. If it is necessary to move a concrete block after it has been once set in place, remove the unit, clean it and set it in fresh mortar.

3.2 WEATHER CONDITIONS

A Protect the tops of walls at all times. Cover the tops of walls with waterproof paper when rain is imminent and work is discontinued.

B Protect masonry construction from loss of moisture during the curing period when ambient air temperature of 90 degrees F (37 degrees C) or greater exists and when relative humidity is less than 50 percent. Use light fog spray nozzles to cure the mortar when these conditions exist. Provide a demonstration of the fog spray nozzles prior to starting the work.

3.3 LAYING REINFORCED MASONRY UNITS

A General:

1. Masonry construction shall conform to the latest City of Los Angeles Building Code as supplemented by these Specifications.

2. All masonry shall be laid to a line.

3. All exposed edges of masonry shall be free of broken corners, chips edges, chipped faces, discoloration, or other defects.

B. Wall Units:

1. Masonry units shall be cut or clipped as necessary to provide openings and to accommodate embedded items.

2. Wall anchors shall be securely embedded in mortar and fully grouted.

3. Glazed Concrete Masonry Units: Single-faced units may be installed through the wall where walls or partitions are indicated to have glazed masonry unit finish on one side only. The facing shall be used for dimensional and plane reference in the installation. Where glazed masonry unit finish is indicated on both sides of a wall or partition, coved bases shall be of two-unit construction or two-faced units installed through the wall. Except as otherwise specified, coved bases shall be flush with finished surfaces above.

4. Door and window frames shall be maintained plumb and true.

5. Masonry shall be built tightly against interior door frames.

6. Care shall be taken at corners and jambs to maintain uniformity of appearance and to insure that only whole, undamaged units are used.

7. All masonry walls shall be laid in running bond.

8. Stack bond shall not be permitted unless indicated on the contract drawings.

9. In running bond, care shall be taken to lay out the work so that vertical joints in alternate courses lie in the same vertical lines midway between the vertical joints in adjacent courses to provide a regular and uniform joint pattern.

10. Lintels shall be provided over all openings of width greater than the length of the masonry unit.

11. Lintels shall be of the type and size indicated on the contract drawings or required for the span and approved by the ENGINEER.

12. Lintels shall bear on grout filled cells of hollow units.

13. Bullnose units shall be provided at all corners, around recessed door openings and where otherwise indicated on the drawings.

14. Square corners shall be provided at flush door and window openings.

15. Toothing of masonry units is not permitted

16. A 1" wide isolation joint shall be provided at all locations where masonry walls abut concrete walls or columns.

17. Isolation joints shall be filled with approved compressible joint filler and caulked on each face.

18. The minimum embedment depth of anchor bolts shall be in accordance with the latest City of Los Angeles Building Code unless otherwise indicated on the contract drawings.

3.4 BUILT-IN ITEMS

A. Door frames; window frames; HVAC connectors, registers, vents and sleeves; flashing; conduit and pipe sleeves; anchors; ties; bolts; hangers; or any other item to be placed in or through the wall shall be accurately set and securely held in the masonry work as indicated on the contract drawings or as accepted by the INSPECTOR.

B. Core drilling and/or saw curing of completed masonry walls is prohibited unless each location is approved in writing by the ENGINEER prior to cutting.

C. Core drilling and/or saw cutting required by changes to the contract shall be approved in writing by the ENGINEER prior to commencing the work.

D. All items passing through masonry walls shall be sleeved. Sleeves shall be accurately set and securely held in a manner acceptable to the INSPECTOR.

E. Sleeves provided for piping passing through masonry walls shall be placed no closer than three pipe diameters apart center to center.

3.5 EMBEDDED CONDUITS

A. Electrical or instrumentation conduits shall not be placed in any cell containing reinforcement unless approved in writing by the ENGINEER.

B. Placing of water piping in any cell containing reinforcement is prohibited.

3.6 MORTAR PREPARATION

A. The method of measurement of all mortar ingredients shall be accurate and shall insure definite and uniform proportions. The method of field measurement of ingredients shall be as approved by the INSPECTOR.

B. Mortar shall be machine mixed for a minimum of five (5) minutes and shall be used within 90 minutes of mixing.

C. No remixing of mortar more than 90 minutes old with additional water, cement, or other materials is permitted.

D. Retempering of mortar is not permitted.

3.7 MORTAR JOINTS

A. The initial bed joint thickness shall not be less than 1/4" or more than 1".

B. Subsequent bed joints shall not be less than 1/4" or more than 5/8" thick.

C. All head and bed joints shall be filled solidly with mortar for a distance in from the face of the unit not less than the thickness of the shell.

D. Tooling of joints shall be regulated so that the mortar for each wall space is of uniform size and appearance.

E. Head joints of open-end units with beveled ends that are to be fully grouted need not be mortared. The beveled ends shall form a grout key which permits grout within 5/8" of the face of the Unit. The units shall be tightly butted to prevent leakage of grout.

F. All solid masonry units and hollow units with horizontal cells shall be laid on a full bed of mortar.

G. All collar joints in multi-wythe masonry shall be completely filled.

H. All exposed mortar joints, except joints which are to be raked, shall be tooled to a smooth uniform surface and finished free of voids using a rounded tool.

I. Mortar joints specified or indicated to be caulked shall be raked to a depth of 2".

3.8 REINFORCING

A. General:

1. All concrete block masonry shall be bonded and reinforced by continuous joint reinforcement spaced not more than 16 inches apart vertically. The joint reinforcement shall have one longitudinal rod at each face shell of the masonry unit.

2. All walls shall be reinforced with both vertical and horizontal reinforcement.

3. Reinforcement shall be placed as indicated on the Drawings and per approved placement drawings.

4. All reinforcing bars, except joint reinforcement, shall be completely embedded in mortar or grout and have a minimum cover, including the masonry unit, of at least 2". The minimum grout space between reinforcing steel and masonry shall be ½".

5. Unless noted otherwise on Drawings, all splices of reinforcement and wall dowels shall be lapped a minimum of 48 bar diameters. Separate spliced bars by one bar diameter or wire them together.

6. All wall dowels shall be placed and securely fastened prior to placement of concrete for the foundation.

7. The size, number, and location of the wall dowels shall match the vertical wall reinforcing as shown on the contract drawings.

8. All dowels for wall reinforcement shall be cast into in the foundation slab. Drilling and grouting of wall dowels shall not be permitted unless approved in writing by the ENGINEER.

9. Any variation from the reinforcement shown on the contract drawings shall be approved in writing by the ENGINEER prior to commencement of work.

10. When a dowel does not line up with a vertical core, do not slope more than one horizontal in six vertical. Grout dowels in a core in vertical alignment, even though it is a cell adjacent to the vertical wall reinforcing.

B. JOINT REINFORCEMENT

1. Sections of joint reinforcement shall have ends lapped a minimum of 8" and wired together at cross wires.

2. Joint reinforcement shall be lapped full width and wired together at corners and intersections, or prefabricated corners and tees shall be used.

3. Widths of joint reinforcement (side rod to side rod) shall be approximately 2 inches less than the nominal overall thickness of the wall in which it is placed. All joint reinforcement, when placed, shall be fully embedded in mortar.

4. Except where bond beams are specified or otherwise indicated on the contract drawings, the top three courses of all masonry walls, including backup, shall have continuous joint reinforcement placed in each joint (8 inches center to center).

5. Joint reinforcement shall be terminated at expansion joints and control joints.

6. Openings in all masonry walls shall have joint reinforcement placed in the two courses immediately above lintels.

C. WALL REINFORCEMENT

1. All walls shall be reinforced with both vertical and horizontal reinforcement.

2. Vertical wall reinforcement shall be provided continuously from support to support at each corner, at each side of any opening, and at the ends of walls.

3. Horizontal wall reinforcement shall be provided at the bottom and top of wall openings and shall extend not less that 24 inches or 48 bar diameters (whichever is greater) past the opening.

4. Horizontal reinforcement shall be provided continuously at structurally connected roof and floor levels, at the tops of walls, at the bottom of walls or in the top of foundations when doweled in walls, and at a maximum spacing of 4 feet, unless otherwise indicated on the contract drawings.

5. Reinforcement shall be of the size and number indicated on the contract drawings.

6. Reinforcement shall be secured against displacement prior to grouting by wire positioners or other approved devices at intervals not to exceed 200 bar diameters.

7. Approved dovetail anchors shall be used at the joint between abutting masonry walls and concrete columns or walls. Dovetail anchors shall be 16 inches long and be spaced no more than 16 inches on center the height of the wall.

8. Dovetail anchors shall also be placed in each bond beam and in the courses above and below the bond beam.

D. COLUMN AND PILASTER REINFORCEMENT

1. The minimum spacing of column ties shall be 4 inches on center for the full column height, unless otherwise indicated on the contract drawings.

2. Column ties shall terminate with a minimum 135 degree bend and with a six-bar diameter extension, but not less than 4 inch extension that engages the longitudinal column reinforcement and projects into the interior of the column.

3.8 GROUTING

A. Proportioning of grout shall be in accordance with the latest City of Los Angeles Building Code.

B. General:

1. Grout masonry shall be constructed in such a manner that all elements of the masonry act together as a structural element.

2. Prior to grouting, the grout space shall be clean so that all spaces to be filled with grout do not contain mortar projections greater than 2 inch, mortar droppings, or other foreign material. Keep vertical cells free of mortar droppings and in vertical alignment to maintain continuous, unobstructed cells not less than 4" x 4" when coarse grout is used, and 2" x 3" for all other conditions.

3. Grout shall be placed so that all spaces designated to be grouted shall be filled with grout and the grout is confined to those specified spaces.

4. Grout materials and water content shall be controlled to provide fluidity for placement without segregation of the materials and shall be mixed thoroughly.

5. The grouting of any section of wall shall be completed in one day with no interruptions greater than one hour.

6. Between group pours, a horizontal construction joint shall be formed by stopping at the same elevation and with the grout stopping a minimum of 1-1/2 inches below a mortar joint, except at the top of the wall. Where bond beams occur, the grout pour shall be stopped a minimum of 2 inch below the top of the masonry.

7. Cleanouts shall be provided for all grout pours over five feet in height. There shall be no exceptions.

8. Cleanouts shall be provided in the bottom course at every vertical bar but shall not be spaced more than 32 inches on center for solidly grouted masonry.

9. Cleanouts shall be sealed and approved by the INSPECTOR after inspection and before grouting.

10. Units may be laid to the full height of the grout pour and grout shall be placed in a continuous pour in grout lifts not exceeding 4 feet.

11. Any placement of grout in lifts exceeding 4 feet must be approved in writing by the ENGINEER.

12. All cells and spaces containing reinforcement shall be filled with grout.

13. Walls which are to be solid grouted shall have vertical grout barriers spaced not more than 30 feet apart extending the full height of the wall.

14. Grouting of beams over openings shall be done in one continuous operation.

15. All bolts, anchors, etc. inserted in the wall shall be solidly grouted in place, so that there is a minimum of 1" of grout between the bolts and the side of the concrete block masonry cell wall.

16. Spaces around metal door frames, windows, and other build-in items shall be filled solidly with grout.

17. Grout shall not be handled nor pumped utilizing aluminum equipment.

18 Grout shall be consolidated at time of pouring by use of a vibrator. Puddling is not permitted.

C. Low-lift Grouting Requirements:

1. Unless otherwise accepted by the ENGINEER prior to the start of the masonry work, all grouting shall be low-lift grouting.

2. When grouting is stopped for 1 hour or longer, horizontal construction joints shall be formed by stopping the pour of grout 2-inch below the top of the uppermost unit. Horizontal steel shall be fully embedded by grout in an uninterrupted pour.

3. Grout pour shall be limited to a maximum height of 4-feet. The wall shall not be constructed more than one course above the top of the grout pour prior to placing the grout.

4. The grout shall be thoroughly consolidated with an internal "pencil" type vibrator to consolidate and reduce the amount of air voids. After waiting sufficient time to permit the grout to become plastic, but before it has taken any set, the grout shall be reconsolidated. The waiting period will vary depending upon weather conditions and block absorption rates, but under "normal" weather conditions with average masonry units, the waiting period should be between 30 to 60 minutes.

D. High-Lift Grouting Requirements:

1. Permission to high-lift grout shall be at the discretion of the ENGINEER and shall be approved by the ENGINEER in writing prior to commencement of construction. The CONTRACTOR is responsible to pay for all necessary extra inspection costs required by the latest City of Los Angeles Building Code.

2. For walls that are grouted solid, the first course shall be an inverted bond beam unit to allow for cleaning.

3. Approved grout pours shall be limited to 12 foot heights with lifts not exceeding 4 feet.

4. Each lift of grout shall be consolidated with an internal vibrator. Puddling is not permitted.

3.10 JOINTS AND BONDING

A. Clean concrete bearing surfaces and remove all laitance by steel brushing or sandblasting to expose the coarse aggregates before laying the first course of concrete block masonry.

B. Lay concrete block masonry in straight and uniform courses in a running bond pattern. Lay the starting joint on concrete bearing surfaces with full mortar coverage, except that area where grout occurs shall be free from mortar so that grout will contact the bearing surface.

C. Mortar joints shall be straight, clean and of a uniform width (approximately 3/8"). Strike joints flush where concrete block masonry will have an elastomeric coating applied on it; tool all other joints with a rounded jointing tool to produce concave joints well bonded to the block.

D. Tool joints with a rounded bar when the mortar has partially set but still sufficiently plastic to bond. Rake out joints which are not tight at the time of tooling, point and then retool.

E. Horizontal joints shall have full mortar coverage on face shells.

F. Butter head joints well for the full width of the face shell and shove these joints tightly so that the mortar bonds well to both concrete block.

G. Provide vertical contraction joints at a spacing not to exceed 30 feet on center in all block masonry walls.

3.11 CLEANING

A. Thoroughly clean all surfaces or excess mortar, grout spillage, dirt, and other foreign substances immediately upon their discovery.

B. After completion of construction, all wall surfaces shall be cleaned using a stone and sealed unless the walls are to be painted. Clean exposed concrete block surfaces with one of the specified cleaners used in strict accordance with the manufacturer's printed instructions. Take all necessary precautions to avoid staining the concrete block and adjacent surfaces. Cover sills and top course of unfinished work with waterproof coverings and tie securely in place to prevent its accidental displacement. Prepare walls for sealing and painting in accordance with Section [09905] “Architectural Paint Finishes”.

C. Where necessary to maintain a consistent finish, damaged or discolored face shells shall be replaced after grout has been placed and cured and before cleaning. Face shell replacement shall be done under inspection and approval of the INSPECTOR.

3.12 PROTECTION

A. At the end of each day's work, tops of walls shall be covered with building paper or by other means that will protect the walls from becoming excessively wet.

B. Dampen (but don't saturate) the surface of the concrete block masonry with a light fog spray when the atmosphere is excessively dry and keep it damp for approximately three days to permit the mortar to thoroughly cure.

3.13 TEMPORARY BRACING

A. Provide all shores and bracing required for this work. Construct shoring and bracing to required shapes and sizes, capable of supporting and sustaining the loads to which they will be subjected without failure or deflection. Leave shores and bracing in place until concrete block masonry can safely carry all required live and dead loads.

B. Brace concrete block masonry walls adequately to withstand all forces they will be subjected to during construction. Walls are not designed to be self-supporting for lateral loads, including wind, until attached to floor and roof elements.

3.14 TESTING AND INSPECTION

A. Inspect adjacent construction and make sure that all conditions detrimental to the proper and timely execution of this work have been corrected before proceeding.

B. Shear Walls and Bearing Walls: Inspection required during preparation of masonry wall prisms, sampling and placing of all masonry units, placement of reinforcement, inspection of grout space, immediately prior to closing of cleanouts, and during all grouting operations.

C. The INSPECTOR will gather masonry unit samples for testing and make all mortar, grout, and prism samples for testing. The CONTRACTOR shall provide assistance as required in gathering materials and making, protecting and transporting samples.

D. All sampling and testing will be as authorized by the INSPECTOR.

E. All masonry units will be tested in accordance with ASTM C140 (Sampling and Testing Concrete Masonry Units) from samples collected from units delivered to the jobsite.

F. Reinforcement will be sampled and tested by the INSPECTOR in accordance with the latest City of Los Angeles Building Code.

G. Joint reinforcement will be sampled and tested by the Inspector in accordance with the latest City of Los Angeles Building Code.

H. All brick delivered to the jobsite will be sampled and tested by the INSPECTOR in accordance with ASTM C67 (Sampling and Testing Brick).

I. Mortar samples will be prepared by the INSPECTOR and tested in accordance with the latest City of Los Angeles Building Code. Each grout test specimen shall exhibit a minimum ultimate compressive strength of 2,000 pounds per square inch at 28 days.

J. Masonry Prism tests shall be conducted for all concrete masonry construction.

1. Masonry prisms shall be constructed and tested in accordance with ASTM C1314.

2. Compressive strength of prisms shall be based on tests at 28 days.

3. The calculated compressive strength of masonry prisms per ASTM C1314, shall equal or exceed specified value listed on Drawings.

4. The CONTRACTOR shall construct masonry prisms when requested by the INSPECTOR in accordance with the following schedule:

a. One set of five prisms shall be built and tested prior to start of construction.

b. During construction, one set of three prisms shall be built and tested for each 5,000 square feet of wall area, but not less than one set of three prisms for the project.

5. Masonry prisms shall be built of the same material as to be used in the structure.

6. The moisture content of the units at the time of laying, consistency of mortar and workmanship shall be the same as will be used in the structure.

END OF SECTION

SECTION 05 12 00

STRUCTURAL STEEL

PART 1 - GENERAL

1.1 THE REQUIREMENT

A. The CONTRACTOR shall provide all labor, tools, material, and equipment necessary so as to furnish, fabricate, and install, the structural steel framing and all appurtenant metal parts required for permanent connection of the structural steel, complete, all in accordance with the requirements of the Contract Documents. The CONTRACTOR shall also design all temporary construction braces and sequences of erection.

1.2 RELATED WORK SPECIFIED ELSEWHERE

A. The WORK of the following Sections or Divisions applies to the WORK of this Section. Other Sections of the Specifications, not referenced below, shall also apply to the extent required for proper performance of this WORK.

B. Associated products furnished but installed under other sections:

1. Anchors for casting into concrete
2. Anchors for embedding into masonry
3. Loose bearing plates to receive Structural Steel

0.1 REFERENCE SPECIFICATIONS, CODES AND STANDARDS

A. Comply with reference standards and Standard Specifications of the GENERAL REQUIREMENTS.

B. Comply with the following American Institute of Steel Construction (AISC) references, as applicable:

1. AISC 303, "Code of Standard Practice for Steel Buildings and Bridges."

2. AISC "Steel Construction Manual”

3. ANSI/AISC 360, "Specification for Structural Steel Buildings"

4. ANSI/AISC 341 "Seismic Provisions For Steel Buildings” and including the “Commentary”

5. ANSI/AISC 358 “Prequalified Connections for Special and Intermediate Steel Moment Frames for Seismic Applications”

C. Comply with the current provisions of the following American Welding Society (AWS) Codes and Specifications, as applicable:

1. AWS B2.1 Specification for Welding Procedure and Performance Qualification

2. AWS D1.1 Structural Welding Code – Steel

3. AWS D1.8 Structural Welding Code – Seismic Supplement

D. Comply with the current references of the American Society for Nondestructive Testing, Inc.

1. SNT TC-1A — Recommended Practice – Personnel Qualification and Certification in Nondestructive Testing.

2. ANSI/ASNT CP-189 — Standard for the Qualification and Certification of Nondestructive Testing Personnel.

E. Comply with the Research Council on Structural Connections (RCSC) “Specification for Structural Joints Using ASTM A325 or A490 Bolts”, as applicable.

F. Comply with the current provisions of the following Codes and Standards, as applicable:

1. American Society of Testing & Materials (ASTM)

ASTM A36/A36M	Standard Specification for Carbon Structural Steel
ASTM A53/A53M	Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless
ASTM A108	Standard Specification for Steel Bar, Carbon and Alloy, Cold Finished
ASTM A123/A123M	Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
ASTM A153/A153M	Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware
ASTM A167	Standard Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip
ASTM A193/A193M	Standard Specification for Alloy-Steel and Stainless Steel Bolting Materials for High Temperature or High Pressure Service and Other Special Purpose Applications
ASTM A194/A194M	Standard Specification for Carbon and Alloy Steel Nuts for Bolts for High Pressure and High Temperature Service
ASTM A307	Standard Specification for Carbon Steel Bolts and Studs, 60 000 PSI Tensile Strength
ASTM A325	Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength
ASTM A354	Standard Specification for Quenched and Tempered Alloy Steel Bolts, Studs, and Other Externally Threaded Fasteners.
ASTM A 370	Standard Test Methods and Definitions for Mechanical Testing of Steel Products.
ASTM A 490	Standard Specification for Structural Bolts, Alloy Steel, Heat Treated, 150 ksi Minimum Tensile Strength. “Conform to -08a or later revisions when Zinc coating is required”
ASTM A496/A496M	Standard Specification for Steel Wire, Deformed, for Concrete Reinforcement

ASTM A500/A500M	Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes
ASTM A563	Standard Specification for Carbon and Alloy Steel Nuts
ASTM A572/A572M	Standard Specification for High Strength Low-Alloy Columbium-Vanadium Steels of Structural Quality.
ASTM A992/A992M	Standard Specification Steel for Structural Shapes For Use in Building Framing
ASTM E709	Standard Guide For Magnetic Particle Testing
ASTM F436	Standard Specification for Hardened Steel Washers
ASTM F959	Standard Specification for Compressible-Washer-Type Direct Tension Indicators for Use with Structural Fasteners
ASTM F1554	Standard Specification for Anchor Bolts, Steel, 36, 55, and 105-ksi Yield Strength
ASTM F1852	Standard Specification for “Twist Off” Type Tension Control Structural Bolt/Nut/Washer Assemblies, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength
ASTM F2280	Standard Specification for “Twist Off” Type Tension Control Structural Bolt/Nut/Washer Assemblies, Steel, Heat Treated, 150 ksi Minimum Tensile Strength

2. Government Standards:

City of Los Angeles, Department of Building and Safety (LADBS) applicable Information Bulletins

CSS	Caltrans Standard Specifications.

3. Trade Standards and References:

SP-1	“Solvent Cleaning”, by the Steel Structures Painting Council, SSPC (also known as The Society of Protective Coatings).
SP-2	“Hand Tool Cleaning” by the Steel Structures Painting Council, SSPC.
SP-3	“Power Tool Cleaning”, by the Steel Structures Painting Council, SSPC.

0.2 CONTRACTOR SUBMITTALS

A. Submittals shall be made in accordance with the GENERAL REQUIREMENTS and include the items indicated herein, and prepared in advance of fabrication, erection, and before incorporated into the work, for review and acceptance by the ENGINEER.

B. Certifications and Proof of Qualifications from the following:

1. Fabricator and erector including lead personnel, and shop and field welders

2. Testing laboratory and technician conducting any of the required tests

3. Non-destructive testing (NDT) technician

4. Shear connector manufacturer authorization for each Installer/Operator

C. Product Data:

1. Submit fabricator's or manufacturer's certification, specifications, recommended installation instructions, laboratory test reports, and all other data required to prove compliance with these specification requirements for the following items.

   a. Structural steel, including certified copies of mill test reports covering chemical and physical properties.

   b. High strength bolts, including nuts and washers, and RCSC related specification.

   c. Unfinished bolts and nuts

   d. Shear connectors and corresponding welding equipment approval by LADBS

   e. Structural steel primer paints and finish coatings

2. Shop drawings shall include all shop and erection details showing all members and their connections, shear connectors, anchor bolt layouts, schedules for fabrication procedures, and diagrams showing the sequence of erection. In addition, the following requirements shall be met:

   a. Members and connections for any portion of the structure not shown on the contract drawings shall be detailed by the fabricator and indicated on the shop drawings.

   b. Include details of cuts, connections, camber, holes, and other pertinent data, as well as items needed for other work; list types of paints and finish coatings, which are compatible.

   c. All welds shall be indicated by standard welding symbols of the AWS. Show location, size, type, and length of welds. Clearly distinguish between shop and field welds.

   d. All bolts and corresponding holes shall be called out. Show location, size, type, and identify pre-tensioned and slip-critical high strength bolted connections including the amount of tensioning required.

   e. For connections containing a combination of bolts and welds, indicate sequence of installation between the two connector types.

   f. Shop drawings shall show reference marks and cross references to drawings.

   g. Fabricator shall be responsible for correct interpretation of the contract drawings and shall call to the ENGINEER's attention any discrepancies found.

h. No deviation shall be made from the contract drawings without prior approval of the ENGINEER in writing.

i. Provide setting drawings, templates and directions for installing anchor bolts and other required anchors.

j. Identify locations of welded and/or bolted connections which require necessary testing.

k. All framing shop drawings shall include final flooring, roofing, parapet and any other relevant elevations.

D. The CONTRACTOR shall submit an erection plan for the structural steel framing that includes drawings and procedures. This erection plan shall conform to the requirements of the AISC "Code of Standard Practice for Steel Building and Bridges". The erection plan shall include shoring and bracing drawings and describe all necessary temporary supports, including the sequence of installation and removal. Submittal shall be prepared and signed by a California licensed civil or structural engineer and be in accordance with Cal OSHA regulations.

E. Test Reports: Submit reports of tests conducted on shop and field welds and bolted connections, including data on type of tests conducted and test results.

F. Welding procedure specifications and welding procedure qualification tests, including those for weld repair, shall be submitted to and approved by the ENGINEER, in triplicate.

G. Documentation and information required in relevant AISC references, including Appendix Q and W of "Seismic Provisions for Steel Buildings.

0.3 QUALITY ASSURANCE

A. Qualifications

1. Fabricator: Company specializing in the fabrication of the work in this Section shall have a minimum 5-year documented experience. Fabricator shall be a City of Los Angeles Department of Building & Safety (LADBS) licensed/certified Fabricator Shop. When work involves high strength steel, fabricator shall also show proof of compliance with LADBS Information Bulletin P/BC 2008-032 or latest revisions.

2. All welders, including shop welders, shall be City of Los Angeles Department of Building & Safety (LADBS) certified welders, in the classification of the work being performed.

3. Erector: Company specializing in the installation of the work of this Section shall have a minimum 5-years documented experience.

4. Technicians performing non-destructive testing (NDT) shall be Certified Level II Technicians in accordance with the American Society for Non-destructive Testing (ASNT)'s references. Certification shall be for the particular NDT being performed.

B. Inspection:

1. Quality Control is the responsibility of the CONTRACTOR for its forces and those of its Subcontractors. Inspection will be provided by the City in accordance with "INSPECTION OF THE WORK" of the GENERAL REQUIREMENTS.

2. Schedule and coordinate with the INSPECTOR all necessary tests, special inspection, and overall general quality assurance inspection.

3. Inspection by Others: Schedule and coordinate all necessary tests, inspections, and quality control services with the authorities having jurisdiction, including the Department of Building and Safety and notify the INSPECTOR that such activity is taking place.

4. If, after fabrication and inspection, the work of this Section is found to be defective and to require re-inspection, cost of such re-inspection will be paid by the CONTRACTOR.

5. Provide labor, equipment, and facilities needed to move and handle the materials to be inspected.

6. Provide access for the testing agencies and inspectors to locations where structural steel work is being fabricated or produced, so that required testing and inspection may be accomplished.

C. Shop Inspection, Fabrication and Tests.

1. Quality Control is the responsibility of the CONTRACTOR for its forces and those of its Fabricators/Subcontractors. As a minimum, conform to Section 8 of AISC's Code of Standard Practice, and when high strength steel is required in the work, conform to LADBS Information Bulletin P/BC 2008-032 or latest revision.

2. Shop Inspection shall be in accordance with "SAMPLING, TESTING AND FABRICATION INSPECTION" of the GENERAL REQUIREMENTS. The CONTRACTOR shall furnish all facilities for the inspection of materials and workmanship in the shop and the INSPECTOR shall be allowed free access to the necessary parts of the work. The INSPECTOR shall have the authority to reject any materials or work not meeting the requirements of these Specifications. Approval of the work by the INSPECTOR, however, shall not relieve the CONTRACTOR of the responsibility of providing a fabricated structure that is in accordance with the drawings and specifications.

3. High-strength bolts shall be installed and verified using the procedure(s) indicated in the Contract Documents, as set forth in the current "Specification for Structural Joints Using ASTM A325 or A490 Bolts".

4. Fabrication of high strength steel shall conform to LADBS requirements as stipulated in Information Bulletin P/BC 2008-032 or latest revision, except field welding is permitted when specifically shown on the Contract Drawings.

5. Welding Inspection:

   a. Except where specified otherwise, the City shall provide Deputy Inspector's visual inspection of welded work. However, where third-party inspection is required, the CONTRACTOR shall perform welding and obtain welding inspection by a qualified inspector from a testing laboratory approved by the INSPECTOR and the Los Angeles City Department of Building and Safety.

   b. Inspect every layer of weld for quality, penetration, and conformity with the design requirements.

c. When the CONTRACTOR retains the services of a qualified welding inspector, that inspector shall submit a signed report to the ENGINEER and the INSPECTOR, verifying that:

1) The welding is adequate and was performed in conformity with design requirements.

2) Adequate testing methods have been used to determine the quality of the welding.

d. Welded connections shall be inspected for conformance with the requirements of AWS D1.1 and these specifications.

e. CONTRACTOR shall provide all equipment for tests specified at no cost to the City.

f. Welded headed anchors / shear connectors shall be visually inspected by qualified personnel as per AWS D1.1. See LADBS Information Bulletin P/BC 2008-046, "Composite Steel Concrete Construction" for additional requirements, including bend test of shear connectors.

6. Welds that are required by the INSPECTOR to be corrected or redone shall be retested as directed, at the CONTRACTOR's expense, and to the satisfaction of the ENGINEER and the INSPECTOR.

7. Fabrication of structural steel for bridge structures shall conform to the appropriate subsections of Section 55-3 of the CSS.

D. Field Inspection, Installation, and Tests

1. Quality Control is the responsibility of the CONTRACTOR for its forces and those of its Subcontractors. The ENGINEER and the INSPECTOR reserve the right to inspect the work at all times. The CONTRACTOR shall provide temporary ladders, steps, scaffolding, planking, etc., necessary for safe access to the work to be inspected.

2. The Contractor shall arrange and pay for such additional tests and inspections of field work as are required by the Building Code and governing authorities and will prepare test reports for the ENGINEER's review and acceptance.

3. The testing agency will conduct and interpret the tests, and will state in each report whether the inspected work complies with requirements, specifically stating all deviations that exist.

4. Field inspection may include, but not be limited to, the following:

a. Inspection of erection steel work for conformance with this specification and the drawings.

b. Inspection of high strength bolted connections in accordance with "Specification for Structural Joints Using ASTM A325 or A490 Bolts", including pre-installation verification (Section 7), installation (Section 8), and Inspection (Section 9).

c. Verification of welding procedures specification, welding procedures, and qualifications of welding operators, welders and tackers in accordance with AWS D1.1.

d. Visual inspection of field welds and field welded headed anchors\shear connectors in accordance with AWS D1.1 and LADBS, including the bend test.

5. The testing agency will conduct and interpret the tests, and will state in each report whether the inspected work complies with requirements, specifically stating all deviations there from.

6. The costs of all tests with the exception of the ultrasonic testing conducted by the City, specified herein shall be borne by the CONTRACTOR.

7. Welds that are required by the INSPECTOR to be corrected or redone shall be retested as directed, at the CONTRACTOR's expense, and to the satisfaction of the ENGINEER and the INSPECTOR.

E. Structural Observation: The Engineer of Record or its designee shall perform the structural observation as stipulated in the Contract Documents and as required by LADBS. Upon completion of the observation of each designated stage of construction or element, the observer shall prepare, sign, and seal the necessary report and submit it to the building official. A copy shall also be provided to the ENGINEER and INSPECTOR. The CONTRACTOR shall submit a written request to the ENGINEER indicating the need for structural observation at least 48 hours before the observation is needed.

PART 1 - PRODUCTS

1.1 MATERIALS

A. General: New tested and fabricated stock complying with applicable grades and standards hereinafter referenced. Unless noted otherwise, the material specification noted hereon shall apply. No dual rated steel shall be allowed in this project.

B. Plates and Bars: Per ASTM A36 and ASTM A572 Grade 50

C. Channels and Angles: Per ASTM A36

D. W-Shapes: Per ASTM A992

E. Hollow Structural Sections (HSS): Per ASTM A500, Grade B, structural tubing.

F. Steel Pipe: Per ASTM A53, Type E or S, Grade B

1. Weight Class: As indicated
2. Finish: Black, except where indicated to be galvanized.

G. Stainless steel shapes and plates: Per ASTM A167, Type 316L

H. E70 - T4 weld metal shall not be used for any welds. All welds indicated in members and connections of the seismic load resisting system shall be made with filler metal with a Charpy V-Notch toughness of 20 ft-pounds minimum at zero degrees Fahrenheit. See AISC Seismic Provisions and Contract Drawings for additional requirements.

I. Structural steel shall be cleaned and coated with a shop paint primer; except, that primer shall be omitted for members to be covered with galvanized coating or fire proofed with no further coating.

J. All structural members shall be furnished full length without splices unless otherwise noted or approved by the ENGINEER.

K. Primer: Approved primer.

L. Paint: Approved paint indicated in Section 09900, “Painting”

M. Teflon Base Plates: Reinforced Teflon, pre-bonded to steel plates and combined with neoprene bearing pad and having a static friction coefficient of maximum 6 percent, as manufactured by Fluorocarbon Company of Anaheim or equal.

N. Non-Shrink Grout: Approved non-shrink grout, minimum compressive strength shall be 3,000 psi in 7 days.

O. Galvanizing Repair Material: Per Section 05 50 00, “Miscellaneous Metal Works”

2.2 BOLTS, CONNECTORS, AND ANCHORS

A. High-strength Bolts, Nuts, and Washers: Per ASTM A325, Type 1, heavy hex steel structural bolts; ASTM A563 heavy hex carbon steel nuts; and ASTM F436 hardened carbon steel washer.

1. Finish: Plain, except where indicated otherwise

2. Direct-Tension Indicators: Per ASTM F959, Type 325, compressible-washer-type.

B. Tension-Control, High-Strength Bolt-Nut-Washer Assembly: ASTM F1852, Type1, heavy hex head steel structural bolts with splined ends; ASTM A563 heavy hex carbon-steel nuts; and ASTM F436 hardened carbon-steel washers. Only manufacturer applied lubricant is permitted..

1. Location: As substitutes where A325, Type 1, plain bolts are specified, when approved by the ENGINEER.

2. Finish: Plain, unless noted otherwise.

3. Quality Assurance: Meet pre-installation verification, installation, and inspection requirements of RCSC specifications.

C. High-Strength Bolts, Nuts, and Washers: Per ASTM A490, Type 1, heavy hex steel structural bolts; ASTM A563 heavy hex carbon-steel nuts; and ASTM F436 hardened carbon-steel washers, plain. Locations as indicated on Drawings.

1. Direct-Tension Indicators: Per ASTM F959, Type 490, compressible-washer-type, plain

D. Tension-Control, High-Strength Bolt-Nut-Washer Assembly: ASTM F2280, Type 1, heavy hex head steel structural bolts with splined ends; ASTM A563 heavy hex carbon-steel nuts; and ASTM F436 hardened carbon-steel washers. Only manufacturer applied lubricant is permitted.

1. Location: As substitutes where A490, Type 1, plain bolts are specified, when approved by the ENGINEER.

2. Finish: Plain

3. Quality Assurance: Meet pre-installation verification, installation, and inspection requirements of RCSC specifications.

E. Machine bolts with nuts and washers: Per ASTM A307; hot dip galvanize per A153 not less than 1.25 oz per square foot; use self locking nuts or lock washers with plain nuts. Locations as indicated on Drawings.

F. Bolts and washers to connect dissimilar metals: Per ASTM A193 and A194, Type 316 stainless steel

G. Shear Connectors: ASTM A108, Grade 1015 through 1020, headed-stud type, threaded type, cold-finished carbon steel; ASTM A496, deformed bar anchor; conform to AWS D1.1, Type B.

1. Location of each type: As indicated on the Contract Drawings

H. Un-headed Anchor Rods: ASTM F1554, Grade 36.

1. See Specification 03250 for related information.
2. Configuration: Hooked, unless noted otherwise.
3. Nuts: ASTM A563 hex carbon steel
4. Plate washers: ASTM A36 carbon steel
5. Washers: ASTM F436 hardened carbon steel
6. Finish: Plain

I. Headed Anchor Rods: ASTM F1554, Grade 36, straight, unless noted otherwise.

1. Nuts: ASTM A563 hex carbon steel.
2. Plate Washers: ASTM A36 carbon steel
3. Washers: ASTM F436 hardened carbon steel
4. Finish: Plain.

J. Threaded Rods: ASTM A36

1. Nuts: ASTM A563 hex carbon steel.
2. Washers: ASTM F436 hardened carbon steel
3. Finish: Plain.

K. Adhesive concrete anchors and/or anchor rods shall use stainless steel anchor rods/assemblies conforming to the requirements of current City of Los Angeles Research Report.

L. Eye Bolts and Nuts: ASTM A108, Grade 1030, cold-finished carbon steel

M. Sleeve Nuts: ASTM A108, Grade 1018, cold-finished carbon steel.

PART 2 -- EXECUTION

2.1 GENERAL

A. Surface Conditions: The CONTRACTOR shall examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until detrimental conditions are corrected.

B. Measurement: The CONTRACTOR shall verify all dimensions, grades, elevations, job conditions, and shall make any field measurements necessary and shall be fully responsible for accuracy and layout of work. The CONTRACTOR shall review the Drawings and any discrepancies shall be reported to the ENGINEER for clarification prior to starting fabrication and erection.

C. Pre-Fabrication And Pre-Erection Conference: Coordinate and arrange for pre-fabrication and pre-erection conferences with the fabricator or manufacturer, INSPECTOR and ENGINEER as required by the Code Requirements and LADBS. Do not proceed with any work prior to the conferences taking place.

2.2 FABRICATION

A. General:

1. Workmanship: In accordance with AISC Specification, Code of Standard Practice, applicable AISC references, with modifications and additional requirements specified here in, as indicated on the Drawings, and as indicated on the shop drawings.

2. Safety Precautions: Conform to latest edition of ANSI/AWS Z49.1, “Safety in Welding and Cutting and Allied Processes”. The Contractor shall determine the applicability of any regulatory limitation prior to use.

B. Shop Fabrication and Assembly of Structural Steel:

1. Fabricate items of structural steel in accordance with AISC specifications, and as indicated on the approved Shop Drawings. Fabrication and assembly shall be done in the shop to the greatest extent possible.

2. Properly mark and match-mark materials for field assembly and for identification as to location for which intended.

3. Fabricate for delivery sequence which will expedite erection and minimize field handling of materials.

4. Where finishing is required, complete the assembly, including welding of units, before start of finishing operations.

5. Provide finish surfaces of members exposed in the final structure free from markings, burrs, and other defects.

6. Joints and intersections to be accurately made, tightly fitted, true to plane and accurately fastened.

7. Camber structural steel where indicated.

8. Care shall be taken so over grinding does not occur. The maximum reduction of the base metal thickness, as delivered, shall not be more than 1/32-in or 5% of the element/member thickness, whichever is less. Welds shall not be over ground so as to reduce their effective throat size below what is called for on the drawings.

C. Architecturally Exposed Structural Steel (AESS)

1. Comply with fabrication requirements, including tolerance limits, of AISC’s “Code of Standard Practice for Steel Buildings and Bridges” for steel identified as AESS.

2. Fabricate with exposed surfaces smooth, square, and free of surface blemishes including pitting, rust, scale, and roughness.

3. Remove blemishes by filling or grinding and sanding or by welding and grinding and sanding, before cleaning, treating, and shop priming.

4. Fabrication to be performed at LADBS approved fabrication facility.

5. Remove backing bars or runoff tabs, back gouge, and grind and sand steel smooth.

6. Verify that weld sizes, fabrication sequence, and equipment used for AESS will limit distortions to allowable tolerance. Prevent weld show-through on exposed steel surfaces.

a. Grind butt welds flush.

b. Grind or fill exposed fillet welds to smooth profile. Dress exposed welds

D. Thermal Cutting: When permitted, perform thermal cutting by machine to the greatest extent possible.

E. Bolt Holes: Cut, drill, or punch standard bolt holes perpendicular to metal surfaces.

F. Finishing: Accurately finish ends of columns and other members transmitting bearing loads.

G. Cleaning: Clean and prepare steel surfaces that are to remain unpainted according to SSPC-SP 1, “Solvent Cleaning”.

H. Shear Connectors: Prepare steel surfaces as recommended by manufacturer of shear connectors. Use automatic end welding of headed-stud shear connectors per AWS D1.1 and the manufacturer’s written instructions.

I. Bases and Bearing Plates: Shop weld to columns and to members which are attached to concrete.

3.3 CONNECTIONS

A. Method: as indicated on the Drawings.

B. Provide bolts and washers of types and sized required for completion of shop fabrication or field erection.

C. Unless otherwise indicated on the drawings, minimum beam framing connections shall be in accordance with AISC “Steel Construction Manual”, have a minimum of two ¾-inch diameter high strength bolts, and be able to develop full strength of members joined.

D. Unless otherwise indicated on the drawings, double-angle members shall be connected together in accordance with AISC Specifications, with a ¾-in diameter, high-strength bolt and a filler plate or welded filler plate.

E. Column ends shall be square and milled to have full bearing at splices and at end plates.

F. The CONTRACTOR shall notify the INSPECTOR to make arrangements to inspect high strength bolted connections and welded connections and to perform testing and prepare test reports. This inspection shall be in addition to the inspection specified in subsections 1.5 of this specification.

G. High Strength Bolted Construction:

1. Install high strength threaded fasteners in accordance with RCSC Specifications.

2. Use ASTM A325 bolts, with slip critical connections and Type A surface, unless noted otherwise, except for handrails, ladders, and girt connections.

3. CONTRACTOR shall provide all equipment for testing of bolted connections as required by Code or Contract Documents at no additional cost to the City.

2.4 WELDED CONSTRUCTION:

A. Comply with all AWS Referenced Documents and this Contract for procedures, appearance, and quality of welds and welders, methods used in correcting welding work, and the following:

1. Shop welding to be done by a fabricator licensed by LADBS.

2. All shop and field welders shall be LADBS certified.

3. Repair welds only after a repair is deemed an acceptable remedy by the ENGINEER using methods also approved by the ENGINEER prior to performing the repair. Cost of repairs to be borne by the CONTRACTOR.

4. Assemble and weld built-up sections by methods which will produce true alignment of axes without warp.

5. Furnish templates and other devices as necessary for presetting bolts and other anchors to accurate locations. CONTRACTOR shall furnish shop drawing prepared by a California Licensed Civil or Structural Engineer.

B. Stainless steel welding shall conform to the details and standards of workmanship of this specification and AWS D1.1, except that the prequalified welds for carbon steel are not applicable to stainless steel. Welders and weld procedures for stainless steel shall be specifically qualified per AWS B2.1 for the type of stainless steel to be welded and LADBS. Welders and weld procedures for welding of stainless steel to carbon steel shall be qualified per AWS B2.1 and LADBS.

C. Unless otherwise shown, all butt and bevel welds shall be complete penetration.

2.5 HOLES FOR OTHER WORK

A. Provide holes required for securing other work to structural steel framing, and for passage of other work through steel framing members, as shown on the Shop Drawings.

B. Provide threaded nuts welded to framing, and other specialty items as shown, to receive other work

C. Cut, drill, or punch bolt holes perpendicular to metal surfaces.

D. Do not thermally cut holes or enlarge holes by burning.

E. Drill holes in bearing plates.

2.6 SHOP PAINT PRIMER

A. General:

1. Shop prime steel surfaces except for the following:

a. Surfaces embedded in concrete or mortar. However, extend priming of partially embedded members to a depth of 2-inches.

b. Surfaces to be welded and high-strength bolted with slip-critical connections. Such areas shall be primed and finish coated after connection is made and inspected. See Figure C-3.1 of RSCS Specification for illustration of bolted connection requirements.

c. Surfaces to receive sprayed-on-fireproofing.

d. Galvanized surfaces.

2. Apply one coat of primer and two coats of paint to surfaces which are inaccessible after assembly or erection. Change color of the second coat to distinguish it from the first.

B. Surface Preparation:

1. After inspection and before shipping, clean steel work to be painted.

2. Remove loose rust, loose mill scale, and spatter, slag, and flux deposits.

3. Clean and prepare the steel in accordance with the following specifications and standards:

a. SSPC – SP2: “Hand Tool Cleaning”

b. SSPC – SP3: “Power Tool Cleaning,” where needed.

C. Priming:

1. Immediately after surface preparation, apply structural steel primer paint in accordance with the manufacturer’s written instruction and at a rate to provide a uniform dry film thickness of not less than 3.0 mils.

2. Use painting methods which will result in full coverage of joints, corners, edges, and exposed surfaces.

D. Galvanizing:

1. Hot-Dip Galvanizing: Galvanize structural steel members conforming to ASTM A123. Provide minimum 2.0 oz/sq.ft. galvanized coating.

2. Fill vent holes and grind smooth after galvanizing.

2.7 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Load structural members in such a manner that they may be transported and unloaded without being excessively stressed, deformed, or otherwise damaged. This includes protection of coating from chipping and scratches.

B. Protect structural steel members and packaged materials from corrosion and deterioration. Material shall be stored in a dry area and shall not be placed in direct contact with the ground. Do not place materials on the structure in a manner that might cause distortion or damage to the members or the supporting structures. Repair or replace damaged materials or structures as directed.

2.8 ERECTION

A. The CONTRACTOR shall comply with the AISC Specifications and Code of Standard Practice, and with specified requirements.

B. High-strength bolts shall be installed per the Specification for Structural Joints using ASTM A325 or ASTM A490 and this section.

C. Anchor Bolts:

1. Provide as indicated on the Contract Drawings; anchor bolts and other connectors required for securing structural steel to foundation and other in-place work

2. Provide templates and other devices necessary for presetting bolts and other anchors to accurate locations in concrete or masonry construction.

3. Contractor shall arrange and pay for all testing for anchor bolts or dowels as required by the Codes and Standards.

4. For dynamically loaded structures or where vibrations are being induced into the structure/anchor bolts, provide structurally conforming lock nuts, structural nuts with lock washers, or a chemical thread seizing compound, such as "Loctite" or equal, as approved b the ENGINEER.

D. Splices:

1. Splice members only where indicated, and with the approval of the ENGINEER.

2. For splices not indicated, submit structural calculations prepared and signed by a California registered Civil or Structural Engineer.

E. Surveys:

1. Establish permanent benchmarks necessary for accurate erection of structural steel.

2. Check elevations of concrete surfaces, and locations of anchor bolts and similar items, before erection proceeds.

F. Temporary Shoring:

1. Provide temporary shoring and bracing members with connections of sufficient strength to bear imposed loads.

2. Provide temporary guy lines to achieve proper alignments of the structure as erection proceeds.

3. Remove temporary connections and members when permanent members are in place and the final connections have been made.

2.9 SETTING BASES AND BEARING PLATES

A. Prior to the placement of non-shrink grout beneath base and bearing plates, the bottom surface of the plates shall be cleaned of all bond-reducing materials, and concrete and masonry bearing surfaces shall also be cleaned of all bond-reducing materials and roughened to improve bonding.

B. Set loose and attached base plates and bearing plates for structural members on wedges, leveling nuts, or other adjustable devices.

C. Tighten the anchor bolts after the supported members have been positioned and plumbed.

D. Do not remove wedges or shims but, if they are protruding, cut off flush with the edge of the base or bearing plates to assure that no voids remain.

E. Grouting of base plates shall be done with non-shrink grout, of flow-able consistency. Grouting shall be completed prior to placing loads on the structure.

F. Finish exposed surfaces, protect installed materials, and allow grout to cure in strict compliance with the manufacturers' recommendations and acceptance requirements by the ENGINEER.

2.10 FIELD ASSEMBLY

A. Set structural frames accurately to the lines and elevations indicated. Align and adjust the various members to form a part of a complete frame or structure before permanently fastening. Clean the bearing surfaces and other surfaces which will be in permanent contact before assembly. Perform necessary adjustments to compensate for discrepancies in elevations and alignment.

B. Level and plumb individual members of the structure within specified AISC tolerances. CONTRACTOR shall provide and install all temporary bracing necessary to carry construction loads until the structure has been completed.

C. Establish required leveling and plumbing measurements at the main operating temperature of the structure, making allowances for the difference between temperature at time of erection and the mean temperature at which the structure will be when completed and in service.

D. Comply with AISC Specifications and Code of Standard Practice for bearing, adequacy of temporary connections, alignment, and the removal of paint on surfaces adjacent to welds.

E. No driven nail or fastener, core holes or other attachments shall be made or allowed on any steel members without the written approval by the ENGINEER.

2.11 TESTING AND INSPECTION

.

A. Quality Control is the responsibility of the CONTRACTOR for its forces and those of its Subcontractors. Schedule and coordinate with the INSPECTOR all necessary tests, special inspection, and overall general quality assurance inspection both in the shop and in the field.

B. Inspection by Others: Schedule and coordinate all necessary tests, inspections, and quality control services with the authorities having jurisdiction, including the Department of Building and Safety and notify the INSPECTOR that such inspections are taking place.

3.12 MISFITS AT BOLTED CONNECTIONS

A. Where misfits in erection bolting are encountered, the CONTRACTOR shall immediately notify the ENGINEER. The CONTRACTOR shall submit a method to remedy the misfit for review by the ENGINEER. The ENGINEER will determine whether the remedy is acceptable or if the members must be refabricated. Methods of remedy for consideration by the ENGINEER may include, but are not limited to, the following:

1. Ream holes that must be enlarged to admit bolts and use oversized bolts.

2. Plug-weld misaligned holes and re-drill holes to admit standard size bolts.

3. Drill additional holes in the connection, conforming to AISC Standards for bolt spacing and end and edge distances, and add additional bolts.

4. Reject the improperly fabricated member and fabricate a new member to ensure proper fit.

B. Mis-sized or misaligned holes in members shall not be enlarged by burning or by the use of drift pins.

2.13 MISFITS AT ANCHOR BOLTS

A. Where misalignment between anchor bolts and bolt holes in steel members are encountered, the ENGINEER shall be immediately notified. The CONTRACTOR shall submit a method to remedy the misalignment for review by the ENGINEER.

2.14 GAS CUTTING

A. Do not use gas cutting torches in the field for correcting fabrication errors in the structural framing, except on secondary members which are not under stress and will be concealed in the finished structure and when approved by the ENGINEER. Finish gas-cut sections equal to a sheared appearance.

2.15 TOUCHUP PAINTING

A. Immediately after erection, clean field welds, bolted connections, and abraded areas of the shop paint primer. Apply touchup paint primer by brush or spray which is the same thickness and material as that used for the shop paint. Galvanized surfaces which have been field welded or damaged shall be repaired.

3.16 FIELD PAINTING

A. General:

1. Prepare surfaces in a manner appropriate to the condition, and as approved by the ENGINEER.

2. Clean spots and surfaces where primer coats have been removed, damaged, or burned off, and clean field bolts and other field connections not concealed in the finished work.

3. Remove dirt, oil, and grease.

4. Apply a spot coat of the approved primer.

5. Do not apply paint to wet, damp, oily, or improperly prepared surfaces.

B. Notify the ENGINEER when the work of this Section is ready to receive field painting. Lapse time between surface areas if necessary at no additional cost to the City.

C. Schedule for inspection and secure approval from the ENGINEER prior to field painting.

D. Using spray or brush, as recommended by the manufacturer of the approved paint material, fill all joints and corners and cover the surfaces with a smooth unbroken film of at least 1.5 dry mils thickness.

E. Apply two coats to all surfaces of steel which will be in accessible for painting, after fabrication and erection.

END OF SECTION

SECTION 05 30 00

METAL DECK

PART 1 - GENERAL

1.1 THE REQUIREMENT

A. The CONTRACTOR shall furnish all tools, equipment, materials, and supplies and shall perform all labor required to complete the work as indicated on the Drawings and specified herein.

B. This section covers the work necessary to fabricate, deliver and install, complete, the steel deck over steel floor/roof framing system. . .

1.2 RELATED WORK SPECIFIED ELSEWHERE

A. Section 05120 Structural Steel

1.3 REFERENCE SPECIFICATIONS, CODES AND STANDARDS

A. Comply with the reference specifications of the GENERAL REQUIREMENTS.

B. Comply with the current provisions of the following Codes and Standards.

1. Material Specifications:

ASTM A653	Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
ASTM A1008	Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Solution Hardened, and Bake Hardenable

2. Reference Codes and Standards:

AISI	North American Specification for the Design of Cold-Formed Steel Structural Members
AWS D1.1	Structural Welding Code - Steel
AWS D1.3	Structural Welding Code - Sheet Steel
SDI	Manual of Construction with Steel Deck – Second Edition
SSPC	SSPC - Paint 15

1.4 CONTRACTOR SUBMITTALS

A. Submittals shall be made in accordance with the GENERAL REQUIREMENTS.

B. The following submittals and specific information shall be provided, as applicable.

1. Product research reports in compliance with the Los Angeles Department of Building and Safety requirements, erection drawings, and shop drawings signed and stamped by a Civil or Structural Engineer registered in the State of California.

2. Shop and erection drawings shall include, but not be limited to, the following:

   a. Plan view layout and section of deck and supporting members, with overall dimensions, and all opening sizes and locations.

   b. Flashing, closure plates, and other accessory materials.

   c.. Fabrication and erection details, indicating the construction loads and type of shoring.

   d. Size and location of all mechanical and electrical equipment supported by the roof system which may affect the design or fabrication.

1.5 QUALITY ASSURANCE

A. The CONTRACTOR shall use skilled workers who are thoroughly trained and experienced in the necessary crafts and completely familiar with the specified requirements and methods needed for the proper performance of the Work of this Section.

1. Fabricator must be a licensed fabricator by the Los Angeles City Department of Building and Safety.

2. All welders must be certified by the Los Angeles City Department of Building and Safety.

B. Fire-Resistive Construction: When the materials of this Section are used as part of an assembly indicated on the Drawings in which fire-resistive construction ratings are required, provide the required approvals by the Los Angeles City Department of Building and Safety. for the fire-proofing product to be used.

1.6 INSPECTIONS

A. Shop: Required for all shop-fabricated items.

B. Field:

1. Perform all floor and roof deck welding under periodic inspection of Registered Deputy Inspector at the CITY's cost, except for instances of re-work, re-testing, and re-inspection, the costs of which shall be borne by the CONTRACTOR. CONTRACTOR shall provide testing equipment for all testing required by Code or Contract at no cost to the CITY.

2. Provide continuous inspection of Registered Deputy Inspector for the placement of the concrete fill.

1.7 HANDLING AND STORING MATERIALS

A. Storage and Handling: Take every precaution to avoid damage and to keep surfaces clean and free from dirt and stains. Provide materials with adequate protection, as required, to prevent corrosion, deformation and other damage during shipment and handling at job-site.

B. Place deck bundles on the building frame near a main supporting beam at a column or wall. Do not place bundles on unbolted or partially welded frames, or unattached or unbridged joists.

C. Do not use steel deck as a working platform and do not store or place other material or equipment on deck until the deck is permanently attached in position and/or the concrete fill is placed and has reached the required strength. Care must be taken before and during placing operations not to allow heavy concentrated loads on the steel deck. When buggies are used to deliver the concrete, the runways shall be planked to avoid damaging the deck. Replace all damaged deck with new material.

1.8 VARIATION OF DIMENSIONS

A. Uncoated thickness of steel deck shall not be less than 95% of the design thickness.

B. Deck panel length shall be within plus or minus ½ inch of specified length.

PART 2 - MATERIAL

2.1 STEEL DECK

A. Deliver materials to the job site in original packages with the manufacturer's labels attached.

B. The deck type, profile and thickness (gauge) shall be as shown on the Drawings.

C. Steel deck shall conform with the American Iron and Steel Institute (AISI) “North American Specification for the Design of Cold-Formed Steel Structural Members”, with appropriate steel fiber stress limitations and appropriate dead and/or live load deflection limitations.

D. Galvanized steel deck shall be formed from steel sheets conforming to ASTM A 653. The steel shall have received, before being formed, a metal protective coating of zinc conforming to ASTM A 653 light commercial coating, G90.

E. Non-Galvanized steel deck shall be formed from steel sheets conforming to ASTM A 1008.

F. All materials shall be new and free from defects impairing strength, durability, and appearance.

G. General Accessories:

1. Provide accessories specifically designed to be used with the steel deck units supplied to the work, and as normal to uses shown on the Drawings.

2. Provide other materials, not specifically described but required for a complete and proper installation, as selected by the CONTRACTOR subject to the approval of the ENGINEER.

3. Provide ridge, valley plates, flat plates at change of deck direction and sump pans as shown on Drawings to provide a finished surface for the application of roof insulation and roof covering.

4. Provide closures as necessary to support roofing insulation where ribs of deck are parallel to edges of insulation at roof perimeters.

H. Accessories for Composite Steel Deck:

1. Provide sheet metal cell closures and Z-closures for open ends of all cell raceways, ribs and sides of deck at columns, walls, and openings shown on the Drawings.

2. Provide sheet steel cover plates as required to close panel ends conditions where panels change direction or abut, and as required to retain concrete fill at edges of steel deck.

I. Related Materials: (As Applicable)

1. Paint primer (for uncoated steel deck): Rust-Oleum Corp. "X-60 Bare Metal Red Primer".

PART 3 - EXECUTION

3.1 MEASUREMENTS

A. The CONTRACTOR shall verify all dimensions given on the Drawings and shall make such field measurements as are necessary to properly lay out the work.

B. The CONTRACTOR shall be fully responsible for accuracy of all measurements and layout of the work.

3.2 INSTALLATION OF STEEL DECK

A. The steel deck shall be installed at right angles to the supporting members unless shown otherwise, and shall be installed according to the manufacturer's recommendations, the details shown, and the approved shop drawings.

B. Steel deck shall be cut and fitted around openings shown on Drawings. No holes shall be punched through the steel deck during installation. Sheets shall extend over a minimum of three spans where possible. End laps shall be a minimum of 2 inches and shall be staggered. Deck ends over supports shall be installed with a minimum end bearing of 1-1/2 inches. The CONTRACTOR shall furnish and install all closure plates and accessories.

C. The finished steel deck shall be free from buckles and irregularities. All welding and other connections necessary to provide a complete and satisfactory installation shall be detailed on the shop drawings.

D. Steel deck shall be securely fastened to the steel supporting members by arc spot puddle welds, fillet welds of equal strength, or mechanical fasteners, as shown on the Drawings. Prior to laying the decking over the supporting members, CONTRACTOR shall verify all deck support member elevations with those shown on Drawings. Report deviations of supporting members elevations from required elevations to the INSPECTOR before deck is fastened to the supporting structure.

1. Mechanical fasteners, either powder actuated, pneumatically driven or screws, shall be permitted in lieu of welding to fasten deck to supporting framing if fasteners meet all project service requirements. When the fasteners are powder actuated or pneumatically driven, the load value per fastener used to determine

the maximum fastener spacing shall be based on a minimum structural support thickness of not less than 1/8 inch and on the fastener providing a minimum 5/16 inch diameter bearing surface (fastener head size). When the structural support thickness is less than 1/8 inch, powder actuated or pneumatically driven fasteners shall not be used, but screws are acceptable.

2. For deck units with spans greater than five feet, side laps and perimeter edges of units between span supports shall be fastened at intervals not exceeding 36 inches on center, using one of the following methods:

   a. #10 self drilling screws.

   b. Crimp or button punch.

   c. Arc puddle welds with minimum 5/8-inch visible outer diameter, or minimum 1-inch long fillet weld.

E. The CONTRACTOR shall qualify all welders and welding procedures in accordance with the latest edition of AWS D1.3, Structural Welding Code - Sheet Steel. Notify the INSPECTOR in advance of welder and welding procedure qualification so that INSPECTOR may witness qualification. Submit to the INSPECTOR, for review and approval, all welding procedures and welder qualification records using forms provided in the appendix to AWS D1.3 welding code prior to any production welding.

F. All welds are to be slagged.

1.1 ERECTION REQUIREMENTS

A. Handling and Erection: Handling and erection shall be in accordance with the latest edition of Steel Deck Institute's "SDI Manual of Construction with Steel Deck" and the following:

1. Care shall be exercised at all times to avoid damage through careless handling during unloading, storing, and erecting.

2. Field welding shall not damage the joists and the steel deck. The total length of weld at any one point on cold-formed members whose yield strength has been attained by cold working and whose as-formed strength is used in the design shall not exceed 50 percent of the overall developed width of the cold-formed section.

3. Except due to inclement weather, once installation of a section of steel deck has been started, it shall be continued and uninterrupted until the entire section has been permanently attached in position.

4. Inspect the deck for tears, dents, or other damage that may prevent the deck from acting as a tight and substantial form or that would impair structural capability. Repair tears, dents or other damage with the directions of the ENGINEER.

5. Clean off any deterioration or material in accordance with manufacturer's recommendations prior to concrete topping or sprayed-on fire proofing operations.

B. Completion: All units shall be in place, properly and completely anchored and approved before any finishes are applied. Any damaged units (steel joists and/or steel deck) for

which in the opinion of the ENGINEER, suitable and adequate repairs cannot be made, will be rejected, whether or not delivered or erected; and whole, approved replacement units shall be provided, by the CONTRACTOR, at no additional cost to the CITY.

3.4 TREATMENT OF DAMGAGED COATINGS

A. Paint – Submit for approval materials and methods to be utilized for the re-application of coating to areas that were damaged during final construction. Re-apply coatings in an approved manner.

B. Galvanized Coating – For the metal decking and appurtenances thereto, areas of galvanized membrane that are damaged during normal installation process (such as by cutting, drilling and/or welding), need not be repaired, unless otherwise noted.

Where the damage to the galvanized membrane is not normal to the field installation or is specified to be repaired, submit for approval materials and methods to be utilized for the repairs. Damage caused by CONTRACTOR's negligence will typically require repair by the "hot stick" or other metalizing method.

3.5 FINISH PAINTING

A. Finish painting of all exposed steel deck and steel joists shall be as indicated on the Finish Schedule on the Drawings.

END OF SECTION

SECTION 05 40 00

COLD FORMED (LIGHT) METAL FRAMING

PART 1 - GENERAL

1.1 THE REQUIREMENT

A. The CONTRACTOR shall construct all light metal framing and appurtenant work, complete, in accordance with the requirements of the Contract Documents.

1.2 REFERENCE SPECIFICATIONS, CODES AND STANDARDS

A. Comply with the reference specifications of the GENERAL REQUIREMENTS.

B. Comply with the current provisions of the following Codes and Standards.

1. Commercial Standards:

ANSI/ASTM A 446	Specification for Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process, Structural (Physical) Quality.
ASTM A 570	Specification for Hot-Rolled Carbon Steel Sheet and Strip, Structural Quality.
ASTM C 645	Specification for Non-Load (Axial) Bearing Steel Studs, Runners (Track), and Rigid Furring Channels for Screw Application of Gypsum Board.

1.3 CONTRACTOR SUBMITTALS

A. Submittals shall be made in accordance with the GENERAL REQUIREMENTS.

PART 2 - PRODUCTS

2.1 METAL STUDS

A. Non-Load Bearing: Metal studs shall be of the non-load-bearing channel type, roll-formed from 18-, 20-, and 25-gage electrogalvanized steel. Tracks and erection accessories shall be standard products of an established metal stud manufacturer, unless otherwise specified or shown. Metal studs shall be 3-5/8-inch deep unless otherwise specified or shown.

B. Height Limits and Schedule: Maximum height limits for non-load-bearing studs shall be as follows, unless otherwise shown:

Gage	Stud Schedule Spacing Ctr. to Ctr. (inches)	2-1/2-Inch Depth
25 (20)	12	16 ft-6 in (19 ft-0 in)
25 (20)	16	15 ft-5 in (18 ft-0 in)
25 (20)	24	14 ft-3 in (16 ft-0 in)

		3-5/8-Inch Depth
25 (20)	12	21 ft-4 in (24 ft-10 in)
25 (20)	16	19 ft-11 in (23 ft-7 in)
25 (20)	24	18 ft-2 in (20 ft-8 in)
		1-5/8-Inch Depth
25 (20)	12	12 ft-4 in
25 (20)	16	11 ft-7 in
25 (20)	24	10 ft-10 in

Note: Parentheses in above table indicate alternative dimensions for 20-gage.

C. Eighteen-gage studs shall be used at non-load bearing walls having a lath and plaster condition.

D. Load Bearing: Metal studs of 16-gage steel shall be used where shown or where specified to be used. They shall be standard 16-gage, punched steel, galvanized studs formed from steel meeting the requirements of ASTM A 570 with 50,000 psi.

2.2 MISCELLANEOUS MATERIALS

A. Hanger Wire: Hanger wire for suspended gypsum board ceilings shall be of soft-temper, annealed and galvanized steel wire. Hanger wire size shall be not less than that required by governing code.

B. Runner Channels: Runner channels shall be 1-1/2-inch cold-rolled channels and 3/4-inch stiffener channels, galvanized or factory-coated with rust-inhibitive paint. Channels shall have minimum weight of 475 and 300 lbs/1000 L.F. respectively.

C. Furring Channels: Furring channels shall be designed for screw attachment of 5/8-inch gypsum wallboard. They shall be roll-formed, galvanized Grade "A" steel conforming to ANSI/ASTM A 446, with a metal thickness of 0.022-inch minimum, 7/8-inch depth, and 1-3/8-inch web.

D. Tie Wire: Tie wire shall be galvanized, 16-gage, annealed steel wire.

E. Fasteners: Fasteners shall be as required and as recommended within the Reference Standards.

F. Welding Materials: Welding materials shall be as recommended in the published standards of the structural stud manufacturer.

G. Power-Driven Pins: Power-driven pins to be installed in concrete or steel shall be of heat-treated steel alloy. If the pins are not sufficiently corrosion-resistant for the conditions to which they are to be exposed, they shall be protected in an acceptable manner. Pins shall have capped or threaded heads capable of transmitting the loads the shanks are required to support. Pins that are connected to steel shall have longitudinal serrations around the circumference of the shank. Complete information describing pin capacity, connections, and proposed area of use shall be submitted to the ENGINEER.

PART 3 - EXECUTION

3.1 INSTALLATION REQUIREMENTS

A. All work shall be installed in conformance with the manufacturer's recommendations, the applicable requirements of the governing code, ANSI, and as specified or shown.

3.2 CEILING SUSPENSION SYSTEM

A. Components: All necessary items for a complete installation shall be provided, including devices for attachment to overhead construction, hanger wires, main runners, splines, splicers, connecting clips, wall connectors, hold-down clips, edge mouldings, and other appurtenances.

B. Hanger Wires: Hanger wires shall be spaced along the main runner so that each hanger supports a maximum area of 16 square feet.

C. Runner Channels: Main runners shall be 1-1/2-inch channels spaced at 4 feet on centers. Hanger wires shall be saddle-tied along runners. Cross-furring channels shall be spaced at 16 inches on centers, maximum, and shall be saddle-tied to main runner channel.

D. Interruptions: At any openings that interrupt the continuity of furring channels, additional cross reinforcing shall be provided to restore lateral stability of grillage.

3.3 METAL STUDS, FURRING AND FRAMING (FOR NON-BEARING WALLS)

A. Runner Track Attachment: Floor and ceiling runner tracks shall be securely fastened to floor and overhead construction as shown and as required.

B. Stud Attachment: Studs shall be securely fastened to tracks, and spaced in accordance with the stud schedule. Each stud shall be crimped into runner tracks at the top, bottom, and both sides for friction fit with 1/4-inch deflection clearance on top.

C. Wall Stiffening: Walls shall be stiffened with 3/4-inch channels placed horizontally at not more than 4-1/2-foot vertical spacing.

D. Stud Requirements: Metal stud installation shall conform to the following requirements:

1. Studs shall be located at all door frame jambs, at abutting construction, intersecting walls, and corners. Each corner and intersection of walls and partitions shall be formed with not less than 3 studs.

2. Double 20-gage studs shall be secured to the jamb anchors of each door frame by bolt or screw attachment. Studs at door openings shall extend to the structure.

3. Studs extending from door frame header to ceiling runner over door frames shall be positioned at wall board joints. Stud walls which do not extend to structures above the ceiling shall be braced to the structure at every 8 ft - 0 inches.

4. The CONTRACTOR shall install 20-gage studs at wall-mounted fixtures and at a maximum of 12 inches on centers behind walls to receive ceramic tile.

5. Stud walls shall be braced as necessary to provide rigid construction. Double row of studs for chase walls shall be braced with cross ties of 1/2-inch or 5/8-inch thick gypsum board, 12 inches wide, installed at quarter points of studs.

6. Parapet walls and hung exterior walls and soffits shall be framed as shown with not less than 18-gage studs.

E. Openings: Openings shall conform to the following requirements:

1. Channels shall be provided around openings for attachment of metal frames, dampers, grilles, and ductwork in connection with metal studs and shall be securely fastened to studs.

2. Headers, sills, and jack studs shall be provided as required at openings. Headers shall overlap adjacent vertical studs and shall be securely screw-attached to adjacent studs.

3. Where 25-gage studs are used, a 1-1/2-inch channel stiffener shall be installed 6 inches above the door openings. Stiffeners shall extend past the second single-stud on each side of the opening, and shall be saddle-tied to the structure.

F. Lintels: Trussed or box-framed lintel members designed to resist applied loads without excessive deflection shall be provided and shall be secured together by screws or other approved means.

G. Support for Wall-Mounted Braced Items: Solid blocking, 1-1/2-inch channels, horizontal studding or other members within walls shall be provided as required to provide secure and adequate support for wall-mounted or wall-braced items. Galvanized plates shall be provided as backing for handrail brackets, 16-gage by 8-inch by 16-inch.

H. Horizontal Stiffeners: Ends of horizontal stiffeners shall be securely fastened to abutting construction.

I. Furring Channels: Furring channels shall be spaced 16 inches on centers, maximum, unless shown otherwise. Spans shall not exceed manufacturer's published recommendations and governing code requirements.

3.4 STRUCTURAL LOAD BEARING STEEL STUD WALLS

A. Prefabrication: Structural steel stud walls may be fabricated into panels or components prior to erection.

B. Component Attachment: All attachments of components shall conform to the following requirements:

1. All attachments of similar components shall be done by welding. Dissimilar stud components shall be attached by welding, screw attaching, or bolting. All welds shall be fillet, plug, butt, or seam welds.

2. Wire tying of framing components in structural applications will not be permitted and will not be acceptable.

3. Splices in axial hooded studs shall not be used.

C. Butt Joints in Tracks: Butt welds or splices shall be used at all butt joints in the tracks.

D. Stud Track Anchorage: All framing members shall be anchored as follows:

1. Bottom track for structural steel studs shall be anchored to concrete floor or foundation slabs with 1/8-inch diameter shank power-driven fasteners at 6-inch on center.

2. Wall top and bottom tracks for structural steel studs connected to structural steel members shall be provided with a 3-inch-long weld connection every 2 ft-6 in of run.

3.5 WORKMANSHIP

A. Alignment: All metal studs shall be installed rigid, in line, level, and plumb and shall be suitable for the application of the intended succeeding contiguous materials. The maximum allowable deviation in any plane shall be 3/16-inch from an 8-foot straight line and 1/2-inch maximum in a surface having a total length in excess of 8 feet.

B. Component Fit: All framing members and tracks shall meet the following requirements:

1. All framing components shall be cut squarely or on an angle, as in bracing, to fit squarely against abutting members.

2. Tracks shall be securely anchored to the floor and overhead structure or other members.

3. Studs shall be seated squarely in the track with the stud web and flanges abutting the track web, shall be plumbed or aligned, and shall be securely attached to the flanges or web of both the upper and lower tracks.

C. Temporary Bracing: Framing and panels shall be braced as follows:

1. All framing shall be held firmly in position until properly fastened.

2. Prefabricated panels shall be square and braced against racking. Lifting of prefabricated panels shall be done in a manner as to not cause local distortion in any member.

D. Jack Studs: Jack studs shall be provided between all track and window sills; between window and door headers and top track; at free-standing stair rails; and elsewhere to furnish structural support. Jack studs shall be securely attached to supporting members.

END OF SECTION

SECTION 05 50 00

METAL FABRICATIONS

PART ONE - GENERAL

1.1 DESCRIPTION

A. Work Included: Provide and install all miscellaneous metal and metal fabrications in place, as indicated on the Contract Drawings and hereafter specified or needed for complete and proper installation.

B. Documents affecting work of this Section include, but are not necessarily limited to the GENERAL CONDITIONS, SUPPLEMENTARY CONDITIONS and Sections in GENERAL REQUIREMENTS of DIVISION 1 of these Specifications.

1.2 QUALITY ASSURANCE

A. Qualifications of Personnel: Use only adequate number of skilled workers who are thoroughly trained and experienced in the necessary crafts and are completely familiar with the necessary crafts and with the specified requirements and methods needed for proper performance of the work of this Section.

B. Welder's Qualifications: Currently qualified according to AWS D1-1.

C. Design: Fabricate and erect work in accordance with A.I.S.C.

D. Welding Operations: Perform shop and/or field welding required in connection with work of this Section in strict accordance with pertinent recommendations of the American Welding Society (AWS).

E. Project Conditions: Do not fabricate components which require fitting to structural elements or into finished spaces until dimensions are verified at the job-site.

F. Regulations: Comply with acceptable California Building Code with the Los Angeles City current Amendments.

G. Shop Inspections: Required

H. Fabricator Qualifications: Firm experienced in successfully producing metal fabrications similar to that indicated for this project with sufficient production capacity to produce work units without causing delay in the Contracted Work.

1.3 SUBMITTALS

A. General: Comply with pertinent provisions in the SUBMITTALS SECTION in DIVISION 01 - GENERAL REQUIREMENTS of these Specifications.

B. Materials List: Submit list of proposed items to be provided under this Section.

C. Shop Drawings: Submit for all items proposed to be fabricated and installed under this Section. Identify each proposed item with corresponding Contract Drawing detail and Specification references.

D. Samples: Submit physical samples of specified materials for color or texture selection by the Consultant, when so requested.

E. Templates: Provide for anchor and bolt installation by other trades.

F. Manufacturers Specifications and Other Data: Provide as-needed to prove compliance with the specified requirements.

G. Manufacturer's Recommended Installation Procedures: When approved by the Consultant, will become the basis for accepting or rejecting actual installation procedures used on the Work.

H. Certificates: Submit certification that specified surface preparation and primer or galvanized coatings as specified have been applied to steel items and are in accordance with the Specifications.

I. Welder's certificates signed by the Contractor certifying that welders comply with requirements specified under "Quality Assurance" article.

1.4 PRODUCT HANDLING

A. General:

1. Fabricated metal items shall not be fabricated or delivered to the job-site before required review of the Shop Drawings by the City Engineer or the Consultant and returned to the Contractor.

2. Store fabricated metal items above ground on platforms, skids or other approved supports in a weathertight and dry location until ready for installation.

B. Protection: Use all means necessary to protect the materials and manufactured items of this Section before, during and after installation and to protect the work and materials of all other trades.

C. Replacements: In the event of damage to work of this Section, immediately make all repairs and replacements necessary to the approval of the City Engineer or the Consultant and at no added cost to the City.

D. Materials to be Installed by Others:

1. Deliver anchor bolts and other anchorage devices to be embedded in concrete to the job-site in time before start of concrete work operations.

2. Provide setting drawings, templates and other directions necessary for installation of anchor bolts and devices.

PART 2 - PRODUCTS

2.1 MATERIALS AND COMPONENTS

A. General:

1. All material shall conform with the following requirements and shall be of new stock of the highest grade available, free from defects and imperfections, of recent manufacture and unused. Where two or more identical articles or pieces of equipment are required, they shall be of the same manufacture.

2. All metal surfaces shall be free from any defects which would impair the strength, durability, appearance, and shall be of the best commercial quality, for the

purposes intended and adequate to withstand the strains and stresses to which they will be subject. Metals shall be protected from injury at the job, in transit, and until erected in place, inspected, and approved.

B. Miscellaneous Metals: (As Applicable)

1. Iron and Steel (General): Uniform Building Code with the Los Angeles City 1992 Amendments, Section 27.

2. Structural Steel: ASTM A36.

3. Steel Plates, Shapes and Bars: Mild or structural grade conforming to applicable ASTM A36 Specifications.

4. Steel Plates (Bent or Cold Formed): ASTM A283 Grade "C".

5. Gray Cast Iron: ASTM A48, Class 10 or as specified.

6. Malleable Iron Castings: ASTM A47.

7. Steel Tubing: AISI MT1010, electric welded, minimum 14-gage, shapes and size as indicated on the Contract Drawings.

8. Steel Pipe: ASTM A53, Grade A, Schedule 40 black finish or ASTM A120, galvanized when used on building exterior.

9. Steel Bars and Bar-size Shapes: ASTM A306 Grade 65 or ASTM A36.

10. Cold Finished Steel Bars: ASTM A108.

11. Galvanized Carbon Steel Sheets: ASTM A526 with G90 zinc coating in accordance with ASTM A525.

12. Aluminum Castings: 214 aluminum alloy.

13. Aluminum Extrusions: 6053 aluminum alloy temper to suit.

14. Stainless Steel: 18-8 alloy, type 302, No. 4 finish except as otherwise specified.

15. Diamond or checker Pattern Plate: U.S. multigrip floor plate; U.S. Steel Corp. or equal.

C. Miscellaneous Related Materials: (As Applicable)

1. Welding Electrodes: Conform to AISC and ASTM A233 and the Code for Arc and Gas Welding in Building Construction, A.W.S. Publication D1.1 use E-70XX Series Electrodes.

2. Paint Primer (for uncoated ferrious metal): Rust-Oleum Corp. "X-60 Bare Metal Red Primer".

3. Hot-Dip Galvanizing: ASTM A-123 or as applicable after fabrication. See Section 210-3 of the "Standard Specifications".

4. Galvanizing Repair Material: "Galvalloy" by Metalloy Products Co., 1341 Sussex Lane, Newport Beach, California or equal 90% zinc rich cold process repair material.

5. Non-Shrink Grout: "Por-Rok" by Hallemite Mfg. Co. Cleveland, Ohio (Los Angeles, Phone (213) 583-4184).

6. Fasteners: Same material and finish of work to be fastened together; screws to be countersunk oval head type, unless otherwise indicated on the Drawings.

7. Mechanical Anchors: For securing miscellaneous metal items to concrete to be self-drilling concrete anchors, not less than 3/8-inch size, Phillips Redhead, or as otherwise indicated on the Drawings.

8. Bolts and Nuts: Low-carbon hexagon-head type, ASTM A-307, Grade "A" or "B". Lag bolts shall be square-head Type FS FF-B-561.

9. Miscellaneous: All items of miscellaneous metal indicated on drawings, including clip angles, ties, straps, anchors, bolts, angles, rods, and other appurtenances required by details or necessary for proper installations.

10. Dry Pack: A cement-sand mix of 1 part Portland cement to 2-1/2 parts sand by volume with necessary water added to provide for solid compaction.

11. Chains: 3/16-inch size, galvanized proof chain complete with suitable size harness snaps and two eyebolts, length to suit job conditions.

12. Gasket Material: Soft compressible neoprene rubber strip, thickness and width as indicated on the drawings.

13. Filler Material for Welding Aluminum: Type 53.

14. Concrete inserts:

    a. Threaded or wedge type galvanized ferrous castings of malleable iron complying with ASTM A27;

    b. Provide required bolts, shims, and washers, hot-dip galvanized in accordance with ASTM A153.

15. Brackets, Flanges and Anchors: Cast or formed metal of the same type material and finish as supported rails, unless otherwise indicated.

16. Welding Rods and Bare Electrodes: Select in accordance with AWS Specifications for the metal alloy to be welded.

2.2 OTHER MATERIALS

A. Provide other materials, not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the approval of the Consultant.

2.3 SHOP PAINT

A. Primer: Use "10-99 Tnemec Primer" or "Rustoleum Number 5769 Primer.

B. For Repair of Galvanizing: Use a high zinc-dust content paint complying with MIL-P-21035.

2.4 FABRICATION

A. Field Measurements: Secure all field measurements required for proper and adequate fabrication and installation of all work of this Section. Exact measurements are the responsibility of the Contractor.

B. Workmanship: (As Applicable)

1. Except as otherwise shown on the Contract Drawings or the approved Shop Drawings use materials of size, thickness, and type required to produce reasonable strength and durability in the work of this Section.

2. Fabricate with accurate angles and surfaces which are true to the required lines and levels, grinding exposed welds smooth and flush, forming exposed connections with hairline joints, and using concealed fasteners wherever possible. Do not fabricate components which require fitting to structural elements or into finished spaces until dimensions are verified at the job-site.

3. Prior to shop painting or priming, properly clean metal surfaces as required for the applied finish and for the proposed use of the item.

4. On surfaces inaccessible after assembly or erection, apply two coats of the specified primer. Change color of second coat to distinguish it from the first.

5. Work to dimensions shown or accepted on the Shop Drawings, using proven details of fabrication and support.

6. Conform to applicable provisions of the Uniform Building Code with the Los Angeles City current Amendments, Chapter 27.

7. Form exposed work true to line and level, with accurate angles and surfaces and with straight sharp edges.

8. Ease the exposed edges to a radius of approximately 1/32-inch unless otherwise shown.

9. Form bent-metal corners to smallest radius possible without impairing the work.

10. Welding: Electric arc welding, Uniform Building Code with the Los Angeles City current Amendments, Chapter 27.

11. Bolting: Bolts to be drawn tight and threads set to secure nuts.

12. Assembly: Assemble all items with parts in true alignment and accurately fitted, joints well made, adequately fastened with butts and sharp edges ground smooth.

13. Conceal all fastenings where practicable and make exposed joints hairline.

14. Nonferrous metal items shall comply with best practice of the trade. Form all sections true to detail and free from defects impairing appearance, strength, and durability.

15. Cut, reinforce, drill and tap miscellaneous metal work as indicated to receive finish hardware and similar items.

16. On surfaces inaccessible after assembly or erection, apply two (2) coats of the specified primer. Change color of second coat to distinguish it from the first coat.

C. Galvanizing: Provide a zinc coating for those items shown or specified to be galvanized as follows and as applicable:

1. ASTM A153 for galvanized iron or steel hardware.

2. ASTM A123 for galvanized rolled, pressed or forged steel shapes, plates, bars and strip 1/8-inch thick and heavier.

D. Field Galvanizing:

1. Required: For repair of protective coating of damaged galvanized surfaces resulting from welding or other construction operations in the shop or at the job-site at no added cost to the City.

2. Method: By "galvalloy" methods, in accordance with manufacturer's directions.

E. Shop Painting:

1. Required: On all uncoated ferrous metals; galvanized ferrous metal not to be shop coated.

2. Paint: Specified paint primer.

3. Painting: Full prime coating, completely covering the metal surfaces; at least 1 coat on all surfaces which will be accessible after fabrication and erection; at least 2 coats on all surfaces which will be inaccessible after fabrication and erection.

4. Remove scale, rust and other deleterious materials before application of Shop Coating.

5. Clean off heavy rust and loose mill scale in accordance with SSPC-SP-2 or SSPC-SP-3 before coating.

6. Remove oil, grease and similar contaminants in accordance with SSPC-SP-1.

F. Rough Hardware:

1. Furnish bent or otherwise custom fabricated bolts, plates, anchors, hangers, dowels, and other miscellaneous steel and iron shapes as required for framing and supporting woodwork, and for anchoring or securing woodwork to concrete or other structures. Straight bolts and other stock rough hardware items are specified in Division 6 sections.

2. Fabricate items to sizes, shapes, and dimensions required. Furnish malleable-iron washers for heads and nuts which bear on wood structural connections; elsewhere, furnish steel washers.

PART 3 - EXECUTION

3.1 SURFACE CONDITIONS

A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the work. Do not proceed until such detrimental conditions are corrected.

3.2 COORDINATION

A. Coordinate work of this Section as required with other trades to assure proper and adequate provisions in the work of those trades for interface with the work of this Section.

3.3 INSTALLATION

A. General: (As Applicable)

1. Set work accurately into position, plumb, level, true, and free from rack.

2. Anchor firmly into position.

3. Where field welding is required, comply with AWS recommended procedures of manual-shielded metal-arc welding for appearance and quality of weld and for methods to be used in correcting welding work.

4. Grind exposed welds smooth, and touchup shop prime coats.

5. Do not cut, weld, or abrade surfaces which have been hot-dip galvanized after fabrication and which are intended for bolted or screwed field connections.

6. Dissimilar Materials: Where metals are in contact with plaster, concrete or other type metals, paint contact faces of the metal before installation, with a heavy bituminous coating:

B. Immediately After Erection: Clean the field welds, bolted connections, and abraded areas of shop priming. Paint the exposed areas with same material used for shop priming.

3.4 PIPE BUMPER POSTS (BOLLARDS)

A. Required: At locations indicated on the Contract Drawings.

B. Materials: Galvanized steel pipe, size and length as indicated on the Drawings.

C. Installation: Set plumb in concrete footings of size indicated on the Drawings, to indicated height; pipe post to be filled with concrete to top and top to be tooled to shed water. Top of exposed portion of footing to be tooled to shed water.

3.5 METAL LADDERS

A. Materials: Steel bar stringers, steel angle clips, steel plate frame, steel bar rungs, steel pipe enclosure with anchor plates and anchor bolts.

B. Fabrication:

1. In accordance with drawing details, weld rungs and supports to stringers.

2. Grind smooth all sharp edges and welds.

3. Hot-dip galvanized exterior ladder and the enclosure after fabrication.

4. Top surface of each ladder ring shall be made non-slip, subject to approval of the City Engineer.

C. Installation: As indicated on the Contract Drawings, securely bolt in accurate location, plumb, square and true.

3.6 STEEL GUARD RAILING

A. Fabrication: From galvanized steel pipe in accord with approved Shop Drawings, pipe sizes as noted on the Drawings. Form all bends, where required, smoothly and with no reduction in cross section. Grind all welds smooth. Definitions in ASTM E985 for railing related terms apply.

B. Installation: True to line, plumb and level, with base plates secured to floor as indicated on the Drawings.

3.7 CLEAN-UP AND ADJUSTMENT

A. Clean-up:

1. During the progress of the work, keep the premises free from debris and waste resulting from work of this Section. Upon completion of this Section remove all surplus materials and debris from the job-site.

2. Immediately after erection, clean the field welds, bolted connections and abraded areas of shop priming. Paint the exposed areas with the same material used for the shop priming.

B. Adjustments: Adjust all operating parts and/or assemblies as may be required to provide the necessary function and smooth operation.

END OF SECTION

SECTION 05 50 01

HEAVY DUTY ALUMINUM LADDERS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Furnish and install heavy duty aluminum ladders as indicated on the drawings and specified.

1.3 ACTION SUBMITTALS

A. Submit shop drawings, manufacturer's literature and illustrations detailing fabrication and erection of the heavy duty aluminum ladders. Include sections, and details of components and their connections.

PART 2 - PRODUCTS

2.1 HEAVY DUTY ALUMINUM LADDERS

A. Subject to review of action submittals by the Architect for compliance with specified requirements crossover ladders shall be as manufactured by the entity indicated on the drawings or an "or equal" product of one of the following:

1. Canway Equipment Manufacturing.
2. Vestil Manufacturing Company.
3. Jomy Safety Ladder Co.
4. Aluminum Ladder Company.
5. Louisville Ladder.
6. Gillis Industries.

B. Ladders shall have a rating of not less than 300 pounds and conform to the standards and requirements of OSHA and ANSI A14.3, Heavy Duty Commercial, Type IA.

C. Finish shall be as selected by the Architect from the manufacturer's standard finishes.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install ladders as recommended by the product manufacturer at locations indicated, fabricated as detailed, and in accordance with the approved shop drawings.

B. Protect the Work of this section until Substantial Completion.

C. Remove rubbish, debris and waste materials and legally dispose of off the Project site.

END OF SECTION

SECTION 05 52 00

HANDRAILS AND RAILINGS

PART 1 -- GENERAL

1.1 THE REQUIREMENT

A. The CONTRACTOR shall furnish all tools, equipment, materials, and supplies and shall perform all labor required to complete the work as indicated on the Drawings and specified herein.

B. This section covers the work necessary to furnish and install handrails and railings, complete.

1.2 REFERENCE SPECIFICATIONS, CODES AND STANDARDS

A. Comply with the reference specifications of the GENERAL REQUIREMENTS.

B. Comply with the current provisions of the following Codes and Standards.

1. Government Standards:

California OSHACalifornia Occupational Safety and Health Standards.

2. Trade Standards:

Aluminum Association (AA) publications, as referenced herein.

3. Manufacturer's Standards: In addition to the standards listed above, the railings and their installation shall be in accordance with the manufacturer's published recommendations and specifications.

1.3 CONTRACTOR SUBMITTALS

A. Submittals shall be made in accordance with the GENERAL REQUIREMENTS.

B. The following submittals and specific information shall be provided:

1. Shop Drawings: Railing supplier's shop drawings on the railing system.

2. Calculations: Engineering calculations shall be submitted for review. Engineering calculations shall include (but not be limited to) railings, handrail brackets, brackets, support flanges, and fasteners or anchors.

1.4 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Delivery of Materials: Manufactured materials shall be delivered in original, unbroken packages, containers, or bundles bearing the label of the manufacturer.

B. Storage: All materials shall be carefully stored in a manner that will prevent damage and in an area that is protected from the elements.

PART 2 - PRODUCTS

2.1 ALUMINUM HANDRAIL SYSTEMS

A. General: Aluminum handrail systems or components shall be fabricated as shown or shall be an ENGINEER-accepted prefabricated/pre-engineered system or component by one fabricator/manufacturer that meet the submittal requirements as stated in SUBMITTALS of the General Requirements. Manufacturers who may meet these specified requirements are: C.R. Laurence, Tubular Specialties, Alumaguard, a division of Bettinger West, Inc., Denver, CO; or Thompson Fabricating Co., Birmingham, AL; or approved equal. These systems shall meet the allowable load and deflection criteria.

B. Pipe:

1. All rails, posts, and formed elbows shall be fabricated from extruded Alloy 6105-T5 with a minimum tensile strength of 38,000 psi and a minimum yield strength of 35,000 psi, and with special close tolerance for tight fit and excellent appearance. All other aluminum parts shall be fabricated from 6063-T6 or 6061-T6 extruded aluminum of adequate strength for all loads.

2. Round tube and round picket railings shall be sleeve or side mounted unless otherwise shown. Posts shall be not less than 1-1/2-inch diameter, Schedule 40 pipe or 1-1/2-inch x 2-inches oval section. The posts shall be evenly spaced at not less than 4-feet nor more than 6-feet on centers. Field conditions may require some adjustment of spacing. The top railings shall be as long as possible and the post shall not project through the top rails. Toeboard of picket rails shall be a specially extruded, snap-in bottom rail enclosure with toeboard or special extruded centered toeboard that is screw applied to bottom of the bottom rail.

C. Fittings:

1. All fittings shall be as shown or shall be one of the following types: A one-piece aluminum extrusion machined to final shape and attached to the handrail post with either concealed welds or a stainless steel fastener. A one-piece connector of aluminum or stainless steel, either welded or attached to the handrail post with stainless steel fasteners and designed to be completely covered when the handrail is connected. All fitting surfaces designed to be exposed to view after installation is complete will match the handrail metal alloy, surface, shape, and anodized finish and shall be the continuous diameter type for smooth appearance and to permit continuous sliding of the hands.

2. The handrail post bolted baseplate connector shall be fabricated as shown on the Drawings or equivalent molded or extruded meeting all of the appearance and strength requirements. The baseplate shown shall conform to ASTM A 167, Type 304 stainless steel with a minimum yield strength of 30,000 psi. The insert shown shall be fabricated from stainless steel pipe with a minimum wall thickness of 0.145-inch and with a minimum yield strength of 50,000 psi. The insert dimensions shall meet the required tolerances shown on the Drawings. Furnish test data to show that the yield strength of the material in the as-delivered pipe equals or exceeds 50,000 psi. Inserts using stainless steel with minimum yield strengths less than 50,000 psi shall have thicker walls to develop equal strength.

3. The handrail wall brackets, aluminum, round top, clear anodized and meeting all the dimensional wall/railing clearance requirements of national, state, and local standards, regulations, and codes, including OSHA.

D. Additional Specific Fabrications:

1. The handrail gate shall meet all the safety requirements of the national, state, and local standards, regulations, and code requirements that specifically apply to this project, including OSHA. The gate shall be fabricated using 6063-T6 extruded aluminum, and as otherwise shown on the Drawings. Gate hardware shall meet all specified requirements. Manufacturers who may provide hardware meeting these Specifications are: Craneveyor Corp., South El Monte, CA; Julius Blum & Co., Inc. Carlstadt, NJ; Thompson Fabricating Co., Birmingham, AL; or approved equal. Provide test reports to show that all gate hardware meets minimum safety strength requirements for handrails and guard rails.

2. The handrail picket panels and clamps shall be fabricated using solid bar 6063, 6105, or 6061 extruded aluminum as shown on the Drawings with finishes specified. All fasteners shall be stainless steel.

3. Toeboards and accessories shall be fabricated as shown on the Drawings, or shall be molded or extruded by a handrail manufacturer providing equivalent appearance, strength, and safety properties to that shown, using 6063 or 6061 aluminum with finishes as specified, meeting all applicable state, federal, and Los Angeles Building Code requirements. All fasteners shall be stainless steel. Provide expansion and contraction connections between each post as shown or equivalent.

E. Embedded Items: All metal anchorages to be embedded in concrete shall be furnished and installed under this section and shall be as shown on the Drawings or as specified herein.

F. Finishes:

1. All exposed aluminum shall be clear anodized in accordance with the Aluminum Association AA-M32-C22-A41. All exposed prefabricated handrail and toeboard handrail, picket panel, and toeboard components, except stainless steel fasteners, shall be anodized after fabrication.

2. All complete rails, modules, and components shall be cushion wrapped to prevent them from being scratched and dented during shipment, storage, and installation. Wrapping shall be left intact, insofar as possible, until the railing is completely installed.

2.2 GALVANIZED STEEL HANDRAILS

A. General: Galvanized steel handrails shall be fabricated by one fabricator.

B. Steel railings materials shall be in conformance with the SSPWC section 206-5.1.

C. Piping: 2-inch NPS with a 2.375-inch outside diameter and a 0.154-inch wall thickness minimum for all rails and posts.

D. Fittings:

1. All handrail fitting components; flanges, wall brackets, anchor plates, and similar accessories shall be hot-dip galvanized after fabrication. All anchor bolts and fasteners shall be stainless steel.

2. The handrail post bolted baseplate connector shall be fabricated from carbon steel meeting the minimum requirements herein specified and as shown on the Drawings. The insert shall be fabricated from pipe with a minimum wall thickness of 0.20-inch or from solid rod. Hot-dip galvanize assembly after fabrication, and provide surface preparation on insert for proper fit into post.

3. The handrail wall brackets shall be malleable iron, round top, galvanized, meeting all the dimensional wall/railing clearance requirements of national, state, and local standards, regulations, and codes, including OSHA.

E. Additional Specific Fabrications:

1. The handrail gate shall meet all the safety requirements of the national, state, and local standards, regulations, and code requirements that specifically apply to this project, including OSHA. The gate shall be fabricated using steel as specified hereinbefore for piping and as otherwise shown on the Drawings. Hot-dip galvanize after fabrication. Gate hardware shall be manufactured of Type 304 stainless steel. The hardware shall be similar in function and operation to Craneveyor Corp., South El Monte, CA, gate hinges with spring No. C4370b, gate latch No. C4369, and gate stop No. C4368; Julius Blum & Co., Inc., Carlstadt, NJ, Connectorail System, gate hinges with spring No. 782/3 with gate latch and stop No. 784; or approved equal.

2. The handrail picket panels and clamps shall be fabricated using solid bar steel meeting the minimum requirements herein specified and as shown on the Drawings. Hot-dip galvanize after fabrication. All fasteners shall be stainless steel.

3. Toeboards and accessories shall be fabricated as shown on the Drawings, using A 36 steel. Hot-dip galvanize after fabrication. All fasteners shall be stainless steel.

F. Embedded Items: All metal anchorages to be embedded in concrete shall be securely affixed in place.

G. Galvanizing:

1. General: Zinc used for galvanizing shall be grade Prime Western conforming to ASTM B 6. Except as otherwise specified, materials shall be galvanized by the hot-dip, mechanical or electro-depositing process.

2. Requirements of Coating: The minimum weight of coating and other requirements shall be 2.0 ounces per square foot of surface area. The weight of coating shall be determined in accordance with ASTM A90, modified to determine the coating of each surface separately. All surfaces, when tested separately, shall meet the minimum requirement.

3. Galvanize in accordance with ASTM A 123 and A 386 after fabrication. The workmanship of zinc coating shall be in conformance with the SSPWC Section 210-3.3.

4. Test Coupon: Test coupons for determining the quantity and quality of the galvanizing shall be in conformance with the SSPWC Section 210-3.4.

2.3 ANCHOR BOLTS, FASTENERS, CONCRETE ANCHORS

A. Miscellaneous Fasteners:

1. Type 316 stainless steel elastic locknuts; Type 316 stainless steel flat washers; molded nylon flat washers; round head machine screws ((RHMS); Type 316 stainless steel, all as supplied by McMaster-Carr Supply Company, Los Angeles, CA; or equal.

2. Stainless steel bolts and nuts for bolting handrail to metal beams, unless otherwise shown, shall be ASTM A 193 and A 194, Type 316 with a minimum yield strength for bolts of 95,000 psi.

3. Anchor bolts, Type 316 stainless steel anchor bolt with a minimum yield strength of 30,000 psi, 5/8-inch minimum diameter with hex nuts, or size as shown.

4. Wedge anchors for exterior use and for interior use shall be 304 or 316 stainless steel, 3/4-inch diameter by 5-inch HILTI Kwik-Bolt, stud type, manufactured by HILTI, Inc., Stamford, CT; Wej-It, stainless steel bolts, 3/4-inch by 5-inch, completely assembled, manufactured by Wej-It Corporation, Broomfield, CO; or equal.

5. Wedge anchors have been limited to 5-inch lengths for use in 6-inch slab and wall thicknesses. Where anchors are to be used in thicker section, larger anchor lengths may be used. Load values for tension pullout with special inspection shall be 3,900 pounds minimum. Special inspection is required.

6. Concrete anchors in other sizes and quantity when used shall be based upon approved test reports with special inspection where required. Submit calculations and test data for review prior to use. Satisfy all applicable codes.

PART 3 - EXECUTION

3.1 FABRICATION OF ALUMINUM HANDRAIL SYSTEMS

A. The work shall be performed according to approved shop drawings by workmen experienced in the fabrication and erection of aluminum railing systems of the type and quality specified. See the Drawings for other requirements.

B. Handrail post to be bolted to metal or concrete shall be furnished longer than needed and field cut to exact dimensions required to satisfy any vertical variations on the actual structure, or in lieu of field cutting provide an approved fitting containing provisions for vertical adjustment. The Detail Drawings require field fit-up. Shims or grout under baseplates shall not be used. Misfits shall be rejected.

C. The aluminum handrail system shall be completely free of all burrs, nicks, and sharp edges when the installation is complete. Welding shall not be permitted.

D. Coat ends of aluminum posts to be set in grout or concrete as specified in Section [09800], "Protective Coating".

E. The railing shall be erected in the field without cutting, drilling, welding, or tapping unless specifically approved by the ENGINEER.

F. No exposed welds, rivets, or screws shall be permitted unless specifically detailed on the plans.

G. Field welding of aluminum connections shall not be permitted. Welded connections shall be permitted only where indicated on the Contract drawing and on the approved shop drawings.

H. Welding shall conform to the SSPWC Section 304-2.1.2.

I. Railing panels shall be in conformance with SSPWC Section 304-2.1.2

J. For structures on curves, either horizontal or vertical, the railing shall conform to the SSPWC Section 304-2.1.2.

K. Completed aluminum railing units shall be anodized after fabrication and in conformance with the SSPWC Section 304-2.1.2.

3.2 FABRICATION OF GALVANIZED STEEL HANDRAIL SYSTEMS

A. Handrail post to be bolted to metal or concrete shall be furnished longer than needed and field cut to exact dimensions required to satisfy any vertical variations on the actual structure. The Detail Drawings require field fit-up. Shims or grout under baseplates shall not be used.

B. Cut pipe square within 2 degrees and to lengths within 1/8-inch.

C. Remove burrs from cut edges.

D. Form elbow bends and wall returns to uniform radius, free from buckles and twists, with finished surfaces smooth.

E. Close exposed ends of steel pipe by welding 3/16-inch thick steel plate in place or use prefabricated fittings.

F. Welding:

1. Miter and cope intersections of posts and rails within 2 degrees, fit to within 0.02-inch (0.5 mm) and weld all around.

2. Thoroughly fuse without undercutting or overlap.

3. Remove splatter, grind exposed welds to blend, and contour surfaces to match those adjacent.

G. Provide explosion prevention holes at closed ends of pipes.

H. Form and assemble joints which will be exposed to the weather so as to exclude water.

I. Repair of Defective Work: Remove defective work and replace with material that meets Specification requirements.

J. Repair of Damaged Zinc Coating: Zinc coating which has been field or shop cut, burned by welding, abraded, or otherwise damaged to such extent as to expose the base metal, shall be repaired and recoated by one of the following methods:

1. Hot-Dip Process: The damaged areas shall be thoroughly stripped and cleaned and a coating of zinc shall be applied by the hot-dip process.

2. Metalizing Process: The damaged area shall be thoroughly cleaned by blasting with sharp sand or steel grit. The blasted area shall lap the undamaged zinc coating at least 1/2-inch. Zinc wire containing not less than 99.98 percent zinc shall be used in the metalizing operation. A zinc coating shall be applied to the damaged area with a metalizing gun to a thickness of not less than 0.005-inch on the damaged area, and shall taper to zero thickness at the edge of the blasted undamaged section.

3. Zinc Oxide-Zinc Dust Paint: The damaged area shall be thoroughly cleaned by wire brushing and all traces of welding flux and loose or cracked zinc coating removed prior to painting. The cleaned area shall be painted with two coats of zinc oxide-zinc dust paint conforming to the requirements of Military Specifications MIL-P-15145. The paint shall be properly compounded with a suitable vehicle in the ratio of one part oxide to four parts zinc dust by weight.

4. Proprietary Materials: Proprietary materials used to repair small areas shall be in conformance with the SSPWC Section 210-3.5.4.

3.3 INSTALLATION

A. Assembly/installation of handrail system shall be performed in strict accordance with manufacturer's written recommendations for installation and the details shown.

B. The railing shall be erected in conformance with the SSPWC Section 304-2.1.3.

C. The railing installation shall be in conformance with the SSPWC Section 304-2.1.3.

D. After erecting the railing, any abrasions or exposed steel shall be repaired as specified.

E. Protection from Entrapped Water: All exterior installations and interior installations subject to high humidity shall have provisions made to drain water from the railing system. When posts are mounted in concrete or when bends or elbows occur at low points, weep holes of 1/4-inch diameter shall be drilled at the lowest possible elevations, one hole per post or rail. Hole shall be drilled in the plane of the rail.

F. Expansion Joints:

1. Provide at intervals of not more than 24-feet on centers and at structural joints as hereinafter specified.

2. Provide slip joint with internal sleeve extending 2-inches beyond each side of joint. Provide slip joint gap of 0.2-inch to allow for expansion.

3. Fasten to one side using either adhesive or two blind rivets, set at 120 degrees and 240 degrees interval from top of pipe.

4. Locate joints within 12-inches of posts. Locate expansion joints in rails to also coincide with expansion joints in the structural walls and floors that support the railings.

G. Setting Posts:

1. Embedded:

   a. Clean dust and foreign matter from sleeves or blockouts.
   b. Moisten interior of hole and surrounding surface with clean water.
   c. Brace railing until grout sets.

2. Surface Mounted:

   a. The post bolted baseplate connectors shall sit solidly on concrete, stair stringer, or other material as shown on the Drawings. The use of shims, wedges, grout, etc. for handrail post alignment or any other reason will not be permitted.

   b. The handrail posts shall be furnished longer than needed and then accurately measured in the field for correct length, cut and secured to the post baseplate connector as shown on the Drawings.

H. Posts and Rails:

1. Set posts plumb and aligned to within 1/8-inch in 12-feet.

2. Set rails horizontal or parallel to rake of steps to within 1/8-inch in 12-feet.

3. Posts and rails shall be all in the same plane. There shall be no projections or irregularities to present a hazard or prevent a user from sliding his hand continuously along the top rail.

I. Handrail Wall Brackets: Support wall rails on brackets, spaced not more than 6-feet on centers. Provide in-wall anchor backplates on solid blocking on stud walls.

J. Toeboard: Toeboards shall be accurately measured in the field for correct length (after handrail post installation), cut and secured to posts as shown on the Drawings. Provide toeboards at all handrails except where concrete curbs are furnished.

K. Handrail Gate: The handrail gate shall be installed to meet safety requirements.

L. Cleaning:

1. Wash thoroughly using clean water and soap. Rinse with clean water.

2. Do not use acid solution, steel wool, or other harsh abrasive.

3. If stain remains after washing, restore in accordance with recommendations of manufacturer, or replace handrails with an acceptable finish.

3.4 CLEANUP

A. Upon completion of installing the handrails and railings, clean up all waste materials and debris resulting from this operation and dispose of such waste materials and debris off the site.

END OF SECTION

SECTION 05 59 33

SECURITY STEEL PICKET GATES WITH PERFORATED PANEL

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Furnish and install security steel gates with perforated panel as indicated on the drawings and specified.

B. In lieu of the factory applied finish coating specified herein, the Contractor may apply the finish coating in the field after installation, primer and two coats of industrial enamel.

1.3 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.4 ACTION SUBMITTALS

A. Product Data: Submit descriptive information.

B. Shop Drawings: For gates. Include plans, elevations, sections, details, and attachments to other work.

1.5 CLOSEOUT SUBMITTALS

A. Maintenance Data: Include in maintenance manuals.

PART 2 - PRODUCTS

2.1 SECURITY STEEL PICKET GATES WITH PANEL

A. Manufacturers: Subject to review by the Architect for compliance with requirements, provide products by one of the following or an Architect evaluated, accepted and approved substitution:

1. Iron Eagle Industries, Inc.
3. Iron World Manufacturing, LLC.
4. Master Halco.
5. Merchants Metals.
6. Virginia Railing and Gates, LLC.
7. Xcel Fence.
8. Any member in good standing of the American Fence Association.

B. Pickets: Provide galvanized square steel tubular members manufactured per ASTM A-924/A-924M, having a 45,000 psi (310 MPa) yield strength and hot-dip galvanized per ASTM A653/A653M with a G90 zinc coating, 0.90 oz/ft2 (0.27 kg/M2. Secure each picket to each rail with 1/4” (6 mm) industrial drive rivets, size number 4.

C. Rails: Provide minimum 11 gauge, 0.120” (3.05mm) thick galvanized steel “U” channel per ASTM A-653/A-653M, having a 50,000 psi (344 MPa) yield strength and G90 zinc coating, 0.90

oz/fl2 (o.27 kg/M2). Punch rails to receive pickets and rivets and attach rails to rail brackets with 2 each, 1/4" (6 mm) industrial drive rivets.

D. Posts shall be made of galvanized steel tube, galvanized inside and outside, produced per ASTM A-653/653M -G90 zinc coating, 0.90 oz/fl2 (o.27 kg/M2), steel to have 45,000 psi (310 MPa) yield strength.

E. Finish coatings shall be as standard with the fence manufacturer, comply with the standards of the Master Painters Institute (MPI), and meeting the performance requirements for each quality characteristics shown below:

COATING PERFORMANCE REQUIREMENTS

Quality Characteristics	ASTM Test Method	Performance Requirements
Adhesion	D3359 – Method B	Adhesion (Retention of Coating) over 90% of test area (Tape and knife
Corrosion Resistance	B117 & D1654	Corrosion resistance over 3,500 hours (Scribes per D1654; Failure mode is accumulation or 1/8" coating loss from scribe or medium #8 blisters).
Impact Resistance	D2794	60 inch pound Impact Resistance. (Forward impact using 0.625 ball).
Weathering Resistance	D822, D2244, & D523 (600 Angle Method)	Weathering Resistance over 1,000 hours (Failure mode is 60% loss of gloss or color variance of more than 3.0 delta-E color units).

F. Colors shall be as selected by the Architect.

2.2 PERFORATED SHEET METAL PANELS

A. Subject to evaluation by the Architect of action submittals for compliance with requirements, perforated metal sheets shall be the product named on the drawings or an approved substitution by one of the following:

1. McNichols Co.
2. Valco Precision works.
3. Continental Industries.
4. Krieger Specialty Products.
5. Advantage Metal Services.
6. Any member in good standing of the Fabricators & Manufacturer's Association or the National Association of Architectural Metal Manufacturers.

B. Steel Sheet: Uncoated, cold-rolled, ASTM A 1008/A 1008M, commercial steel, exposed or electrolytic zinc-coated, ASTM A 879/A 879M, with steel sheet substrate complying with ASTM A 1008/A 1008M, commercial steel, exposed, or material equal in serviceability or visual properties that is standard with the fabricator of the steel sheet.

2.3 SWINGING GATES

A. Equip swing gates with hardware that complies with the City Building Code. Provide gussets and braces to prevent wracking out of square. Gates shall always be operable from the inside by simple turn of a lever (When not intentionally locked). The inside lever shall be protected from unwanted intrusion by steel shields and plates. The outside lever shall be pinned.

B. Hinges: Heavy-duty ball and socket, offset type.

C. Provide ANSI Security Level 5 lockset operable with bitted key having protected front, two cylinders (one cylinder each side), latch bolt retracted by lever from either side, as manufactured by Schlage, Sargent, Marks, or equal. Equip cylinders with hardened guard rings.

D. Panic Hardware: Exit Device, Exit Only -- Exit device shall be rim exit only function with 3/4 inch latches bolt, dogging device and a stainless steel touch pad. Furnish standard Allen-type dogging key with suitable hole for key ring. The exit device shall be as manufactured by.Corbin/Russwin, Precision, Sargent, Von Duprin, Dorma Detex, or equal.

1. Key all locks to the Owner’s keying system. Furnish four change keys to the Owner.

E. Frame Construction: All welded framing with welded joints ground smooth.

1. Brace gate frames with truss rods or gusset plates to prevent racking.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install gates according to manufacturer's written instructions, level, plumb, and secure for full opening without interference. Secure hardware using tamper-resistant or concealed means. Adjust hardware for smooth operation and lubricate where necessary.

B. Adjust gates to operate smoothly, easily, and quietly, free of binding, warp, excessive deflection, distortion, nonalignment, misplacement, disruption, or malfunction, throughout entire operational range. Confirm that latches and locks engage accurately and securely without forcing or binding.

END OF SECTION

SECTION 06 10 00

ROUGH FRAMING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Furnish and perform rough framing as indicated on the drawings and specified, including the following:

1. Wood blocking, and nailers.
2. Plywood backing panels.

1.3 DEFINITIONS

A. Lumber grading agencies, and the abbreviations used to reference them, include the following:

1. NeLMA: Northeastern Lumber Manufacturers' Association.
2. NHLA: National Hardwood Lumber Association.
3. NLGA: National Lumber Grades Authority.
4. SPIB: The Southern Pine Inspection Bureau.
5. WCLIB: West Coast Lumber Inspection Bureau.
6. WWPA: Western Wood Products Association.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.

1. Include data for wood-preservative treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Indicate type of preservative used and net amount of preservative retained.

2. Include data for fire-retardant treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Include physical properties of treated materials based on testing by a qualified independent testing agency.

3. For fire-retardant treatments, include physical properties of treated lumber both before and after exposure to elevated temperatures, based on testing by a qualified independent testing agency according to ASTM D 5664.

4. For products receiving a waterborne treatment, include statement that moisture content of treated materials was reduced to levels specified before shipment to Project site.

5. Include copies of warranties from chemical treatment manufacturers for each type of treatment.

PART 2 - PRODUCTS

2.1 WOOD PRODUCTS, GENERAL

A. Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, provide lumber that complies with the applicable rules of any rules-writing agency certified by the ALSC Board of Review. Provide lumber graded by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated.

1. Factory mark each piece of lumber with grade stamp of grading agency.

2. For exposed lumber indicated to receive a stained or natural finish, mark grade stamp on end or back of each piece or omit grade stamp and provide certificates of grade compliance issued by grading agency.

3. Where nominal sizes are indicated, provide actual sizes required by DOC PS 20 for moisture content specified. Where actual sizes are indicated, they are minimum dressed sizes for dry lumber.

4. Provide dressed lumber, S4S, unless otherwise indicated.

B. Maximum Moisture Content of Lumber: 19 percent.

2.2 WOOD-PRESERVATIVE-TREATED MATERIALS

A. Preservative Treatment by Pressure Process: AWPA U1; Use Category UC2 for interior construction not in contact with the ground, Use Category UC3b for exterior construction not in contact with the ground, and Use Category UC4a for items in contact with the ground.

1. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium. Do not use inorganic boron (SBX) for sill plates.

2. For exposed items indicated to receive a stained or natural finish, use chemical formulations that do not require incising, contain colorants, bleed through, or otherwise adversely affect finishes.

B. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. Do not use material that is warped or does not comply with requirements for untreated material.

C. Mark lumber with treatment quality mark of an inspection agency approved by the ALSC Board of Review.

1. For exposed lumber indicated to receive a stained or natural finish, mark end or back of each piece or omit marking and provide certificates of treatment compliance issued by inspection agency.

D. Application: Treat all miscellaneous carpentry unless otherwise indicated. items indicated on Drawings, and the following:

1. Wood cants, nailers, curbs, equipment support bases, blocking, stripping, and similar members in connection with roofing, flashing, vapor barriers, and waterproofing.

2. Wood sills, sleepers, blocking, furring, stripping, and similar concealed members in contact with masonry or concrete.

3. Wood framing and furring attached directly to the interior of below-grade exterior masonry or concrete walls.

4. Wood framing members that are less than 18 inches (460 mm) above the ground in crawl spaces or unexcavated areas.

5. Wood floor plates that are installed over concrete slabs-on-grade.

2.3 FIRE-RETARDANT-TREATED MATERIALS

A. General: Where fire-retardant-treated materials are indicated, use materials complying with requirements in this article, that are acceptable to authorities having jurisdiction, and with fire-test-response characteristics specified as determined by testing identical products per test method indicated by a qualified testing agency.

B. Fire-Retardant-Treated Lumber and Plywood by Pressure Process: Products with a flame spread index of 25 or less when tested according to ASTM E 84, and with no evidence of significant progressive combustion when the test is extended an additional 20 minutes, and with the flame front not extending more than 10.5 feet (3.2 m) beyond the centerline of the burners at any time during the test.

1. Use treatment that does not promote corrosion of metal fasteners.

2. Exterior Type: Treated materials shall comply with requirements specified above for fire-retardant-treated lumber and plywood by pressure process after being subjected to accelerated weathering according to ASTM D 2898. Use for exterior locations and where indicated.

3. Interior Type A: Treated materials shall have a moisture content of 28 percent or less when tested according to ASTM D 3201 at 92 percent relative humidity. Use where exterior type is not indicated.

4. Design Value Adjustment Factors: Treated lumber shall be tested according ASTM D 5664, and design value adjustment factors shall be calculated according to ASTM D 6841.

C. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. Kiln-dry plywood after treatment to a maximum moisture content of 15 percent.

D. Identify fire-retardant-treated wood with appropriate classification marking of testing and inspecting agency acceptable to authorities having jurisdiction.

1. For exposed lumber indicated to receive a stained or natural finish, mark end or back of each piece or omit marking and provide certificates of treatment compliance issued by inspection agency.

E. For exposed items indicated to receive a stained or natural finish, use chemical formulations that do not bleed through, contain colorants, or otherwise adversely affect finishes.

F. Application: Treat all miscellaneous carpentry unless otherwise indicated. items indicated on Drawings, and the following:

1. Framing for raised platforms.

2. Concealed blocking.

3. Roof framing and blocking.

4. Wood cants, nailers, curbs, equipment support bases, blocking, and similar members in connection with roofing.

5. Plywood backing panels.

2.4 MISCELLANEOUS LUMBER

A. General: Provide miscellaneous lumber indicated and lumber for support or attachment of other construction, including the following:

1. Blocking.
2. Nailers.
3. Furring.
4. Grounds.

B. For items of dimension lumber size, provide Construction or No. 2 grade lumber and any of the following species:

1. Hem-fir (north); NLGA.
2. Mixed southern pine; SPIB.
3. Spruce-pine-fir; NLGA.
4. Hem-fir; WCLIB or WWPA.
5. Spruce-pine-fir (south); NeLMA, WCLIB, or WWPA.
6. Western woods; WCLIB or WWPA.
7. Northern species; NLGA.
8. Eastern softwoods; NeLMA.

C. For concealed boards, provide lumber with 15 percent maximum moisture content and any of the following species and grades:

1. Mixed southern pine, No. 2 or No. 3 grade; SPIB.

2. Hem-fir or hem-fir (north), Construction or No. 2 Common grade; NLGA, WCLIB, or WWPA.

3. Spruce-pine-fir (south) or spruce-pine-fir, Construction or No. 2 Common grade; NeLMA, NLGA, WCLIB, or WWPA.

4. Eastern softwoods, No. 2 or No. 3 Common grade; NELMA.

5. Northern species, No. 2 or No. 3 Common grade; NLGA.

6. Western woods, Construction or No. 2 Common grade; WCLIB or WWPA.

D. For blocking not used for attachment of other construction, Utility, Stud, or No. 3 grade lumber of any species may be used provided that it is cut and selected to eliminate defects that will interfere with its attachment and purpose.

E. For blocking and nailers used for attachment of other construction, select and cut lumber to eliminate knots and other defects that will interfere with attachment of other work.

F. For furring strips for installing plywood or hardboard paneling, select boards with no knots capable of producing bent-over nails and damage to paneling.

2.5 PLYWOOD BACKING PANELS

A. Equipment Backing Panels: DOC PS 1, Exterior, C-C Plugged, fire-retardant treated, in thickness indicated or, if not indicated, not less than 1/2-inch (13-mm) nominal thickness.

2.6 FASTENERS

A. General: Provide fasteners of size and type indicated that comply with requirements specified in this article for material and manufacture.

1. Where carpentry is exposed to weather, in ground contact, pressure-preservative treated, or in area of high relative humidity, provide fasteners with hot-dip zinc coating complying with ASTM A 153/A 153M.

B. Nails, Brads, and Staples: ASTM F 1667.

C. Power-Driven Fasteners: NES NER-272.

D. Wood Screws: ASME B18.6.1.

E. Screws for Fastening to Metal Framing: ASTM C 1002 or ASTM C 954, length as recommended by screw manufacturer for material being fastened.

F. Lag Bolts: ASME B18.2.1 (ASME B18.2.3.8M).

G. Bolts: Steel bolts complying with ASTM A 307, Grade A (ASTM F 568M, Property Class 4.6); with ASTM A 563 (ASTM A 563M) hex nuts and, where indicated, flat washers.

H. Expansion Anchors: Anchor bolt and sleeve assembly of material indicated below with capability to sustain, without failure, a load equal to 6 times the load imposed when installed in unit masonry assemblies and equal to 4 times the load imposed when installed in concrete as determined by testing per ASTM E 488 conducted by a qualified independent testing and inspecting agency.

1. Material: Carbon-steel components, zinc plated to comply with ASTM B 633, Class Fe/Zn 5.

2. Material: Stainless steel with bolts and nuts complying with ASTM F 593 and ASTM F 594, Alloy Group 1 or 2 (ASTM F 738M and ASTM F 836M, Grade A1 or A4).

2.7 METAL FRAMING ANCHORS

A. Galvanized-Steel Sheet: Hot-dip, zinc-coated steel sheet complying with ASTM A 653/A 653M, G60 (Z180) coating designation.

1. Use for interior locations unless otherwise indicated.

B. Hot-Dip Heavy-Galvanized Steel Sheet: ASTM A 653/A 653M; Structural Steel (SS), high-strength low-alloy steel Type A (HSLAS Type A), or high-strength low-alloy steel Type B (HSLAS Type B); G185 (Z550) coating designation; and not less than 0.036 inch (0.9 mm) thick.

1. Use for wood-preservative-treated lumber and where indicated.

C. Stainless-Steel Sheet: ASTM A 666, Type 304.

1. Use for exterior locations and where indicated.

2.8 MISCELLANEOUS MATERIALS

A. Adhesives for Gluing Furring and Sleepers to Concrete or Masonry: Formulation complying with ASTM D 3498 that is approved for use indicated by adhesive manufacturer.

1. Adhesives shall have a VOC content of 70 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

2. Adhesives shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

B. Flexible Flashing: Composite, self-adhesive, flashing product consisting of a pliable, butyl rubber or rubberized-asphalt compound, bonded to a high-density polyethylene film, aluminum foil, or spunbonded polyolefin to produce an overall thickness of not less than 0.025 inch (0.6 mm).

PART 3 - EXECUTION

3.1 INSTALLATION

A. Set carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit carpentry to other construction; scribe and cope as needed for accurate fit. Locate furring, nailers, blocking, grounds, and similar supports to comply with requirements for attaching other construction.

B. Where wood-preservative-treated lumber is installed adjacent to metal decking, install continuous flexible flashing separator between wood and metal decking.

C. Framing Standard: Comply with AF&PA's WCD 1, "Details for Conventional Wood Frame Construction," unless otherwise indicated.

D. Install plywood backing panels by fastening to studs; coordinate locations with utilities requiring backing panels. Install fire-retardant treated plywood backing panels with classification marking of testing agency exposed to view.

E. Metal Framing Anchors: Install metal framing anchors to comply with manufacturer's written instructions. Install fasteners through each fastener hole.

F. Do not splice structural members between supports unless otherwise indicated.

G. Provide blocking and framing as indicated and as required to support facing materials, fixtures, specialty items, and trim.

1. Provide metal clips for fastening gypsum board or lath at corners and intersections where framing or blocking does not provide a surface for fastening edges of panels. Space clips not more than 16 inches (406 mm) o.c.

H. Provide fire blocking in furred spaces, stud spaces, and other concealed cavities as indicated and as follows:

1. Fire block furred spaces of walls, at each floor level, at ceiling, and at not more than 96 inches (2438 mm) o.c. with solid wood blocking or noncombustible materials accurately fitted to close furred spaces.

2. Fire block concealed spaces of wood-framed walls and partitions at each floor level, at ceiling line of top story, and at not more than 96 inches (2438 mm) o.c. Where fire blocking is not inherent in framing system used, provide closely fitted solid wood blocks of same width as framing members and 2-inch nominal (38-mm actual) thickness.

3. Fire block concealed spaces between floor sleepers with same material as sleepers to limit concealed spaces to not more than 100 sq. ft. (9.3 sq. m) and to solidly fill space below partitions.

4. Fire block concealed spaces behind combustible cornices and exterior trim at not more than 20 feet (6 m) o.c.

I. Sort and select lumber so that natural characteristics will not interfere with installation or with fastening other materials to lumber. Do not use materials with defects that interfere with function of member or pieces that are too small to use with minimum number of joints or optimum joint arrangement.

J. Comply with AWPA M4 for applying field treatment to cut surfaces of preservative-treated lumber.

1. Use inorganic boron for items that are continuously protected from liquid water.

2. Use copper naphthenate for items not continuously protected from liquid water.

K. Securely attach carpentry work to substrate by anchoring and fastening as indicated, complying with the following:

1. NES NER-272 for power-driven fasteners.

2. Table 2304.9.1, "Fastening Schedule," in ICC's International Building Code.

L. Use steel common nails unless otherwise indicated. Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting wood. Drive nails snug but do not countersink nail heads unless otherwise indicated.

3.2 WOOD GROUND, BLOCKING, AND NAILER INSTALLATION

A. Install where indicated and where required for screeding or attaching other work. Form to shapes indicated and cut as required for true line and level of attached work. Coordinate locations with other work involved.

B. Attach items to substrates to support applied loading. Recess bolts and nuts flush with surfaces unless otherwise indicated.

C. Provide permanent grounds of dressed, pressure-preservative-treated, key-beveled lumber not less than 1-1/2 inches (38 mm) wide and of thickness required to bring face of ground to exact thickness of finish material. Remove temporary grounds when no longer required.

3.3 WOOD FURRING INSTALLATION

A. Install level and plumb with closure strips at edges and openings. Shim with wood as required for tolerance of finish work.

B. Furring to Receive Plywood or Hardboard Paneling: Install 1-by-3-inch nominal-size (19-by-63-mm actual-size) furring horizontally and vertically at 24 inches (610 mm) o.c.

C. Furring to Receive Gypsum Board or Plaster Lath: Install 1-by-2-inch nominal-size (19-by-38-mm actual-size) furring vertically at 16 inches (406 mm) o.c.

3.4 PROTECTION

A. Protect wood that has been treated with inorganic boron (SBX) from weather. If, despite protection, inorganic boron-treated wood becomes wet, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.

B. Protect miscellaneous rough carpentry from weather. If, despite protection, miscellaneous rough carpentry becomes wet, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.

END OF SECTION

SECTION 06 16 51

GLASS FIBER SURFACED GYPSUM (DENSGLAS) SHEATHING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Furnish and install glass fiber surfaced gypsum (Densglas) sheathing as indicated on the drawings and specified.

B. Submit product data for the gypsum sheathing. Include certificates of compliance and installation instructions.

PART 2 - PRODUCTS

2.1 GLASS FIBER SURFACED GYPSUM (DENSGLAS) SHEATHING

A. Provide exterior grade glass fiber surfaced gypsum sheathing board consisting of noncombustible gypsum core incorporating a water-resistant material, surfaced on face and back with inorganic glass fiber mats, and with unsurfaced square edges; complying with ASTM C79, and requirements indicated below:

1. Type: Type X.
2. Thickness: As indicated on the drawings.

B. Products: Subject to compliance with specified requirements, provide "Dens-Glass" or "Dens-Glass Gold by Georgia-Pacific Corp., or equal.

C. Infiltration barrier shall be as recommended by the Waterproofing Consultant.

D. Fasteners: As recommended by the Waterproofing Consultant.

E. Sealant: Provide solvent-release-curing joint sealant compatible with joint substrates formed by gypsum sheathing and other related materials.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Comply with manufacturer's instructions, and GA 252. Cover gypsum board sheathing with air infiltration barrier in two layers.

END OF SECTION

SECTION 06 20 00

FINISH CARPENTRY AND ARCHITECTURAL WOODWORK

PART 1 GENERAL

*1.1 DESCRIPTION

A. Install wood, nails, screws, hardware and accessories and other items as needed, and perform finish carpentry for the construction shown on the Contract Drawings, as specified herein, and as needed for a complete and proper installation.

1.2 QUALITY ASSURANCE

A. Workmanship: All work of this Section to be manufactured and constructed, assembled and installed by skilled craft persons in finish carpentry in compliance with Woodwork Institute (W.I.) construction types and grades hereinafter specified and detailed on the Contract Documents. All such work to be accurately fabricated, assembled, joined and expertly finished in accordance with measurements taken on the job-site. Manufacturer must regularly engage in the manufacture of similar items and with a history of successful production acceptable to the City. Manufacturer must provide evidence demonstrating that they are members of WI and they can issue WI certified Compliance Certificates or they have arranged for Inspection by a WI Inspector.

B. Defective Work: All work, work not true to line, not in satisfactory operating condition, improperly installed, damaged or marred will not be accepted. Remedy, remove or replace defective work as directed by the City Engineer subject to his approval at no cost to the City.

C. Standards: All applicable Sections of the "Manual of Mill work" and current supplements published by the Woodwork Institute (W.I.) for the construction types and grades hereinafter specified. All modifications to such standards shown on the Contract Drawings and approved Shop Drawings or specified shall govern.

D. Certification: Before delivery to the job-site, Manufacturer shall issue a W.I. Certified Compliance Certificate indicating that woodwork to be furnished for this project will fully meet all specified requirements of W.I. grades.

1. All mill work or wood work shall bear the W.I. Certified Compliance Label indicating they meet the requirements of the W.I. grade specified.

E. Shop Inspection: To assure quality as specified, the Consultant or City Engineer may inspect work in the process of the manufacturing or the finished casework prior to delivery and installation to assure quality of work.

1.3 GENERAL REQUIREMENTS

A. Submittals: Comply with provisions in the SUBMITTALS Section 01340 in DIVISION 1 - GENERAL REQUIREMENTS of these Specifications. Submit shop drawings, manufacturer's technical data and material specifications and samples as applicable, for all products specified herein for City Engineer's review prior to start of work of this Section.

B. Verification of Job Conditions: Required and take field measurements as may be required. Coordinate with other trade for the locations of the backing and supports.

Inspect all backings and supports with the Inspector prior to covering the walls. Report to the City Engineer or Consultant any discrepancies between the Drawings and job-site conditions, and wait for further instructions. Show recorded measurements on final shop drawings.

C. Coordination and Cooperation: Do work of this Section in a fully coordinated and cooperative manner with work of other trades to provide complete and proper installation and to expedite the job without delays.

D. Defective Work: All work of this Section that is not set true to line, plane and elevation or is damaged or marred or is not in a condition to receive other trade work will not be accepted. Remedy, remove or replace defective work as directed by the City Engineer or Consultant, at no added cost to the City.

E. Priming and Backpainting: Priming and backpainting of all carpentry and millwork is specified in Section 099000 - PAINTING. Do not set items until priming and backpainting have been completed.

F. Protection: Protect all work against damage of any kind until final acceptance of the building. Repair or replace damaged work to the satisfaction of the City Engineer without additional cost to the City.

G. When Contract Drawings require finish carpentry to match existing trim base, etc., new work is to conform to the dimensions, profile, proportions, design, stain and finish of existing material. Shop Drawings are required for review by the Consultant or City Engineer.

1.4 SUBMITTALS

A. Shop Drawings: Submit shop drawings of all woodwork indicating materials and hardware, details of construction, dimensions, methods of fastening and erection details. Shop Drawings shall bear a W.I. certified compliance label indicating that Drawings fully meet the requirement of the W.I. grade specified. Shop Drawings shall indicate all grounds, backing, blocking, sleepers, steel support, utility penetration, mechanical and electrical items, and other items required for the installation of wood work which are to be provided and installed by other as part of the structure. Coordinate with other trades and submit any information pertinent to the work. City Engineer may with hold the review of the submittal until such information is received by the City Engineer.

B. Sample:

1. Submit 2" x 3" plastic laminate chips bearing the manufacturer’s name, color pattern or texture designations.

2. Submit to the City Engineer (4) samples of each type of wood finish, complete data or manufacturer’s full range of colors, patterns and textures.

C. Manufacturer’s Recommended Installation Procedures: Such submitted procedures approved by the City Engineer will become the basis for City Engineer’s or Consultant’s acceptance or rejection of actual installation procedures used on the work of this Section.

D. Qualification data for firms and persons specified in “Quality Assurance” article to demonstrate their capabilities and experience. Include list of completed projects with project names, addresses, architect’s and owner’s names and other information specified.

1.5. DELIVERY, STORAGE AND HANDLING:

A. No fabrication, finishing or installation shall be performed until Shop and Erection Drawings and finish samples have been reviewed by the City Engineer or Consultant. Delivery shall be as required by a progress schedule furnished by the Contractor.

B. Defer delivery to the job until the installation and storage areas are complete and dry of all wet-type construction.

C. Provide and maintain relative humidity in storage areas not to exceed 60 percent at 60° to 90° F and protected from extreme changes in temperature and humidity or direct sunlight. EMC (Equilibrium Moisture Content) conditions shall be maintained between 8% and 12%. For wall surfacing, all wood millwork shall be acclimated to these conditions for 72 hours prior to installation.

D. Protect all surfaces of work subject to damage while in transit.

E. Identification: All wood work delivered to the job-site for installation shall be properly identified as to where they are to be located in the structure.

F. Store flat on level surface in clean, dry, well-ventilated area, protected from sunlight. Cover to keep clean, but permit air circulation.

PART 2 - PRODUCTS

2.1 MATERIALS

A. General: Provide materials in the quantities needed for the work shown on the Contract Drawings and meeting or exceeding the following standards of quality:

B. Lumber shall be in accordance with WIC Section 3 and the WI Custom Grade, with a moisture content of 12 percent.

C. Plywood shall be in accordance with WI Section 4 and the WI Custom Grade.

D. Performance and fabrication shall comply to Custom Grade, First Class Workmanship, as defined by WI MANUAL OF MILLWORK.

2.2 OTHER MATERIALS

A. Provide other materials, not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the reviewed by the City Engineer or Consultant.

1. Glue: Type I as suitable for required joining; water-resistant where subject to moisture conditions.

2. Reinforced Building Paper: Sisalkraft; the Sisalkraft Company, Chicago, Illinois.

3. Stock Framing Connectors and Brackets: Simpson, Teco or Trimfast, galvanized metal of types and sizes indicated or required. Use nails furnished by the connector manufacturer.

4. Nails: Use finish nails for finish carpentry and millwork, all nails shall be filled or plugged.

5. Fasteners used at wood or metal stud walls shall be a minimum #14x3" phillips truss head, type 17 hard, zinc plated, self taping, full thread screw there shall be at least 4 fasteners attaching each shelving to the wall.

6. Plastic Laminate: See High Pressure laminate NEMA 2D-3, Section 15 - CASEWORK HPL and Section 16 - COUNTER TOP - LAMINATED PLASTIC of WI.

PART 3 - EXECUTION

3.1 GENERAL

A. Surface Conditions:

1. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until detrimental conditions are corrected.

2. It shall be the responsibility of the contractor to coordinate and furnish all structural members, blocking, backing, furring brackets, or other anchorage required for the millwork installation which becomes an integral part of the walls, floors or ceilings.

B. Material:

1. Material shall be of the Species and WI Custom Grade specified and fabricated from solid stock.

2. Knots and other wood characteristics shall not exceed size limits defined in WI Sections 3 and 4.

C. Workmanship

1. Produce joints which are true, tight and well connected by nails and screws with all members assembled in accordance with the Drawings.

   Open joints, visible madime marks, cross sanding, tears, nicks, chips and/or scratches are not permitted.

2. Jointing:

   a. Make joints to conceal shrinkage; miter exterior joints; cope interior joints; miter or scarf end-to-end joints.

   b. Install trim in pieces as long as possible, jointing only where solid support is obtained.

D. Fastening:

1. Install items straight, true, level, plumb, and firmly anchored in place.

2. Where blocking or backing is required, coordinate as necessary with other trades to ensure placement of required backing and blocking in a timely manner.

3. Nail trim with finish nails of proper dimension to hold the member firmly in place without splitting the wood.

4. Nail exterior trim with galvanized nails, making joints to exclude water and setting in waterproof glue or the sealant.

5. All nails at exposed and semi-exposed surfaces shall be filled or plugged.

6. Screw, do not drive wood screws; except that screws may be started by driving and then screwed home.

7. Nailing, Screwing and Bolting: Conform to provisions of the with the Los Angeles City Building Code, Table 25-Q of Division 25 as applicable to Finish Carpentry. All screws or fasteners shall be concealed or countersunk plugged.

E. Assembly and Installation:

1. Assemble all millwork at the mill as far as practicable when size and design permits, and deliver to building ready to set in place. Work material in the best manner known to the trade, mortise and tenon, dowel, block, and glue together so as to avoid the use of nails as much as possible. Follow detail closely, cut moldings cleanly and define sharply and make miters accurately. Butt joints without an approved device for preventing the separation of the joint will not be accepted. Set all nails, and where screws are used in exposed and semi exposed surfaces, conceal with wood plugs.

2. All work shall be installed level or plumb within tolerance specified by WI.

END OF SECTION

SECTION 07 13 26

UNDER SLAB AND BELOW GRADE WATERPROOFING MEMBRANES (HDPE)
FOR CAST-IN-PLACE CONCRETE

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Furnish and install under slab and below grade wall waterproofing membranes (HDPE) for cast-in-place concrete as indicated on the drawings and specified.

1.3 SUBMITTALS

A. Product Data: Submit manufacturer's product data including installation instructions.

B. Samples: Submit samples, not less than 12 inches square, of each type of the under slab waterproofing membrane, mounted on plywood.

C Qualifications of Installer: Submit a certificate, prepared by the waterproofing system manufacturer, stating waterproofing applicator is certified by the waterproofing material manufacturer and, upon completion, submit a certificate stating that waterproofing systems have been installed in conformance with reviewed submittals and manufacturer's recommendations.

1.4 QUALITY ASSURANCE

A. Qualifications of Manufacturer: Sheet membrane waterproofing system shall be manufactured by a firm with a minimum of 5 years experience in the production of under slab sheet membrane waterproofing.

B. Qualifications of Installer: A firm which has at least 3 years experience in work of the type required by this section, and is recommended by manufacturer to install the specified products.

C. Pre-Installation Conference and Inspection: After review of submittals but before starting installation of the Work of this section, conduct a meeting at the Project site attended by the individual who will be responsible for placement of the concrete slab, and the waterproofing applicator. Coordinate placement of concrete with the application of the waterproof membrane.

D. Materials shall comply with current State of California and the South Coast Air Quality Management District (SCAQMD) requirements for volatile organic compounds.

1.5 WARRANTY

A. Installer shall provide a 5 year labor warranty.

B. Manufacturer shall provide a 5 year material warranty.

PART 2 PRODUCTS

2.1 PROPRITARY, HIGH DENSITY POLYETHYLENE (HDPE) COMPOSITE MEMBRANE

A. Subject to compliance with specified requirements, the under slab waterproofing membrane shall be Preprufe 300 and the vertical below grade wall membrane shall be Preprufe R160R by Grace Construction Products, no known equal.

B. The waterproofing membrane shall be comprised of multi-layered composite sheets consisting of the following:

1. The outer layer shall be a high density polyethylene (HDPE) film.

2. The middle layer shall be a highly aggressive pressure sensitive adhesive. It shall be soft and conformable to assist in developing the mechanical bond to concrete. It also shall provide self-adhesive side laps.

3. The inner layer which comes in direct contact with the concrete shall be a specially formulated reflective white coating. It shall be designed to protect the membrane from weather and sunlight for up to 30 days before the concrete is poured. It shall also work with the middle layer to bond with the concrete.

C. The waterproofing membranes shall be designed to form a continuous mechanical bond between the membrane and the concrete structure. The bond is created at the microscopic level when the liquid concrete becomes interlocked with the conformable pressure sensitive adhesive and the protective coating layers of the membrane. When the concrete is poured, the membrane shall immediately conform to the tiny ridges and crevices which are present at the interface of the membrane and concrete.

D. The continuous mechanical bond becomes tenacious when the concrete hardens. The result shall be a membrane that forms such an effective bond that it prevents water migration between the membrane and the concrete.

E. Accessory materials shall be types recommended by the manufacturer for installation with specified HDPE membrane sheet.

PART 3 EXECUTION

3.1 INSTALLATION

A. Install the under slab waterproofing membrane as recommended by its manufacturer. Upon completion, the membrane shall be watertight.

END OF SECTION

SECTION 07 13 66

SPRAY APPLIED VAPOR BARRIER (LIQUID BOOT)

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Furnish and install spray applied vapor barrier as indicated on the drawings and specified.

1.3 QUALITY ASSURANCE

A. Vapor barrier contractor/applicator shall be trained and approved by waterproof membrane manufacturer, Mineral Technologies, Inc. or equal.

B. A pre-installation conference shall be held prior to application of waterproof membrane to assure proper substrate and installation conditions, to include contractor, applicator, architect/engineer and special inspector (if any).

1.4 ACTION SUBMITTALS

A. Project Data - Submit manufacturer's product data and installation instructions for specific application.

B. Samples - Submit representative samples of the following for approval:

1. Waterproof membrane material.
2. Protection Board and/or Protection Mat.
3. Geotextiles.

1.5 DELIVERY, STORAGE AND HANDLING -

A. Deliver materials to site in original unbroken packages bearing manufacturer's label showing brand, weight, volume and batch number. Store materials at site in strict compliance with manufacturer's instructions. Do not allow materials to freeze in containers.

1.6 JOB CONDITIONS

A. Protect all adjacent areas not to be waterproofed. Where necessary, apply masking to prevent staining of surfaces to remain exposed wherever membrane abuts to other finish surfaces.

B. Perform work only when existing and forecasted weather conditions are within manufacturer's recommendations for the material and product used.

C. Minimum clearance of required for application of product:

1. 90 degree spray wand – 2 feet.
2. Conventional spray wand – 4 feet.

D. Ambient temperature shall be within manufacturer's specifications. (Greater than +32°F/+0°C).

E. All plumbing, electrical, mechanical and structural items to be under or passing through the waterproof membrane shall be positively secured in their proper positions and appropriately protected prior to membrane application.

F. Waterproof membrane shall be installed before placement of reinforcing steel. When not possible, all exposed reinforcing steel shall be masked by General Contractor prior to membrane application.

G. Expansion joints must be filled with a conventional waterproof expansion joint material.

H. Surface preparation shall be per manufacturer's specification.

PART 2 PRODUCTS

2.1 MATERIALS -

A. Spray applied vapor barrier system - Provide LIQUID BOOT; a single course, high build, polymer modified asphaltic emulsion, water borne and spray applied at ambient temperatures. Achieve a minimum thickness of 80 dry mils, unless specified otherwise. Non-toxic and odorless. LIQUID BOOT Trowel Grade has similar properties with greater viscosity and is trowel applied. Manufactured by Mineral Technologies, Inc.

B. Spray applied vapor barrier physical properties:

VAPOR BARRIER	**TEST METHOD**	**VALUE**
Soil Burial	ASTM E154-88	Passed
Water Penetration Rate	ASTM D2434	$<7.75 \times 10^{-9}$ cm/sec
Water Vapor Permeability	ASTM E96	0.24 perms
Water Vapor Transmission	ASTM E96	0.10 grains/h-ft^2
GAS VAPOR MEMBRANE	**TEST METHOD**	**VALUE**
Hydrogen Sulfide Gas Permeability	ASTM D1343	None Detected
Benzene, Toulene, Ethylene, Xylene, Gasoline, Hexane, Perchloroethylene	ASTM D543, D412, D1434 (tested at 20,000 ppm)	Passed in gas permeability and weight change
Sodium Sulfate (2% water solution)	ASTM D543, D412, D143	Passed in gas permeability
Acid Exposure (10% H_2SO_4 for 90 days)	ASTM D543	Less than 1% weight change
Radon Permeability	Tested by US Dept. of Energy	Zero permeability to Radon (222Rn)
Bonded Seam Strength Tests	ASTM D6392	Passed
Micro Organism Resistance (Soil Burial) average weight change, average tensile strength change, average tensile stress change, average elongation change, bonded seams, methane permeability	ASTM D4068-88	Passed
Methane Permeability	ASTM 1434-82	Passed
Oil Resistance Test average weight change, average tensile strength change, average tensile stress change, average elongation change, bonded seams, methane permeability	ASTM D543-87	Passed

Heat Aging average tensile strength change, average tensile stress change, average elongation change, bonded seams	ASTM D4068-88	Passed
Dead Load Seam Strength	Redwood City	Passed
Environmental Stress-Cracking	ASTM D1693-78	Passed
POTABLE WATER	**TEST METHOD**	**VALUE**
Toxicity Test	22 CCR 66696	Passed. CCR Bioassay—
Potable Water Containment	ANSI/NSF 61	NSF Certified for tanks >300,000 gallons
GENERAL INFORMATION	**TEST METHOD**	**VALUE**
Coefficient of Friction (with geotextile both sides)	ASTM D5321	0.72
Cold Bend Test	ASTM D146	Passed. No cracking at –25°F
Freeze-Thaw Resistance (100 Cycles)	ASTM A742	Meets criteria. No spalling or disbondment
Accelerated Weathering and Ultraviolet Exposure	ASTM D822	No adverse effect after 500 hours
Hydrostatic Head Resistance	ASTM D751	Tested to 138 feet or 60 p.s.i
Elongation	ASTM D412	1,332% without reinforcement, 90% recovery
Elongation with 8oz. non-woven geotextile both sides	ASTM D751	100% (same as geotextile tested separately)
Tensile Strength	ASTM D412	58 p.s.i. without reinforcement
Tensile Strength with 8oz. non-woven geotextile both sides	ASTM D751	196 p.s.i. (same as geotextile tested separately)
Tensile Bond Strength to Concrete	ASTM D413	2,556 lbs/ft^2 uplift force
Puncture Resistance with 8oz. non-woven geotextile both sides	ASTM D4833	286 lbs. (travel of probe = 0.756 inches) (same as geotextile tested separately)
Flame Spread	ASTM E108	Class A with top coat (comparable to UL790)
Electric Volume Resistivity	ASTM D257	1.91 x 10^{10} ohms-cm

C. Agency Approvals –

- City of Los Angeles Research Report – RR 24860
  Approved for “LIQUID BOOT Spray Applied Membrane for Below-Grade Vapor barrier”

- United States Navy
  Approved for “LIQUID BOOT for use World Wide to Waterproof Earth-Covered Steel Ammunition Storage”

- County of Kern Environmental Health Services Department
  Approved for “LIQUID BOOT as a Methane Barrier”

- NSF International
  NSF/61 approved for “Potable Water Tank Liner”

- Canadian Construction Materials Board
  Approved for “Vapor barrier and Dampproofing”

- Los Angeles City Department of Public Works
  Approved for “LIQUID BOOT Application as a Methane Gas Barrier”

D. LIQUID BOOT 500

LIQUID BOOT 500 may be used in lieu of LIQUID BOOT where the membrane is not exposed to hydrostatic head pressure. The Agency Approvals above do not apply to LIQUID BOOT 500. The physical properties of LIQUID BOOT 500 are as follows:

VAPOR BARRIER	**TEST METHOD**	**VALUE**
Elongation	ASTM D412	800%
Bond Seam Strength Tests	ASTM D6392	Passed
Methane Permeability	ASTM D1434	None detected
Water Vapor Permeability	ASTM E96	0.18 perms

E. Protection - On vertical surfaces, use: LIQUID BOOT® UltraShield P-100 or other protections as approved by the manufacturer, project architect or engineer.

1. On horizontal surfaces, use: LIQUID BOOT UltraShield P-150 or other protections as approved by the manufacturer, project architect or engineer.

2. All protection materials must be approved by the membrane manufacturer, including the use of the LIQUID BOOT UltraShield products.

F. Cold Joints, Cracks, and Form Tie Holes: Covered with Hardcast CRT 1602 Tape 3" wide.

PART 3 EXECUTION

3.1 EXAMINATION

A. All surfaces to be waterproofed shall be inspected and approved by the applicator at least one day prior to commencing work.

3.2 SURFACE PREPARATION

A. Provide 24 inch minimum clearance out from surfaces to receive the waterproof membrane. The application surface shall be prepared and provided to the applicator in accordance with manufacturer’s specifications listed below:

B. Concrete or Shotcrete Masonry: Concrete surfaces shall be light broom finish or smoother, free of any dirt, debris, loose material, release agents or curing compounds. Fill all voids more than 1/4 inch deep and 1/4 inch wide. Masonry joints, cold joints, and form joints shall be struck smooth.

1. All penetrations shall be prepared in accordance with manufacturer’s specifications. Provide a 3/4 inch minimum cant of LIQUID BOOT, or other suitable material as approved by manufacturer, at all horizontal to vertical transitions and other inside corners of 120° or less. Allow to cure overnight before the application of LIQUID BOOT.

2. All form ties holes must be completely grouted from the inside to outside of wall with non-shrink grout as approved by engineer.

3. All cracks or cold joints greater than 1/16 inch must be completely grouted with non-shrink grout as approved by engineer.

4. Install Hardcast reinforcing tape over all cold joints, cracks and form tie holes (after holes and cracks are grouted).

C. Dirt and Gravel

1. The sub-grade shall be moisture conditioned and compacted to a minimum relative compaction of 90 percent or as specified by civil/geotechnical engineer. The finished surface shall be smooth, uniform, free of debris and standing water. Remove all stones or dirt clods greater than 1/4 inch. (NOTE: Aggregate sub-bases shall be rolled flat). Final sub-grade preparation shall not precede the membrane application by more than 72 hours. All penetrations shall be prepared in accordance with manufacturer's specifications. All form stakes that penetrate the membrane shall be of rebar, which shall be bent over and left in the slab.

2. Trenches shall be cut oversize to accommodate waterproof membrane and protection course with perpendicular to sloped sides and maximum obtainable compaction. Adjoining grade shall be finish graded and compacted. Excavated walls shall be vertical or sloped back, free of roots and protruding rocks. Specific sub-grade preparation shall be designed by a qualified civil or geotechnical engineer.

3 If organic materials with potential for growth (ie: seeds or grasses) exist within the subbase, spray apply soil sterilant at the sterilant manufacturer's recommended rate.

3.3 INSTALLATION ON CONCRETE

A. Provide a 3/4 inch minimum cant of LIQUID BOOT, or other suitable material as approved by manufacturer, at all horizontal to vertical transitions and other inside corners of 120° or less. Allow to cure overnight before the application of LIQUID BOOT.

B. Delineate a test area on site with a minimum dimension of 10 feet by 10 feet (3m by 3m). Apply LIQUID BOOT to a thickness of 80 mils and let it cure for 24 hours. Observe for blisters. If minor or no blistering occurs, proceed to the next step. (See note regarding blisters). If significant blistering does occur, apply a thin (10 mil) tack coat of LIQUID BOOT "A" side without catalyst to the entire concrete surface and allow to cure before proceeding. (See also information regarding blister repair).

C. Spray apply LIQUID BOOT to an 80 mil minimum dry thickness. Increase thickness to 100 dry mils if shotcrete is to be applied directly to membrane. If a second coat is required, remove any standing water from the membrane before proceeding with the second application.

D. Do not penetrate membrane. Keep membrane free of dirt and debris and traffic until a protective cover is in place. It is the responsibility of the General Contractor to insure that the membrane and the protection system are not penetrated.

E. After membrane has cured and checked for proper thickness and flaws, install protection material pursuant to manufacturer's instructions.

1. If water testing or inspection is to be performed, conduct before placing protection course.

2. NON-HORIZONTAL SURFACES: Spray on non-horizontal surfaces should begin at the bottom and work towards the top. This method allows the product to adhere to the surface before hitting catalyst runoff.

3.4 INSTALLATION ON DIRT SURFACES AND AGGREGATE BASE

A. Roll out geotextile on sub-grade with the heat-rolled side facing up. Overlap seams a minimum of six inches (6"). Lay geotextile tight at all inside corners. Spray LIQUID BOOT within the seam overlap to a thickness of 80 mils minimum.

B. Line trenches with geotextile extending at least six inches (6") onto adjoining sub-grade if slab and footings are to be sprayed separately. Overlap seams a minimum of six inches (6"). Lay geotextile tight at all inside corners. Spray LIQUID BOOT within the seam overlap to a thickness of 80 mils minimum.

C. Spray apply LIQUID BOOT onto geotextile to an 80 mil minimum dry thickness. Increase thickness to 100 dry mils if shotcrete is to be applied directly to membrane. If a second coat is required, remove any standing water from the membrane before proceeding with the second application.

D. Do not penetrate membrane. Keep membrane free of dirt, debris and traffic until a protective cover is in place. It is the responsibility of the General Contractor to insure that the membrane and the protection system are not penetrated.

E. After membrane has cured and checked for proper thickness and flaws, install protection material pursuant to manufacturer's instructions. If water testing or inspection is to be performed, conduct before placing protection course.

F. Provide a 3/4 inch minimum cant of LIQUID BOOT, or other suitable material as approved by manufacturer, at all horizontal to vertical transitions and other inside corners of 120° or less. Allow to cure overnight before the application of LIQUID BOOT membrane.

G. Spray apply LIQUID BOOT to a minimum thickness of 80 mils (100 mils if installing shotcrete walls). Remove any standing water.

H. Do not penetrate membrane. Keep membrane free of dirt and debris until concrete is in place. It is the responsibility of the General Contractor to ensure that the membrane and the protection system are not penetrated.

3.5 SEALING AROUND PENETRATIONS

A. Clean all penetrations. All metal penetrations shall be sanded clean with emery cloth.

B. For applications requiring geotextile, roll out geotextile on sub-grade with the heat-rolled side facing up, overlapping seams a minimum of six inches (6"). Cut the geotextile around penetrations so that it lays flat on the sub-grade. Lay geotextile tight at all inside corners. Spray LIQUID BOOT within the seam overlap to a thickness of 80 mils minimum.

C. At the base of penetration Install a minimum 3/4 inch thick membrane cant of LIQUID BOOT, or other suitable material as approved by manufacturer. Extend the membrane at an 80 mil thickness three inches (3") around the base of penetration and up the penetration a minimum of three inches (3"). Allow to cure overnight before the application of LIQUID BOOT membrane.

D. Spray apply LIQUID BOOT to an 80 mils minimum dry thickness around the penetration, completely encapsulating the collar assembly and to a height of one and one half inches (1 1/2") minimum above the membrane as described in 3.03.40 C above. Spray apply LIQUID BOOT to surrounding areas as specified for the particular application. (SEE MANUFACTURER'S STANDARD DETAIL)

F. Allow LIQUID BOOT to cure completely before proceeding to step "G".

G. Wrap penetration with polypropylene cable tie at a point two inches (2") above the base of the penetration. Tighten the cable tie firmly so as to squeeze the cured membrane collar.

3.6 FIELD QUALITY CONTROL -

A. Field Quality Control is a very important part of all LIQUID BOOT applications. Applicators should check their own work for coverage, thickness, and all around good workmanship before calling for inspections.

B. Applicators and Inspectors should check membrane for holes, shadow shrinkage, and any other membrane damage when reviewing the membrane.

C. When thickness or integrity is in question the membrane should be tested in the proper manner as described below. However, over-sampling defeats the intent of inspections. Inspectors should always use visual and tactile measurement to guide them. Areas suspected of being too thin to the touch should be measured with the gauges to determine the exact thickness. With practice and by comparing tactile measurements with those of the gauges, fingers become very accurate tools.

3.7 ON CONCRETE

A. Membrane may be checked for proper thickness with a blunt-nose depth gauge. Record the minimum reading. Mark the test area for repair, if necessary.

B. If necessary, test areas are to be patched over with LIQUID BOOT to an 80 mils minimum dry thickness, extending a minimum of one inch (1") beyond the test perimeter.

3.8 ON DIRT

A. Samples may be cut from the membrane and geotextile sandwich to a maximum area of 2 square inches. Measure the thickness with a mil-reading caliper. Deduct the plain geotextile thickness to determine the thickness of LIQUID BOOT membrane. Mark the test area for repair.

B. Voids left by sampling are to be patched with geotextile overlapping the void by a minimum of two inches (2"). Apply a thin tack coat of LIQUID BOOT under the geotextile patch. Then spray or trowel apply LIQUID BOOT to an 80 mils minimum dry thickness, extending at least three inches (3") beyond geotextile patch.

END OF SECTION

SECTION 07 13 67

MULTI-LAYERED PLASTIC VAPOR BARRIER

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Furnish and install multi-layered plastic vapor barriers as indicated on the drawings and specified.

1.3 REFERENCES

A. American Society for Testing and Materials (ASTM):

1. ASTM E1745- 11Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill Under Concrete Slabs.

2. ASTM E1643- 11Selection, Design, Installation, and Inspection of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete Slabs.

B. Technical Reference – American Concrete Institute (ACI):

1. ACI 302.2R-06 Guide for Concrete Slabs that Receive Moisture-Sensitive Flooring Materials.

1.4 ACTION SUBMITTALS

A. Quality control/assurance: Submit the following:

1. Summary of test results per ASTM E1745.

2. Manufacturer’s samples and literature.

3. Manufacturer’s installation instructions for placement, seaming, penetration repair, and perimeter seal per ASTM E1643.

4. All mandatory ASTM E1745 testing must be performed on a single production roll per ASTM E1745 Section 8.1.

PART 2 - PRODUCTS

2.1 MULTI-LAYERED PLASTIC VAPOR BARRIERS

A. Subject to review of action submittals by the Architect for compliance with specified requirements, provide one of the following products (or equal):

1. Stego Industries, Stego Wrap 15 mil., vapor barrier
2. W.R. Meadows Perminator-HP 15 mil., vapor barrier.
3. Or equal.

B. Vapor Barrier shall have all of the following qualities:

1. Maintain permeance of less than 0.01 Perms [grains/(ft2 · hr · inHg)] as tested in accordance with mandatory conditioning tests per ASTM E1745 Section 7.1 (7.1.1-7.1.5).

2. Other performance criteria:

   a. Strength: ASTM E1745 Class A.
   b. Thickness: 15 mils minimum

3. Provide third part documentation that all testing was performed on a single production roll per ASTM E1745 Section 8.1

PART 3 - EXECUTION

3.1 PREPARATION

A. Ensure that subsoil is approved by Architect or Geotechnical Engineer.

1. Level and compact base material.

3.2 INSTALLATION

A. Install vapor barrier as recommended by the product manufacturer and in accordance ASTM E1643

1. Unroll vapor barrier with the longest dimension parallel with the direction of the concrete placement and face laps away from the expected direction of the placement whenever possible.

2. Extend vapor barrier to the perimeter of the slab. If practicable, terminate it at the top of the slab, otherwise (a) at a point acceptable to the structural engineer or (b) where obstructed by impediments, such as dowels, waterstops, or any other site condition requiring early termination of the vapor barrier.

3. Overlap joints 6 inches and seal with manufacturer’s instructions.

4. Apply tape to a clean and dry vapor barrier.

5. Seal all penetrations (including pipes) per manufacturer’s instructions.

6. Avoid the use of non-permanent stakes driven through vapor barrier.

7. If non-permanent stakes are driven through vapor barrier, repair as recommended by vapor barrier manufacturer.

8. Repair damaged areas with vapor barrier material of similar (or better) permeance, puncture and tensile.

END OF SECTION

SECTION 07 21 07

THERMAL AND ACOUSTICAL INSULATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Furnish and install thermal and acoustical insulation as indicated on the drawings and specified, including the following (as applicable):

1. Glass-fiber board insulation.
2. Mineral-wool board insulation.
3. Glass-fiber blanket insulation.
4. Mineral-wool blanket insulation.
5. Rigid isocyanurate foam insulation board.
6. Vapor retarders.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

B. LEED Submittals:

1. Product Data for Credit MR 4: For products having recycled content, documentation indicating percentages by weight of postconsumer and preconsumer recycled content. Include statement indicating cost for each product having recycled content.

1.4 INFORMATIONAL SUBMITTALS

A. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for each product.

B. Research/Evaluation Reports: For foam-plastic insulation, from ICC-ES.

1.5 QUALITY ASSURANCE

A. Surface-Burning Characteristics: As determined by testing identical products according to ASTM E 84 by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Protect insulation materials from physical damage and from deterioration due to moisture, soiling, and other sources. Store inside and in a dry location. Comply with manufacturer's written instructions for handling, storing, and protecting during installation.

B. Protect foam-plastic board insulation as follows:

1. Do not expose to sunlight except to necessary extent for period of installation and concealment.

2. Protect against ignition at all times. Do not deliver foam-plastic board materials to Project site before installation time.

3. Quickly complete installation and concealment of foam-plastic board insulation in each area of construction.

PART 2 - PRODUCTS

2.1 GLASS-FIBER BOARD INSULATION

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following (or equal):

1. CertainTeed Corporation.
2. Johns Manville.
3. Knauf Insulation.
4. Owens Corning.

B. Recycled Content: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 25 percent.

C. Unfaced, Flexible Glass-Fiber Board Insulation: ASTM C 612, Type IA; ASTM C 553, Types I, II, and III; or ASTM C 665, Type I; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively, per ASTM E 84, passing ASTM E 136 for combustion characteristics.

1. Nominal density of 1.0 lb/cu. ft., thermal resistivity of 3.7 deg F x h x sq. ft./Btu x in. at 75 deg F.

2. Nominal density of not less than 1.5 lb/cu. ft. or more than 1.7 lb/cu. ft., thermal resistivity of 4 deg F x h x sq. ft./Btu x in. at 75 deg F.

D. Foil-Faced, Flexible Glass-Fiber Board Insulation: ASTM C 612, Type IA or ASTM C 553, Types I, II, and III; faced on one side with foil-scrim-kraft vapor retarder; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively, per ASTM E 84.

1. Nominal density of 1.0 lb/cu. ft., thermal resistivity of 3.7 deg F x h x sq. ft./Btu x in. at 75 deg F.

2. Nominal density of not less than 1.5 lb/cu. ft. or more than 1.7 lb/cu. ft., thermal resistivity of 4 deg F x h x sq. ft./Btu x in. at 75 deg F.

E. Unfaced, Glass-Fiber Board Insulation: ASTM C 612, Type IA; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively, per ASTM E 84, passing ASTM E 136 for combustion characteristics.

F. Foil-Faced, Glass-Fiber Board Insulation: ASTM C 612, Type IA; faced on one side with foil-scrim-kraft or foil-scrim-polyethylene vapor retarder, with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively, per ASTM E 84.

G. Dark-Surfaced, Glass-Fiber Board Insulation: ASTM C 612, Type IA; faced on one side with black glass-fiber mat or black polymer finish; maximum flame-spread and smoke-developed indexes of 25 and 50, respectively, per ASTM E 84.

H. Sustainability Requirements: Provide glass-fiber board insulation as follows:

1. Free of Formaldehyde: Insulation manufactured with 100 percent acrylic binders and no formaldehyde.

2. Low Emitting: Insulation tested according to ASTM D 5116 and shown to emit less than 0.05-ppm formaldehyde.

2.2 MINERAL-WOOL BOARD INSULATION

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following (or equal):

1. Fibrex Insulations Inc.
2. Isolatek International.
3. Owens Corning.
4. Roxul Inc.
5. Thermafiber.

B. Recycled Content: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 25 percent.

C. Unfaced, Mineral-Wool Board Insulation: ASTM C 612; with maximum flame-spread and smoke-developed indexes of 15 and zero, respectively, per ASTM E 84; passing ASTM E 136 for combustion characteristics.

D. Foil-Faced, Mineral-Wool Board Insulation: ASTM C 612; faced on one side with foil-scrim or foil-scrim-polyethylene vapor retarder; with maximum flame-spread and smoke-developed indexes of 25 and 5, respectively, per ASTM E 84.

2.3 GLASS-FIBER BLANKET INSULATION

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following (or equal):

1. CertainTeed Corporation.
2. Guardian Building Products, Inc.
3. Johns Manville.
4. Knauf Insulation.
5. Owens Corning.

B. Recycled Content: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 25 percent.

C. Unfaced, Glass-Fiber Blanket Insulation: ASTM C 665, Type I; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively, per ASTM E 84; passing ASTM E 136 for combustion characteristics.

D. Polypropylene-Scrim-Kraft-Faced, Glass-Fiber Blanket Insulation: ASTM C 665, Type II (non-reflective faced), Class A (faced surface with a flame-spread index of 25 or less); Category 1 (membrane is a vapor barrier).

E. Kraft-Faced, Glass-Fiber Blanket Insulation: ASTM C 665, Type II (non-reflective faced), Class C (faced surface not rated for flame propagation); Category 1 (membrane is a vapor barrier).

F. Reinforced-Foil-Faced, Glass-Fiber Blanket Insulation: ASTM C 665, Type III (reflective faced), Class A (faced surface with a flame-spread index of 25 or less); Category 1 (membrane is a vapor barrier), faced with foil scrim, foil-scrim kraft, or foil-scrim polyethylene.

G. Foil-Faced, Glass-Fiber Blanket Insulation: ASTM C 665, Type III (reflective faced), Class B (faced surface with a flame-propagation resistance of 0.12 W/sq. cm);

Category 1 (membrane is a vapor barrier), faced with foil scrim, foil-scrim kraft, or foil-scrim polyethylene.

H. Eave Ventilation Troughs: Preformed, rigid fiberboard or plastic sheets designed and sized to fit between roof framing members and to provide cross ventilation between insulated attic spaces and vented eaves.

I. Sustainability Requirements: Provide glass-fiber blanket insulation as follows:

1. Free of Formaldehyde: Insulation manufactured with 100 percent acrylic binders and no formaldehyde.

2. Low Emitting: Insulation tested according to ASTM D 5116 and shown to emit less than 0.05-ppm formaldehyde.

2.4 MINERAL-WOOL BLANKET INSULATION

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following (or equal):

1. Fibrex Insulations Inc.
2. Owens Corning.
3. Roxul Inc.
4. Thermafiber.

B. Recycled Content: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 25 percent.

C. Unfaced, Mineral-Wool Blanket Insulation: ASTM C 665, Type I (blankets without membrane facing); consisting of fibers; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively, per ASTM E 84; passing ASTM E 136 for combustion characteristics.

D. Reinforced-Foil-Faced, Mineral-Wool Blanket Insulation: ASTM C 665, Type III (reflective faced), Class A (faced surface with a flame-spread index of 25 or less per ASTM E 84); Category 1 (membrane is a vapor barrier), faced with foil scrim, foil-scrim kraft, or foil-scrim polyethylene.

2.5 RIGID ISOCYANURATE FOAM INSULATION

A. Subject to compliance with specified requirements. Insulation components shall be manufactured by one of the following (or equal):

1. Dyplast Products
2. Celotex Insulation by Celotex Building Products
3. GAFTEMP by G. A. F.
4. Apache Products Co.

B. Rigid insulation shall consist of polyisocyanurate foam panels, chemically bonded during the foaming process to special organic/inorganic facers on the top and bottom surfaces, and shall conform to the following:

PROPERTIES	TEST METHOD	VALUE
Compressive Strength	ASTM D 1621	16PSI min.
Dimensional Stability (Thermal & Humid Aging)	ASTM D 2126 (-4 degrees F, amb RH) (158 degrees F, 97 percent RH) (200 degrees F, ambient RH)	<2.0 percent Linear change <2.0 percent Linear change <2.0 percent Linear change
Flexural Strength (Modulus of Rupture) (Break load)	ASTM C 203	40 PSI min. 17 PSI min.
Tensile Strength (Perpendicular to surface)	ASTM C 203	500 PSF min.
Water Absorption	ASTM C 209	
Water Vapor Transmission	ASTM E 96	
Core Foam Flame Spread	ASTM E 84	

C. Thickness shall be as indicated on the drawings.

2.6 VAPOR RETARDERS

A. Polyethylene Vapor Retarders: ASTM D 4397, 6 mils thick, with maximum permeance rating of 0.13 perm.

B. Reinforced-Polyethylene Vapor Retarders: Two outer layers of polyethylene film laminated to an inner reinforcing layer consisting of either nylon cord or polyester scrim and weighing not less than 25 lb/1000 sq. ft., with maximum permeance rating of 0.0507 perm.

1. Products: Subject to compliance with requirements, provide one of the following (or equal):

a. Raven Industries Inc.; DURA-SKRIM 6WW.

b. Reef Industries, Inc.; Griffolyn T-65.

C. Fire-Retardant, Reinforced-Polyethylene Vapor Retarders: Two outer layers of polyethylene film laminated to an inner reinforcing layer consisting of either nonwoven grid of nylon cord or polyester scrim and weighing not less than 22 lb/1000 sq. ft. (10 kg/100 sq. m), with maximum permeance rating of 0.1317 perm (7.56 ng/Pa x s x sq. m) and with flame-spread and smoke-developed indexes of not more than 5 and 60, respectively, per ASTM E 84.

1. Products: Subject to compliance with requirements, provide one of the following (or equal):

a. Raven Industries Inc.; DURA-SKRIM 2FR.
b. Reef Industries, Inc.; Griffolyn T-55 FR.

D. Foil-Polyester-Film Vapor Retarders: Two layers of 0.5-mil- (0.013-mm-) thick polyester film laminated to an inner layer of 1-mil- (0.025-mm-) thick aluminum foil, with maximum water-vapor transmission rate in flat condition of 0.0 g/h x sq. m and with maximum flame-spread and smoke-developed indexes of 5, per ASTM E 84.

1. Products: Subject to compliance with requirements, provide the following (or equal):

    a. Alumiseal Corporation; Zero Perm Vapor Barrier.

E. Vapor-Retarder Tape: Pressure-sensitive tape of type recommended by vapor-retarder manufacturer for sealing joints and penetrations in vapor retarder.

F. Vapor-Retarder Fasteners: Pancake-head, self-tapping steel drill screws; with fender washers.

G. Single-Component Nonsag Urethane Sealant: ASTM C 920, Type I, Grade NS, Class 25, Use NT related to exposure, and Use O related to vapor-barrier-related substrates.

H. Adhesive for Vapor Retarders: Product recommended by vapor-retarder manufacturer and has demonstrated capability to bond vapor retarders securely to substrates indicated.

2.7 INSULATION FASTENERS

A. Adhesively Attached, Spindle-Type Anchors: Plate welded to projecting spindle; capable of holding insulation of specified thickness securely in position indicated with self-locking washer in place.

1. Products: Subject to compliance with requirements, provide one of the following (or equal):

    a. AGM Industries, Inc.; Series T TACTOO Insul-Hangers.
    b. Gemco; Spindle Type.

2. Plate: Perforated, galvanized carbon-steel sheet, 0.030 inch thick by 2 inches square.

3. Spindle: Copper-coated, low-carbon steel; fully annealed; 0.105 inch in diameter; length to suit depth of insulation indicated.

B. Adhesively Attached, Angle-Shaped, Spindle-Type Anchors: Angle welded to projecting spindle; capable of holding insulation of specified thickness securely in position indicated with self-locking washer in place.

1. Products: Subject to compliance with requirements, provide the following (or equal):

    a. Gemco; 90-Degree Insulation Hangers.

2. Angle: Formed from 0.030-inch thick, perforated, galvanized carbon-steel sheet with each leg 2 inches square.

3. Spindle: Copper-coated, low-carbon steel; fully annealed; 0.105 inch in diameter; length to suit depth of insulation indicated.

C. Insulation-Retaining Washers: Self-locking washers formed from 0.016-inch- (0.41-mm-) thick galvanized-steel sheet, with beveled edge for increased stiffness, sized as required to hold insulation securely in place, but not less than 1-1/2 inches (38 mm) square or in diameter.

1. Products: Subject to compliance with requirements, provide one of the following (or equal):

a. AGM Industries, Inc.; RC150 or SC150.
b. Gemco; Dome-Cap, R-150 or S-150.

2. Protect ends with capped self-locking washers incorporating a spring steel insert to ensure permanent retention of cap in the following locations:

a. Ceiling plenums.
b. Attic spaces and
c. Where indicated.

D. Insulation Standoff: Spacer fabricated from galvanized mild-steel sheet for fitting over spindle of insulation anchor to maintain air space of 1 inch between face of insulation and substrate to which anchor is attached.

1. Products: Subject to compliance with requirements, provide the following (or equal):

a. Gemco; Clutch Clip.

E. Anchor Adhesive: Product with demonstrated capability to bond insulation anchors securely to substrates indicated without damaging insulation, fasteners, and substrates.

1. Products: Subject to compliance with requirements, provide one of the following (or equal):

a. AGM Industries, Inc.; TACTOO Adhesive.
b. Gemco; Tuff Bond Hanger Adhesive.

PART 3 - EXECUTION

3.1 PREPARATION

A. Clean substrates of substances that are harmful to insulation or vapor retarders, including removing projections capable of puncturing vapor retarders, or that interfere with insulation attachment.

3.2 INSTALLATION

A. Comply with insulation manufacturer's written instructions applicable to products and applications indicated.

B. Install insulation that is undamaged, dry, and unsoiled and that has not been left exposed to ice, rain, or snow at any time.

3.3 INSTALLATION OF INSULATION IN CEILINGS FOR SOUND ATTENUATION

A. Where glass-fiber blankets are indicated for sound attenuation above ceilings, install blanket insulation over entire ceiling area in thicknesses indicated. Extend insulation 48 inches up either side of partitions.

3.4 INSTALLATION OF CURTAIN-WALL INSULATION

A. Install board insulation in curtain-wall construction where indicated on Drawings according to curtain-wall manufacturer's written instructions.

1. Hold insulation in place by securing metal clips and straps or integral pockets within window frames, spaced at intervals recommended in writing by insulation

manufacturer to hold insulation securely in place without touching spandrel glass. Maintain cavity width of dimension indicated between insulation and glass.

2. Install insulation where it contacts perimeter fire-containment system to prevent insulation from bowing under pressure from perimeter fire-containment system.

3.5 INSTALLATION OF VAPOR RETARDERS

A. Place vapor retarders on side of construction indicated on Drawings. Extend vapor retarders to extremities of areas to protect from vapor transmission. Secure vapor retarders in place with adhesives or other anchorage system as indicated. Extend vapor retarders to cover miscellaneous voids in insulated substrates, including those filled with loose-fiber insulation.

B. Seal vertical joints in vapor retarders over framing by lapping no fewer than two studs.

1. Fasten vapor retarders to wood framing at top, end, and bottom edges; at perimeter of wall openings; and at lap joints. Space fasteners 16 inches o.c.

2. Before installing vapor retarders, apply urethane sealant to flanges of metal framing including runner tracks, metal studs, and framing around door and window openings. Seal overlapping joints in vapor retarders with vapor-retarder tape according to vapor-retarder manufacturer's written instructions. Seal butt joints with vapor-retarder tape. Locate all joints over framing members or other solid substrates.

3. Firmly attach vapor retarders to metal framing and solid substrates with vapor-retarder fasteners as recommended by vapor-retarder manufacturer.

C. Seal joints caused by pipes, conduits, electrical boxes, and similar items penetrating vapor retarders with vapor-retarder tape to create an airtight seal between penetrating objects and vapor retarders.

D. Repair tears or punctures in vapor retarders immediately before concealment by other work. Cover with vapor-retarder tape or another layer of vapor retarders.

3.6 PROTECTION

A. Protect installed insulation[and vapor retarders] from damage due to harmful weather exposures, physical abuse, and other causes. Provide temporary coverings or enclosures where insulation is subject to abuse and cannot be concealed and protected by permanent construction immediately after installation.

END OF SECTION

SECTION 07 22 26

RIGID ISOCYANURATE INSULATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Furnish and install flat and tapered rigid polyisocyanurate insulation as indicated on the drawings and specified, including crickets. If PVC roofing alternate is approved, submit equivalent rigid insulation system and cover board compatible with alternate roofing manufacturer's system.

1.3 ACTION SUBMITTALS

A. Shop Drawings: Submit roof plans and details. Indicate dimension and profiles of panels. Include roof dimensions, drain and scupper locations, and the layout of insulation panels. Provide details indicating components, attachment and insulation thickness. Provide calculations indicating the average R-value for the system. Indicate drainage patterns and slopes required.

B. Product Data: Submit manufacturer's data substantiating the insulation complies with specified requirements.

C. Installation Instructions: Submit manufacturer's installation instructions.

1.4 QUALITY ASSURANCE

A. As a minimum, comply with the California Building Code (CBC), and the following:

1. ASTM C 1289 - Faced Rigid Cell Polyisocyanurate Thermal Insulation Board; Type 2.
2. Provide systems complying with requirements for FM Class 1.
3. Provide systems complying with requirements for UL Class A.
4. Achieve a minimum thermal resistance (R) value indicated on the drawings.

B. Qualifications: Installers: Minimum 5 years experience installing specified type of insulation under roofing systems, and certified by the insulation manufacturer to install the Work of this section.

C. Pre-installation Meetings: In accordance with related Division 01 sections, conduct a pre-installation meeting on the Project site.

1.5 DELIVERY, STORAGE AND HANDLING

A. Deliver materials in manufacturer's original sealed and labeled containers.

B. Avoid exposure to sunlight and the elements.

C. Handle materials in a manner to avoid damage or contamination with moisture or foreign matter.

1.6 PROJECT CONDITIONS

A. Environmental requirements:

1. Install products in strict accordance with manufacturer's recommendations.

2. Do not install any materials when water in any form is present on the deck or materials are wet. Do not install any materials if precipitation is forecast and partially completed Work will be left unprotected.

3. Do not install the Work of this section if the temperature of the roof deck is below 40 degrees F.

PART 2 - PRODUCTS

2.1 RIGID ISOCYANURATE INSULATION

A. Subject to review of action submittals by the Architect for compliance with specified requirements, Insulation shall be as indicated on the drawings or a substitution product that has been evaluated by the Architect and found to be acceptable and be manufactured by one of the following:

1. Johns Manville Corp.
2. Dyplast Products
3. Celotex Insulation by Celotex Building Products
4. GAFTEMP by G. A. F.
5. Hunter Panels.

B. Roof insulation shall meet the requirements of ASTM C1289, Type II, Class 1, Grade 2

C. Roof insulation shall consist of polyisocyanurate foam panels, chemically bonded during the foaming process to special organic/inorganic facers on the top and bottom surfaces, and shall conform to the following:

PROPERTIES	**TEST METHOD**	**VALUE**
Dimensional Stability (Thermal & Humid Aging)	ASTM D 2126 (-4 degrees F, amb RH) (158 degrees F, 97 percent RH) (200 degrees F, ambient RH)	<2.0 percent Linear change <2.0 percent Linear change <2.0 percent Linear change
Flexural Strength (Modulus of Rupture) (Break load)	ASTM C 203	40 PSI min. 17 PSI min.
Tensile Strength (Perpendicular to surface)	ASTM C 203	500 PSF min.
Water Absorption	ASTM C 209	
Water Vapor Transmission	ASTM E 96	
Core Foam Flame Spread	ASTM E 84	

D. Tapered Roof insulation shall be available in multiple slope profiles that vary in increments of 1/16 inch per foot and afford the following features:

1. Glass reinforced facers that resist indentation and crushing. Facers shall be compatible with the specified roofing system and affirmed by its manufacturer that it complies with all the terms and conditions of the roofing warranty.

2. Closed cell polyisocyanurate core is sandwiched between facers (top and bottom) that are suitable for direct application to the specified roof deck.

E. Adhesives shall be the products recommended by the manufacturer of the insulation.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify suitability of substrates to receive the Work. Do not proceed until unsatisfactory conditions have been corrected.

B. Verify suitability of related Work such as the following:

1. Roof drains and scuppers are properly installed.

2. Roof curbs, nailers, equipment supports, vents, and other items penetrating the roof are of the proper height, properly prepared and fastened to the substrate.

3. Concrete surface are sufficiently dry, free from extremes in pH, properly primed and free of fines, edges, or voids.

3.2 INSULATION APPLICATION

A. Install the insulation in accordance with the manufacturer's recommendations and to provide the R values indicated. Butt the panels snugly together.

B. Start boards from either the roof drain or the high point depending on the insulation system. Stencil direction of slope on each board. Stagger joints of underlayment boards from insulation boards.

C. Cut valleys and hips. Field cut crickets from insulation boards. Install valleys, hips, and crickets as required for R values and drainage.

D. All Roofing Systems: Fasten insulation with a method recommended by the manufacturer. Method of attachment shall provide a minimum FM 1-90 Wind Uplift Rating.

END OF SECTION

SECTION 07 25 41

SELF ADHERING FLEXIBLE BUTYL FLASHING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Furnish and install self-adhering flashing as indicated on the drawings and specified.

B. Section Includes: Provides flashing systems, moisture-retardant membranes, including sealing joints and protrusions through membranes, with accessories as required for complete installation.

1.3 ACTION SUBMITTALS

A. Product Data: Submit manufacturer's current product data literature for each type of membrane.

B. Samples: Submit samples of each type of material.

C. Quality Control Submittals: Submit manufacturer's installation instructions for each material.

PART 2 - PRODUCTS

2.1 SELF ADHERING FLEXIBLE BUTYL FLASHING

A. Basis of Design (BOD) Products: Subject to review of action submittals by the Architect for compliance with requirements, available BOD products that may be incorporated into the Work include, but are not limited to, those by the following:

1. Dow Chemical Company (The).
2. DuPont (E. I. du Pont de Nemours and Company).
3. Ludlow Coated Products.
4. Pactiv, Inc.
5. Raven Industries Inc.
6. Reemay, Inc.

B. Flexible Flashings: Self-adhesive, all butyl (no asphalt) waterproof membrane laminated to high density engineered film membrane.

1. Waterproof: Henry - FortiFlash® Butyl Waterproof Flashing (BOD).
2. Reference Standards: AAMA 711.
3. Water Vapor Permeance: <.1 (waterproof); ASTM F1249, E96 (A).
4. Water Resistance: 200 hours (waterproof); ASTM D779.

C. Primer: Polymer emulsion based primer for self-adhesive membranes as needed.

1. Primer: Henry® - Aquatac Primer (BOD).
2. Composition: Water based, VOC< 50 g/L.

D. Sealant: One component, moisture curing, non-sag, gun-grade elastomeric polymer for use as a sealant or liquid applied flashing.

1. Sealant: Henry – Moistop® Sealant (BOD).
2. Referenced Standard: AAMA 808.3 and ASTM C920.
3. Movement Capability: ±25%; ASTM C719.
4. Max VOC: 9 g/L; ASTM D3960.
5. Compatibility: Tested for compatibility with flexible flashing; AAMA 713.

E. The installed system must include one of each of the following three items:

1. A Weather resistive barrier (BOD)Blueskin® VP 100, WeatherSmart®, WeatherSmart Drainable, WeatherSmart Commercial, Hydro Tex®, Super Jumbo Tex®, or Jumbo Tex brands.

2. Flashing (BOD)FortiFlash®, FortiFlash Butyl, FortiFlash 365, FortiFlex® Butyl, Moistop neXT®, Moistop PF®, Moistop EZ Seal® or Air-Bloc LF®.

3. Sealant (BOD)Moistop® Sealant and Liquid Flashing.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Apply flashing membrane in accordance with manufacturer's recommendations, laid smooth without creases or bunches of material. Verify compatibility with adjacent materials prior to installation.

END OF SECTION

SECTION 07 25 43

SINGLE LAYER 60-MINUTE BUILDING PAPER WEATHER BARRIERS

PART 1 - GENERAL

1.1 SUMMARY

A. Furnish and install single layer 60-minute building paper weather barrier as indicated on the drawings and specified.

B. Section Includes: Provides weather-resistive barriers including sealing joints and protrusions through membranes, with accessories as required for complete installation.

1.2 ACTION SUBMITTALS

A. Product Data: Submit manufacturer's literature for each type of membrane.

B. Samples: Submit samples of each type of material.

C. Quality Control Submittals: Submit manufacturer's installation instructions for each material.

PART 2 - PRODUCTS

2.1 SINGLE LAYER 60-MINUTE BUILDING PAPER WEATHER BARRIER

A. Basis of Design (BOD) Products: Subject to review of action submittals by the Architect for compliance with requirements, available BOD products that may be incorporated into the Work include, but are not limited to, those by the following:

a. Dow Chemical Company (The).
b. DuPont (E. I. du Pont de Nemours and Company).
c. Ludlow Coated Products.
d. Pactiv, Inc.
e. Raven Industries Inc.
f. Reemay, Inc.

B. Vapor Permeable Weather-Resistive Barriers: Asphalt saturated kraft Grade D 60-minute building paper.

1. Basis of Design (BOD): Building Paper: Henry/ - Super Jumbo Tex® 60 Minute.
2. Reference Standard; Federal Specification UU-B-790a, Type 1, Grade D, Style 2.
3. Reference Standard; ASTM E2556, Type II.
4. Moisture Vapor Transmission: 10 perms minimum; ASTM E96.
5. Water Resistance: 60 minutes, ASTM D779.

C. Weather-Resistive Barrier Seam Tape: pressure sensitive tape as recommended by membrane manufacturer.

1. Sheathing Tape (BOD): Henry/ – Sheathing Tape.
2. Adhesive Type: Acrylic.

D. Sealant: One component, moisture curing, non-sag, gun-grade elastomeric polymer for use as a sealant or liquid applied flashing.

1. Sealant: Henry (BOD) – Moistop® Sealant.
2. Referenced Standards: Must meet AAMA 808.3 and ASTM C920.
3. Movement Capability: ±25%; ASTM C719.
4. Max VOC: 9 g/L; ASTM D3960.
5. Compatibility: Chemically compatible with flexible flashing; AAMA 713.

E. The installed system must include one of each of the following three items, or BOD comparable product:

1. A Weather resistive barrier (BOD) Blueskin® VP 100, WeatherSmart®, WeatherSmart Drainable, WeatherSmart Commercial, Hydro Tex®, Super Jumbo Tex®, or Jumbo Tex brands.

2. Flashing (BOD) FortiFlash®, FortiFlash Butyl, FortiFlash 365, FortiFlex® Butyl, Moistop neXT®, Moistop PF®, Moistop EZ Seal® or Air-Bloc LF®.

3. Sealant (BOD) Moistop® Sealant and Liquid Flashing.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Apply membrane in accordance with manufacturer's recommendations, laid smooth without folds or bunches of material.

1. Seam Overlap: As recommended by membrane manufacturer for specific membrane material and application indicated.

2. Sealing: Seal edges and items projecting through vapor retarders and vapor barriers.

B. Inspect and repair membrane prior to application of finish material over membrane; tape tears, perforations and similar damage.

END OF SECTION

SECTION 07 41 66

METAL WALL PANELS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Furnish and install corrugated metal wall panels as indicated on the drawings and specified, including accessories, supplementary or miscellaneous items, appurtenances and devices incidental to or necessary for a watertight installation.

1.3 ACTION SUBMITTALS

A. Shop Drawings: Submit Shop Drawings, indicating panel and fastener layout, joints, corners, supports, anchorages, trim, flashing, closures and special details.

B. Product Data:

1. Submit catalog cuts, technical data sheets and descriptive literature on sheets, panels, accessories and fasteners.

2. Submit complete installation recommendations.

C. Material Samples: Submit Samples showing full range of manufacturer's standard colors, minimum 3 inch x 5 inch size.

1.4 QUALITY ASSURANCE

A. Comply with the following as a minimum requirement:

1. AISC - Steel Construction Manual.

2. AISI - Cold Form Steel Design Manual.

3. ASTM A 653 - Steel Sheet, Zinc Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

4. ASTM A 792 - Steel Sheet, 55% Aluminum-Zinc Alloy Coated by the Hot-Dip Process.

5. ASTM A 924 - Steel Sheet, Metallic- Coated by the Hot-Dip Process.

6. SMACNA – Architectural Sheet Metal Manual.

B. Qualifications of Installer: Minimum 2 years experience in the installation of wall panel systems of similar complexity as required by this section.

C. Trained and certified by manufacturer to install the specified products by manufacturer.

D. Mockups: Build mockups to verify selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for fabrication and installation.

1. Build mockup of typical metal material panel assembly of reasonable size , including supports, attachments, and accessories.

2. Water-Spray Test: Conduct water-spray test of mockup of metal material panel assembly, testing for water penetration according to AAMA 501.2.

3. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.

4. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.5 DELIVERY, STORAGE AND HANDLING

A. Delivery: Deliver panels to the Project site without damage.

B. Storage: Store materials and accessories above ground on skidded platforms. Store under waterproof covering. Provide proper ventilation to panels to prevent condensation build-up.

C. Handling: The bending, warping, or twisting of panels is not permitted during unloading, storing or installation.

1.6 WARRANTY

A. Manufacturer shall provide a 20 year material warranty.

B. Installer shall provide a 5 year labor warranty.

PART 2 - PRODUCTS

2.1 METAL WALL PANELS

A. Subject to review of action submittals by the Architect for compliance with specified requirements, metal wall panels shall be by the manufacturer indicated on the drawings or an “or equal” product by one of the following:

1. Berridge Manufacturing Company.
2. IMETCO.
3. AEP-Span.
4. Peterson Aluminum Corporation.
5. Una-Clad Copper Sales, Inc.
6. McElroy Metal Inc.
7. Morin Corp.

B. Wall panel profiles (corrugated and flat at locations selected by the Architect) and materials shall be one of the following:

1. Galvanized Steel: ASTM A 653, Coating Class G90.

2. Galvalume (Zincalume): Steel sheets coated with 55 percent aluminum and 45 percent zinc/mischmetal by weight, conforming to ASTM A 792, 0.55 ounces per square foot.

3. Aluminum: ASTM B 209, for sheets, alloy 3003-H14 aluminum not less than 0.040 inch thick. For fasteners, clips, and accessories, alloy 6063-T5 extruded aluminum, 0.051 inch minimum thickness.

C. Conform to the minimum thickness, profiles, dimensions, and configurations established in the SMACNA Architectural manual for the specific material involved.

D. Clips, flashings, ridge sections, closures and other accessories: Manufacturer's standard, finished to match wall sheets where exposed.

E. Sealants: Elastomeric type containing no oil or asphalt. Exposed sealant shall be colored to match the applicable building color and shall cure to a rubber-like consistency. Sealant placed in the wall panel seams shall be provided in accordance with the manufacturer's recommendations.

F. Gaskets and insulating compounds: Non-absorptive and suitable for insulating contact points of incompatible materials. Insulating compounds shall be non-running after drying.

2.2 FABRICATION

A. Roll form panels in continuous lengths, full length of detailed runs.

B. Fabricate trim, flashing and accessories to detailed profiles.

C. Fabricate trim and flashing from same material as panel.

2.3 FINISHES (AS SELECTED BY THE ARCHITECT)

A. Steel Panels and Accessories:

1. Two-Coat Fluoropolymer: AAMA 621. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

2. Three-Coat Fluoropolymer: AAMA 621. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in both color coat and clear topcoat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

3. Mica Fluoropolymer: AAMA 621. Two-coat fluoropolymer finish with suspended mica flakes containing not less than 70 percent PVDF resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

4. Metallic Fluoropolymer: AAMA 621. Three-coat fluoropolymer finish with suspended metallic flakes containing not less than 70 percent PVDF resin by weight in both color coat and clear topcoat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

5. FEVE Fluoropolymer: AAMA 621. Two-coat fluoropolymer finish containing 100 percent fluorinated ethylene vinyl ether resin in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

6. Siliconized Polyester: Epoxy primer and silicone-modified, polyester-enamel topcoat; with a dry film thickness of not less than 0.2 mil for primer and 0.8 mil for topcoat.

7. Concealed Finish: Apply pretreatment and manufacturer's standard white or light-colored acrylic or polyester backer finish consisting of prime coat and wash coat with a minimum total dry film thickness of 0.5 mil.

B. Aluminum Panels and Accessories:

1. Two-Coat Fluoropolymer: AAMA 620. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

2. Three-Coat Fluoropolymer: AAMA 620. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in both color coat and clear topcoat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

3. Mica Fluoropolymer: AAMA 620. Two-coat fluoropolymer finish with suspended mica flakes containing not less than 70 percent PVDF resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

4. Metallic Fluoropolymer: AAMA 620. Three-coat fluoropolymer finish with suspended metallic flakes containing not less than 70 percent PVDF resin by weight in both color coat and clear topcoat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

5. FEVE Fluoropolymer: AAMA 620. Two-coat fluoropolymer finish containing 100 percent fluorinated ethylene vinyl ether resin in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

6. Siliconized Polyester: Epoxy primer and silicone-modified, polyester-enamel topcoat; with a dry film thickness of not less than 0.2 mil for primer and 0.8 mil for topcoat.

PART 3 - EXECUTION

3.1 SURFACE CONDITIONS

A. Examination: Examine substrates and other installed item to verify suitability for installation. Do not proceed until unsuitable conditions have been corrected.

3.2 INSTALLATION

A. Install panels weathertight, without waves, wraps, buckles, fastening stresses or distortion, allowing for expansion and contraction.

B. Install panels in accordance with manufacturer's installation instructions and Shop Drawings.

C. Provide concealed anchors at all panel attachment locations.

D. Install panels plumb, level and straight with seams and corrugations parallel, conforming to design indicated on Drawings.

3.3 ERECTION TOLERANCES

A. Installation Tolerances: Shim and align metal material wall panel units within installed tolerance of 1/4 inch in 20 feet (6 mm in 6 m), non-accumulative, on level, plumb, and location lines as indicated, and within 1/8-inch (3-mm) offset of adjoining faces and of alignment of matching profiles.

3.4 FIELD QUALITY CONTROL

A. Testing Agency: Owner may engage (and will pay if engaged) a qualified independent testing agency to perform field tests and inspections.

B. Water-Spray Test: After installation, test area of assembly as directed by Architect for water penetration according to AAMA 501.2.

C. Metal material wall panels will be considered defective if they do not pass test and inspections.

D. Additional tests and inspections, at Contractor's expense, are performed to determine compliance of replaced or additional work with specified requirements.

E. Prepare test and inspection reports.

3.5 CLEANING AND PROTECTION

A. Remove temporary protective coverings and strippable films, if any, as metal material panels are installed, unless otherwise indicated in manufacturer's written installation instructions. On completion of metal material panel installation, clean finished surfaces as recommended by metal material panel manufacturer. Maintain in a clean condition during construction.

B. After metal material panel installation, clear weep holes and drainage channels of obstructions, dirt, and sealant. Replace metal material panels that have been damaged or have deteriorated beyond successful repair by minor repair procedures.

END OF SECTION

SECTION 07 42 13.26

PERFORATED METAL WALL PANELS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SECTION INCLUDES

A. Concealed fastener single skin perforated metal wall panels used as a screen wall.

B. Accessories including fasteners, perimeter trim and penetration treatments.

1.3 REFERENCES

A. ASTM International

1. ASTM A240; Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications.

2. ASTM A653; Standard Specification for Steel Sheet, Zinc Coated (Galvanized) or Zinc Iron Alloy Coated (Galvannealed) by the Hot Dip Process.

3. ASTM A666; Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar.

4. ASTM B209; Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.

5. ASTM C645 – Standard Test Method for Nonstructural Steel Framing Members.

6. ASTM E1592; Standard Test Method for Structural Performance of Sheet Metal Roof and Siding Systems by Uniform Static Air Pressure Difference.

B. German Institute for Standardization (DIN)

1. DIN EN988; Specifications for zinc and zinc alloy rolled flat products for building.

2. DIN EN1179; Zinc and Zinc alloys – Primary Zinc.

1.4 SUBMITTALS

A. Product Data: Submit manufacturer current technical literature for each type of product.

B. Delegated Design: Design metal wall panel assembly, submit comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.

C. Shop Drawings - Submit detailed drawings showing:

1. Profile
2. Gauge of panel
3. Location, layout and dimensions of panels

4. Location and type of fasteners
5. Shape and method of attachment of all trim
6. Installation sequence.
7. Other details as may be required for installation

D. Samples: Provide nominal 3 x 5 inch of each color indicated.

E. Quality Assurance Submittals

1. Manufacturer Erection Instructions: Provide manufacturer's written installation instructions including proper material storage, material handling, installation sequence, panel location(s), and attachment methods, details and required trim and accessories.

1.5 ADMINISTRATIVE REQUIREMENTS

A. Pre-installation meeting: Conduct a pre-installation meeting at the job site attended by Owner, Architect, Manufacturer's Technical Representative, Panel Installer, and Contractors of related trades. Coordinate structural support requirements in relation to wall panel system, treatment of fenestration, and other requirements specific to the project.

1.6 QUALITY ASSURANCE

A. Manufacturer Qualifications: Manufacturer shall have a minimum of ten (10) years experience in the production of metal wall panels. Manufacturer shall demonstrate past experience with examples of projects of similar type and exposure.

B. Installer Qualifications: Installer shall be authorized by the manufacturer and the work shall be supervised by a person having successfully completed a manufacturer training seminar regarding proper installation of the specified product.

1.7 DELIVERY, STORAGE AND HANDLING

A. Deliver panel materials and components in manufacturer's original, unopened, undamaged packaging with identification labels intact.

B. Store wall panel materials on dry, level, firm, and clean surface. Elevate one end of bundle to allow moisture run-off, cover and ventilate to allow air to circulate and moisture to escape.

1.8 WARRANTY

A. Material Warranty: Standard form in which manufacturer agrees to repair or replace items that fail in materials or workmanship within specified warranty period. The items covered by the warranty include structural performance.

1. Warranty Period: Two (2) years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURER

A. Morin; a Kingspan Group Company; 685 Middle Street, Bristol, Connecticut 06010-8416; 1-800-640-9501 (Toll Free); (www.morincorp.com), or equal.

B. Basis of Design: "Morin Matrix Series Perforated Metal Wall Panels," or equal.

C. Substitution Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. AEP Span; a BlueScope Steel company.
2. Berridge Manufacturing Company.
3. CENTRIA Architectural Systems.
4. Firestone Metal Products, LLC.
5. Industrial Building Panels.
6. Peterson Aluminum Corp.
7. McElroy Metal, Inc.
8. The Garkand Company.
9. Morin; a Kingspan Group company.
10. Any member in good standing of the Metal Construction Association.

D. Limitations:

1. Submit written request for approval of substitutions to the Architect 30 days after receipt of the Notice to Proceed. Include the following information:

a. Name of the materials and description of the proposed substitute.
b. Drawings, cut sheets, performance and test data.
c. List of projects similar scope and photographs of existing installations.
d. Other information necessary for evaluation.

2. After evaluation by Architect, approval will be issued via addendum. No verbal approval will be given.

2.2 PERFORMANCE CRITERIA

A. Structural Performance: Provide metal wall panel systems designed to resist the following loads. Testing shall be done based on ASTM E1592:

1. Wind Loads: Determine loads based on the following minimum design wind pressures:

a. Uniform pressure 30 psi.

2. Deflection Limits: Perforated metal wall panel assemblies shall withstand horizontal deflections no greater than L/90 of the span.

2.3 WALL PANEL MATERIALS

A. Aluminum:

1. Coil Stock meeting ASTM B209; Alloy and temper as required for forming operations.

2. Thickness: 0.040 inch.

2.4 CONCEALED FASTENER WALL PANELS

A. Wall Panel Description:

1. Panel Width: 12 inches.
2. Profile: As indicated on drawings.
3. Panel thickness: 1-1/2 inch thick.
4. Panel joint: Tongue and groove interlock joint.
5. Texture: Perforated, as selected by the Architect.

2.5 ACCESSORIES

A. Wall panel accessories: Provide accessories as required for a complete installation. Accessories shall be as indicated on approved shop drawings and per manufacturer's approved standard details. Match material and finish of metal wall panels.

1. Closure Strips:

a. Closed Cell Closure Strips: Provide minimum 1 inch thick matching metal wall panel profile.

b. Metal Profile Closure Strips: Shall be fabricated from same gauge, material and finish as metal panel.

2. Concealed Clips: 20 gauge; ASTM A240or ASTM A666, Type 304, dead soft, fully annealed.

3. Panel Reveal Trim: Extruded aluminum; 0.078 inch thick, 6063-T5 alloy.

a. Profile: As shown on Drawings.

B. Trim:

1. Fabricate trim from same material and material thickness as wall panels. Finish to match metal wall panels.

2. Locations include, but are not limited to the following: Drips, sills, jambs, corners, framed openings, parapet caps, and fillers.

C. Metal Framing: As indicated on the drawings.

D. Fasteners: Self-tapping stainless steel screws, bolts, nuts, self-locking rivets and bolts, and other suitable fasteners designed to withstand design loads.

2.6 FABRICATION

A. Metal wall panels and liner panels shall be formed to lap and interconnect with edges of adjacent panels which are then mechanically attached through panel to supports using concealed fasteners.

B. Panels shall be factory formed. Field formed panels are not acceptable.

C. Trim Accessories: Provide manufacturer's standard extruded aluminum trim.

2.7 FINISHES SHALL BE AS SELECTED BY THE ARCHITECT

A. Aluminum:

1. Finish and Color:

a. Panels shall be finished on exterior and interior surfaces.
b. Finish System:

PART 3 - EXECUTION

3.1 EXAMINATION

A. Provide field measurements to manufacturer as required to achieve proper fit of the metal wall panels to building envelope. Measurements shall be provided in a timely manner so that there is no impact to construction or manufacturing schedule.

B. Supporting Steel: Verify that Supporting Steel members are installed within the following tolerances:

1. Plus or minus 1/8 inch in 5 feet in any direction along plane of framing.

2. Plus or minus 1/4 inch cumulative in 20 feet in any direction along plane of framing.

3. Plus or minus 1/2 inch from framing plane on any elevation.

4. Plumb or level within 1/8 inch at all changes of transverse for performed corner panel applications.

5. Verify that bearing support has been provided behind vertical joints of horizontal panel systems and vertical joints of horizontal panel systems. Width of support shall be as recommended by manufacturer.

C. Examine individual panels upon removing from the bundle; notify manufacturer of panel defects. Do not install defective panels.

3.2 PANEL INSTALLATION

A. Installation shall be in accordance with manufacturer's installation guidelines and recommendations.

B. Install panels plumb, level, and true-to-line to dimensions and layout indicated on approved shop drawings.

C. Cutting and fitting of panels shall be neat, square and true. Torch cutting is prohibited.

3.3 TRIM INSTALLATION

A. Place trim and trim fasteners only as indicated per details on the approved shop drawings.

3.4 CLEANING AND PROTECTION

A. Remove protective film immediately after installation.

B. Touch-up, repair or replace metal panels and trim that have been damaged.

C. After metal wall panel installation, clear weep holes and drainage channels of obstructions, dirt, and sealant.

END OF SECTION

SECTION 07 51 03

ROOF OVERFLOW DRAINS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Furnish and install roof overflow drains as indicated on the drawings and specified.

1.3 SUBMITTALS

A. Submit shop drawings and product data that fully describe the roof drains. Include component sizes, rough-in requirements, service sizes and finishes.

PART 2 - PRODUCTS

2.1 ROOF OVERFLOW DRAINS

A. Subject to compliance with specified requirements provide products of the manufacturer indicated on the drawings or “or equal” products by one of the following:

1. Zurn
2. Josam
3. Smith.

B. Provide lacquered cast iron two piece body with double drainage overflow flange, weep holes, reversible clamping collar, round, polyethylene dome strainer, and no hub outlet.

C. Lead lining shall conform to ASTM B749 and weigh not less than 4 pounds per sq.ft.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install roof drains in accordance with manufacturer's instructions to ensure durability and serviceability and permit the intended performance.

B. Flashing for Roof Drains: Provide the lead lining in a manner that will not adversely affect the required roof warranty. Set flashing in a full bed of adhesive. Clamp the roof membrane, flashing sheet, and stripping felt in the drain clamping ring. Secure clamps so that roof membrane and drain flashing are free of wrinkles and folds.

END OF SECTION

SECTION 07 54 12

THERMOPLASTIC MEMBRANE SARNAFIL ROOFING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Furnish and install a complete adhered Sika Sarnafil thermoplastic roofing system including membrane, flashings and other components.

1.3 WARRANTY

A. Special Warranty: Manufacturer's standard form, without monetary limitation, in which manufacturer agrees to repair or replace components of membrane roofing system that fail in materials or warranty period. Failure includes roof leaks.

1. Special warranty includes roofing membrane, base flashings, roofing membrane accessories, roof insulation, fasteners, cover boards, substrate board, vapor retarder, walkway products and other components of membrane roofing system.

2. Warranty Period: 15 years from date of Substantial Completion.

B. Special Project Warranty: Submit roofing Installer's warranty, on warranty form at end of this Section, signed by Installer, covering Work of this Section, including all components of membrane roofing system such as roofing membrane roofing system such as roofing membrane, base flashing, roof insulation, fasteners, cover boards, substrate boards, vapor retarders, and walkway products, for the following warranty period:

1. Warranty Period: Two years from date of Substantial Completion.

1.4 REFERENCES

A. Standard references shall conform to current edition of American Society for Testing and Materials (ASTM) Standards:

Parameters	ASTM Test Method	Minimum ASTM Requirement	Sarnafil Typical Physical Properties
Reinforcing Material	-		Fiberglass
Overall Thickness, min., inches (mm)	D638	0.045 (1.14)	[0.0__inches)]
Tensile Strength, min., psi (MPa)	D638	1500 (10.4)	1600 (11.1)
Elongation at Break, min. (machine x tranverse)	D638	250% / 230%	270% / 250%
Seam strength(2), min. (% of tensile strength)	D638	75	80
Retention of Properties After Heat Aging	D3045	-	-
Tensile Strength, min., (% of original)	D638	90	95
Elongation, min., (% of original)	D638	90	90
Tearing Resistance, min., lbf (N)	D1004	10 (45.0)	14 (63.0)
Low Temperature Bend, -40º F (-40º C)	D2136	Pass	Pass
Accelerated Weathering Test (Xenon Arc)	D2565	5,000 Hours	Pass
Cracking (7x magnification)	-	None	None
Discoloration (by observation)	-	Negligible	Negligible
Crazing (7 x magnification)	-	None	None

Parameters	ASTM Test Method	Minimum ASTM Requirement	Sarnafil Typical Physical Properties
Linear Dimensional Change	D1204	0.10 %	0.02%
Weight Change After Immersion in Water	D570	± 3.0%	2.5%
Static Puncture Resistance, 33 lbf (15 kg)	D5602	Pass	Pass
Dynamic Puncture Resistance, 7.3 ft-lbf (10 J)	D5635	Pass	Pass

*Failure occurs through membrane rupture not seam failure.

1.5 SUBMITTALS

The Applicator shall submit to the Owner (or Representative) the following:

A. Copies of Specification.

B. Samples of each primary component to be used in the roof system and the manufacturer's current literature for each component.

C. Written approval by the insulation manufacturer (as applicable) for use and performance of the product in the proposed system.

D. Sample copy of Sika Sarnafil's warranty.

E. Sample copy of Applicator's warranty.

F. Dimensioned shop drawings which shall include:

1. Outline of roof with roof size and elevations shown.

2. Details of flashing methods for penetrations.

3. Technical acceptance from Sika Sarnafil.

G. Certifications by manufacturers of roofing and insulating materials that all materials supplied comply with all requirements of the identified ASTM and other industry standards or practices.

H. Certification from the Applicator that the system specified meets all identified code and insurance requirements as required by the Specification.

1.6 PRODUCT HANDLING

A. All products delivered to the job site shall be in the original unopened containers or wrappings bearing all seals and approvals.

B. Handle all materials to prevent damage. Place all materials on pallets and fully protect from moisture.

C. Membrane rolls shall be stored lying down on pallets and fully protected from the weather with clean canvas tarpaulins. Unvented polyethylene tarpaulins are not accepted due to the accumulation of moisture beneath the tarpaulin in certain weather conditions that may affect the ease of membrane weldability.

D. As a general rule all adhesives shall be stored at temperatures between 40º F (5º C) and 80º F (27º C). Read instructions contained on adhesive canister for specific storage instructions.

E. All flammable materials shall be stored in a cool, dry area away from sparks and open flames. Follow precautions outlined on containers or supplied by material manufacturer/supplier.

F. All materials which are determined to be damaged by the Owner's Representative or Sika Sarnafil are to be removed from the job site and replaced at no cost to the Owner.

PART 2 - PRODUCTS

2.1 GENERAL

A. The components of the Sarnafil Adhered roof system are to be products of Sika Sarnafil as indicated on the Detail Drawings and specified in the Contract Documents.

1. Other Accesptable Manufacturers: Subject to compliance with specified requirements (especially warranty requirements), the following manufacturers may also be acceptable:

a. Duro-Last Roofing, Inc.
b. Firestone Building Products Company.
c. Flex Membrane International, Inc.
d. GAF Materials Corporation.
e. GenFlex Roofing Systems.

B. Components to be used that are other than those supplied or manufactured by Sika Sarnafil may be submitted for review and acceptance by Sika Sarnafil. Sika Sarnafil's acceptance of any other product is only for a determination of compatibility with Sika Sarnafil products and not for inclusion in the Sika Sarnafil warranty. The specifications, installation instructions, limitations, and/or restrictions of the respective manufacturers must be reviewed by the Owner's Representative for acceptability for the intended use with Sika Sarnafil products.

2.2 MATERIALS

A. Sarnafil G410 Feltback fiberglass reinforced membrane with a lacquer coating.

B. Membrane shall conform to ASTM D4434 (latest version), "Standard for Polyvinyl Chloride Sheet Roofing". Classification: Type II, Grade I.

C. Sarnafil G410-15, 60 mil (1.5 mm), thermoplastic membrane with fiberglass reinforcement.

2.3 FLASHING MATERIALS

A. Wall/Curb Flashing:

1. Sarnafil G410 Membrane: A fiberglass reinforced membrane adhered to approved substrate using Sarnacol adhesive. Consult Product Data Sheets for adhesive options and additional information.

2. Sarnafil G459: Membrane An asphalt-resistant, fiberglass reinforced membrane adhered to approved substrate using Sarnacol adhesive. Consult Product Data Sheet for adhesive rates and additional information.

3. Sarnaclad: A PVC-coated, heat-weldable sheet metal capable of being formed into a variety of shapes and profiles. Sarnaclad is a 25 gauge, G90 galvanized metal sheet with a 20 mil (1 mm) unsupported Sarnafil membrane laminated on

one side. The dimensions of Sarnaclad are 4 ft x 8 ft (1.2 m x 2.4 m) or 4 ft x 10 ft (1.2 m x 3.0m). Consult Product Data Sheet for additional information.

B Perimeter Edge Flashing:

1. Sarnatherm: A rigid isocyanurate foam insulation with black mat facers. Sarnatherm is available in 4 x 4 ft (1.2 x 1.2 m) or 4 x 8 ft (1.2 x 2.4 m) sizes and various thicknesses. Consult Product Data Sheet for additionalinformation.

2. DensDeck® Prime: A fire-tested, gypsum hardboard with glass-mat facers and a pre-primed surface on one side. DensDeck Prime is provided in a 4 x 8 ft (1.2 x 2.4 m) board size and in thicknesses of 1/4, 1/2 and 5/8 inch (6, 13 and 16 mm). Consult Product Data Sheet for size, thickness and additional information.

C Insulation Board Adhesive:

1. Sarnacol 2163 Adhesive: A low odor, VOC compliant, one step, low-rise urethane foam used to attach insulation to approved compatible substrates. Adhesive is applied with a gravity fed applicator or by hand with a dual component caulk gun. Additional adhesive may be required for rougher surfaces. Consult Product Data Sheets for additional information. Application rate is as follows: Coverage - Approximately 600 sq. ft. (55.7 sq. m) per case. Rates are based on an application pattern of 4 ribbons, 1/4-1/2 in. (6-13 mm) beads, 12 in. (30 cm) o.c. per 4 x 4 ft. (121.9 x 121.9 cm) insulation board. Coverage rates may vary over irregular surfaces.

D. Crossgrip Walkway:

1. A rolled-out walkway protection mat used to protect Sarnafil roofing membrane from mechanical abuse. Crossgrip Walkway is 9/16 inch (14 mm) thick flexible pvc with a heavily textured surface. Crossgrip Walkway is loose laid on top of completed Sika Sarnafil roof assemblies. Where design windspeeds exceed 94 mph (150 km/h) the walkway must be secured with loops of Sarnafil membrane welded to the field sheet. Consult Product Data Sheet for additional information.

PART 3 - EXECUTION

3.1 PREPARATION

A. Poured Structural Concrete Deck: The roof deck shall be smooth, even, free of dust, dirt, excess moisture or oil and be structurally sound. Sharp ridges, other projections and accumulations of bitumen above the surface shall be removed to ensure a smooth surface before roofing. Any deteriorated decking shall be repaired and made smooth.

3.2 INSTALLATION

A. Insulation:

1. Insulation shall be installed according to insulation manufacturer's instructions.

2. Insulation shall be neatly cut to fit around penetrations and projections.

3. Install tapered insulation in accordance with insulation manufacturer's shop drawings.

4. Install tapered insulation around drains creating a drain sump.

5. Do not install more insulation board than can be covered with Sarnafil membrane by the end of the day or the onset of inclement weather.

6. Use at least 2 layers of insulation when the total insulation thickness exceeds 2-1/2 inches (64 mm). Stagger joints at least 12 inches (0.3 m) between layers.

B. Sarnafil Membrane:

1. The surface of the insulation or substrate shall be inspected prior to installation of the Sarnafil roof membrane. The substrate shall be clean, dry, free from debris and smooth with no surface roughness or contamination. Broken, delaminated, wet or damaged insulation boards shall be removed and replaced.

C. Sarnacol 2121 Adhesive:

1. Over the properly installed and prepared substrate, Sarnacol 2121 adhesive shall be poured out of the pail and spread using notched 1/4 inch x 1/4 inch x 1/4 inch (6 mm x 6 mm x 6 mm) squeegees. The adhesive shall be applied at a rate according to Sika Sarnafil requirements (no adhesive is placed on back of the membrane). The formation of a film on the surface of the adhesive shall not be allowed to occur. The membrane shall be carefully unrolled into the wet adhesive while the edges are overlapped 3 inches (75 mm). The membrane shall be pressed firmly into the adhesive layer with a water-filled, foam-covered lawn roller by frequent rolling in two directions.

2. Notes: Sarnacol 2121 shall not be used if temperatures below 40ºF (5ºC) are expected during application or subsequent drying time. No adhesive shall be applied in seam areas. All membrane shall be applied in the same manner. Sarnacol 2121 shall not be used on vertical surfaces or sloped surfaces greater than a 2 inch (50 mm) rise per 1 horizontal foot (0.3 m).

D. Hot-Air welding of seam overlaps:

1. All seams shall be hot-air welded. Seam overlaps should be 3 inches (75 mm) wide when automatic machine-welding and 4 inches (100 mm) wide when hand-welding, except for certain details.

2. Welding equipment shall be provided by or approved by Sika Sarnafil. All mechanics intending to use the equipment shall have successfully completed a training course provided by a Sika Sarnafil Technical Representative prior to welding.

3. All membrane to be welded shall be clean and dry.

E. Hand-Welding: Hand-welded seams shall be completed in two stages. Hot-air welding equipment shall be allowed to warm up for at least one minute prior to welding.

1. The back edge of the seam shall be welded with a narrow but continuous weld to prevent loss of hot air during the final welding.

2. The nozzle shall be inserted into the seam at a 45 degree angle to the edge of the membrane. Once the proper welding temperature has been reached and the membrane begins to "flow," the hand roller is positioned perpendicular to the nozzle and rolled lightly. For straight seams, the 1-1/2 inch (40 mm) wide nozzle is recommended for use. For corners and compound connections, the 3/4 inch (20 mm) wide nozzle shall be used.

F. Machine Welding:

1. Machine welded seams are achieved by the use of Sika Sarnafil's automatic welding equipment. When using this equipment, Sika Sarnafil's instructions shall be followed and local codes for electric supply, grounding and over current protection observed. Dedicated circuit house power or a dedicated portable generator is recommended. No other equipment shall be operated simultaneously off the generator.

2. Metal tracks may be used over the deck membrane and under the machine welder to minimize or eliminate wrinkles.

3.3 COMPLETION

A. Prior to demobilization from the site, the work shall be reviewed by the Owner's Representative and the Applicator. All defects noted and non-compliances with the Specifications or the recommendations of Sika Sarnafil shall be itemized in a punch list. These items must be corrected immediately by the Applicator to the satisfaction of the Owner's Representative and Sika Sarnafil prior to demobilization.

B. All Warranties referenced in this Specification shall have been submitted and have been accepted at time of contract award.

END OF SECTION

SECTION 07 60 00

FLASHING AND SHEET METAL

PART 1 - GENERAL

1.1 SUMMARY

A. Provide and install all flashings and sheet metal work indicated on the Contract Drawing and hereinafter specified, not specifically described in other Sections these Specifications, but required to prevent penetration of water through the exterior shell of the building.

B. LEED Goals: The project requirements are to use materials with recycled content such that the sum of the postconsumer recycled content plus ½ of the preconsumer content constitutes at least 10%, based on cost, of the total value of the materials in the project.

1.2 QUALITY ASSURANCE

A. Standards: In accordance with best trade practice, Architectural Sheet Metal Manual, latest edition by the Sheet Metal and Air Conditioning Contractors National Association, Inc. (SMACNA).

B. Fabricator's Qualifications: Products used in the work of this Section shall be produced by fabricators regularly engaged in the manufacture of similar items and with a history of successful production acceptable to the City Engineer or the Consultant.

C. Installer Qualifications: Use adequate numbers of skilled installers who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

D. Standard commercial items may be used for flashing, trim, reglets, and similar purposed provided such items meet or exceed the quality standards specified.

E. Current recommendations of the National Roofing Contractor's Association (NRCA) Roofing and Waterproofing Manual latest edition.

1.3 SUBMITTALS

A. General: Comply with applicable provisions in SUBMITTALS in DIVISION 1-GENERAL REQUIREMENTS of these Specifications.

B. Comply with requirements of Section 010220 – ENVIRONMENTAL PROCEDURES for submittal and documentation of environmentally sensitive materials per LEED goals listed above.

C. Manufacturer's Data:

1. Complete materials list of all items proposed to be furnished and installed under this Contract.

2. Manufacturer's specifications and other data required to demonstrate compliance with the specified requirements.

3. Shop Drawings in sufficient detail to show fabrications, installation, anchorage, and interface of the work of this Section with the work of adjacent trades:

4. Manufacturer's recommended installation procedures when approved by the City Engineer or the Consultant will become the basis for inspecting and acceptance or rejection of actual installation procedures used on the Work.

D. Samples: To be provided when requested by the City Engineer or Consultant for approval of surface finish or texture.

1.4 COORDINATION

A. Coordinate work of this Section with that of roofing and waterproofing and dampproofing trades so that all sheet metal work and related items will provide waterproof connections.

1.5 INSPECTION

A. Shop Inspection Required: On all shop fabricated items if called for on the reviewed shop drawings, at no cost to the Contractor or his Subcontractor.

B. To assure quality as specified, the Consultant or the City Engineer may inspect work in process and installation to assure quality of work and revise process to achieve desired quality.

1.6 PROTECTION (PRODUCT HANDLING)

A. Adequately guard against damaging sheet metal work by walking on or placing of other materials thereon during construction operations. After completion of work of this Section, replace damaged work and remove stains and debris.

B. Replace or repair work of other trades damaged during this Section's work operations to the full satisfaction of the Inspector at no added cost to the City. Patched or defective work will not be accepted.

1.7 GUARANTY-WARRANTY

A. The Contractor shall and does hereby warrant and guaranty that all work executed under this Contract be free from defects of materials and workmanship for a period of one year from the date of final acceptance of the project by the Board of Public Works, except certain specific items of work, materials and equipment requiring a guaranty or warranty for a greater period of time is specified.

PART 2 - PRODUCTS

2.1 MATERIALS AND GAGES

A. Where sheet metal is required, and no material or gage is indicated on the Drawings, provide the highest quality and gage commensurate with the referenced standards.

B. Note: all steel contributes to the LEED Goal for recycled content listed above.

2.2 GALVANIZED STEEL

A. Galvanized sheet metal shall comply with ASTM A526, G90 Commercial hot-dip galvanizing.

B. Gages: As indicated on the Contract Drawings and in these Specifications, understood to be U.S. Standard Gage, minimum No. 24 unless otherwise indicated or noted.

2.3 LEAD

A. Pure sheet lead weighing 4 pounds.

2.4 RELATED MATERIALS

A. Solder: Where solder is required, comply with ASTM B32, composed of not less than 40% block tin, with manufacturer's name, class and grade thereon.

B. Flux: Muriatic acid killed with zinc or an approved brand of soldering paste. After soldering, was off remaining acid flux with a solution of soap and 5 to 10 percent washing soda. flux for stainless steel.

C. Flashing Cement: Neoprene, ASTM D412, trowel grade having 500 pound psi tensile strength and 250 percent elongation.

D. Fastenings: Bolt, expansion anchors, screws and/or nails as required for best workmanship.

E. Adhesives shall be urethane-based or epoxy based Nordot Adhesives by Synthetic Surfaces Inc., or equal.

2.5 NAILS, RIVETS, AND FASTENERS

A. Use only soft iron rivets having rust-resistive coating, galvanized nails, and cadmium plated screws and washers in connection with galvanized iron and steel.

B. Use same metal fasteners as metal being installed.

C. Use annular type nails for securing sheet metal to wood. Use soft iron rivets with rust-resistive coating with ferrous metals.

2.6 EDGE STOPS

A. Expansion joints shall be provided at 20-foot intervals for galvanized steel edge stops, except that where the distance between the last expansion joint and the end of the continuous run is more than half the required interval spacing an additional joint shall be provided. Joints shall be evenly spaced.

B. A continuous cleat shall be provided to secure the bottom loose edge of the edge stop. Cleat butt joints shall be spaced approximately 1/8-inch apart. The cleat shall be fastened to the supporting construction with nails evenly spaced not more than 12 inches on centers. Where the fastening is to be made to concrete or masonry, screws shall be used and shall be driven in expansion shields set in concrete or masonry. The cleat for edge anchorage shall be installed to extend below the supporting construction to form a drip and to allow the flashing to be hooked over the lower edge at least 3/4 inch. The cleat shall be of sufficient width to provide adequate bearing area to ensure a rigid installation.

C. The top edge of the edge stop shall be hemmed. Expansion joints shall be shop fabricated to form a sleeve that will receive the longitudinal strips, enveloping them internally. Corner units with mitered joints shall be provided.

D. Provide a continuous pressure treated nailer affixed in the concrete formwork. The edge flange shall be set in elastomeric sealant, and secured to the structure with through slotted holes, face nailed at 8 inches on The lower edge of fascia shall be hooked 3/4 inch over a continuous cleat.

2.7 DRIP SCREEDS

A. Provide drip screeds for installation above the heads of doors, windows, and other openings for the purpose of directing water away from the opening. Fabricate drips of galvanized steel not lighter than 18 gage with the lower edge formed on a brake at a 45 degree angle outwardly. Drill holed for countersunk screw fastening.

2.8 OTHER MATERIALS

A. Provide other materials, not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the approval of the City Engineer or the Consultant.

B. Roofer's Cement: Federal Specification SS-C-153, Type I, black.

PART 3 - EXECUTION

3.1 SURFACE CONDITIONS

A. General: Examine the areas and conditions under which work of this Section will be performed.

B. Surfaces to receive sheet metal shall be smooth, sound, clean and dry. Correct conditions detrimental to timely and proper completion of the work. Do not proceed until detrimental conditions are corrected.

3.2 WORKMANSHIP

A. General:

1. Form sheet metal accurately and to the dimensions and shapes required, finishing molded and broken surfaces with true, sharp, and straight lines and angles and, where intercepting other members, coping to an accurate fit and soldering securely.

2. Unless otherwise specifically permitted by the Consultant, turn exposed edges back 1/2".

3. Coordinate work of this Section with work of other Sections. Verify placement of wood blocking, nailers, inserts, nailing strips, cants, etc.

B. Fabrication: Form, fabricate, and install sheet metal so as to adequately provide for expansion and contraction in the finished work.

1. Accurately form items to required shape and size. Molded or braked members to have true, straight, and sharp lines and angles. Cope members to accurately fit and be securely soldered at intersections.

2. Turn back all exposed edges 1/2-inch unless otherwise noted on the drawings.

3. Adequately provide for expansion and contraction in the completed work.

4. Take care of preserve coatings; avoid scaring or breaking of coating.

5. Accurately install work as hereinafter specified and as indicated on the Contract Drawings.

C. Weatherproofing:

1. Finish watertight and weathertight where so required.

2. Make lock seam work flat and true to line, sweating full of solder.

3. Make lock seams and lap seams, when soldered, at least 1/2" wide.

4. Where lap seams are not soldered, lap according to pitch, but in no case less than 3".

5. Make flat and lap seams in the direction of water flow.

D. Joints:

1. Join parts with rivets or sheet metal screws where necessary for strength and stiffness.

2. Provide suitable watertight expansion joints for runs of more than 40'-0", except where closer spacing is indicated on the Drawings or required for proper installation.

3. On continuous sheet metal shapes, splicing joints shall be soldered and smoothed out to match finish surface.

E. Nailing:

1. Whenever possible, secure metal by means of clips or cleats, without nailing through the exterior metal.

2. In general, space nails, rivets, and screws not more than 8" apart and, where exposed to the weather, use lead washers.

3. For nailing into wood, use barbed galvanized roofing nails 1-1/4" long by 11 gage.

4. For nailing into concrete, use drilled plugholes and plugs.

3.3 SOLDERING

A. General:

1. Thoroughly clean and tin the joint materials prior to soldering.

2. Perform soldering slowly, with a well heated copper, in order to heat the seams thoroughly and to completely fill them with solder.

3. Perform soldering with a heavy soldering copper of blunt design, properly tinned for use.

4. Make exposed soldering on finished surfaces neat, full flowing, and smooth.

5. After soldering, thoroughly acid flux with a soda solution.

3.4 TESTS

A. Demonstrate by hose or standing water that the flashing and sheet metal are completely watertight. For testing the built-in gutter, allow water to stand at least 24 hours.

3.5 DISSIMILAR MATERIALS PROTECTION

A. Separate aluminum or copper from contact with cementitious materials and other metals (except stainless steel and/or zinc) with a heavy coat of bituminous paint, liquid neoprene, or chromate gasketing or priming.

3.6 REPAIR OF DAMAGED GALVANIZED SURFACES

A. Clean and pretreat with a phosphoric or vinyl resin primer.

1. Metal Surfaces to be Painted. Apply coat of zinc dust-zinc oxide primer, Federal Specification TT-P-641d.

2. Metal Surfaces to be Left Unpainted: Coat with a 90 percent zinc content paint; PRC cold galvanizing process, "Galvicon" or "Drygalv".

3.7 ROOFING SHEET METAL WORK

A. General: All surfaces to which sheet metal is applied or attached to be free from defects of any kind and brushed clean; set flush or remove any projections, nails, fins, etc., as required for neat, secure, and waterproof installation.

B. Reglets and Counterflashings:

1. Materials: 24-gage galvanized sheet steel of gage noted on the Contract Drawings.

2. Products: Metal spring-lock flashings by Metco Metal Products Co., Los Angeles, California, or Lane-Aire Permanent Flashings by Lane-Aire Mfg. Co., Los Angeles, California, or "Spring Lock" Reglet and Counterflashing System by Fry Reglet Corp., Los Angeles, California.

3. Installation: As per manufacturer's approved shop drawings and printed instructions.

C. Flashings for Overflow Drains Passing Through Roof:

1. Material: 20-gage galvanized sheet steel.

2. Fabrication and Installation: Overflow drain to extend two inches above roof surface. Flashings to be sized to properly fit around overflow drain pipe and be sealed watertight. Flashing flange to extend at least 6-inches in all directions and be embedded in roofing bitumen over the roof insulation under the roofing felts.

D. Flashings for Electrical Conduit Passing Through Roof:

1. Materials: 20-gage galvanized sheet metal.

2. Fabrication and Installation: Extend sleeve minimum 6-inches above roof surface of size to properly fit the conduit or antenna and sealed watertight. Extend 4-inch roof flanges in all directions and embed in roofing bitumen.

E. Sheet Metal Covering on Flat, or Sloped Surfaces: Except as specified or indicated otherwise, cover and flash all minor flat, or sloped surfaces, and small decks with metal sheets of the material used for flashing; maximum size of sheets, 16 inches by 18 inches. Fasten sheets to wood with metal cleats. Lock seams and solder. Lock aluminum seams and fill with sealer as recommended by aluminum manufacturer. Provide an underlayment of building paper for all sheet metal covering.

F. Gutters shall terminate at least 1/2 inch away from vertical surfaces. Gutters shall be hung with high points at ends or equidistant from downspouts and shall have a slope of not less than 1/16 inch per foot.

END OF SECTION

SECTION 07 60 08

BUILT-IN ALUMINUM GUTTERS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Furnish and install built-in aluminum gutters, including underlayment, flashing and sheet metal as indicated on the drawings and specified.

1.3 ACTION SUBMITTALS

A. Submit shop drawings. Include Indicate thicknesses, dimensions, fastenings and anchoring methods, expansion joints, and other provisions necessary for thermal expansion and contraction. Scaled manufacturer's catalog data may be submitted for factory fabricated items.

PART 2 - PRODUCTS

2.1 BUILT-IN ALUMINUM GUTTERS

A. Furnish aluminum sheet metal items in 8-to 10-foot lengths. Single pieces less than 8 feet long may be used to connect to factory-fabricated inside and outside corners, and at ends of runs. Provide accessories and other items essential to complete the sheet metal installation. These accessories shall be made of the same materials as the items to which they are applied. Fabricate sheet metal items of the materials specified below. Sheet metal items shall have mill finish unless specified otherwise.

B. Aluminum Sheet: Conform to ASTM B 209, alloy and to suit forming operations and performance required.

1. Thickness: Not less than 0.40 inches.
2. Profile as indicated on the drawings.

C. Soldering Flux: Conform to ASTM B284.

D. Solder: Conform to ASTM B32.

E. Bituminous Plastic Cement: Conform to ASTM D2822, Type I.

F. Fasteners: Use aluminum or stainless steel nails, screws, or other mechanical fastening devices.

2.2 WATERPROOF UNDERLAYMENT BACKING

A. Provide waterproof membranes under aluminum gutters. Waterproofing materials shall be either polyethelene sheet, or unrethane type as follows:

1. Polyethylene sheet Waterproofing: Manufacturer’s standard proprietary product consisting of composite sheets, 60 inches wide by a nominal thickness of 0.030,

composed of an inner layer of chlorinated polyethylene sheet faced on both sides with laminated high-strength nonwoven polyester material, designed for embedding in thin set mortar.

2. Products: Subject to compliance with specified requirements, provide one of the following (or equal):

a. Polyethylene Sheet Waterproofing: "Nobleseal TS", Noble Co. (distributed by H.B. Fuller Co.).

b. Urethane Waterproofing and Tile-Setting Adhesive: "Hydroment Ultra-Set", Bostik construction Products Div.

PART 3 - EXECUTION

3.1 INSTALLATION OF WATERPROOFING

A. Install waterproofing in compliance with waterproofing manufacturer's instructions to produce a waterproof membrane of uniform thickness bonded securely to substrate.

B. The metal-flashing flange of drains, and other penetrations through the membrane shall be sealed to the waterproofing membrane, then covered, flashed and sealed watertight.

3.2 INSTALLATION OF GUTTERS

A. Install aluminum in accordance with the approved shop drawings. Secure gutters in place without penetrating the underlying waterproofing membrane.

3.3 LEAKAGE TESTS

A. Both the waterproofing membrane and the built-in gutter shall be subjected to separate leakage tests and there shall be no visible or detectable leakage.

B. After the waterproofing has properly cured, and approved, the cavity shall be filled with water and tested. The Contractor shall fill the cavity with water. Advise the Owner of the time of the test. Keep cavity half full the first 12 hours of test, then fill to full capacity. Monitor the water level intermittently during the first 24 hours of the fill test and then daily for the next 2 days with measurements taken at the same time each day. Use a measuring rule with at least 1/8-inch calibrations. Notify the Owner immediately of any loss of water greater than 3/16 inch or any detectable or visible leaks. If there is no measurable drop in the water, or the drop is less than 3/16 inch during the test period, the waterproofing will be accepted. If leakage is detected, the Contractor shall drain the water from the cavity. When empty, clean the waterproofing, and carefully inspect the membrane for evidence of failures or other possible sources of leakage. Repair defects found in the waterproofing and repeat tests until there is no loss of water greater than 3/16 inch.

C. After the aluminum gutter has been installed, it shall pass the same leakage test as specified for the waterproofing membrane.

END OF SECTION

SECTION 07 77 22

ROOF ACCESS HATCHES WITH SAFETY POLE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Furnish and install roof access hatches with safety pole, and accessories is indicated on the drawings and specified.

1.3 QUALITY ASSURANCE

A. Submit manufacturer’s technical product data, illustrations, specifications, rough-in diagrams, details, dimensions, installation instructions and general maintenance recommendations.

B. Coordinate rough opening sizes and installation work with that of the roofing installer and other trades to ensure proper fit up, and weather tightness.

C. Exercise care to avoid damage during unloading, storing and installation. Immediately remove and replace any damaged products.

PART 2 - PRODUCTS

2.1 ROOF ACCESS HATCHES:

A. Fabricate units of sizes shown, single-leaf type unless otherwise indicated, for 40 lbs. per sq. ft. external loading and 20 lbs. per sq. ft. internal loading pressure. Frame with 9" high integral-curb double-wall construction with 1-1/2" insulation, cant strips and cap flashing (roofing counter-flashing), with welded or sealed mechanical corner joints. Provide double-wall cover (lid) construction with 1" insulation core. Equip units with complete hardware set including hold-open devices, interior padlock hasps, and both interior and exterior latch handles.

1. Provide gasketing. Fabricate units of aluminum or zinc coated steel, or in combination, at Contractor's option.

2. Provide a torsion coil spring to assist in lifting the cover.

B. Manufacturers: Subject to compliance with specified requirements, provide prefabricated roof hatch units with ladder up safety pole as manufactured by Milcor, or an "or equal" product by one of the following:

1. Milcor Inc.
2. Babcock-Davis Hatchways Inc.
2. Dur-Red Products.
3. Bristol Fiberlite Industries.
4. O'Keefe's, Inc.
5. Bilco Co.

2.2 LADDER-UP SAFETY POLE

A. Safety: Ladder shall be equipped with a center mounted mechanism that fosters the safety of the person using the ladder. The safety pole shall be readily raised as an individual ascends through the hatch door and affixes securely in the upright position, automatically locks when fully extended.

B. Mechanism: A release mechanism shall allow the safety pole to be lowered from below the hatch door. The mechanism shall meet OSHA requirements, and shall be Bilco Model LU-2 (galvanized), or an "or equal" model by one of the aforementioned manufacturers.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Comply with manufacturer's instructions and recommendations. Coordinate with installation of roof deck and other substrates to receive accessory units, and vapor barriers, roof insulation, roofing and flashing; as required to ensure that each element of the work performs properly, and that combined elements are waterproof and weathertight. Anchor units securely to supporting structural substrates, adequate to withstand lateral and thermal stresses as well as inward and outward loading pressures.

B. Flange Seals: Except as otherwise indicated, set flanges of the unit in a thick bed of roofing cement, to form a seal.

C. Cap Flashing: Where cap flashing is required as component of hatch, install it to provide adequate waterproof overlap with roofing or roof flashing (as counter flashing). Seal with thick bead of mastic sealant.

D. Operational Units: Test operate hatches, ladder up pole, and other operable components. Clean and lubricate joints and hardware. Adjust for proper operation.

E. Clean exposed surfaces in accordance with manufacturer's instructions. Touch up damaged metal coatings.

F. Demonstrate by water hose that the installation is completely weathertight.

END OF SECTION

SECTION 07 84 00

FIRESTOPPING

PART 1 - GENERAL

1.1 DESCRIPTION

A. Scope of Work: Provide all labor and materials or a combination of materials to form an effective barrier against the spread of flame, smoke and gases and to maintain the integrity of the time-rated firestopping system in the following locations, but not necessarily limited to, of fire resistive and non-fire resistive constructions:

1. In concealed spaces of stud walls and partitions, including furred spaces at the ceiling and floor levels and at 10-foot intervals both vertical and horizontal, along the length of the wall.

2. In all interconnections between concealed vertical and horizontal spaces occur at soffits, drop ceilings and cove ceilings.

3. In concealed space between stair stringers at the top and bottom of the run and between studs along and in line with the run of stairs if the wall under the stairs are unfinished.

4. In openings around vents, pipes, ducts, chimneys, fireplaces and similar openings which afford a passage for fire at ceiling and floor levels.

5. In openings of area separation walls in fire resistive or non-fire resistive construction.

6. Duct, cable, cable tray, conduit, electrical busways and raceways, and pipe penetrations through fire rated horizontal barriers (above grade floor slabs/ceiling assemble), and verticle barriers (partitions and walls) of fire resistance rated areas such as occupied rooms, storage spaces, mechanical and electrical rooms.

7. Penetrations of vertical shafts such as pipe chases.

8. The gaps at the perimeter joint of the above grade floor slabs and curtain walls.

9. Penetrations in fire resistive floor-ceiling, roof-ceiling, wall-ceiling, and parapet wall systems.

10. Head of wall joints between the top of fire resistive walls and underside of ceiling or roof assemblies.

11. Exterior wall and floor openings and joints.

12. All perimeter joints of the door frames, windows and louvers in fire rated walls or exterior walls. Coordinate and provide fire, hot gases, smoke and draft control sealant between door and door frame, meeting UBC Standard 7-2 (Part I and II), UL10B and UL10C.

13. Openings around structural members which penetrate floors or walls.

B. Related Work: Documents affecting work of this Section include, but are not necessarily limited to the GENERAL CONDITIONS, SUPPLEMENTARY CONDITIONS and Sections in DIVISION 01 - GENERAL REQUIREMENTS of the Project Manual.

1.2 QUALITY ASSURANCE

A. Labor: Use adequate number of skilled workers who are thoroughly trained and certified by the manufacturer, and experienced in the necessary crafts and who are completely familiar with the specified requirements and methods needed for the proper performance of the work of this Section.

B. Code Requirements: All work of this Section shall conform to the latest requirements of the National Fire Protection Association (NFPA), the Los Angeles City Fire Department, Los Angeles City Building Code, Plumbing Code, Mechanical Code, Electrical Code, and Applicable Amendments.

C. Materials shall meet the requirements of the NFPA 101, "Life Safety Code" and NFPA 70 "National Electrical Code".

1.3 SUBMITTALS

A. Conform to applicable provisions of SHOP DRAWINGS/SUBMITTALS of DIVISION 01 - GENERAL REQUIREMENTS of the Project Manual.

B. Material List: Submit a list of all material intended to be used in this Project and their locations.

C. Shop Drawings: Shall be submitted for City Engineer’s review and shall include manufacturer's descriptive data, material safety data sheet, typical details, installation instructions, and the fire-test report and data as appropriate for the time-rated construction and location of all firestopping. The fire-test report and data shall include a certification by a nationally recognized testing authority or by other supporting, evidence satisfactory to the Consultant Architect or City Engineer.

D. Mock-up Panels: Submit mock-up panel, minimum 12 inches x 12 inches, for each of proposed materials with the proposed application/installation.

E. Color samples.

F. Installer Training certificates.

G. Any alternate or substitution to fire resistive material or construction must be approved by City Engineer and Local governing official on the basis of evidence submitted by a California licensed Structural Engineer obtained by the Contractor showing that the material or construction meets the required fire resistive classification.

H. Submit product certificates signed by manufactured of firestopping material certifying that the products furnished, comply with requirements.

1.4 PRODUCT HANDLING

A. Delivery: Materials shall be delivered to the job-site in the original unopened packages or containers showing name of the manufacturer and the brand name.

B. Storage: Materials shall be stored off the ground and shall be protected from damage and exposure to heat, sunlight and other the elements.

C. Handling: Damaged or deteriorated materials shall be removed from the job-site and shall be replaced with new materials at no added cost to the City.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Firestopping Materials in Combustible Construction/Building Assembly:

1. Except locations specified in the codes where the noncombustible materials are required; firestopping in combustible construction/building assembly may consist of 2 inches nominal lumber or two thicknesses of 1-inch nominal lumber with broken lap joints or one thickness of 23/32 inch plywood with joints backed by 23/32 inch plywood.

2. Firestops may also be of gypsum board, cementitious board, mineral wool or other approved materials securely fastened in place. Walls having parallel or staggered studs for sound transmission control shall have fire stops of mineral wool or other approved non-rigid material.

B. Firestopping Materials in Fire Resistive Constructions: Fire resistive walls, floor-ceiling or roof ceiling construction shall have fire-resistance rating set forth in the Contract Drawings or code requirements. Penetrations in wall, floors and ceiling requiring protected opening; construction joints and gaps occurring between floors; the intersection of floors to exterior walls; and intersection of the top of wall to ceiling shall be firestopped. The firestopping materials shall consist of commercially manufactured products tested for firestop installations and shall meet or exceed the requirements of ASTM E814 - STANDARD TEST METHOD FOR FIRE TESTS OF THROUGH - PENETRATION FIRESTOPS.

1. F and T Rating System: Material shall conform to Flame (F)-rating and Temperature (T)-rating requirements of ASTM E814 – STANDARD TEST METHOD FOR FIRE TESTS OF THROUGH-PENETRATION FIRE STOPS. Unless specified otherwise, F-rating and T-rating shall have rating of not less than the required rating of the construction assemblies.

C. The firestopping shall also comply with the following minimum requirements:

1. Flame Spread: Twenty-five (25) or less when tested in accordance with ASTM E84 - STANDARD TEST METHOD FOR SURFACE CHARACTERISTICS OF BUILDING MATERIAL.

2. Smoke Density/Development: Fifty (50) or less when tested in accordance with ASTM E84.

3. Fuel Contribution: Twenty-five (25) or less when tested in accordance with ASTM E84.

4. Nontoxicity: Nontoxic to human beings at all stages of application and during fire conditions.

5. Firestopping at penetrations of electrical cables or conduits shall also comply with requirements of NFPA 70.

6. Fire Resistance:

a. Materials used to seal penetrations in time-rated construction assemblies shall be capable of preventing the passage of flame and hot gases sufficient to ignite cotton waste when subjected to ASTM E119 - TEST METHODS FOR FIRE TESTS OF BUILDING CONSTRUCTION AND MATERIALS time-temperature fire conditions. Materials shall have rating of not less than required rating of the construction assemblies.

b. Materials used to seal openings between floor slabs and curtain walls shall be capable of preventing the passage of flame and hot gases sufficient to ignite cotton waste when subjected to ASTM E119 time-temperature fire conditions. Material shall have rating of not less than required rating of the construction assemblies.

c. Material shall not require a rise in temperature to install or activate seal.

7. Construction joint/gap fire stopping material must be tested for cyclic movement according to ASTM E1399 - TEST METHOD FOR CYCLIC MOVEMENT AND MEASURING THE MINIMUM AND MAXIMUM JOINT WIDTHS OF ARCHITECTURAL JOINT SYSTEMS and to meet or not to exceed 500 cycles at 10 cycles per minute.

8. All firestopping material in exterior surface application shall be moisture, water [and Ultraviolet light] resistant, in addition to fire, smoke and gas resistant.

9. All firestopping material shall be halogen, solvents and asbestos free and comply with local regulations controlling use of volatile organic compounds (VOCs) and capable for new painting. All firestopping material shall be non-toxic to building occupants.

D. All firestopping products must be from a single manufacturer. All trades shall use products from same manufacturer.

E. Where floor openings without penetrating items are more than [4 inches] in width and subject to traffic or loading, firestopping materials with supporting steel plate must be capable of supporting same loading as floor.

F. Conduit and piping terminations or penetrations at roof, wall or slab on grade subject to moisture or ground water shall be sealed with water resistant fire stopping.

G. Accessories: As part of the contract, provide components for each firestopping system that are needed to form, support or install the firestopping material. Use components specified by the firestopping manufacturer, and approved by the qualified testing agency and local governing agencies for the designated fire-resistance-rated system.

Accessories include, but are not limited to, the following:

1. Slag wood fiber insulation.
2. Foams or sealants used to prevent leakage of fill materials in liquid state.
3. Polyethylene/polyurethane backer rod.
4. Rigid polystyrene board.
5. Temporary forming materials.
6. Substrate primers.
7. Steel sleeves.
8. Retraining angles/retaining angles.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verification of conditions: examine areas and conditions under which work is to be performed and identify conditions detrimental to proper or timely completion.

1. Verify barrier penetrations are properly sized and in suitable temperature and humidity conditions for application of materials.

2. Do not proceed until unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Clean surfaces to be in contact with penetration seal materials of dirt, grease, oil, loose materials, rust, or other substances that may affect proper fitting, adhesion, or the required fire resistance.

B. PRIMING

Use only the primer recommended by the firestopping manufacturer and approved by the City Engineer for any particular installation. Apply primer in strict accordance the manufacturer's recommendations as approved by the City Engineer prior to application of fire stopping.

3.3 INSTALLATION

A. Firestopping shall be installed at locations shown or specified in accordance with manufacturers' written instruction and fire-test report. Cutting and patching of construction and providing sleeves, where required and/or shown in Contract Drawings or specified in other sections.

B. Filling the Voids: Firestopping material shall completely fill void or sleeve annular spaces, or opening at the penetration regardless of geometric configuration, subject to tolerances established by the manufacturer. Firestopping for filling voids in floors in which the smallest dimension of the void is 4-inches or more shall support the same load as the floor is designed to support.

C. Insulated Pipes and Ducts: Insulated pipes and ducts penetrating fire-rated floors and walls shall be insulated with materials which provide the same performance as the firestopping material. This material shall extend a minimum of 6-inches on each side of the opening. Vapor barrier of such insulation shall have a perm-rating of 0.03 maximum.

D. Electrical Conduits: Outlet boxes on opposite sides of walls or partitions shall be separated by a horizontal distance of [24 inches].

E. Seal holes or voids made by penetrations to ensure an effective fire and smoke barrier.

F. Where large openings are created in walls or floors to permit installation of pipes, ducts, cable tray, bus duct or other items, close unused portions of opening with firestopping materials tested for the application.

G. Install smoke stopping as specified for firestopping.

H. All penetrations including electrical panel, fire extinguisher cabinet, plumbing access door, and toilet accessories through any combustible or noncombustible firestoppings

within the cavity of fire resistive or non-fire resistive wall assemblies must be tightly sealed with a noncombustible material impervious to the passage of fire, smoke or gas.

I. Use only the filler or backing material recommended by the fire stopping manufacturer and approved by the City Engineer for each installation. Compress the filler or backing material 25% to 50% as recommended by the manufacturer to secure a positive and tight fit. When using the filler or backing material of tube or rod stock, avoid lengthwise stretching of material. Do not twist or braid hose or rod backing stock.

All firestopping must be inspected prior to any wall or ceiling closure.

J. For air duct, mount retaining angles to all sides of the air duct on both sides of the wall assemblies with the appropriate fasteners in recommended spacing. Angles do not have to be attached to the wall.

K. For head of wall joints, spray firestopping material to completely cover mineral wool and to over lap a minimum of ½ inch on to gypsum wall and metal decking on both sides of wall.

3.4 IDENTIFICATION

Install identification marker or plate in a visible position next to the firestopping. For a continuous opening, install on both sides identification marker or plate minimum 10 feet on center. For any wall penetration, identification marker or plate shall be installed on each side of the penetration.

3.5 CLEAN-UP

1. Clean adjacent surfaces free from fire seal as the installation progress. Do not use any solvent cleaning agent until it is approved by the manufacturer or City Engineer.

2. Remove excess fire seal from adjacent surfaces of joint, penetrations, etc. leaving the work in a neat and clean condition.

END OF SECTION

SECTION 07 92 00

CAULKING AND SEALANTS

PART 1 - GENERAL

1.1 SUMMARY

A. Throughout the Contracted Work furnish all tools, equipment, materials, and supplies and perform all labor to provide a positive barrier against passage of air or moisture from the exterior.

1. Caulk and Seal around entire exposed perimeters of all penetrations and openings through walls and for slabs on grade where any item is installed in the opening or through the penetrations.

2. Caulk and seal the sheet metal flashings and other items penetrating through the roof.

B. Related Sections: Documents affecting work of this Section include, but are not necessarily limited to the GENERAL CONDITIONS, SUPPLEMENTARY CONDITIONS and Sections in DIVISION 01 - GENERAL REQUIREMENTS of these Specifications.

1.2 QUALITY ASSURANCE

A. Reference Standards:

1. All materials specified herein shall conform to the requirements of the publications hereinafter listed, to the extent that the requirements therein specified are not in conflict with the provisions of this Section.

2. References to "ANSI Standards" shall mean the American National Standards Institute Publication A116.1-1967 "Two Component Elastomeric Sealing Components for the Building Trade".

B. Qualifications of Manufacturers: Products used in the work of this Section shall be produced by manufacturers regularly engaged in the manufacture of similar items and with a history of successful production acceptable to the City Engineer or the Consultant. Manufacturer shall have been on business of manufacturing the specified types of Sealants for not less than 10 years.

C. Qualification of Installers:

1. Installers shall be thoroughly trained and experienced in the necessary skills and be thoroughly familiar with the specified requirements and shall have a minimum of 5 years experience installing caulking and sealants.

2. Installers shall be completely familiar with the joint details shown on the Contract Drawings and installation requirement hereinafter specified in this Section.

1.3 SUBMITTALS

A. Manufacturer's Data: Comply with provisions in the SUBMITTALS in DIVISION 01 – GENERAL REQUIREMENTS of these Specifications.

1. Submit within 45 days after execution of the Contract:

a. A complete materials list showing all items specified to be furnished and installed under this Section.

b. Sufficient data to demonstrate that all materials meet or exceed the specified requirements.

c. Specification, installation instructions and general recommendations from manufacturer showing procedures under which it is proposed that materials will be installed.

d. Upon approval by the City Engineer or the Consultant, the proposed installation procedures will become the basis for inspection and acceptance or rejection of actual installation procedures used on the work.

B. Samples: Submit separate samples for each type of caulking or sealant material, together with manufacturer's data, all as necessary to fully demonstrate functional and service ability characteristics that comply with the specified requirements. Obtain approval prior to delivery of materials to the job-site for material substitutions. Samples of the sealant in concrete construction expansion joints shall be applied between 1-inch thick concrete blocks to the full size and shape of sealant in the joints indicated. Conform to the provisions of MATERIALS, SAMPLING AND TESTING of Section 31 in the GENERAL CONDITIONS of these Specifications.

1.4 GUARANTEE

A. Guarantee: The guarantee period specified in Section 28 of the GENERAL CONDITIONS of these Specifications shall hereby be extended to two (2) years. Contractor shall provide the City Engineer with a written guarantee against any inherent or developed defects in material or in installation and file five (5) copies of same with the City Engineer or the Consultant as a prerequisite for final acceptance of the work.

B. Warranty shall further state that installed sealants are warranted against the following:

1. Water leakage through sealed joints.
2. Adhesive or co-adhesive failure of sealant.
3. Staining of adjacent surfaces caused by migration of sealant or primer.
4. Chalking or visible color changes of the cured sealant.

1.5 DEFECTIVE WORK

A. Work will be adjudged defective by the City Engineer or the Consultant if leakage results from failure of sealant or caulking to bond to adjacent work or if it hardens, cracks, shrinks, or runs or stains adjacent work.

B. Remove defective work, clean joints and install new caulking and/or sealant materials as approved by the City Engineer or the Consultant at no added cost to the City.

1.6 PRODUCT HANDLING

A. Delivery and Storage: Deliver all materials of this Section to the job-site in their original unopened or unbroken containers with all labels intact and legible at time of use. Store only under conditions recommended by the manufacturer concerning shelf life, temperature humidity, ensuring the fitness of the material when installed. Do not retain

on the job-site any material which has exceeded the manufacturer's recommended shelf life.

B. Protection: Use all means necessary to protect the materials of this Section before, during and after installation and to protect work and materials of other trades.

C. Replacements: In the event of damage, immediately make all repairs and replacements necessary to the approval of the City Engineer or the Consultant, at no added cost to the City.

PART 2 - PRODUCTS

2.1 GENERAL

Materials shall conform to the referenced standards specified hereinafter, to the extent that they do not conflict with requirements of this Section.

2.2 SEALANTS

A. Type of Sealants:

1. Asphalt Sealant shall conform to Federal Specifications SS-S-1614 (1), EDOCO Technical Product No. 3060 or Burke's No. 400 Sealing Compound.

2. Elastomeric Joint Sealant: Federal Specification TT-S-00227E (3) for 2-part rubber base sealant or Federal Specification TT-S-230A for 1-part synthetic rubber base sealant.

a. Use "Class A" sealant for non-traffic bearing horizontal surfaces.

b. Use "Class B" sealant for vertical surfaces.

B. Sealant Colors:

1. Colors for each sealant installation will be selected by the City Engineer or the Consultant from standards colors normally available from the manufacturer. Should such standard color is not available from the approved manufacturer except at additional charge, provide all such colors at no additional cost to the City.

2. In concealed installations and in partially or full exposed installations, where so approved by the City Engineer or the Consultant, use standard gray or black sealant.

2.3 CAULKING MATERIALS

A. Caulking Compound: W.R. Grace & Co. "Hornflex Standard Gun Grade" or "Thiokol" approved polysulfide sealant for all other joints including miscellaneous vertical joints, exterior door, window and louver frames, etc.

B. Caulking Stop: Polyurethane for open joints of size 1-1/2 times the joint width opening and depth no more than 3/8 inch for sealant bite.

C. Oakum: Untarred, picked (loose), fine hemp fibers.

2.4 BACKUP MATERIALS FOR SEALANTS

A. Primers and Bond Breakers: As recommended by the sealant manufacturer in their published instructions.

B. Backer Rods and Other Backing Materials: Type as recommended by the Sealant manufacturer.

1. Closed-cell resilient urethane or polyvinyl chloride foam;
2. Closed-cell polyethylene foam;
3. Closed-cell sponge of vinyl or rubber;
4. Polychoroprene tubes or beads;
5. Polyisobuthlene extrusion;
6. Oil-less dry jute.

C. Filler for Use with Asphalt Sealant: Asphalt impregnated, as per ASTM D 1715.

D. Filler of Use with Elastomeric Sealer: Plain type as per ASTM D 1752 Type II or Type III.

E. Surface Covers: (Where Simple bond-prevention is necessary).

1. Polyethelene Tape, pressure-sensitive adhesive, required only to hold tape to the construction material.

2. Aluminum foil conforming to MIL-SPEC-MIL-A-148E

3. Heavy wax paper conforming to Fed. Spec. UU-P-270

F. Other Materials: All other materials, not specifically described but required for complete and proper caulking and installation of sealants, shall be first quality of their respective kinds as selected by the Contractor subject to the approval of the City Engineer or the Consultant.

PART 3 - EXECUTION

3.1 INSPECTION AND INSTRUCTIONS

A. Manufacturer's Inspection: Just prior to start of application of each type sealant, provide initial instructions at start of work in order to verify if physical conditions are proper in order to properly instruct applicators and that supervision provided is by qualified personnel handling such materials.

B. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to the proper and timely completion of the work. Do not proceed until detrimental conditions have been corrected.

C. Contractor to notify the manufacturer at least 72 hours prior to time inspection is required.

D. Failure or refusal of manufacturer to provide inspection and supervision shall constitute grounds for non-acceptability of materials manufactured, even though specified hereinafter in this Section.

E. Applicator shall report to the Contractor any detrimental conditions impairing the proper installation of such materials. Contractor shall correct all such detrimental conditions to the full satisfaction of the City Engineer or the Consultant or the Inspector at no added cost to the City.

3.2 WORKMANSHIP

A. Application: In strict accordance with ASTM C-962 and ASTM C-1193 and manufacturer's instructions and supervised by the manufacturer's approved applicator. Manufacturer to provide field assistance to insure proper mixing of sealants, cleaning of surfaces, and application of materials.

B. Cleaning: Immediately remove caulking and/or sealant materials from adjacent surfaces not specified to receive sealant, and/or caulking materials. Leave work in a condition satisfactory to the City Engineer or the Consultant.

C. Protection: Carefully protect adjoining surfaces from staining. Carefully provide necessary strippable masking where required to limit extent of caulking and sealant material application.

3.3 PREPARATION (AS APPLICABLE)

A. Joint Cleaning: Joints shall be free of foreign materials full depth of joint. Joint surfaces to be clean, dry and free from grease, oil, wax or other foreign matter, which would tend to destroy or impair adhesion. Clean surfaces in accordance with manufacturer's instructions.

B. Priming: Joint surfaces to be primed in accordance with sealant manufacturer's instructions.

C. Steel Surfaces:

1. Steel surfaces in contact with sealant shall be sandblasted or scraped or wire-brushed to remove mill scale.

2. Use solvent to remove oil and grease, wiping the surfaces with clean rags.

3. Remove protective coatings on steel by sandblasting or by a solvent that leaves no residue.

* D. Aluminum Surfaces:

1. Surfaces in contact with sealant shall be cleaned of temporary protective coatings, dirt, oil and grease.

2. When masking tape is used as a protective cover, remove tape just prior to application of sealant.

3. Use only such solvents to remove protective coatings as recommended for that purpose by the aluminum manufacturer, and which are non-staining.

* E. Concrete and Ceramic Tile Surfaces:

1. All contact surfaces shall be dry, sound, well brushed and wiped free from dust.

2. Use solvent to remove oil and grease, wiping the surfaces with clean rags.

3. Treated surfaces shall have the surface treatment removed by sandblasting or wire brushing.

4. Remove all laitance and mortar from the joint cavity.

5. Where backstop is required, insert an approved backup material into the joint cavity to required depth.

3.4 INSTALLATION OF BACKUP MATERIAL

A. Use only the backup materials recommended by the Sealant manufacturer and approved by the City Engineer or the Consultant for the particular installation, compressing the backup material 25% to 50% to secure a positive and secure fit. When using backup of tube or rod stock, avoid lengthwise stretching of material. Do not twist or braid hose or rod backup stock.

1. Sealant bite 1/8" to 2" but never more than 2 to 1/4 of joint width.
2. Use foam backup rod or bond breaker tape to minimize joint configuration.

3.5 PRIMING

Use only the primer recommended by the Sealant Manufacturer and approved by the City Engineer or the Consultant for the particular installation. Apply primer in strict accordance with manufacturer's recommendations as approved by the City Engineer or the Consultant.

3.6 SCHEDULE

A. Elastomeric Caulking Joint Compound: Use in expansion and contraction joints where limited movement is anticipated and areas where general caulking is required.

B. Multi-Part Sealant: Use in expansion and construction joints and all joints in all concrete walking surfaces where indicated or noted on the Contract Drawings and/or specified in the Specifications.

3.7 INSTALLATION SEALANTS

A. General: Prior to start of installation in each joint, verify the joint type according to Contract Drawing Details and that the required proportion of width to depth of joint has been secured.

B. Equipment: Apply sealants under pressure with hand or power actuated gun or other appropriate means. Guns shall have nozzle of proper size and shall provide sufficient pressure to completely fill joints as designed.

C. Application:

1. Caulking performed under other Sections of these Specifications shall comply with all of the following requirements unless specific changes are specified in those other Specification Sections.

2. Fill all joints where no backing exists partially with filler material (that is compatible with specified caulking or sealant material).

a. Metal to Metal Joints: Minimum joint width of 1/4-inch.

b. All Other Joints: Maximum 3/4-inch, unless otherwise detailed.

c. Minimum joint depth shall be 1/4-inch, for metal joints; 2-inch for concrete, masonry, and plaster work joints.

3. Apply sealants under sufficient pressure to completely fill all voids.

4. Apply non-sagging type sealants in vertical joints.

5. Apply self-leveling type sealants in horizontal joints.

6. Apply non-tracking sealants, having a shore hardness range of 40 to 55, to concrete, masonry or tile expansion joints, subject to foot or vehicular traffic.

7. Finish all exposed joints smooth, flush with surfaces, or recessed as shown.

8. Provide strippable masking for factory applied sealing materials to prevent dirt contamination until parts are assembled.

9. Tool all joints to the profile shown on the Contract Drawing Details.

10. Caulk and seal open joints left between openings and both sides of frames on the exterior of building and all other joints between building units or materials where Contract Drawings call for caulking and/or sealants, interior and exterior or where necessary to completely seal off joints against passage of water, air or dust.

D. Cleaning Up:

1. Remove masking tape immediately after joints have been tooled.

2. Clean adjacent surfaces free from sealants as the installation progresses. Use solvent or cleaning agent as recommended by the sealant manufacturer.

3. Remove excess caulking and sealants from adjacent surfaces of joints, leaving the work in a neat and clean condition.

E. Concrete Expansion and/or Contraction Joints: Construct such joints as indicated on the Contract Drawings and specified in DIVISION 3 - CONCRETE.

END OF SECTION

SECTION 08 11 00

METAL DOORS AND FRAMES

PART 1 - GENERAL

1.1 SUMMARY

A. All materials, tools, equipment, supplies and all labor required to fabricate and install metal doors and frames indicated on the Contract Drawings and in these Specifications.

B. Related Sections: Documents affecting work of this Section include, but are not necessarily limited to the GENERAL CONDITIONS, SUPPLEMENTARY CONDITIONS and Sections in DIVISION 01 - GENERAL REQUIREMENTS of these Specifications.

1.2 QUALITY ASSURANCE

A. Qualifications of Manufacturer: Products used in the work of this Section shall be produced by manufacturers regularly engaged in manufacture of similar items and with a history of successful production acceptable to the City Engineer or the Consultant and a Los Angeles City Building and Safety licensed fabricator.

B. Qualifications of Installer: Use adequate numbers of skilled installers who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

C. Single Source: All work of this Section shall be produced by a single manufacturer unless otherwise approved by the Consultant or City Engineer.

D. Shop Inspection: Required in accordance with General Conditions.

1.3 SUBMITTAL

A. Manufacturer's Data: Submit to the City Engineer after execution of Contract, in accordance with provisions in SUBMITTALS in DIVISION 01-GENERAL REQUIREMENTS of these Specifications, the following:

1. Complete materials list of all items proposed to be furnished and installed under this Section.

2. Manufacturers' specifications and other data required to demonstrate compliance with the specified requirements.

3. Shop Drawings minimum 1/4-inch scale showing details of each frame type, elevations of each door design type, details of all openings, and all details of construction, installation, and anchorage.

4. Manufacturer's recommended installation procedures.

NOTE: The manufacturer's recommended installation procedures, when approved by the City Engineer or the Consultant, will become the basis for inspecting and accepting or rejecting actual installation procedures used on the Work.

1.4 PRODUCT HANDLING

A. Delivery: Deliver, store and handle metal doors and frames in a manner to prevent damage or deterioration.

B. Packaging: Carefully package metal doors and frames in shipping containers to prevent damage to doors or marring the finish during shipping and handling. Identify shipping containers relative to door number and location.

C. Storage: Store Doors in an upright position inside the building outside of weather exposure until installed, where directed by the City Engineer at least 1-inch or more off the floor or ground and at least 1/4-inch between individual doors.

D. Protection: Use all means necessary to protect materials of this Section before, during and after installation and to protect installed work and materials of other trades.

E. Clean Up and Touch Up: Abraded, scarred or rusty areas of doors and/or frames shall be cleaned up and touched up with specified coating system immediately upon detection, subject to the approval of the City Engineer or the Consultant.

F. Replacements: In the event of damage, immediately make all replacements and/or repairs necessary to the approval of the City Engineer or the Consultant, at no added cost to the City.

1.5 GENERAL REQUIREMENTS

A. Labeled Doors and Frames: Construction and necessary built-in hardware shall conform to NFPA Standards and Uniform Building Code with the Los Angeles City current Amendments. Both doors and frames shall bear Underwriters, Inc. label for the rating indicated on the "Door Schedule" on the Contract Drawings.

B. Applicable Regulations: All exterior metal doors must comply with air infiltration standards as per California Energy Conservation Standards, Title 24, Part 6, Division T-20, Chapter 2, Subchapter 4 of the California Administrative Code.

C. Field Measurements: Verify all opening dimensions and field conditions at the job-site prior to submittal of Shop Drawings and fabrication.

D. Clean Up: Upon completion of work of this Section, remove all tools, equipment and rubbish resulting from this work from the premises and leave the work areas in a safe and clean condition.

E. Exterior Door Astragals: To be provided to prevent unauthorized entry from the outside.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Basic Materials for Doors and Transom Panels:

1. Cold rolled steel sheets of stretcher-leveled flatness, commercial quality conforming to ASTM A366 and A568 and Commercial Standards, CS 242-62 except where more stringent construction is required to satisfy U.L. labeling requirements.

2. Exterior doors shall be fabricated of sheet steel having a zinc coating of 1.25 ounces per square foot on each side before assembly.

3. Filler for labeled doors shall be material as approved by Underwriters Laboratories for fire rated doors. Other metal doors shall be filled with manufacturer's standard sound deadening material.

4. Paint: Rust-inhibitive primer, Federal Specification TT-P-645 which shall be baked on applied after assembly.

B. Basic Materials for Frames:

1. Door Frames: 14-gage (0.0747-inch thick) cold-rolled sheet steel of stretcher-leveled flatness conforming to ASTM A366-72.

2. Paint: Rust-inhibited zinc chromate primer, Federal Specifications TT-P-645 which shall be applied after assembly.

C. Inserts, Bolts and Fasteners: Manufacturer's standard units, except hot-dipped galvanized items to be built into exterior wall, comply with ASTM A-153, Class C or D as applicable.

2.2 FABRICATION

A. Construction Standards for Doors and Frames: Conform to Commercial Standards, CS242-62 except where more stringent construction is required to satisfy U.L. labeling requirements.

B. General Construction:

1. Construct metal doors and pressed metal frames in accordance with Contract Drawing details and reviewed Shop Drawings. Provide U.L. label on doors at time of delivery to the job-site. U.L. label shall be as noted on the "Door Schedule" on the Contract Drawings.

2. Fabricated steel door and frame units to be rigid, neat in appearance, free from defects, warp or buckles and metal accurately formed to required sizes and profiles.

3. Wherever practicable, fit and assemble units in the manufacturer's plant. Clearly identify work that cannot be permanently factory-assembled before shipment, to assure proper assembly at the job-site.

C. Door Fabrication:

1. Type: Flush, hollow steel doors, security type with suitable filler and U.L. Label.

2. General: In accordance with details on the Contract Drawings and reviewed Shop Drawings.

3. Metal Covering: Two formed sheets on each side of door not thinner than 12 gage steel, rigidly connected and reinforced with 18-gage steel vertical stiffeners running full length of door, approximately 6-inches on center.

4. Door Top and Bottom: Closed and reinforced with channel member running full width of door. Provide top edges of doors with channels welded in with web flush with upper edges of doors with no depression to eliminate accumulation of water

and provide protection against weather and penetration of water to interior of the door.

5. Light Panels: Manufacturer's standard design with removal stops secured with rust-resistant oval-head countersunk screws; sizes as indicated in Door Schedule on the Contract Drawings; build into door neatly, plumb and square, and accurately off-centered.

6. Door Edges and Hardware Reinforcements: Join and reinforce edges with 9-gage minimum steel strip, offset at hinge locations. Drill and tap to receive mortise hinges. Located bottom of bottom hinge 10-inches above door bottom and top of top hinge 5-inches below top of door, and center hinge midway between top and bottom hinges. Reinforce at locksets, panic bars, closers, and remainder of specified hardware; use specified minimum thickness material.

7. Cutouts: Make neatly to indicated size to receive louvers and lights with integral stops and/or applied stops on the exterior securely welded in place. Conceal all welds. Make interior removal stops, of at least 18 gage steel, sized to commensurate glass or louver thickness. Secure in place with countersunk oval head Phillips head sheet metal screws at maximum 10-inches on centers, except as otherwise indicated on the Contract Drawings.

8. Interior Door Louvers: Inverted "V" type as indicated on the Contract Drawings.

9. Fire-Rated Door Louvers: Controllair "FLDL" fusible link door louvers by Anemostat Controllair Co., Los Angeles, California, or equal; U.L. approved with movable 16-gage cold rolled "Z" shaped steel blades and frame with stainless steel pivots an U.L. approved 135 degree F fusible link and with baked-on epon enamel prime finish.

10. Exterior Door Louvers: Straight blades formed of 18-gage steel extended storm proof "Z" Section. Securely weld to flush permiter frames formed of the same gage and material as the blades, welded or riveted at corners. Provide on back side of louver a 1/4 inch mesh galvanized screen in a removable U-shaped galvanized frame.

11. Transoms: Material, thickness and construction shall match doors in the same opening.

D. Door Frame Fabrication:

1. Type: Pressed metal steel door frames of unit-type design.

2. Fabrication:

a. Accurately form to required shape, size and profile, as indicated on the Contract Drawings.

b. Weld corners full length of joint and grind welds smooth.

c. Jamb anchors on frame to be 12-gage steel for attachment to masonry or wood or concrete; 12-gage steel clip angle at bottom of each jamb fastening to floor; adjustable anchors as required by wall conditions. Provide spreader at the bottom of frame to be removed after frame is set and anchored. Provide minimum two anchors at head section and in jambs and one anchor for each 2-1/2 feet of door height or fraction thereof.

d. Provide manufacturer's gauge label for each item.

E. Preparation for Finish Hardware:

1. Prepare hollow metal door units to receive mortised and concealed finish hardware, including cutouts, reinforcing, drilling and tapping in accordance with final Finish Hardware Schedule and templates provided by the hardware suppliers. Comply with applicable requirements of ANSI-A115, CAC Title 24, NFPA, BHMA and NAAMM.

2. Accurately reinforce door and frame, drill and tap for hardware. For exterior door and frame, all reinforcing plates shall be zinc coated to match door and frame material:

a. Provide one internal 7 ~~9~~-gage steel plate 10-inches long for each of three mortise hinges. Locate top of top hinge 5-inches below top of door. Locate bottom of bottom hinge 10-inches above bottom of door. Locate immediate hinge midway between top and bottom hinges. Weld plates to the door frame.

b. Reinforce frames with 12-gage steel plates for door closers.

F. Astragal on Exterior Doors: Specified in the FINISH HARDWARE Section 087100.

G. Shop Finish: Doors and frames to receive two (2) coats of a baked-on-rust inhibitive metal primer over bonderized surfaces and make ready for field painting at the job site.

H. Factory Baked-On Enamel Finish:

1. Required on all hollow metal doors and pressed metal frames.

2. Colors: Color shall be selected by the City Engineer or the Consultant from manufacturer's standard colors submitted to the City Engineer or the Consultant and shall be formulated to match color chip furnished by the City Engineer or the Consultant or as noted on the Contract Drawings.

3. Application: To properly clean and phosphate treat galvanized surfaces, manufacturer shall apply a coat of zinc chromate primer (Federal Specification TT-P-636) which shall be at least 1.25 combined oz. per square foot of surface on both sides and then shall apply two (2) coats of an acrylic baking enamel having 20 + 5 gloss conforming to test method 6101 of Federal Standard 141, each coat shall be minimum 1-mil thick and shall be baked under controlled conditions at proper time and temperature for the particular color desired to provide a hard and durable finish.

4. Tests: Baked-on enamel finish shall be capable of withstanding a minimum 1000 hour salt spray test conforming to Federal Standard test method No. 141 without appreciable undercutting and 1000 hours on Atlas Fadeometer without showing appreciable fading.

5. Protection: Doors and frames with baked-on enamel finish shall be wrapped in plastic film to protect against damage during transportation, handling and storage until time of installation. Plastic film wrapping shall be removed just prior to installation of frames and doors.

PART 3 - EXECUTION

3.1 INSPECTION

Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to the proper and timely completion of the work. Do not proceed until detrimental conditions have been corrected.

3.2 INSTALLATION

A. General: Install hollow metal units and accessories in accordance with manufacturer's data and as hereinafter specified.

B. Installation of Door Frames: Frames shall be set into position and in, accurate alignment, plumb, straight and true to plane and shall be rigidly and securely anchored to the adjacent concrete or masonry construction and filled with grout. Bottom anchor to wall shall be installed approximately 24 inches above the floor. Upon completion of door frame installation, the bottom spreader shall then be removed and the frame shall be made ready to receive hardware and the door. Protect frames against damage after erection.

C. Installation of Doors: Doors shall be accurately fitted, leaving 1/8 inch (plus or minus 1/32-inch) clearance at sides and top. Doors shall be hung plumb and square, in accurate alignment, true to plane on specified hardware and shall operate freely but not loosely without binding. Installation of astragals specified in Section 087100 - FINISH HARDWARE.

D. Final Adjustments:

1. Check and readjust operating finish hardware items in hollow metal work just prior to final inspection.

2. Leave work in complete and proper operating condition.

3. Remove defective work and replace with work complying with the specified requirements.

E. Final Cleaning: Immediately after erection, sand smooth all rusted and damaged areas of prime coat and apply touch-up of compatible air-drying primes prior to painting on the job-site.

F. Protection: Provide protection for doors and frames against damage resulting from other construction operations until acceptance by the City. Contractor shall repair any damage to baked-on-enamel finish as directed by the Manufacturer at no added cost to the City.

G. Maintenance Materials: Furnish the City with a full, labeled and sealed 1-gallon can of touch-up material of each color and instructions for repair of doors and frames.

H. Testing: Upon completion of installation, Contractor shall test installed doors against moisture and air penetration through door, frame and sill joints as directed under the presence of the City Engineer and/or Architect. Contractor shall comply with corrections as directed by the City Engineer or Architect at no added cost to the City.

END OF SECTION

SECTION 08 11 51

STEEL TUBE DOOR FRAMES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Furnish and install steel tube door frames as indicated on the drawings and specified.

1.3 SUBMITTALS

A. Shop Drawings: Submit scalable drawings. Indicate frame elevations, reinforcement, anchor types and spacing, location of operator, hardware, and finish.

1.4 COORDINATION

A. Coordinate Work with frame opening construction, door, operator and hardware installation. Sequence installation to accommodate required door electric wire connections.

PART 2 - PRODUCTS

2.1 STEEL TUBE (HSS) DOOR FRAMES

A. Square and Rectangular HSS: ASTM A500 Grade B or C.

B. Galvanized per ASTM A123, G-90 after fabrication.

C. Fabricate framework of HSS steel tubes as shown on the drawings.

1. Continuously weld joints. Miter and weld channel frame at corners. Reinforce corner with plate angles. Drill and tap for fastenings and anchorages.

2. Weld all frames and grind smooth. Provide continuous flush welds.

3. Provide jamb anchors at 30 inches on center (or fractional portion) on each jamb.

4. Primer: Use the zinc rich cathodic protecting and rust inhibiting paint.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install frames as recommended by the product manufacturer and in accordance with the approved shop drawings.

B. Maximum Diagonal Distortion: 1/16 inch measured with straight edges, crossed corner to corner.

END OF SECTION

SECTION 08 30 50

ACCESS PANELS

PART 1 GENERAL

1.1 SUMMARY

A. All materials, tools, equipment, supplies and all labor required to fabricate and install access panels and frames indicated on the Contract Drawings and in these Specifications.

1.2 RELATED WORK

A. Documents affecting work of this Section include, but are not necessarily limited to the GENERAL CONDITIONS, and Sections in DIVISION 1 - GENERAL REQUIREMENTS of these Specifications.

1.3 QUALITY ASSURANCE

A. Qualifications of Manufacturer: Products used in the work of this Section shall be produced by manufacturers regularly engaged in manufacture of similar items and with a history of successful production acceptable to the City Engineer or the Consultant.

B. Qualifications of Installer: Use adequate numbers of skilled installers who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

C. Single Source: All work of this Section shall be produced by a single manufacturer unless otherwise approved by the Consultant or City Engineer.

D. Fire-Resistance Ratings: Wherever a fire-resistance classification is indicated, provide access panel assembly with panel door, frame, hinge, and latch from manufacturer listed in Underwriters Laboratories, Inc.'s "Building Materials Directory" for rating indicated on the Contract Drawings.

1. Provide UL label on each fire-rated access panel.

E. Coordination: Furnish inserts and anchoring devices that must be built into other work for installation of access panels. Coordinate delivery with other work to avoid delay.

1.4 SUBMITTAL

A. General: Submit the following:

1. Product data in form of manufacturer's technical data and installation instructions for each type of access panel assembly, including setting drawings, templates, instructions, and directions for installation of anchorage, devices.

2. Shop drawings showing fabrication and installation of customized access panels and frames, including details of each frame type, elevations of panel design types, anchorage and accessory items.

1.5 GUARANTY-WARRANTY

A. The Contractor shall and does hereby warrant and guaranty that all work executed under this Contract be free from defects of materials and workmanship for a period of one year from the date of final acceptance of the project by the Board of Public Works, except certain specific items of work, materials and equipment requiring a guaranty or warranty for a greater period of time is specified.

PART 2 PRODUCTS

2.1 ACCESS PANELS

A. Manufacturers: Subject to compliance with specified requirements, provide access panels by one of the following:

1. Cesco Products
2. Karp Associates, Inc.
3. Milcor, Inc.
4. Nystrom, Inc.

B. Standard: The design was based on Nystrom Fire Rated Access Panels, or equal, to establish a standard of quality. Equal products of the aforementioned manufacturers will also be acceptable. Provide the following Nystrom models, or equal:

1. Fire Rated Wall Access Panel:

a. Model: APFR-WP
b. Size: 36 x 36 Nominal Dimensions.

2. Fire Rated Ceiling Access Panel:

a. Model: APFR-WP
b. Size: 24 x 24 Nominal Dimensions.

3. Non-Rated Ceiling Access Panel:

a. Model: APWB-RD
b. Size: 24" x 24" Nominal Dimensions.

C. Construction:

1. High quality commercial grade cold rolled steel with 16 gauge frame and 20 gauge panel.

2. Finish shall be phosphate dipped with a factory applied baked-on rust inhibitive gray prime finish. Field finish paint to match adjacent surfaces.

3. Finish Beading: Standard 22 gauge galvanized steel drywall bead.

4. Hinge: Concealed Pin Hinge.

5. Provide continuous spring closer.

6. Latch/Lock: Ball bearing cylinder lock operated by a recessed turn ring or flush key which allows surface covering to be applied over face of panel without

obstruction. All panels shall have an interior latch release mechanism allowing panels to be unlocked from the inside.

PART 3 EXECUTION

3.1 INSTALLATION

A. Install access panels where indicated on the Contract Drawings, and in accordance with manufacturer's installation recommendations and all applicable building codes.

B. Set frames accurately in position and securely attach to supports with face panels plumb or level in relation to adjacent finish surfaces.

3.2 ADJUST AND CLEAN

A. Adjust hardware and panels after installation for proper operation.

B. Remove and replace panels or frames that are warped, bowed, or otherwise damaged.

END OF SECTION

SECTION 08 31 13

COILING COUNTER DOORS

PART 1 - GENERAL

1.1 SUMMARY

A. Furnish and install coiling counter doors as indicated on the drawings and specified.

B. Related Sections: Division 01 - General Requirements.

1.2 SYSTEM DESIGN REQUIREMENTS

A. Drawings indicate locations, sizes, profiles and general details of coiling counter door construction and installation.

B. Fire rated coiling doors shall bear a UL label, Warnock Hersey, FMG or other nationally recognized testing laboratory for the fire ratings listed in the drawings, and shall be approved for use by the California State Fire Marshal.

1.3 SUBMITTALS

A. Product Data: Submit manufacturer's specifications, rough-in diagrams, installation instructions and manufacturer's data. Submit manufacturer's data on locking devices that are included in this Work.

1.4 DELIVERY, STORAGE AND HANDLING

A. Provide protection as required by manufacturer to protect products from damage during shipping and storage.

1.5 WARRANTY

A. Provide manufacturer’s one year warranty against defects in materials, fabrication, and installation.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Provide coiling counter doors manufactured by The Cookson Company, Lawrence Roll-Up Doors, Inc., Cornell Iron Works, or equal.

2.2 GENERAL REQUIREMENTS

A. Coiling counter doors shall be stainless steel, manually operated, push-up type. Cookson Model CD10-1SS, Lawrence Model CDFP-SS, or equal.

B. Locking Devices: Furnish sliding locks surface mounted on a single angle bottom bars that locks into each side guide. Devices shall be substantially constructed and properly adjusted to operate as required.

1. Unless otherwise specified, doors shall be provided with have sliding at each side, arranged to operate separately from inside face of door. Sliding locks shall positively engage side guides.

2. Doors, where slide-up wicket windows occur, shall be provided with have sliding bolts concealed within tubular bottom bar feature, operated from inside face of door by a single turn knob in center of bottom bar.

3. Doors at instrument storage cabinets and others cabinets as indicated shall be provided with have sliding bolts concealed within a tubular bottom bar arranged to operate from outside by means of thumb turn and cylinder-lock, set in bottom bar midway between side guides.

C. Curtain slats shall be 22 gage stainless steel type 304, brush finish.

D. Door guides shall be stainless steel type 304, brush finish.

E. Hood shall be 24 gage stainless steel type 304, brush finish.

F. Push-up operation shall not exceed 30 pounds of force.

G. Furnish sheet metal Work to dimensions and shape required. Brake metal shapes true, sharp, straight lines and angles to a precise fit.

2.3 LABELED COILING COUNTER DOORS

A. Fire rated doors shall be Cookson Model FD 1-SS, Lawrence Model CLFP-SS, Cornell, or equal.

B. Door shall be furnished with an automatic closing device, which shall operate upon activation of a fusible link. Governor shall regulate downward speed curtain. Door shall have an average closing speed of not less than 6 inches per second and not more than 24 inches per second. Crank and motor operated fire doors shall automatically close without a loss of spring tension. Doors shall be easily reset by reconnecting the fusible link cable or chain and shall not require restoring spring tension.

2.4 INTEGRAL COILING COUNTER DOORS

A. Manually operated coiling doors with integral frame, curtain, hood, fascia and sill of stainless steel shall be Cookson Model CDF, Lawrence Model CDSP-SS, Cornell, or equal.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Installation shall be provided by an authorized representative of coiling overhead door manufacturer.

B. Install shutters and operating equipment plumb, in true alignment, free of springing, forcing, racking, or distortion.

C. Provide necessary hardware, jamb anchors, inserts, hanger, and equipment supports as required in manufacturer's literature.

D. Fasten curtain guide assembly to adjacent supports with galvanized fasteners at 24 inches on center for a rigid installation.

E. Upon completion of installation, lubricate, test and adjust doors to operate easily, free from warp, twist or distortion and fitting weathertight for entire perimeter.

3.2 CLEAN UP

A. Remove rubbish, debris and waste materials and legally dispose of off the Project site.

3.3 PROTECTION

A. Protect the Work of this section until Substantial Completion.

END OF SECTION

SECTION 08 36 00

OVERHEAD ROLL-UP DOORS

PART 1 - GENERAL

1.1 THE REQUIREMENT

A. The CONTRACTOR shall furnish and install all overhead door assemblies and frames and all appurtenant work, complete and operable, including manual drive systems and power drive systems, including locking hardware and control systems, in accordance with the requirements of the Contract Documents. Overhead door assemblies include sectional overhead doors and roll-up doors of the metal-curtain slat design.

1.2 REFERENCE SPECIFICATIONS, CODES AND STANDARDS

A. Comply with the current reference specifications of the GENERAL REQUIREMENTS.

B. Federal Specifications: QQ-S-775E, Int. Amd.1Steel Sheets, Carbon, Zinc-Coated (Galvanized) By The Hot-dip Process.

C. Commercial Standards:

1. NEMANational Electric Manufacturers' Association.
2. NECNational Electric Code.

D. Trade Standards: Aluminum Association:Anodizing Systems.

E. Manufacturers' Standards: In addition to the standards listed above, the overhead doors and their installation shall be in accordance with the manufacturer's published recommendations and specifications.

1.3 CONTRACTOR SUBMITTALS

A. Submittals shall be made in accordance with the GENERAL REQUIREMENTS.

B. The following submittals and specific information shall be provided.

1. Manufacturer's Information: Manufacturer's literature, wiring diagrams, manufacturer's installation instructions, and any engineering calculations that may be required elsewhere in this Section shall be submitted. Calculations by a civil or structural engineer registered in the State of California shall be submitted which show that the overhead door systems and their structural connections are designed to meet code requirements and loads.

2. Shop Drawings: Shop drawings showing details of the products and systems and connections to adjoining materials shall be submitted along with any manufacturer's installation instructions. Schedules showing sizes, types, and locations of louvers and glass shall be submitted.

3. O and M Instructions: Upon completion, the CONTRACTOR shall deliver to the ENGINEER complete operation and maintenance instructions for the overheard door assemblies.

1.4 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Delivery of Materials: Manufactured materials shall be delivered in original and unbroken packages, containers, or bundles bearing the name of the manufacturer.

B. Storage: All materials shall be carefully stored in an area that is protected from the elements. Storage shall be in a manner that will prevent damage or marring of the door and its finish.

PART 2 - PRODUCTS

2.1 ROLL-UP DOORS

A. General: Roll-up doors shall be of the galvanized steel metal-curtain slat design and shall be chain-operated, and shall be weather and dust-resistant. Doors shall be provided complete with slats, guides, hoods, reduction gears, galvanized hand chain, operating mechanism, motors, controls, wiring, brackets, gears, head, bottom and side weather stripping, hardware, and all other items necessary for their installation and operation.

B. Wind Loading: The doors shall be designed to withstand a windload of 20 lb/sq ft.

C. Steel Curtain Slats: Curtain slats shall be roll-formed from galvanized steel sheet conforming to Federal Specification (FS) QQ-S-775-E Int. Amd. 1, Type I, class D. Curtain slats shall be flat Cookson No. 5; Kinnear No. 17; or equal, and shall be of a gage size suitable for dimension and loading of the opening, but shall be not lighter than 20 gage. Slats shall be insulated.

D. Endlocks: Endlocks shall be continuous galvanized malleable iron castings, designed to provide for curtain alignment and security against lateral movement.

E. Bottom Bar: The bottom bar shall consist of 2 angles galvanized and bolted back-to-back on each side of curtain, to suit floor profile. A replaceable flexible vinyl or neoprene gasket shall be provided as a weather seal and cushion bumper.

F. Guides and Stops: Guides shall consist of a galvanized steel angle assembly of proper size to retain the curtain. Guides shall be provided with weatherstripping. Angle thickness shall be minimum 3/16-inch. Jamb angles shall be anchored to the supporting walls with 3/8-inch bolts spaced at 30-inches on centers, and extending above door opening head to support the coil brackets. Removable stops on guides to prevent over-travel of curtain and a continuous bar for holding windlocks, where required, shall be provided.

G. Barrel Assembly and Balancing Mechanism: The barrel shall be a steel pipe of sufficient diameter and thickness to support the roll-up curtain without distortion of slats, and to limit deflection of the barrel to not more than 0.03-inch per foot of span under full load. The barrel shall have a minimum diameter of 4-inches. The spring balance shall consist of one or more helical torsion springs of oil-tempered heat-treated steel to transfer full load to a single steel torsion bar in the barrel. Rotating members shall turn on self-lubricating graphite or grease-sealed ball bearings, with adjustment for counterbalance springs accessible from outside barrel. Brackets shall be 5/16-inch-thick, cold-rolled steel plate, or equal strength cast iron, attached to the jamb angle guide with 1/2-inch bolts. Brackets shall have a bell-mouth guide groove for the curtain.

H. Hood: For steel doors, the hood shall be manufactured of 24-gage galvanized steel sheet with bonderized treatment. For aluminum doors, the hood shall be at least 18 B&S gage aluminum. The hood shall fit over the end brackets. Top and bottom edges of hood shall be rolled and reinforced for stiffness, and intermediate supports shall be provided as necessary. The hood baffle shall be of neoprene and sheet metal.

I. Chain Holder: A chain holder shall be provided on wall with provision for padlocking.

J. Manual Operation Features: Manual operation shall be accomplished by endless chain, sprocket, and reduction gearing to the barrel, designed to require not more than a 35-lb pull on the chain to move curtain. Sprockets and gears shall have machine cut teeth, or shall be machine-molded. Bearings shall be lubricated for life and self-aligning, either self-lubricating graphite bearings or grease-sealed precision ball bearings, depending on size of door. Operating chain shall be hot-dip galvanized, located at side of door as shown on the approved shop drawings, and shall be continuous loop design that extends to a point approximately 24-inches above the floor. Chain and gear guards shall be provided as necessary for protection against malfunction or personal hazard.

K. Primer and Priming: Curtains and wicket doors shall be provided with a baked acrylic finish which is compatible with the finish paint. All other metal parts, exposed and concealed, and doors, shall be shop-primed with primer which is compatible with finish paint specified. The inside working area of the guides shall not be painted.

PART 3 - EXECUTION

3.1 GENERAL

A. Installation shall be in accordance with the manufacturer's printed recommendations and instructions.

3.2 INSTALLATION

A. Doors and frames shall be accurately cut, fitted, and installed level, square, plumb, and in alignment. Fasteners shall be of sufficient length, and shall be sized for loads imposed. Doors and frames shall be provided with accurately made cutouts, and shall be reinforced for strength where necessary. Doors shall be adjusted to provide smooth, unbinding operation with all hardware fully operable.

3.3 CLEANUP

A. Upon completion of installation of the overhead doors, cleanup all waste materials and debris resulting from this operation and dispose of such waste materials and debris off the site.

END OF SECTION

SECTION 08 41 60

ALUMINUM ENTRANCES AND STOREFRONTS

PART 1 - GENERAL

1.1 SUMMARY

A. Provide and install all storefront framing, including aluminum glass entrance doors and windows, indicated on the Contract Drawings and in these Specifications and as needed for a complete and proper installations.

B. Related Sections: Documents affecting work of this Section include, but are not necessarily limited to the GENERAL CONDITIONS, SUPPLEMENTARY CONDITIONS and Sections in DIVISION 01 - GENERAL REQUIREMENTS of these Specifications.

1.2 QUALITY ASSURANCE

A. Employees: Use adequate number of Contractor's skilled employees who are thoroughly trained and experienced in the necessary crafts and completely familiar with the specified requirements and methods needed for proper performance of the Work of this Section.

B. Referenced Specifications and Standards (As Applicable):

1. ASTM - American Society Testing and Materials.
2. AAMA - Architectural Aluminum Mfgr's. Association.
3. PE1 - Porcelain Enamel Institute.
4. AMA - Aluminum Manufacturer's Association.

C. Applicable Regulations: All exterior door transoms and sidelights and windows must comply with air infiltration standards as per California Energy Conservation Standards "Title 24" Division 4T20-1495 of the California Administrative Code. Comply also to the following:

1. American National Standard Institute (ANSI) A117/1 1986
2. Americans With Disabilities Act (ADA)

1.3 SUBMITTALS

A. Comply with provisions of the SUBMITTALS in DIVISION 01 - GENERAL REQUIREMENTS of these Specifications.

B. Shop-Erection Drawings: Prior to fabrication and delivery furnish the City Engineer with structural calculations, Shop-Erection Drawings in sufficient detail to show fabrication, installation, anchorages, glass and glazing and hardware interface with work of adjacent trades for review and approval by the City Engineer or Consultant.

C. Manufacturer's Specifications and Data: Required to prove compliance with specified requirements. Manufacture shall be a Los Angeles City Building and Safety licensed fabricator.

D. Materials List: Items proposed to be provided under this Section.

E. Manufacturer's Recommended Installation Procedures: When approved by the City Engineer or Consultant, will become the basis for accepting or rejecting actual installation procedures used on the work.

F. Samples: Prior to fabrication and delivery, submit finish samples of frames and other components complete with stops, windows and hardware to the City Engineer or the Consultant for approval, if requested by the City. Approved samples may be incorporated into the project.

G. Certificates: If requested by the City, Contractor shall deliver to the City Engineer or Consultant a certificate signed by the finisher and the Contractor stating that the anodized finishes provided conform to the Specifications, with the certificate deliver the finishes test reports of tests made on random production samples, each test report shall be certified.

1.4 PRODUCT HANDLING

A. Shipment Preparation: Prior to shipment, manufacturer shall adequately provide protection for all exposed aluminum framing and trim components against damage to components and to anodized finish during shipping, handling and erection operations. All work showing defects or damage of any kind will not be accepted.

B. Shipping and Delivery: Door and/or window assemblies to be shipped to the job-site in manufacturer's original unbroken cartons properly marked for location in building. Stack framing components in a manner that will prevent binding and avoid significant or permanent damage.

1.5 VERIFICATION OF JOB CONDITIONS AND FIELD MEASUREMENTS

A. Prior to starting work or processing Shop/Erection Drawings and fabrication, verify all framing dimensions and installation conditions at the job-site, including heights, widths, and specific locations.

B. Report to the City Engineer or Consultant all conditions adversely affecting the proper installation of the specified work and would require remedial work.

C. Start of specified work shall imply Contractor's acceptance of job conditions.

D. Contractor shall be entirely responsible for the correctness conformity, accuracy, and proper execution of the specified storefront framing work.

1.6 DISSIMILAR MATERIALS PROTECTION

A. Separate aluminum surfaces in contact with or in proximity of ferrous metals and cementatious materials by means of nonabsorbent tape or heavy coat of alkali-resistant bituminous paint or zinc-chromate primer.

1.7 CLEAN-UP

Upon completion of the Work of this Section, remove all tools, equipment and rubbish resulting from work of this Section and leave the work area in a safe and clean condition.

1.8 WARRANTY

A. Comply with provisions of Section 28 in the GENERAL CONDITIONS of these Specifications.

B. Failure due to defective materials or workmanship is deemed to include, but not to be limited to:

1. Failures in operation of operating component or components;

2. Leakage or air infiltration in excess of the specified standard;

3. Deterioration of finish to an extent visible to the unaided eye;

4. Defects which contribute to unsightly appearance, potential safety hazard, or potential untimely failure of the Work of this Section or the Work as a whole.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. All materials hereinafter specified shall be products of the United States Aluminum Corporation, Kawneer Co. Inc. or equal. Provide Los Angeles City Building and Safety Research Report number and expiration date.

B. Storefront Framing and Windows: Thermo-set system, perimeter combinations with a nylon clip that prevents the transfer of heat and cold through the metals using 2-thick laminated acoustical glass.

C. Swinging Aluminum-Glass Door: No. 250 narrow stile door with a bottom rail of 10-inches conforming to Handicapped Regulations (CAL/ABL and ADA), 1-3/4-inch thick size of door as indicated on the Contract Drawings.

2.2 STOREFRONT AND ENTRANCE FRAMING

A. Materials: Aluminum extrusions, 6063-T5 alloy and temper, corrosion resistant, having an ultimate tensile strength of not less than 22,000 psi; shapes and sizes as indicated on the Contract Drawings and approved Shop/Erection Drawings.

1. Framing Members: Not less than 0.125-inch wall thickness; subject to commercial tolerances of plus or minus 10 percent; Component No. TG-418 and Face Component No. TP-138.

2. Trim Members: Not less than 0.062-inch wall thickness.

3. Fasteners: Where required to secure framing to adjoining structure to be aluminum, stainless steel, or other non-corrosive metal guaranteed to be compatible with aluminum extrusions.

4. Glazing: Flush type aluminum snap-in shapes and manufacturer's standards non-stretch, highshore vinyl pull-in, or roll-in type glazing beads (color compatible with anodic color coating of aluminum framing and trim).

5. Finish: All storefront and swinging door framing and trim shall have manufacturer's standard dark bronze anodized finish.

6. Weatherstripping: Manufacturer's standard for exterior door.

7. Aluminum Sill Cover, color to match the aluminum frame and trim, No. SC-200 or SC-100, size as required to make a watertight installation.

8. Aluminum Filler Plates, (2) two OSI aluminum plates with vinyl spacers, approximately 2-inch thickness, color of filler plates to match framing and trim.

B. Door Frame: Aluminum Frame No. TJ450 with continuous vinyl thermo-break No. VT450; delete fixed stop and install filler piece plus the soundproof doorstop specified under hardware section; finish of door frame shall match adjacent framing and trim.

2.3 DOOR HARDWARE

A. Floor Hinge: Single acting-offset pivot, no-hold open, 105 back stop, unit complete with cement case and dress plates; door-O-matic No. F251R, or equal.

B. Pivots: Standard type, fully mortised, top and intermediate pivot, door-O-matic No. 280 AC for tip and No. D19 AC for intermediate; finish shall match the dark bronze anodized aluminum finish.

C. Threshold: 7-inch with end plate for use with offset floor hinge, aluminum, all corners mitered return, finish No. #130 dark bronze.

D. Lock: Standard 1-point securely lock with aluminum flat faceplate; finish to match the dark bronze aluminum frame; Adams Rite MS1851, or equal.

E. Push and Pull: United States Aluminum No. P-007, with black insert and anodized finish to match the door frame.

F. Cylinders, Stop and Indicator: See FINISH HARDWARE - Section 087100.

G. Door Seals and Door Bottom: Zero "Sound-Stop Door System No. 770 Compress-O-Matic 3001, sound stop for head and jamb, and No. 361 sound stop at sill; finish shall be Duranodic 313 to match the frame and door. All corners mitered, welded and ground smooth and made watertight.

2.4 GLASS

A. Furnished and installed under Section 088000 - GLASS AND GLAZING. See Subsection 3.4A3 of the Section for further data.

2.5 FIXED OR OPERATING ALUMINUM WINDOWS

A. Type: United States Aluminum Corporation of Los Angeles standard 1-3/4-inch. x 5-inch. or equal.

B. Construction: Aluminum of 6063-T5 alloy and temper; equipped vinyl glazing (black color) channel to accommodate designated glass thickness.

C. Hardware and Locks: The bottom rail of the sliding panel shall house a recessed flush self-latching, spring loaded mechanisms. The lock shall clamp on sill track to prevent lift-out.

D. Finish: Finish shall be uniform and shall match appearance and equality of that specified for storefront framing and entrance doors.

2.6 FABRICATION

A. Fabricate in strict accordance with the manufacturers' specifications and Shop Erection Drawings as approved by the City Engineer or Consultant, prefabricating in the Manufacturer's shop to the maximum extent practicable.

B. Provide hairline fit at joints, make watertight with smooth continuity of line and accurate relation of planes and angles. Securely fasten.

PART 3 – EXECUTION

3.1 SURFACE CONDITIONS

A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until detrimental conditions are corrected.

3.2 COORDINATION

A. Coordinate fabrication schedule with construction progress as required with other trades to assure proper and adequate provision in the work of those trades for interface with the Work of this Section to avoid delay of the Work.

B. Make measurements as required in the field to assure proper fit of doors and framing assemblies with adjacent work prior to fabrication.

3.3 WORKMANSHIP

A. Install the Work of this Section in strict accordance with the original design, the approved Shop Drawings, pertinent requirements of governmental agencies having jurisdiction, and the manufacturer's recommended installation procedures as approved by the City Engineer, anchoring all components firmly into position for long life.

B. General: All work shall be done by workers skilled in the fabrication and installation of this type of work. Where assemblies require field connections, temporarily assemble work in the shop and test for accuracy of fit.

C. Specifics: (As Applicable)

1. Complete all cutting, fitting, forming, drilling, and grinding of all metal work prior to cleaning, finishing, treatment, and application of anodic color coating.

2. Where field cutting of framing and/or trim components is required, exercise extreme care not to damage or mar specified finish.

3. Cut, drill, tap, and reinforce door frames at the factory as necessary to receive door hardware, except do not drill and tap for surface applied hardware until time of installation at the job-site. Comply with hardware manufacturer's instructions and template requirements. Where fasteners have to be exposed, they shall have countersunk heads and be finished to match adjoining work; otherwise, all fasteners shall be concealed. Use concealed fasteners to the maximum extent practicable.

4. Glazing stops shall be removable from the inside when swinging doors are locked, also for storefront glazing as detailed.

5. Provide door and storefront framing with internal stiffeners where strengthening is necessary and/or where indicated.

3.4 INSTALLATION

A. General: Install storefront framing, swinging, door and door frame and windows in accordance with manufacturer's recommendations, approved Shop Drawings, and as specified.

1. Set framing components plumb, level, and true to line; properly secure to structure.

2. Accurately hang and adjust doors to function smoothly and quietly without binding complete with all specified hardware.

3. Filler Plates: Accurately install within storefront framing, plumb, level and in line, and on approved bearing blocks as per approved Shop Drawings.

B. Adjustment: Properly adjust all operating parts and hardware prior to glazing and re-adjust after glazing and painting operations are completed. Leave swinging door ready for use.

C. Cleaning, Polishing and Repairing:

1. Thoroughly clean all aluminum and porcelain enamel surfaces before acceptance of the building; remove all protective coatings. Use plain water or a petroleum product, such as white gasoline, kerosene or distillate. No abrasive cleaning agents or other material shall be used which would damage anodic color coating on aluminum surfaces.

2. Clean glass surfaces after installation, complying with requirements contained in the "Glass and Glazing" Section for cleaning and maintenance. Remove excess glazing and sealant compounds, dirt and other substances from aluminum surfaces.

3. Provide watertight testing for leakage before final inspection.

4. Remove and replace any framing or trim component damaged in any manner with specified materials and workmanship at no extra cost to the City and to the full satisfaction of the City Engineer or the Consultant.

5. Leave all aluminum framing, trim and doors, and windows in a neat and clean and operable condition upon completion of the Work of this Section.

D. Protection: Institute protective measures required throughout the remainder of the construction period to ensure that aluminum entrances and storefronts will be without damage or deterioration, other than normal weathering, at time of acceptance.

END OF SECTION

SECTION 08 42 24

AUTOMATIC SLIDING STOREFRONT DOORS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Furnish and install automatic sliding power-operated automatic sliding doors as indicated on the drawings and specified.

1.3 DEFINITIONS

A. AAADM: American Association of Automatic Door Manufacturers.

B. Activation Device: A control that, when actuated, sends an electrical signal to the door operator to open the door.

C. IBC: International Building Code.

D. Safety Device: A control that, to avoid injury, prevents a door from opening or closing.

E. For automatic door terminology, refer to BHMA A156.10 for definitions of terms.

1.4 COORDINATION

A. Coordinate sizes and locations of recesses in concrete floors for recessed sliding tracks that control automatic entrances. Concrete, reinforcement, and formwork requirements are specified elsewhere.

B. Templates: Distribute for doors, frames, and other work specified to be factory prepared for installing automatic entrances.

C. Coordinate hardware with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish. Coordinate hardware for automatic entrances with hardware required for rest of Project.

D. Electrical System Roughing-in: Coordinate layout and installation of automatic entrances with connections to power supplies and access-control system.

1.5 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.6 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for automatic entrances.

2. Include rated capacities, operating characteristics, electrical characteristics, and furnished specialties and accessories.

B. Shop Drawings: For automatic entrances.

1. Include plans, elevations, sections, hardware mounting heights, and attachment details.

2. Indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.

3. Include diagrams for power, signal, and control wiring.

4. Indicate locations of activation and safety devices.

5. Include hardware schedule and indicate hardware types, functions, quantities, and locations.

C. Samples for Initial Selection: For units with factory-applied color and metal-clad finishes.

1. Include Samples of hardware and accessories involving color or finish selection.

D. Samples for Verification: For each type of exposed finish required, in manufacturer's standard sizes.

1.7 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer, manufacturer, and Certified Inspector.

B. Product Certificates: For each type of automatic entrance. Include emergency-exit features of automatic entrances serving as a required means of egress.

C. Product Test Reports: For each type of automatic entrance, for tests performed by a qualified testing agency.

D. Field quality-control reports.

E. Sample Warranties: For manufacturer's special warranties.

1.8 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For automatic entrances, safety devices, and control systems to include in operation and maintenance manuals.

1.9 QUALITY ASSURANCE

A. Manufacturer Qualifications: A manufacturer with company certificate issued by AAADM indicating that manufacturer has a Certified Inspector on staff.

B. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for installation and maintenance of units required for this Project and who employs a Certified Inspector.

1. Maintenance Proximity: Not more than two hours' normal travel time from Installer's place of business to Project site.

C. Certified Inspector Qualifications: Certified by AAADM.

1.10 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace components of automatic entrances that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Structural failures including, but not limited to, excessive deflection.

b. Faulty operation of operators, controls, and hardware.

c. Deterioration of metals, metal finishes, and other materials beyond normal weathering and use.

2. Warranty Period: Two years from date of Substantial Completion.

B. Special Finish Warranty: Manufacturer agrees to repair or replace components on which finishes fail in materials or workmanship within specified warranty period.

1. Deterioration includes, but is not limited to, the following:

a. Color fading more than 5 Hunter units when tested according to ASTM D 2244.

b. Chalking in excess of a No. 8 rating when tested according to ASTM D 4214.

c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.

2. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 AUTOMATIC SLIDING STOREFRONT DOORS

A. Manufacturers: Subject to the Architect's review of action submittals for compliance with requirements, automatic doors shall be the product of the manufacturer named on the drawings (Besam Entrance Solutions), or an acceptable substitution of one of the following:

1. Stanley Access Technology.
2. Hunter Automatics Inc.
3. Horton Automatics.
4. Besam Entrance Solutions.

B. Source Limitations: Obtain sliding sliding automatic entrances from single source from single manufacturer.

C. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

D. Power-Operated Door Standard: BHMA A156.10.

E. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes.

1. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.

F. Operating Temperature Range: Automatic entrances shall operate within minus 20 to plus 122 deg F.

G. Air Infiltration: Maximum air leakage through fixed glazing and framing areas of 1.25 cfm/sq. ft. of fixed entrance-system area when tested according to ASTM E 283 at a minimum static-air-pressure difference of 1.57 lbf/sq. ft.

H. Opening Force:

1. Power-Operated Doors: Not more than 50 lbf required to manually set door in motion if power fails, and not more than 15 lbf required to open door to minimum required width.

2. Breakaway Device for Power-Operated Doors: Not more than 50 lbf required for a breakaway door or panel to open.

I. Entrapment-Prevention Force:

1. Power-Operated Sliding Doors: Not more than 30 lbf (133 N) required to prevent stopped door from closing.

J. Operator Features:

1. Power opening and closing.

2. Drive System: Manufacturer's standard.

3. Adjustable opening and closing speeds.

4. Adjustable hold-open time between zero and 30 seconds.

5. Obstruction recycle.

6. On-off/hold-open switch to control electric power to operator, key operated.

K. Controls: Activation and safety devices as indicated on Drawings and according to BHMA standards, and subject to selection by the Architect.

1. Activation Device: Motion sensor mounted on each side of door header to detect pedestrians in activating zone and to open door.

2. Activation Device: Control mat installed on ingress side of door to detect pedestrians in activating zone and to open door.

3. Activation Device: As selected by the Architect.

4. Safety Device: Two photoelectric beams mounted in sidelite jambs on each side of door to detect pedestrians in presence zone and to prevent door from closing.

5. Safety Device: Presence sensor mounted to underside of door header and two photoelectric beams mounted in sidelite jambs on one side of the door to detect pedestrians in presence zone and to prevent door from closing.

6. Safety Device: Presence sensor mounted on each side of door header and two photoelectric beams mounted in sidelite jambs on one side of the door to detect pedestrians in presence zone and to prevent door from closing.

7. Sidelite Safety Device: Presence sensor, mounted above each sidelite on side of door opening through which doors travel, to detect obstructions and to prevent door from opening.

8. Opening-Width Control: Two-position switch that in the normal position allows sliding doors to travel to full opening width and in the alternate position reduces opening to a selected partial opening width.

L. Finish: Finish framing, door(s), and header with finish matching adjacent storefront.

2.2 MATERIALS

A. Aluminum: Alloy and temper recommended by manufacturer for type of use and finish indicated.

1. Extrusions: ASTM B 221.

2. Sheet: ASTM B 209.

B. Steel Reinforcement: Reinforcement with corrosion-resistant primer complying with SSPC-PS Guide No. 12.00 applied immediately after surface preparation and pretreatment. Use surface preparation methods according to recommendations in SSPC-SP COM and prepare surfaces according to applicable SSPC standard.

C. Glazing: As indicated on the drawings.

D. Sealants and Joint Fillers: Elastomeric type.

E. Nonmetallic, Shrinkage-Resistant Grout: Premixed, nonmetallic, noncorrosive, nonstaining grout; complying with ASTM C 1107/C 1107M; of consistency suitable for application.

F. Bituminous Coating: Cold-applied asphalt emulsion complying with ASTM D 1187.

G. Fasteners and Accessories: Corrosion-resistant, nonstaining, nonbleeding fasteners and accessories compatible with adjacent materials.

2.3 DOOR OPERATORS AND CONTROLS

A. General: Provide operators and controls, which include activation and safety devices, according to BHMA standards, for condition of exposure, and for long-term, maintenance-free operation under normal traffic load for type of occupancy indicated.

B. Door Operators: Provide door operators of size recommended by manufacturer for door size, weight, and movement.

1. Door Operator Performance: Door operators shall open and close doors and maintain them in fully closed position when subjected to Project's design wind loads.

2. Electromechanical Operators: Concealed, self-contained, overhead unit powered by fractional-horsepower, permanent-magnet dc motor; with closing speed controlled mechanically by gear train and dynamically by braking action of electric motor; with solid-state microprocessor controller; UL 325; and with manual operation with power off.

C. Motion Sensors: Self-contained, K-band-frequency, microwave-scanner units; fully enclosed by its plastic housing; adjustable to provide detection-field sizes and functions required by BHMA A156.10.

1. Provide capability for switching between bidirectional and unidirectional detection.

2. For one-way traffic, sensor on egress side shall not be active when doors are fully closed.

D. Presence Sensors: Self-contained, active-infrared scanner units; adjustable to provide detection-field sizes and functions required by BHMA A156.10. Sensors shall remain active at all times.

E. Photoelectric Beams: Pulsed infrared, sender-receiver assembly for recessed mounting. Beams shall not be active when doors are fully closed.

F. Push-Button Switch: Momentary-contact door-control switch with one red-button actuator; enclosed in nominal 2-by-4-inch junction box.

G. Key Switch: Recess-mounted, door-control switch with key-controlled actuator; enclosed in 2-by-4-inch junction box. Provide faceplate engraved with letters indicating switch functions.

H. Wireless or Remote Radio Control Switch: Auxiliary radio control system consisting of header-mounted receiver and transmitter switch.

I. Electrical Interlocks: Unless units are equipped with self-protecting devices or circuits, provide electrical interlocks to prevent activation of operator when door is locked, latched, or bolted.

2.4 HARDWARE

A. General: Provide units in sizes and types recommended by automatic entrance and hardware manufacturers for entrances and uses indicated. Finish exposed parts to match door finish unless otherwise indicated on the drawings.

B. Breakaway Device for Power-Operated Doors: Device that allows door to swing out in direction of egress to full 90 degrees from any operating position. Maximum force to open door shall be as stipulated in "Performance Requirements" Article. Interrupt powered operation of door operator while in breakaway mode.

C. Deadlocks: Deadbolt operated by exterior cylinder and interior thumb turn, with minimum 1-inch long throw bolt; BHMA A156.5, Grade 1.

1. Cylinders: BHMA A156.5, Grade 1, seven-pin mortise type.

a. Keying: Integrate into building master key system as directed by the Owner.

2. Deadbolts: Laminated-steel hook, mortise type, BHMA A156.5, Grade 1.

3. Two-Point Locking for Stile and Rail Sliding Doors: Mechanism in stile of active door leaf that automatically extends second lockbolt into overhead carrier assembly or threshold.

D. Automatic Locking: Electrically controlled device mounted in header that automatically locks sliding door against sliding when in closed position. Provide fail secure and safe operation if power fails.

1. Include concealed, vertical-rod exit devices, UL 305, with latching into threshold and overhead carrier assembly and released by full-width panic bar; and that prevent emergency breakaway doors from swinging unless released to permit emergency egress.

2. Include locking devices for sidelites to prevent manual break out.

E. Weather Stripping: Replaceable components.

1. Sliding Type: AAMA 701, made of wool, polypropylene, or nylon woven pile with nylon-fabric or aluminum-strip backing.

2.5 FABRICATION

A. General: Factory fabricate automatic entrance components to designs, sizes, and thicknesses indicated and to comply with indicated standards.

1. Form aluminum shapes before finishing.

2. Weld in concealed locations to greatest extent possible to minimize distortion or discoloration of finish. Remove weld spatter and welding oxides from exposed surfaces by descaling or grinding.

3. Use concealed fasteners to greatest extent possible. Where exposed fasteners are required, use countersunk Phillips flat-head machine screws, finished to match framing.

a. Where fasteners are subject to loosening or turning out from thermal and structural movements, wind loads, or vibration, use self-locking devices.

b. Reinforce members as required to receive fastener threads.

4. Where aluminum will contact dissimilar metals, protect against galvanic action by painting contact surfaces with primer or by applying sealant or tape recommended by manufacturer for this purpose.

B. Framing: Provide automatic entrances as prefabricated assemblies. Complete fabrication, assembly, finishing, hardware application, and other work before shipment to Project site.

1. Fabricate tubular and channel frame assemblies with welded or mechanical joints. Provide subframes and reinforcement as required for a complete system to support required loads.

2. Perform fabrication operations in manner that prevents damage to exposed finish surfaces.

3. Form profiles that are sharp, straight, and free of defects or deformations.

4. Provide components with concealed fasteners and anchor and connection devices.

5. Fabricate components with accurately fitted joints with ends coped or mitered to produce hairline joints free of burrs and distortion.

6. Fabricate exterior components to drain condensation and water passing joints within system to the exterior.

7. Provide anchorage and alignment brackets for concealed support of assembly from building structure.

8. Allow for thermal expansion of exterior units.

C. Doors: Factory fabricated and assembled in profiles indicated. Reinforce as required to support imposed loads and for installing hardware.

D. Door Operators: Factory fabricated and installed in headers, including adjusting and testing.

E. Glazing: Fabricate framing with minimum glazing edge clearances for thickness and type of glazing indicated, according to GANA's "Glazing Manual."

F. Hardware: Factory install hardware to greatest extent possible; remove only as required for final finishing operation and for delivery to and installation at Project site. Cut, drill, and tap for factory-installed hardware before applying finishes.

G. Controls:

1. General: Factory install activation and safety devices in doors and headers as required by BHMA A156.10 for type of door and direction of travel.

2. Install photoelectric beams in vertical jambs of sidelites, with dimension above finished floor as follows:

a. Top Beam: 48 inches.
b. Bottom Beam: 24 inches.

2.6 FINISHES SHALL BE AS SELECTED BY THE ARCHITECT

A. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

B. Apply organic and anodic finishes to formed metal after fabrication unless otherwise indicated.

C. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

2.7 ALUMINUM FINISHES

A. Clear Anodic Finish: AAMA 611, AA-M12C22A41, Class I, 0.018 mm or thicker.

B. Color Anodic Finish: AAMA 611, AA-M12C22A42/A44, Class I, 0.018 mm or thicker.

C. Baked-Enamel or Powder-Coat Finish: AAMA 2603 except with a minimum dry film thickness of 1.5 mils. Comply with coating manufacturer's written instructions for cleaning, conversion coating, and applying and baking finish.

D. High-Performance Organic Finish: Two-coat fluoropolymer finish complying with AAMA 2604 or AAMA 2605 and containing not less than 50 or 70 percent PVDF resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

E. High-Performance Organic Finish: Three-coat fluoropolymer finish complying with AAMA 2605 and containing not less than 50 percent PVDF resin by weight in both color coat and clear topcoat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine conditions, with Installer present, for compliance with requirements for installation tolerances, header support, and other conditions affecting performance of automatic entrances.

B. Examine roughing-in for electrical systems to verify actual locations of power connections before automatic entrance installation.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. General: Install automatic entrances according to manufacturer's written instructions and cited BHMA standard for direction of pedestrian travel, including signage, controls, wiring, and connection to the building's power supply.

1. Do not install damaged components. Fit frame joints to produce hairline joints free of burrs and distortion. Rigidly secure nonmovement joints. Seal joints watertight.

2. Where aluminum will contact dissimilar metals, protect against galvanic action by painting contact surfaces with primer or by applying sealant or tape recommended by manufacturer for this purpose.

3. Where aluminum will contact concrete or masonry, protect against corrosion by painting contact surfaces with bituminous coating.

B. Entrances: Install automatic entrances plumb and true in alignment with established lines and grades without warp or rack of framing members and doors. Anchor securely in place.

1. Install surface-mounted hardware using concealed fasteners to greatest extent possible.

2. Set headers, carrier assemblies, tracks, operating brackets, and guides level and true to location with anchorage for permanent support.

3. Install components to drain water passing joints, condensation occurring within framing members, and moisture migrating within system to exterior.

4. Level recesses for recessed thresholds using nonshrink grout.

C. Door Operators: Connect door operators to electrical power distribution system.

D. Access-Control Devices: Connect access-control devices to access-control system."

E. Controls: Install and adjust activation and safety devices according to manufacturer's written instructions and cited BHMA standard for direction of pedestrian travel. Connect control wiring according the requirements of the authority having jurisdiction.

F. Sealants: Comply with requirements specified to provide weathertight installation.

1. Set thresholds, or bottom-guide-track system, framing members and flashings in full sealant bed.

2. Seal perimeter of framing members with sealant.

G. Signage: Apply signage on both sides of each door as required by cited BHMA standard for direction of pedestrian travel.

H. Wiring within Automatic Entrance Enclosures: Bundle, lace, and train conductors to terminal points with no excess and without exceeding manufacturer's written limitations on bending radii. Provide and use lacing bars and distribution spools.

3.3 FIELD QUALITY CONTROL

A. Certified Inspector: Owner may engage and pay a Certified Inspector to test and inspect components, assemblies, and installations, including connections.

B. Perform the following tests and inspections with the assistance of a factory-authorized service representative:

1. Test and inspect each automatic entrance, using AAADM inspection forms, to determine compliance of installed systems with applicable BHMA standards.

C. Automatic entrances will be considered defective if they do not pass tests and inspections.

D. Prepare test and inspection reports.

3.4 ADJUSTING

A. Adjust hardware, moving parts, door operators, and controls to function smoothly, and lubricate as recommended by manufacturer; comply with requirements of applicable BHMA standards.

1. Adjust exterior doors for weathertight closure.

B. Readjust door operators and controls after repeated operation of completed installation equivalent to three days' use by normal traffic (100 to 300 cycles).

C. Occupancy Adjustments: When requested within 12 months of date of Substantial Completion, provide on-site assistance in adjusting system to suit actual occupied conditions. Provide up to two visits to Project during other-than-normal occupancy hours for this purpose.

3.5 CLEANING

A. Clean glass and metal surfaces promptly after installation. Remove excess glazing and sealant compounds, dirt, and other substances. Repair damaged finish to match original finish.

3.6 PROPOSED MAINTENANCE SERVICE

A. The manufacturer may propose maintenance service and submit a proposed service agreement.

B. Initial Maintenance Service: Beginning at Substantial Completion, maintenance service shall include three, six, nine, or 12 months' full maintenance by skilled employees of automatic entrance Installer. Include monthly or quarterly preventive maintenance, repair or replacement of worn or defective components, lubrication, cleaning, and adjusting as required for proper automatic entrance operation. Parts and supplies shall be manufacturer's authorized replacement parts and supplies.

1. Engage a Certified Inspector to perform safety inspection after each adjustment or repair and at end of maintenance period. Furnish completed inspection reports to Owner.

2. Perform maintenance, including emergency callback service, during normal working hours.

3. Include 24-hour-per-day, 7-day-per-week, emergency callback service.

3.7 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain automatic entrances.

END OF SECTION

SECTION 08 44 13

GLAZED ALUMINUM CURTAIN WALLS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Furnish and install glazed aluminum curtain walls as indicated on the drawings and specified.

1.3 DEFINITIONS

A. Definitions: For fenestration industry standard terminology and definitions refer to American Architectural Manufactures Association (AAMA) – AAMA Glossary (AAMA AG).

1.4 PERFORMANCE REQUIREMENTS

A. General Performance: Comply with performance requirements specified, as determined by testing of glazed aluminum curtain walls representing those indicated for this Project without failure due to defective manufacture, fabrication, installation, or other defects in construction.

1. Glazed aluminum curtain walls shall withstand movements of supporting structure including, but not limited to, story drift, twist, column shortening, long-term creep, and deflection from uniformly distributed and concentrated live loads. Failure also includes the following.

a. Thermal stresses transferring to building structure.
b. Glass breakage.
c. Loosening or weakening of fasteners, attachments, and other components.
d. Failure of operating units.

B. Delegated Design: Design glazed aluminum curtain walls, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.

C. Wind loads: Provide Curtain Wall system; include anchorage, capable of withstanding wind load design pressures of 45 lbs./sq. ft. inward and 45 lbs./sq. ft. outward. The design pressures are based on the California Building Code; Current Edition.

D. Air Infiltration: The test specimen shall be tested in accordance with ASTM E 283. Air infiltration rate shall not exceed 0.06 cfm/ft^2 (0.3 l/s · m^2) at a static air pressure differential of 6.2 psf (300 Pa).

E. Water Resistance, (static): The test specimen shall be tested in accordance with ASTM E 331. There shall be no leakage at a static air pressure differential of 12 psf (575 Pa) as defined in AAMA 501.

F. Water Resistance, (dynamic): The test specimen shall be tested in accordance with AAMA 501.1. There shall be no leakage at an air pressure differential of 12 psf (575 Pa) as defined in AAMA 501.

G. Uniform Load: A static air design load of 40 psf (1915 Pa) shall be applied in the positive and negative direction in accordance with ASTM E 330. There shall be no deflection in excess of L/175 of the span of any framing member at design load. At structural test load equal to 1.5 times the specified design load, no glass breakage or permanent set in the framing members in excess of 0.2% of their clear spans shall occur.

H. Seismic: When tested to AAMA 501.4, system must meet design displacement (elastic) of 0.010 x the story height and ultimate displacement (inelastic) of 1.5 x the design displacement.

I. Thermal Transmittance (U-factor): When tested to AAMA Specification 1503, the thermal transmittance (U-factor) shall not be more than: 0.66 (clear). .

J. Condensation Resistance (CRF): When tested to AAMA Specification 1503, the condensation resistance factor shall not be less than 66frame and 60glass (clear). OR. Condensation Index (I): when tested to CSA-A440-00, the Condensation Index shall not be less than 68_{frame} and 54_{glass} (clear).

K. Thermal Transmittance (U-factor): When tested to AAMA Specification 1503, the thermal transmittance (U-factor) shall not be more than: 0.43 (HP glass).

L. Condensation Resistance (CRF): When tested to AAMA Specification 1503, the condensation resistance factor shall not be less than 71frame and 71glass (HP glass).

M. Sound Transmission Loss: When tested to ASTM E90 and ASTM E1425, the Sound Transmission Class (STC) and Outdoor/Indoor Transmission Class (OITC) shall not be less than:

N. STC 31 or OITC 26 based upon 1" (25.4) insulating glass (1/4", 1/2" AS, 1/4"),

O. Windborne-Debris-Impact Resistance Performance: Shall be tested in accordance with ASTM E1886, information in ASTM E1996, and TAS 201/203.

1. Large – Missile Impact: For aluminum-framed systems located within 30 feet (9.1 m) of grade.

2. Small – Missile Impact: For aluminum-framed systems located above 30 feet (9.1 m) of grade.

P. Blast Mitigation performance: Shall be tested or proven through analysis to meet ASTM F1642, GSA-TS01, and UFC 04-010.01 performance criteria. To meet UFC 04-010-01, B-3.1 Standard 10 for Windows and Skylights, the following options are available:

1. Section B-3.1.1 Dynamic analysis.
2. Section B-3.1.2 Testing.
3. Section B-3.1.3 ASTM F2248 Design Approach.

1.5 SUBMITTALS

A. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.

B. Shop Drawings: For glazed aluminum curtain walls. Include plans, elevations, sections, full-size details, and attachments to other work.

C. Samples for Initial Selection: For units with factory-applied color finishes.

D. Samples for Verification: For each type of exposed finish required, in manufacturer's standard sizes.

E. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified preconstruction testing agency, for glazed aluminum curtain walls, indicating compliance with performance requirements.

F. Fabrication Sample: Of each vertical-to-horizontal intersection of aluminum-framed curtain wall systems, made from 12" (304.8 mm) lengths of full-size components and showing details of the following.

1. Joinery.
2. Glazing.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: Installer who has had successful experience with installation of the same or similar systems required for the project and other projects of similar size and scope.

B. Manufacturer Qualifications: A manufacturer capable of fabricating glazed aluminum curtain walls that meet or exceed performance requirements.

C. Source Limitations: Obtain aluminum curtain wall system through one source from a single manufacturer.

D. Product Options: Information on Drawings and in Specifications establishes requirements for aesthetic effects and performance characteristics of assemblies. Aesthetic effects are indicated by dimensions, arrangements, alignment, and profiles of components and assemblies as they relate to sightlines, to one another, and to adjoining construction.

1. Do not modify intended aesthetic effects, as judged solely by Architect, except with Architect's approval. If revisions are proposed, submit comprehensive explanatory data to Architect for review.

E. Mockups: Build mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.

1. Build mockups for type(s) of curtain wall elevation(s) indicated, where directed by the Architect, or in location(s) shown on Drawings.

F. Pre-installation Conference: Conduct conference at Project site to comply with requirements in Division 01 Section “Project Management and Coordination”.

1.7 PROJECT CONDITIONS

A. Field Measurements: Verify actual locations of structural supports for glazed aluminum curtain walls by field measurements before fabrication and indicate measurements on Shop Drawings.

1.8 WARRANTY

A. Manufacturer’s Warranty: Provide a special warranty of materials and workmanship for a duration of not less than 10 years. from Date of Substantial Completion of the project.

B. Installer’s Warranty period shall be not less than two years following the date of substantial completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Basis-of-Design Product. Subject to the Architect's review of action submittals, provide the products of the manufacturer named on the drawings, or an approved substitution by one of the following:

1. Kawneer Company Inc.
2. Arcadia Inc.
3. EFCO Corp.
4. United States Aluminum.

2.2 MATERIALS

A. Aluminum Extrusions: Alloy and temper recommended by glazed aluminum curtain wall manufacturer for strength, corrosion resistance, and application of required finish and not less than 0.070" (1.78) wall thickness at any location for the main frame and complying with ASTM B 221: 6063-T6 alloy and temper.

B. Aluminum sheet alloy: Shall meet the requirements of ASTM B209.

C. Fasteners: Aluminum, nonmagnetic stainless steel or other materials to be non-corrosive and compatible with aluminum window members, trim hardware, anchors, and other components.

D. Anchors, Clips, and Accessories: Aluminum, nonmagnetic stainless steel, or zinc-coated steel or iron complying with ASTM B 633 for SC 3 severe service conditions or other suitable zinc coating; provide sufficient strength to withstand design pressure indicated.

E. Pressure Plate: Pressure plate shall be aluminum and fastened to the mullion with stainless steel screws.

F. Reinforcing Members: Aluminum, nonmagnetic stainless steel, or nickel/chrome-plated steel complying with ASTM B 456 for Type SC 3 severe service conditions, or zinc-coated steel or iron complying with ASTM B 633 for SC 3 severe service conditions or other suitable zinc coating; provide sufficient strength to withstand design pressure indicated.

G. Sealant: For sealants required within fabricated curtain wall system, provide permanently elastic, non-shrinking, and non-migrating type recommended by sealant manufacturer for joint size and movement.

H. Thermal Barrier: Thermal separator shall be extruded of a silicone compatible elastomer that provides a minimum 1/4" (6.3) separation.

I. Tolerances: Reference to tolerances for wall thickness and other cross-sectional dimensions of glazed curtain wall members are nominal and in compliance with AA Aluminum Standards and Data.

2.3 CURTAIN WALL FRAMING

A. Framing Members: Manufacturer's standard extruded- or formed-aluminum framing members of thickness required and reinforced as required to support imposed loads.

1. Glazing System: 4 sided captured.
2. Glazing Plane: Front.

B. Glass: 1" (25.4) insulating glass option.

C. Brackets and Reinforcements: Manufacturer's standard high-strength aluminum with nonstaining, nonferrous shims for aligning system components.

D. Framing Sealants: Shall be suitable for glazed aluminum curtain wall as recommended by sealant manufacturer.

E. Fasteners and Accessories: Manufacturer's standard corrosion-resistant, nonstaining, nonbleeding fasteners and accessories compatible with adjacent materials. Where exposed shall be stainless steel.

F. Perimeter Anchors: When steel anchors are used, provide insulation between steel material and aluminum material to prevent galvanic action.

G. Packing, Shipping, Handling and Unloading: Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.

H. Storage and Protection: Store materials protected from exposure to harmful weather conditions. Handle curtain wall material and components to avoid damage. Protect curtain wall material against damage from elements, construction activities, and other hazards before, during and after installation.

2.4 GLAZING

A. Glazing: Comply with Division 08 Section “Glazing” and the requirements stated on the drawings..

B. Glazing Gaskets: Gaskets to meet the requirements of ASTM C864.

C. Spacers and Setting Blocks: Manufacturer's standard elastomeric type.

D. Bond-Breaker Tape: Manufacturer's standard TFE-fluorocarbon or polyethylene material to which sealants will not develop adhesion.

E. Glazing Sealants: As recommended by manufacturer for joint type.

2.5 OPERABLE UNITS

A. Doors: Comply with Division 08 Section “Aluminum-Framed Entrances and Storefronts.”

2.6 ACCESSORY MATERIALS

A. Bituminous Paint: Cold-applied asphalt-mastic paint complying with SSPC-Paint 12 requirements except containing no asbestos, formulated for 30-mil (0.762 mm) thickness per coat.

B. Sun Shade System, When called for on the drawings: An aluminum sunshade consisting of strut anchors and strut arms and three louvers per bay with integral amorphous silicon (photovoltaic or P.V.) panels which produce nominal 45 watts of electrical generation per bay at peak performance. Optional aluminum panels are also available, if selected, in lieu of the P.V. panels. Strut anchors and strut arms shall be painted (Selected by the Architect from standard paints and colors.).

C. SunShade – Outrigger/Single Blade System, When called for on the drawings: An aluminum sunshade (consisting of outriggers, louvers, and fascia which may be selected from standard configurations, modified configurations, or customized) that is anchored

directly to the vertical curtain wall mullions. Sunshades shall be painted (Selected by the Architect from standard paints and colors.

2.7 FABRICATION

A. Form or extrude aluminum shapes before finishing.

B. Fabricate components that, when assembled, have the following characteristics.

1. Profiles that are sharp, straight, and free of defects or deformations.

2. Accurately fitted joints.

3. Physical and thermal isolation of glazing from framing members.

4. Accommodations for thermal and mechanical movements of glazing and framing to maintain required glazing edge clearances.

5. Provisions for field replacement of glazing from exterior.

6. Fasteners, anchors, and connection devices that are concealed from view to greatest extent possible.

7. Internal weeping system or other means to drain water passing joints, condensation occurring within framing members, and moisture migrating within glazed aluminum curtain wall to exterior.

C. Curtain Wall Framing: Fabricate components for assembly using shear block system following manufacturer's standard installation instructions.

D. After fabrication, clearly mark components to identify their locations in Project according to Shop Drawings.

2.8 ALUMINUM FINISHES SHALL BE AS SELECTED BY THE ARCHITECT

A. Finish designations prefixed by AA comply with the system established by the Aluminum Association for designating aluminum finishes.

B. Factory Finishing shall be as selected by the Architect from one of the following:

1. Kawneer Permafluor™ (70% PVDF), AAMA 2605, Fluoropolymer Coating (Color as selected).

2. Kawneer Permadize™ (50% PVDF), AAMA 2604, Fluoropolymer Coating (Color as selected).

3. Kawneer Permacoat™ AAMA 2604, Powder Coating (Color as selected).

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. General: Install curtain wall systems as recommended by the manufacturer; plumb, level, and true to line, without warp or rack of frames with manufacturer's prescribed tolerances and installation instructions. Provide support and anchor in place.

1. Dissimilar Materials: Provide separation of aluminum materials from sources of corrosion or electrolytic action contact points.

2. Glazing: Glass shall be outside glazed and held in place with extruded aluminum pressure plates anchored to the mullion using stainless steel fasteners spaced no greater than 9" (228.6) on center.

3. Water Drainage: Each light of glass shall be compartmentalized using joint plugs and silicone sealant to divert water to the horizontal weep locations. Weep holes shall be located in the horizontal pressure plates and covers to divert water to the exterior of the building.

3.3 FIELD QUALITY CONTROL

A. The Owner will engage and pay a qualified testing agency to perform tests.

B. First Water Spray Test: After the installation of minimum area of 100 square feet but not less than one full bay of the building and after the glazed aluminum; fixed windows, storefront, and fixed doors have been completed but before installation of interior finishes has begun. Test areas shall be randomly selected and as determined by the by Architect. Testing shall be performed according to AAMA 501.2.

1. Invite the Owner and Architect 5 days in advance to be present at the performance of testing. Schedule testing to accommodate their presence.

2. Repair or remove work where test results indicate water penetration of systems.

3. Perform additional testing to determine resistance to water penetration of replaced or additional work.

4. Report test results to the Architect and Owner.

C. Subsequent Field Tests: Following the first field test, the Contractor shall conduct tests for air infiltration and water penetration with manufacturer's representative, and the Architect present. The timing, scheduling and performance of subsequent field test shall be the conditional prerogative of the Contractor, but subject to the approval of the Architect. Tests not meeting specified performance requirements and units having deficiencies shall be corrected as part of the contract amount.

1. Testing: Testing shall be performed per AAMA 503 by a qualified independent testing agency. Air Infiltration Tests: Conduct tests in accordance with ASTM E 783. Allowable air infiltration shall not exceed 1.5 times the amount indicated in the performance requirements or 0.09 cfm/ft^2, which ever is greater.

2. Water Infiltration Tests: Conduct tests in accordance with ASTM E 1105. No uncontrolled water leakage is permitted when tested at a static test pressure of two-thirds the specified water penetration pressure but not less than 8 psf (383 Pa).

D. Manufacturer's Field Services: At the discretion of the Owner and upon Owner's written request, provide periodic site visit by manufacturer's field service representative.

E. Adjusting, Cleaning and Protection

1. Protection: Protect installed product's finish surfaces from damage during construction. Protect aluminum curtain wall system from damage from grinding and polishing compounds, plaster, lime, acid, cement, or other harmful contaminants.

2. Cleaning: Repair or replace damaged installed products. Clean installed products in accordance with manufacturer's instructions prior to owner's acceptance. Remove construction debris from project site and legally dispose of debris.

F. Remove and replace glass that has been broken, chipped, cracked, abraded, or damaged during construction period.

END OF SECTION

SECTION 08 71 00

DOOR HARDWARE

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Door hardware, including electric hardware.
2. Storefront and entrance door hardware.
3. Gate Hardware.
4. Hold-open closers with fire-alarm interface.
5. Power supplies for electric hardware.
6. Cylinders for doors fabricated with locking hardware.
7. Point-to-point wiring diagrams for electric hardware.
8. Key cabinets.

B. Related Divisions:

1. Division 06 – door hardware installation
2. Division 07 – sealant at exterior thresholds
3. Division 08 – metal doors and frames, interior aluminum frames, storefront and glazed curtainwall systems.
4. Division 21 – fire and life safety systems
5. Division 28 – security access systems

C. Specific Omissions: Hardware for the following is specified or indicated elsewhere.

1. Windows.
2. Cabinets, including open wall shelving and locks.
3. Signs, except where scheduled.
4. Toilet accessories, including grab bars.
5. Installation.
6. Rough hardware.
7. Conduit, junction boxes & wiring.
8. Sliding aluminum doors, except cylinders where detailed.
9. Access doors and panels, except cylinders where detailed.

1.2 REFERENCES**:**

A. Use date of standard in effect as of Bid date.

1. American National Standards Institute

a. ANSI 156.18 – Materials and Finishes.

2. BHMA – Builders Hardware Manufacturers Association

3. 2013 California Building Code

a. Chapter 11B – Accessibility To Public Buildings, Public Accommodations, Commercial Buildings and Public Housing

4. DHI – Door and Hardware Institute

5. NFPA – National Fire Protection Association

a. NFPA 80 2013 Edition – Standard for Fire Doors and Other Opening Protectives.
b. NFPA 105 – Smoke and Draft Control Door Assemblies
c. NFPA 252 – Fire Tests of Door Assemblies

6. UL – Underwriters Laboratories

a. UL10C – Positive Pressure Fire Tests of Door Assemblies.
b. UL 305 – Panic Hardware

7. WHI – Warnock Hersey Incorporated State of California Building Code

8. Local applicable codes

9. SDI – Steel Door Institute

10. WI – Woodwork Institute

11. AWI – Architectural Woodwork Institute

12. NAAMM – National Association of Architectural Metal Manufacturers

B. Abbreviations

1. Manufacturers**:** see table at 2.1.A of this section
2. Finishes**:** see 2.7 of this section.

1.3 SUBMITTALS & SUBSTITUTIONS

A. SUBMITTALS**:** Submit six copies of schedule per D. Only submittals printed one sided will be accepted and reviewed. Organize vertically formatted schedule into “Hardware Sets” with index of doors and headings, indicating complete designations of every item required for each door or opening. Minimum 10pt font size. Include following information**:**

1. Type, style, function, size, quantity and finish of hardware items.
2. Use BHMA Finish codes per ANSI A156.18.
3. Name, part number and manufacturer of each item.
4. Fastenings and other pertinent information.
5. Location of hardware set coordinated with floor plans and door schedule.
6. Explanation of abbreviations, symbols, and codes contained in schedule.
7. Mounting locations for hardware.
8. Door and frame sizes, materials and degrees of swing.
9. List of manufacturers used and their nearest representative with address and phone number.
10. Catalog cuts.
11. Point-to-point wiring diagrams.
12. Manufacturer’s technical data and installation instructions for electronic hardware.

B. Bid and submit manufacturer’s updated/improved item if scheduled item is discontinued.

C. Deviations**:** Highlight, encircle or otherwise identify deviations from “Schedule of Finish Hardware” on submittal with notations clearly designating those portions as deviating from this section.

D. If discrepancy between drawings and scheduled material in this section, bid the more expensive of the two choices, note the discrepancy in the submittal and request direction from Architect for resolution.

E. Substitutions per Division 1. Include product data and indicate benefit to the Project. Furnish operating samples on request.

F. Furnish as-built/as-installed schedule with closeout documents, including keying schedule, riser and point-to-point wiring diagrams, manufacturers' installation, adjustment and maintenance information, and supplier's final inspection report.

1.4 QUALITY ASSURANCE**:**

A. Qualifications**:**

1. Hardware supplier**:** direct factory contract supplier who employs a certified architectural hardware consultant (AHC), available at reasonable times during course of work for project hardware consultation to Owner, Architect and Contractor.

a. Responsible for detailing, scheduling and ordering of finish hardware. Detailing implies that the submitted schedule of hardware is correct and complete for the intended function and performance of the openings.

B. Hardware**:** Free of defects, blemishes and excessive play. Obtain each kind of hardware (latch and locksets, exit devices, hinges and closers) from one manufacturer.

C. Exit Doors**:** Operable from inside with single motion without the use of a key or special knowledge or effort.

D. Fire-Rated Openings**:** NFPA 80 compliant. Hardware UL10C (positive pressure) compliant for given type/size opening and degree of label. Provide proper latching hardware, non-flaming door closers, approved-bearing hinges, and resilient seals. Coordinate with wood door section for required intumescent seals. Furnish openings complete.

E. Furnish hardware items required to complete the work in accordance with specified performance level and design intent, complying with manufacturers' instructions and code requirements.

F. Pre-Installation Meetings**:** Initiate and conduct with supplier, installer and related trades, coordinate materials and techniques, and sequence complex hardware items and systems installation. Include manufacturers' representatives of locks, panic hardware and door closers in the meetings. Convene prior to commencement of related work.

1.5 DELIVERY, STORAGE AND HANDLING**:**

A. Delivery**:** coordinate delivery to appropriate locations (shop or field).

1. Permanent keys and cores**:** secured delivery direct to Owner's representative.

B. Acceptance at Site**:** Items individually packaged in manufacturers' original containers, complete with proper fasteners and related pieces. Clearly mark packages to indicate contents, locations in hardware schedule and door numbers.

C. Storage**:** Provide securely locked storage area for hardware, protect from moisture, sunlight, paint, chemicals, dust, excessive heat and cold, etc.

1.6 PROJECT CONDITIONS AND COORDINATION**:**

A. Where exact types of hardware specified are not adaptable to finished shape or size of members requiring hardware, provide suitable types having as nearly as practical the same operation and quality as type specified, subject to Architect's approval.

B. Coordination**:** Coordinate hardware with other work. Furnish hardware items of proper design for use on doors and frames of the thickness, profile, swing, security and similar requirements indicated, as necessary for proper installation and function, regardless of omissions or conflicts in the information on the Contract Documents. Furnish related trades with the following information**:**

1. Location of embedded and attached items to concrete.

2. Location of wall-mounted hardware, including wall stops.

3. Location of finish floor materials and floor-mounted hardware.

4. At masonry construction, coordinate with the anchoring and hollow metal supplier prior to frame installation by placing a strip of insulation, wood, or foam, on the back of the hollow metal frame behind the rabbet section for continuous hinges, as well as at rim panic hardware strike locations, silencers, coordinators, and door closer arm locations. When the frame is grouted in place, the backing will allow drilling and tapping without dulling or breaking the installer's bits.

5. Locations for conduit and raceways as needed for electrical, electronic and electro-pneumatic hardware items. Fire/life-safety system interfacing. Point-to-point wiring diagrams plus riser diagrams to related trades.

6. Coordinate: back-up power for doors with automatic operators.

7. Coordinate: flush top rails of doors at outswinging exteriors, and throughout where adhesive-mounted seals occur.

8. Manufacturers' templates to door and frame fabricators.

C. Check Shop Drawings for doors and entrances to confirm that adequate provisions will be made for proper hardware installation.

D. Environmental considerations**:** segregate unused recyclable paper and paper product packaging, uninstalled metals, and plastics, and have these sent to a recycling center.

1.7 WARRANTY**:**

A. Part of respective manufacturers' regular terms of sale. Provide manufacturers' written warranties.

B. Include factory order numbers with close-out documents warranty information:

C. Minimum warranties:

1.	Locksets**:**	Three years
2.	Extra Heavy Duty Cylindrical Lock:	Seven Years
3.	Exit Devices**:**	Three years mechanical One year electrical
4.	Closers**:**	Thirty years mechanical Two years electrical
5.	Hinges**:**	One year
6.	Other Hardware	Two years

1.8 COMMISSIONING**:**

A. Conduct these tests prior to request for certificate of substantial completion**:**

1. With installer present, test door hardware operation with climate control system and stairwell pressurization system both at rest and while in full operation.

2. With installer, access control contractor and electrical contractor present, test electrical, electronic and electro-pneumatic hardware systems for satisfactory operation.

3. With installer and electrical contractor present, test hardware interfaced with fire/life-safety system for proper operation and release.

PART 2 - PRODUCTS

2.1 2.1 MANUFACTURERS**:**

A. Listed acceptable alternate manufacturers**:** these will be considered; submit for review products with equivalent function and features of scheduled products.

ITEM**:**	MANUFACTURER**:**	ACCEPTABLE ALTERNATE**:**
Hinges	(IVE) Ives	Hager, Stanley
Continuous Hinges	(IVE) Ives	Hager, Stanley
Key System	(SCH) Schlage	Best
Mechanical Locks	(SCH) Schlage	Best
Exit Devices	(VON) Von Duprin	Owner standard
Closers	(LCN) LCN	Norton
Auto Flush Bolts	(IVE) Ives	Owner standard
Coordinators	(IVE) Ives	Owner standard
Silencers	(IVE) Ives	Rockwood, Trimco
Push & Pull Plates	(IVE) Ives	Rockwood, Trimco
Kickplates	(IVE) Ives	Rockwood, Trimco
Stops & Holders	(IVE) Ives	Owner standard
Overhead Stops	(GLY) Glynn-Johnson	Owner standard
Thresholds	(ZER) Zero	Pemko, Reese
Seals & Bottoms	(ZER) Zero	Pemko, Reese
Key Cabinets	(LUN) Lund	TelKee
Aluminum Door Locks	(ADA) Adams Rite	None

2.2 HINGING METHODS**:**

A. Drawings typically depict doors at 90 degrees, doors will actually swing to maximum allowable. Use wide-throw conventional or continuous hinges as needed up to 8 inches

in width to allow door to stand parallel to wall for true 180-degree opening. Advise architect if 8-inch width is insufficient.

B. Conform to manufacturer's published hinge selection standard for door dimensions, weight and frequency, and to hinge selection as scheduled. Where manufacturer's standard exceeds the scheduled product, furnish the heavier of the two choices; notify Architect of deviation from scheduled hardware.

C. Conventional Hinges**:** Steel or stainless steel pins and approved bearings. Hinge open widths minimum, but of sufficient throw to permit maximum door swing.

1. Out swinging exterior doors**:** non-ferrous with non-removable (NRP) pins and security studs.

2. Non-ferrous material exteriors and at doors subject to corrosive atmospheric conditions.

D. Continuous Hinges**:**

1. Geared-type aluminum.

E. Use wide-throw units where needed for maximum degree of swing, advise architect if commonly available hinges are insufficient.

F. If units are used at storefront openings, color-coordinate hinge finish with storefront color. Custom anodizing and custom powder coat finishes subject to Architect approval.

2.3 2.3 LOCKSETS, LATCHSETS, DEADBOLTS**:**

A. Mortise Locksets and Latchsets**:** as scheduled.

1. Chassis**:** cold-rolled steel, handing field-changeable without disassembly.

2. Universal lock case – 10 functions in one case.

3. Floating mounting tabs automatically adjusts to fit a beveled door edge.

4. Latchbolts**:** 0.75 inch throw stainless steel anti-friction type.

5. Lever Trim**:** through-bolted, accessible design, cast lever or solid extruded bar type levers as scheduled. Filled hollow tube design unacceptable.

B. Spindles**:** security design independent breakaway. Breakage of outside lever does not allow access to inside lever's hubworks to gain wrongful entry.

C. Inside lever applied by screwless shank mounting – no exposed trim mount screws.

D. Levers rotate up or down for ease of use.

1. Furnish solid cylinder collars with wave springs. Wall of collar to cover rim of mortise cylinder.

2. Turn pieces**:** accessible offset turn-lever design not requiring pinching or twisting motions to operate.

3. Deadbolts**:** stainless steel 1-inch throw.

4. Strikes**:** 16 gage curved steel, bronze or brass with 1 inch deep box construction, lips of sufficient length to clear trim and protect clothing.

5. Scheduled Lock Series**:** Schlage L series.

6. Certifications**:**

E. ANSI A156.13, 1994, Grade 1 Operational.

F. ANSI/ASTM F476-84 Grade 31 UL Listed.

1. Accessibility: Require not more than 5 lb to retract the latchbolt or deadbolt, or both, per CBC 2013 11B-404.2.7 and 11B-309.4.

2.4 2.4 EXIT DEVICES / PANIC HARDWARE

A. General features**:**

1. Independent lab-tested 1,000,000 cycles.

2. Push-through push-pad design. No exposed push-pad fasteners, no exposed cavities when operated. Return stroke fluid dampeners and rubber bottoming dampeners, plus anti-rattle devices.

3. Deadlocking latchbolts, 0.75 inch projection.

4. End caps**:** impact-resistant, flush-mounted. No raised edges or lips to catch carts or other equipment.

5. No exposed screws to show through glass doors.

6. Non-handed basic device design with center case interchangeable with all functions, no extra parts required to effect change of function.

7. Releasable in normal operation with 15-pound maximum operating force per UBC Standard 10-4, and with 32-pound maximum pressure under 250-pound load to the door.

8. Exterior doors scheduled with XP-series devices**:** Static load force resistance of at least 2000 pounds.

9. Accessibility: Require not more than 5 lb to retract the latchbolt, per CBC 2013 11B-404.2.7 and 11B-309.4.

B. Mechanical method: Von Duprin “AX-“ feature, where touchpad directly retracts the latchbolt with 5 lb or less of force.

C. Electrical method: Von Duprin’s “RX-QEL-“, where lightly pressing the touchpad with 5 lb or less of force closes an electric switch, activating quiet electric latch retraction.

D. Specific features**:**

1. Non-Fire Rated Devices**:** cylinder dogging.

2. Lever Trim**:** breakaway type, forged brass or bronze escutcheon min. 0.130 inch thickness, compression spring drive, match lockset lever design.

3. Electrically Operated Devices**:** Single manufacturer source for electric latch retraction devices, electrically controlled trim, power transfers, power supplies, monitoring switches and controls.

4. Removable Mullions**:** Removable with single turn of building key. Securely reinstalled without need for key. Furnish storage brackets for securely stowing the mullion away from the door when removed.

2.5 CLOSERS

A. Surface Closers**:**

1. Full rack-and-pinion type cylinder with removable non-ferrous cover and cast iron body. Double heat-treated pinion shaft, single piece forged piston, chrome-silicon steel spring.

2. ISO 2000 certified. Units stamped with date-of-manufacture code.

3. Independent lab-tested 10,000,000 cycles.

4. Non-sized and adjustable. Place closers inside building, stairs and rooms.

5. Plates, brackets and special templating when needed for interface with particular header, door and wall conditions and neighboring hardware.

6. Advanced Variable Backcheck (AVB)**:** where scheduled, these units commence backcheck at approximately 45 degrees.

7. Adjust doors to open with not more than 5.0-pounds pressure to open at exterior doors and 5.0-pounds at interior doors. As allowed per 2013 California Building Code Section 11B-404.2.9, local authority may increase the allowable pressure for fire doors to achieve positive latching, but not to exceed 15-pounds.

8. Separate adjusting valves for closing speed, latching speed and backcheck, fourth valve for delayed action where scheduled.

9. Extra-duty arms (EDA) at exterior doors scheduled with parallel arm units. EDA arms**:** rigid main and forearm, reinforced elbow.

10. Exterior door closers**:** tested to 100 hours of ASTM B117 salt spray test, furnish data on request.

11. Exterior doors**:** seasonal adjustments not required for temperatures form 120 degrees F to -30 degrees F, furnish checking fluid data on request.

12. Non-flaming fluid, will not fuel door or floor covering fires.

13. Pressure Relief Valves (PRV) not permitted.

2.6 OTHER HARDWARE

A. Automatic Flush Bolts**:** Low operating force design.

B. Overhead Stops**:** Non-plastic mechanisms and finished metal end caps. Field-changeable hold-open, friction and stop-only functions.

C. Kick Plates**:** Four beveled edges, .050 inches minimum thickness, height and width as scheduled. Sheet-metal screws of bronze or stainless steel to match other hardware.

D. Door Stops**:** Provide stops to protect walls, casework or other hardware.

1. Unless otherwise noted in Hardware Sets, provide floor type with appropriate fasteners. Where floor type cannot be used, provide wall type. If neither can be used, provide overhead type.

2. Locate overhead stops for maximum possible opening. Consult with Owner for furniture locations. Minimum**:** 90deg stop / 95deg deadstop. Note degree of opening in submittal.

E. Seals**:** Provide weatherstripping (including door sweeps, seals, astragals) and gasketing systems (including smoke, sound, and light) as specified and per architectural details. Match finish of other items.

1. Proposed substitutions**:** submit for approval.

2. Provide door sweeps, seals, astragals, and auto door bottoms only of type where resilient or flexible seal strip is easily replaceable and readily available.

F. Thresholds**:** As scheduled and per details. Comply with CBC 2013 11B-404.2.5. Substitute products**:** certify that the products equal or exceed specified material's thickness. Proposed substitutions**:** submit for approval.

1. Saddle thresholds**:** 0.125 inches minimum thickness.

2. Exteriors**:** Seal perimeter to exclude water and vermin. Use sealant complying with requirements in Division 7 "Thermal and Moisture Protection". Minimum 0.25 inch diameter fasteners and lead expansion shield anchors, or Red-Head #SFS-1420 (or approved equivalent) Flat Head Sleeve Anchors. National Guard Products' "COMBO" or Pemko Manufacturing's "FHSL".

3. Fire-rated openings, 90-minutes or less duration**:** use thresholds to interrupt floor covering material under the door where that material has a critical radiant flux value less than 0.22 watts per square centimeter, per NFPA 253. Use threshold unit as scheduled. If none scheduled, include a 0.25in high 5in wide saddle in the bid, and request direction from Architect.

a. City of Los Angeles**:** regardless of critical radiant flux values of organic-material floor coverings, furnish metal, concrete, or stone thresholds at fire-rated openings.

4. Fire-rated openings, 3-hour duration**:** Thresholds, where scheduled, to extend full jamb depth.

5. Acoustic openings**:** Set units in full bed of Division-7-compliant, leave no air space between threshold and substrate.

6. Plastic plugs with wood or sheet metal screws are not an acceptable substitute for specified fastening methods.

7. Fasteners**:** Generally, exposed screws to be Phillips or Robertson drive. Pinned TORX drive at high security areas. Flat head sleeve anchors (FHSL) may be slotted drive. Sheet metal and wood screws**:** full-thread. Sleeve nuts**:** full length to prevent door compression.

G. Through-bolts**:** Do not use. Coordinate with wood doors; ensure provision of proper blocking to support wood screws for mounting panic hardware and door closers. Coordinate with metal doors and frames; ensure provision of proper reinforcement to support machine screws for mounting panic hardware and door closers.

1. Exception**:** surface-mounted overhead stops, holders, and friction stays.

H. Silencers**:** Interior hollow metal frames, 3 for single doors, 4 for pairs of doors. Leave no unfilled/uncovered pre-punched silencer holes. Intent**:** door bears against silencers, seals make minimal contact with minimal compression – only enough to effect a seal.

2.7 2.7 FINISH**:**

A. Generally**:** BHMA 626 Satin Chromium.

1. Areas using BHMA 626: furnish push-plates, pulls and protection plates of BHMA 630, Satin Stainless Steel, unless otherwise scheduled.

B. Door closers**:** factory powder coated to match other hardware, unless otherwise noted.

C. Finish designators used in appended hardware schedule**:**

ANSI	US	Description	Base Metal
626	US26D	Satin Chromium Plated Over Nickel	Brass, Bronze
628	US28	Satin Aluminum, Clear Anodized	Aluminum
630	US32D	Satin Stainless Steel	Stain. Steel 300 Ser
652	US26D	Satin Chromium Plated Over Nickel	Steel
682	US26D	Satin Chromium Plated Over Nickel	Zinc
689	US28	Aluminum Painted	Any
BLK		Black	Any
GRY		Grey	Any
US26D	US26D	Satin Chromium Plated	Any

2.8 KEYING REQUIREMENTS**:**

A. Key System: Schlage Everest Primus 29 high-security utility-patented keyway, interchangeable core throughout. Utility patent protection to extend at least until 2029. Key blanks available only from factory-direct sources, not available from after-market keyblank manufacturers. For estimate use factory GMK charge. Initiate and conduct meeting(s) with Owner to determine system keyway(s), keybow styles, structure, stamping, degree of physical security and degree of geographic exclusivity. Furnish Owner's written approval of the system; do not order keys or cylinders without written confirmation of actual requirements from the Owner. Note: Master-Keying and installation of permanent high-security cores must be done by GSD Locksmiths only.

1. Verify with owner whether new or existing factory-registered master key system.

2. Primus Level – verify with owner.

3. Construction keying**:** furnish temporary keyed-alike cores. Remove at substantial completion and install permanent cylinders/cores in Owner's presence. Demonstrate that construction key no longer operates.

4. Temporary cylinders/cores remain supplier's property.

5. Furnish 10 construction keys.

6. Furnish 2 construction control keys.

7. Key Cylinders**:** furnish 6-pin solid brass construction.

B. Cylinders/cores**:** keyed at factory of lock manufacturer where permanent records are maintained.

C. Permanent keys**:** use secured shipment direct from point of origination to Owner.

1. For estimate**:** 3 keys per change combination, 5 master keys per group, 5 grand-master keys, 3 control keys.

2. For estimate**:** VKC stamping plus “DO NOT DUPLICATE”.

D. Bitting List**:** use secured shipment direct from point of origination to Owner at completion.

PART 3 - EXECUTION

3.1 ACCEPTABLE INSTALLERS**:**

A. Can read and understand manufacturers’ templates, suppliers’ hardware schedule and printed installation instructions. Can readily distinguish drywall screws from manufacturers’ furnished fasteners. Available to meet with manufacturers’ representatives and related trades to discuss installation of hardware.

3.2 PREPARATION**:**

A. Ensure that walls and frames are square and plumb before hardware installation. Make corrections before commencing hardware installation. Installation denotes acceptance of wall/frame condition.

B. Locate hardware per SDI-100 and applicable building, fire, life-safety, accessibility, and security codes.

1. Notify Architect of code conflicts before ordering material.

2. Locate latching hardware between 34 inches to 44 inches above the finished floor, per California Building Code, Section 1008.1.9.2 and 11B-404.2.7.

3. Locate panic hardware between 36 inches to 44 inches above the finished floor.

4. Where new hardware is to be installed near existing doors/hardware scheduled to remain, match locations of existing hardware.

C. Overhead stops**:** before installing, determine proposed locations of furniture items, fixtures, and other items to be protected by the overhead stop's action.

3.3 INSTALLATION

A. Install hardware per manufacturer’s instructions and recommendations. Do not install surface-mounted items until finishes have been completed on substrate. Set units level, plumb and true to line and location. Adjust and reinforce attachment substrate for proper installation and operation. Remove and reinstall or replace work deemed defective by Architect.

1. Gaskets**:** install jamb-applied gaskets before closers, overhead stops, rim strikes, etc; fasten hardware over and through these seals. Install sweeps across bottoms of doors before astragals, cope sweeps around bottom pivots, trim astragals to tops of sweeps.

2. When hardware is to be attached to existing metal surface and insufficient reinforcement exists, use RivNuts, NutSerts or similar anchoring device for screws.

3. Use manufacturers' fasteners furnished with hardware items, or submit Request for Substitution with Architect.

4. Replace fasteners damaged by power-driven tools.

B. Locate floor stops no more than 4 inches from walls and not within paths of travel. See paragraph 2.2 regarding hinge widths, door should be well clear of point of wall reveal.

Point of door contact no closer to the hinge edge than half the door width. Where situation is questionable or difficult, contact Architect for direction.

C. Core concrete for exterior door stop anchors. Set anchors in approved non-shrink grout.

D. Locate overhead stops for minimum 90 degrees at rest and for maximum allowable degree of swing.

E. Drill pilot holes for fasteners in wood doors and/or frames.

F. Lubricate and adjust existing hardware scheduled to remain. Carefully remove and give to Owner items not scheduled for reuse.

3.4 ADJUSTING

A. Adjust and check for proper operation and function. Replace units, which cannot be adjusted to operate freely and smoothly.

1. Hardware damaged by improper installation or adjustment methods**:** repair or replace to Owner's satisfaction.

2. Adjust doors to fully latch with no more than 1 pound of pressure.

a. Door closer valves: turn valves clockwise until at bottom – do not force. Turn valves back out one and one-half turns and begin adjustment process from that point. Do not force valves beyond three full turns counterclockwise.

3. Adjust delayed-action closers on fire-rated doors to fully close from fully-opened position in no more than 10 seconds.

B. Fire-rated doors**:**

1. Wood doors**:** adjust to 0.125 inches clearance at heads, jambs, and meeting stiles.

2. Steel doors**:** adjust to 0.063 inches minimum to 0.188 inches maximum clearance at heads, jambs, and meeting stiles.

3. Adjust wood and steel doors to 0.75 inches maximum clearance (undercut) above threshold or finish floor material under door.

C. Final inspection**:** Installer to provide letter to Owner that upon completion installer has visited the Project and has accomplished the following**:**

1. Has re-adjusted hardware.

2. Has evaluated maintenance procedures and recommend changes or additions, and instructed Owner's personnel.

3. Has identified items that have deteriorated or failed.

4. Has submitted written report identifying problems.

3.5 DEMONSTRATION**:**

A. Demonstrate mechanical hardware and electrical, electronic and pneumatic hardware systems, including adjustment and maintenance procedures.

3.6 PROTECTION/CLEANING**:**

A. Cover installed hardware, protect from paint, cleaning agents, weathering, carts/barrows, etc. Remove covering materials and clean hardware just prior to substantial completion.

B. Clean adjacent wall, frame and door surfaces soiled from installation / reinstallation process.

END OF SECTION

SECTION 08 80 00

GLASS AND GLAZING

PART 1 - GENERAL

1.1 SUMMARY

A. Provide all glass and glazing materials including all tools, equipment, supplies, accessories and all labor necessary for complete fabrication and installation of glass and glazing as shown on the Contract Drawing and herein specified.

B. Related Sections: Documents affecting work of this Section include, but are not necessarily limited to the GENERAL CONDITIONS, SUPPLEMENTARY CONDITIONS and Sections in DIVISION 01 - GENERAL REQUIREMENTS of these Specifications.

1.2 QUALITY ASSURANCE

A. Reference Specifications and Standards:

1. ASTM C-1036-85 for flat glass

2. ASTM C-1048 for tempered glass

3. Glazing Manual for Flat Glass Marketing Association for flat glass DD-G-451

a. Glazing Sealing Systems Manual
b. Glazing Manual

4. Underwriters' Laboratory Inc. (UL)

B. Qualification of Installers: Use adequate numbers of skilled laborers who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and methods needed for the proper performance of work of this Section.

C. Codes and Regulations: Perform work of this Section in accordance with all applicable Federal, State, County and the Uniform Building Code with the City of Los Angeles 1992 Amendments.

1. Comply with Federal Standard 16 CFR 1201, Federal Safety Standard for Architectural Glazing Materials.

2. Comply with pertinent recommendations of the Flat Glass Marketing Association (FGMA).

1.3 SUBMITTALS

A. General: Comply with the provisions of SUBMITTALS of DIVISION 01 - GENERAL REQUIREMENTS of these Specifications.

B. Material List: Submit a listing of each glazing material including type of caulking and sealant material and fire rating proposed for use and location in Project to the City Engineer or the Consultant for review prior to installation.

C. Manufacturer's Data: Submit to the City Engineer or the Consultant the manufacturer's specifications and printed data for all material proposed for use.

D. Samples: Submit to the City Engineer or the Consultant, when so requested 4-inch x 4-inch samples of the various types of glass, noting name of manufacturer, grade, quality and thickness, coloration and setting materials for review and approval prior to installation.

E. Labeling: Required on each lite showing quality, thickness and type and manufacturer's name, which shall remain on glass until final cleaning and acceptance.

F. Manufacturer's recommended installation procedures and special precautions which when approved by the City Engineer or the Consultant, will become the basis for accepting or rejecting actual installation procedures used on the Work.

1.4 PRODUCT HANDLING AND STORAGE

A. Protection: Protect all glass against damage and store glass of this Section before, during and after installation and protect the work and materials of all other trades as per glass manufacturer's instructions or recommendations. During storage and handling of glass provide cushions at edges of glass to prevent impact damage.

B. Upon Completions of Construction Operations: Leave installed glass unbroken and in perfect condition and maintain so until City's acceptance of the building.

C. Replacements: In the event of damage, immediately make all repairs and replacements necessary to the approval of the City Engineer or the Consultant, at no added cost to the City.

D. Guarantee: Guarantee all materials installed for a period one (1) year against defects and workmanship after acceptance by the City in accordance with provisions of Section 28 of the GENERAL CONDITIONS.

PART 2 - PRODUCTS

2.1 GLASS

A. General: Glass is called for by "type" as noted on the Contract Drawings details and on "Window and Door Schedule".

1. For all glass, provide the type and thickness shown on the Contract Drawings or specified herein.

GLAZING TYPES		
Type	**Description**	**Notes:**
GL-1	Single Glazed Clear	
GL-2	Single Glazed Translucent	
GL-3	Single Glazed Back Painted	
GL-4	Dual Glazed Clear	See Sched. For SHGC
GL-5	Dual Glazed Translucent	See Sched. For SHGC
GL-6	Insulated Metal Panel	

NOTES:
1. All glazing to be tempered unless otherwise noted.
2. All exterior glazing to have U-Factor or 0.6

3. SHGC varies depending on glazing orientation. See Window Schedule for SHGC

B. Quality: As per ASTM C-1036-85 for flat glass and ASTM C-1048-85 and Z97.1-84 Safety Performance Specifications and Methods of Test for tempered or heat strengthened glass as manufactured by Pittsburgh Plate Glass Industries (P.P.G.), Libby-Owens-Ford (L.O.F.) or Hordis Brothers, Inc. or equal.

C. Glass Material:

1. 1/4-inch thick Pittsburgh bronze tinted tempered safety glass, free from tong marks, or equal.

   a. Manufactured in accord with ANSI-297.1 and Standard 16 CFR 1201.

   b. Permanently label each light by etching, sand blasting, or fired-on ceramic. Identify labelers, thickness and material type.

   c. Locate label in lower corner, position to be legible and visible after installation.

   d. Visible tong marks in installed glass will not be acceptable.

   e. Sandblast as noted on the Contract Drawings.

2. Clear 1/4-inch Wire Glass, Mississippi "Polished Misco" or equal U.L. listed with diamond pattern wire mesh not smaller than 25 AWS gauge.

3. Laminated Safety Glass; clear and/or tinted as noted on the Contract Drawings, consisting of an inner face and outer face of float glass laminated under heat and pressure to a clear plastic core.

   a. Use 1/4-inch thickness for maximum size of 60" x 120".
   b. Use 3/8-inch thickness for larger sizes.

4. Heat-Strengthened Glass

   a. Comply with Federal Spec. DD-G-1403.

   b. Strengthened by the manufacturer's standard heat-treating process, increasing flexural strength to not less than twice the strength before treatment.

   c. Permit minimum warpage practicable.

5. Obscure Glass: Mississippi "Smooth Rough" pattern glass 1/8-inch thick, having a light transmission factor of 87.5 percent, as manufactured by Combustion Engineering Company.

6. Mirrors: 1/4-inch thick, "Mirror Select Quality", with two coats of silver, one coat of copper and one coat of protection paint, with exposed edges beveled sizes noted on the Contract Drawings.

7. Spandrel Glass: Pittsburgh Plate Glass Co. "Spandrelite" No. EG5216 double ceramic coated on inside of 1/4-inch thick clear tempered float glass, color as noted on the Contract Drawings.

8. Transparent Mirror: 1/8 or 1/4-inch thick plate glass coated by the vaporized chrome bath process to produce a chromium deposit of minimum .0000004-inch thickness to allow transmission of the total incident light not less than 6% and not more than 10 percent.

2.2 GLAZING MATERIALS

A. Setting Blocks: Neoprene, Shore A durometer hardness of 80-90. Each block not less than 3-inches long or thickness as required, locate in bottom frame member to assure glass penetrates frame maximum 3/8-inch.

B. Spacer and/or Shins: Neoprene, Shore A durometer hardness of 80-90 with self adhesives on one face. Each spacer not less than 3-inches long or thickness as required.

C. Glazing Compound: Use Silicone rubber for all sealing.

D. Wood or Metal Sash Putty: Standard brands, light colored, permanently elastic, non-staining, equal to best grades manufactured by H.R. Hunt Putty Mfg. Co., Los Angeles, California, delivered in manufacturer's original unopened labeled containers.

2.3 OTHER MATERIALS

Provide other materials, not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the approval of the City Engineer or the Consultant.

PART 3 - EXECUTION

3.1 GENERAL

A. Workmanship: Best standard practice as per recommendations of the Flat Glass Jobbers Association "Glazing Manual".

B. Inspection: Examine the areas and conditions under which work of this Section will be installed. Verify that openings for glazing are correctly sized and within tolerances and are clean and free from obstructions and ready to receive glazing. Correct conditions detrimental to the proper and timely installation of the work of this Section. Do not proceed until the detrimental conditions have been corrected.

C. Preparation:

1. Compute actual glass size for each opening by field measurements. Allow for edge clearance and required grip.

2. Clean glass and glazing surfaces prior to installing in framing; remove dust, oil and contaminants and wipe dry making free from obstructions and deleterious substances which might impair the work.

3. Comply with manufacturer's instructions for final wiping of surfaces immediately prior to application of primer and glazing compounds or tapes.

4. Prime surfaces to receive glazing compounds in accordance with manufacturer's recommendations.

3.2 INSTALLATION

A. Inspection: Inspect each piece of glass immediately prior to start of installation.

1. Do not install items which are improperly sized, have damaged edges or are scratched, abraded or damaged in any other manner.

2. Do not remove labels from glass until so directed by the City Engineer or the Consultant.

3. Install glass so distortion waves, if present, run in the horizontal direction.

B. General Glass Setting: (As Applicable)

1. Tight and True, with equal bearing along the edges in a manner which produces the greatest possible degree uniformity in appearance.

2. With metal stops or glazing beads where indicated on the Contract Drawings; stops and beads neatly mitered at corners and secured with oval-head screws or bolts as suitable.

3. Do not use two different glazing materials in the same joint system unless the joint used is approved in advance by the City Engineer or the Consultant.

4. Mask or otherwise protect surfaces adjacent to installation of sealants.

5. Secure in stationary glass window openings with vinyl gaskets, resilient clips, snap-on beads, and other glazing devices; in accordance with the directions of the glass manufacturer.

6. Immediately after glazing, a white 'x' shall be painted on glass or each light.

7. Check glass surfaces and edges for damage before glazing; do not install glass having broken or chipped edges; never slide one light over another.

8. There shall be no metal to glass contact, except as otherwise detailed.

9. Set exterior glass on neoprene glazing blocks; maintain proper clearances.

10. Begin glazing in concrete openings only after any surface treatments such as grouting, and waterproofing have been completed.

11. Bed glass in wood doors, not otherwise specified or detailed in putty and secure with wood stops with tamperproof screws as indicated on the Contract Drawings.

12. For Tempered Float Glass: Locate tong marks concealed as much as possible at top and bottom rails of doors or windows.

13. For Heavy Plate Glass: Support bottom edges on lead blocks at quarter points and side and top edges with neoprene or plastic setting blocks at quarter points.

14. Glass Replacement: Prior to replacing glass panes in existing exterior wood or metal windows, properly clean all glazing rebates of old glazing materials and make ready to receive new application of glazing points or sprigs spaced not more than 24-inches on center around the perimeter of the frame. Where light edge is 12-inches or less, provide one point or sprig centered.

15. Miter-cut and seal the joints of glazing gaskets in accordance with the manufacturer's recommendations, to provide watertight and airtight seal at corners and other locations when joints are required.

16. Set glass mirrors with adhesive or clips in accordance with manufacturer's instructions.

C. Cleaning, Polishing and Repairing:

1. Provisions of Section 017100 - CLEANING of the GENERAL REQUIREMENTS in DIVISION 1 applicable.

2. Remove excess glazing compound from all surfaces. Remove labels from glass surfaces.

3. Wash and polish all glass upon completion of the Project. Clean glass with methods and materials as recommended by the glass manufacturer.

4. Remove and replace, scratched, chipped, or otherwise defective glass and replace with proven materials and workmanship, at no added cost to the City.

5. Trim putty to required straight, true lines; trimmings removed.

D. Protection: Protect glass from breakage after installation by promptly installing streamers or ribbons suitably attached to the framing and held free from glass. Do not apply warning markings, streamers, ribbons or other items directly to the glass except as specifically directed by the City Engineer or the Consultant. Upon completion of construction operations, leave the glass unbroken and in perfect condition and maintain so until acceptance of the Contracted Work. Provide water test for leakage.

END OF SECTION

SECTION 08 83 03

HSS FRAMEWORK MOUNTED MIRRORS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Furnish and install hollow structural section (HSS) mounted mirrors as indicated on the drawings and specified.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

1. Mirrors. Submit descriptions of materials and process used to produce each type of silvered flat glass mirror specified that indicates sources of glass, glass coating components, edge sealer, and quality-control provisions. Include electrical characteristics of LED lighting.

B. Shop Drawings: Submit dimensioned drawings of the HSS framework. Include mirror elevations, edge details, mirror hardware, LED lighting, and attachments to other work.

C. Samples: For each type of the following products:

1. Mirrors: 12 inches (300 mm) square, including edge treatment on two adjoining edges.

2. LED lighting for color selection.

1.4 WARRANTY

A. Special Warranty: Manufacturer's standard form in which mirror manufacturer agrees to replace mirrors that deteriorate within specified warranty period. Deterioration of mirrors is defined as defects developed from normal use that are not attributed to mirror breakage or to maintaining and cleaning mirrors contrary to manufacturer's written instructions. Defects include discoloration, black spots, and clouding of the silver film.

1. Warranty Period: Five of Substantial Completion.

PART 2 - PRODUCTS

2.1 HSS FRAMEWORK MOUNTED SILVERED TEMPERED GLASS MIRRORS

A. Glass Mirrors, General: ASTM C 1503**;** manufactured using copper-free, low-lead mirror coating process.

1. Manufacturers: Subject to review of action submittals by the Architect for compliance with requirements, provide products of the manufacturer indicated on the drawings or an acceptable substitution by one of the following:

a. Avalon Glass and Mirror Company.
b. Binswanger Mirror; a division of Vitro America, Inc.
c. Donisi Mirror Company.
d. Gilded Mirrors, Inc.

e. Guardian Industries.
f. Independent Mirror Industries, Inc.
g. Lenoir Mirror Company.
h. Maran-Wurzell Glass & Mirror.
i. Stroupe Mirror Co., Inc.

B. Tempered Clear Glass: Mirror Glazing Quality, for blemish requirements; and comply with ASTM C 1048 for Kind FT, Condition A, tempered float glass before silver coating is applied.

1. Nominal Thickness: As indicated on the drawings.

2.2 HSS STEEL FRAMEWORK

A. Round, Square and Rectangular HSS: ASTM A500 Grade B or C.

B. Galvanized per ASTM A123, G-90 after fabrication.

1. Fabricate framework of HSS steel angles or channels as shown.

2. Continuously weld joints. Miter and weld channel frame at corners. Reinforce corner with plate angles. Drill and tap for fastenings and anchorages.

2.3 MISCELLANEOUS PRODUCTS

A. Lighting System: Provide removable and accessible LED strips as selected by the Architect from the manufacturer’s standard products. Include internal wiring with single concealed electrical connection to building system. Coordinate electrical characteristics with power supply provided.

B. Fasteners: Fabricated of same basic metal and alloy as fastened metal and matching it in finished color and texture where fasteners are exposed.

C. Anchors and Inserts: Provide devices as required for mirror framework and hardware installation. Provide toothed or lead-shield expansion-bolt devices for drilled-in-place anchors. Provide galvanized anchors and inserts for applications on inside face of exterior walls and where indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, over which mirrors are to be mounted, with Installer present, for compliance with installation tolerances, substrate preparation, and other conditions affecting performance of the Work.

B. Examine roughing-in for electrical power system to verify actual locations of connections before installation of mirrors.

C. Proceed with installation only after unsatisfactory conditions have been corrected and surfaces are dry.

3.2 INSTALLATION

A. Install mirrors to comply with mirror manufacturer's written instructions and with referenced GANA publications. Mount mirrors accurately in place in a manner that avoids distorting reflected images.

B. Protect mirrors from breakage and contaminating substances resulting from construction operations.

C. Do not permit edges of mirrors to be exposed to standing water.

D. Maintain environmental conditions that will prevent mirrors from being exposed to moisture from condensation or other sources for continuous periods of time.

E. Wash exposed surface of mirrors not more than four days before date scheduled for inspections that establish date of Substantial Completion. Wash mirrors as recommended in writing by mirror manufacturer.

END OF SECTION

SECTION 08 91 21

EXTRUDED ALUMINUM LOUVERS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Furnish and install extruded aluminum louvers as indicated on the drawings and specified.

1.3 SUBMITTALS

A. Submit product data for each louver indicated.

B. Submit shop drawings of louver units and accessories. Include plans, elevations, sections, and details showing profiles, angles, spacing of louver blades; unit dimensions related to wall openings and construction; free areas for each size indicated; and profiles of frames at jambs, heads and sills.

C. Submit samples of the finish required, prepared on 6 inch square metal samples of same thickness and alloy indicated for final unit of Work. Where finishes involve normal color and texture variations, include sample sets showing full range of variations expected.

1. Colors shall be as selected by the Architect form the manufacturer’s standard available palette.

D. Product test reports evidencing compliance of units with performance requirements indicated.

PART 2 - PRODUCTS

2.1 EXTRUDED ALUMINUM LOUVERS

A. Manufacturers: Subject to compliance with specified requirements, provide products by the entity named on the drawings, or one of the following (or an acceptable substitution):

1. Airolite Co.
2. Construction Specialties, Inc.
3. Industrial Louvers, Inc.
4. Ruskin Mfg. Div., Phillips Industries, Inc.
5. Architectural Louvers Co.

B. Aluminum Extrusions: ASTM B221, Alloy 6063-T5 or T-52.

C. Aluminum Sheet: ASTM B209, Alloy 3003 or 5005 with temper as required for forming, or as otherwise recommended by metal producer to produce required finish.

D. Fasteners: Aluminum of same basic metal and alloy as fastened metal, or stainless steel.

1. Use types, gages, and lengths to suit unit installation conditions.

2. Use Phillips flat-head machine screws for exposed fasteners, unless otherwise indicated.

E. Provide aluminum expanded metal screens, alloy 3003 H14, 0.10” thick, and not less than 50 percent open area, standard, with U-edging.

F. Anchors and Inserts: Of type, size, and material required for type of loading and installation indicated. Use nonferrous metal or hot-dip galvanized steel anchors and inserts. Use toothed steel or expansion bolt devices for drilled-in-place anchors.

G. Bituminous Paint: SSPC-Paint 12 (cold-applied asphalt mastic).

2.2 FABRICATION

A. Horizontal Drainable Fixed Blade Louvers: Extruded aluminum frames and louver blades; designed to collect and drain water to exterior at sill by means of gutters in front edges of blades and of channels in jambs and mullions; complying with the dimensions and profiles indicated on the drawings.

1. AMCA Seal: Mark units with AMCA Certified Ratings Seal.

2. Frame Thickness: 0.081 inch, unless otherwise indicated.

3. Louver Blade Thickness: 0.081 inch, unless otherwise indicated.

4. Exterior Corners: Prefabricated corner units with mitered and welded blades aligned with straight sections, with concealed bracing.

2.3 PREFINISHING SHALL BE AS SELECTED BY THE CONTRACTING OFFICER

A. Fluorocarbon 2-Coat Coating System: Provide a high performance organic coating using the manufacturer's standard 2-coat thermo-cured system, composed of specially formulated inhibitive primer and fluorocarbon color topcoat containing not less than 70 percent polyvinyldene resin by weight; complying with AAMA 605.2.

1. Color and Gloss: As selected by the Architect from manufacturer's standard choices for color and gloss.

2.4 LOUVER SCREENS (IF REQUIRED)

A. General: Provide screen at each exterior louver.

1. Screen Location for Fixed Louvers: Interior face.

2. Screening Type: Bird screening, 1/4” square mesh.

B. Secure screens to lover frames with stainless-steel machine screws, spaced a maximum of 6 inches from each corner and at 12 inches o.c.

C. Louver Screen Frames: Fabricate with mitered corners to louver sizes indicated.

1. Metal: Same kind and form of metal as indicated for louver to which screens are attached. Reinforce extruded-aluminum screen frames at corners with clips.

2. Finish: Mill finish.

3. Type: Non-rewireable, U-shaped frames for permanently securing screen mesh.

PART 3 - EXECUTION

3.1 PREPARATION

A. Coordinate setting drawings, diagrams, templates, instructions and directions for installation of anchorages which are to be embedded in concrete or masonry construction. Coordinate delivery of such items to project site.

3.2 INSTALLATION

A. Install louvers as recommended by the manufacturer and in accordance with the approved shop drawings. Locate and place louver units plumb, level, and in proper alignment with adjacent work.

B. Use concealed anchorages where possible. Provide brass or lead washers fitted to screws where required to protect metal surfaces and to make a weathertight connection.

C. Form closely fitted joints with exposed connections accurately located and secured.

D. Repair finishes damaged by cutting, welding, soldering, and grinding operations require for fitting and jointing. Restore finishes so there is no evidence of corrective work. Return items which cannot be refinished in field to shop, make required alterations and refinish entire unit, or provide new units.

E. Protect galvanized and nonferrous metal surfaces from corrosion or galvanic action by application of a heavy coating of bituminous paint on surfaces which will be in contact with concrete, masonry, or dissimilar metals.

F. Install concealed gaskets, flashings, joint fillers, and insulation, as louver installation progresses where required to make louver joints weathertight. Apply sealants in accordance with the sealant manufacturer's written directions.

G. Protect louvers from damage of any kind during construction period including use of temporary protective coverings where needed and approved by louver manufacturer. Remove protective covering at time of Substantial Completion.

H. Restore louvers damaged during installation and construction period, so that no evidence remains of correction work. If results of restoration are unsuccessful, as judged by Architect, remove damaged units and replace with new units.

1. Clean and touch-up minor abrasions in finishes with air-dried coating that matches color and gloss of, and is compatible with, factory-applied finish coating.

END OF SECTION

SECTION 09 26 00

GYPSUM BOARD SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

A. All labor, materials and equipment necessary for gypsum board systems (Drywall Construction) as indicated on the Contract Drawings and in these Specifications.

B. Related Sections: Documents affecting work of this Section include, but are not necessarily limited to the GENERAL CONDITIONS, SUPPLEMENTARY CONDITIONS and Sections of GENERAL REQUIREMENTS in DIVISION 1 of these Specifications.

C. Regulatory Agency: Los Angeles City Building Code, DIVISION 47 and current Amendments to the CBC.

D. References Standards:

1. GA216-85 Recommended Specifications for the Application and Finishing of Gypsum Board.

2. ASTM C-630, Water-Resistant Gypsum Board.

1.2 SUBMITTALS

A. Conform to DIVISION 01 - GENERAL REQUIREMENTS of these Specifications.

B. Samples: Submit 12-inch x 12-inch sample of texture with metal furring for acceptance, when requested by the City Engineer or the Consultant.

C. Product Data:

1. Materials list of items proposed to be provided under this Section.

2. Manufacturer's specifications noting fastener detail and spacing and other data needed to prove compliance with specified requirements.

3. Covering or painting preparation procedure.

4. Manufacturer's recommended installation procedures, when approved by the City Engineer, will become the basis of accepting or rejecting actual installation procedures used on the work.

1.3 QUALITY ASSURANCE

A. Labor: Use adequate number of skilled laborers who are thoroughly trained and experienced in the necessary crafts and completely familiar with the specified requirements and methods needed for proper performance of the work of this Section.

1.4 PROJECT CONDITIONS

A. Environmental Requirements: During work operations of this Section maintain temperatures within the building within the range of 55 to 70 degrees F. For 24-hours

before, during and after gypsum board and joint treatment application. Provide adequate ventilation in the work areas to carry off excess moisture.

1.5 GENERAL REQUIREMENTS

A. Product Handling:

1. To be arranged for delivery and storage of adequate supplies of drywall materials to the job-site to permit uninterrupted progress of the work.

2. Deliver materials and accessories to the job-site in their original containers or bundles properly identified with manufacturer's name and brand name. Store as directed by the City Engineer or the Consultant and protect against damage during the extent of the Contract.

3. Store drywall finish materials in flat area, protected from moisture, on flat and solid supports off the floor surface.

B. Scaffolding: In accordance with Federal, State, County, and City of Los Angeles Safety Rules and Regulations and CAL/OSHA. Avoid interference with work of other trades.

C. Protection:

1. Adequately protect all existing and/or new work in place against damage.
2. Keep floor surfaces covered to prevent staining by spackling materials.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Drywall and Accessories:

1. United States Gypsum (USG)
2. Glenstar Gypsum Products (Flintkote)
3. Georgia-Pacific Co.
4. National Gypsum Co. (Gold Bond)
5. Celolex Company
6. Louisiana - Pacific
7. Acceptable substitutes shall conform to conditions in GENERAL CONDITIONS of these Specifications.

2.2 GYPSUM WALLBOARD

A. General:

1. Wallboard shall conform to Fed. Spec. SS-L-30D, in 48" widths by lengths as will minimize cross joints.

2. Regular wallboard, type III grade R, Class I, 5/8" thick except as otherwise noted on the Drawings.

3. Fire-retardant wallboard, type III, grade X, class 1, 5/8" thick and shall bear label (U.L.) for 1-hour fire rating and conforming to ASTM E119 or equal.

4. Exterior water-resistant wallboard shall conform to ASTM C-630, type "X" or "W" conforming to L.A. City Building Code with current Amendments to the CBC. and 5/8" thick except as otherwise noted on the Contract Drawings.

5. Shaft walls wallboard designed for encasing shafts of required fire-resistivity, conform to Fed. Spec. SS-L-30D, type IV, grade "R" or "X", class 1, in dimensions shown on the Contract Drawings.

6. Sheathing: where indicated or noted on the Drawings, board shall comply with Fed. Spec. SS-L-30D, type II, class 2, grade W.

B. Screws: Type "W" bugle head drywall screws, conforming to ASTM C664, 1 1/4-inch long, except where longer length is required by Code. Provide type “G” fasteners for gypsum board applications.

C. Tape: U.S. Gypsum "Perf-A-Tape" or equal.

D. Taping Compound: As recommended by the wallboard manufacturer.

E. Texture: Fine to medium spray texture as recommended by the wallboard manufacturer. Prepare samples for the City Engineer's or the Consultant's selection.

2.3 ACCESSORIES

A. Metal Trim: Form from zinc-coated steel not lighter than 26 gage, conforming to Fed. Spec. QQ-S-775, type I, class "d" or "e".

B. Furring Channels ("Hat" Section): Roll formed of .022-inch galvanized steel, 7/8-inch deep with 1-3/8-inch face width, as manufactured by U.S. Gypsum, or equal.

C. Casings (for all free edges of exposed gypsum wallboard): U.S. Gypsum No. 200-4 metal trim, U-shaped and of 2-inch size.

D. Corner Reinforcement: "Perf-A-Bead", a metal corner reinforcement of formed galvanized steel with 1-3/16-inch wide "Perf-A-Tape" wings to receive joint compound, as manufactured by U.S. Gypsum, or equal.

E. All other accessories, etc., as necessary for a complete drywall installation.

F. Sound Deadening Board: Fiber or gypsum sound deadening board 2-inch thick as supplied by Georgia-Pacific Corporation, or equal.

G. Edge Beads at Perimeter of Ceilings: Angle shapes with wings not less than 3/4" wide, with concealed wing perforated for nailing and exposed wing edge folded flat and factory finished white.

2.4 JOINTING SYSTEM

A. Materials: Reinforcing tape and compound, designed to be used together as recommended by the wallboard manufacturer.

B. Jointing compound may be used for finishing if so recommended by its manufacturer.

2.5 ACCESS DOORS

A. In Partitions and Ceilings: Provide for access to mechanical and/or electrical installations.

B. Types:

1. 24" x 24" metal access doors with concealed hinges to metal frame and with Allen key lock.

2. Where to be located in fire-rated partitions, access doors to have the same fire-rating.

3. For tile surfaces and toilet room access doors and frames to be stainless steel with satin finish.

PART 3 - EXECUTION

3.1 PREPARATION

A. Project Conditions: Examine all parts of the work for any conditions which would affect the soundness or correctness of drywall work. Verify all corrective work to be done before proceeding with drywall construction operations.

B. Cooperation: Required, with all other trades involved in the work of placing of work, building-in, and embedding into drywall construction of all fixtures, anchors, backing, sleeves, inserts; providing of openings, chases to the extent necessary for proper and secure installation, attachments, and passing of other work.

C. All piping, conduit, and fixtures to be concealed by wallboard or to penetrate drywall finish to be in place, tested, and approved before start of application of wallboard.

3.2 INSTALLATION OF GYPSUM BOARD

A. General:

1. In accordance with Contract Drawings and with the separate boards in moderate contact but not forced in place.

2. At internal and external corners, conceal the cut edges by overlapping covered edges of abutting boards.

3. Stagger the boards so that corners of any four boards will not meet at a common point except in vertical corners.

B. Cutting: By scoring and breaking, or by sawing. Do all cutting from the face side. Sandpaper cut edges for neat jointing in finished work. Cutouts for pipes, fixtures, or other small openings to be scored before knocking out or cut out with saw. Openings are not to be punched out. Scribe gypsum wallboard finish to intersecting or abutting surfaces.

C. Ceilings: Secure boards along perimeters of ceilings, around edges of openings to all furring channels. Place boards with long dimensions perpendicular to supports, screw in place at 12-inches on center in the field and 8-inches on center along board edges. Locate screws not less than 1/8-inch from board edges.

D. Walls and/or Vertical Planes: Place wallboard horizontally or vertically in accordance with manufacturer's recommendations for the particular situation for minimum taping. Secure wallboard to structural supports with drywall screws spaced 12-inches on center in the field and 8-inches on center staggered along each board edge. Use 1-1/4-inch long screws for fastening single layer of wallboards.

E. Fasteners: Firmly fasten boards to supporting framing member with fasteners not cutting surface paper or fracturing the gypsum core. Where a fastener has cut surface paper,

provide another screw fastener approximately 1-1/2-inches from the defective fastener and remove the defective fastener. Butt join vertical joints of wallboard at supports and stagger on opposite faces of partitions.

F. Casings or Trim: Provide at all exposed edges and/or ends of wallboard and where intersecting with other materials. At exterior corners of wallboard joints secure in place specified corner reinforcements ready for taping compound.

G. Sealants: Where indicated on the Contract Drawings, provide a bead of sealant where trim or casings abutt adjacent construction.

H. Access Doors:

1. By careful coordination with the Drawings and with the trades involved, install the specified access doors where required.

2. Anchor firmly into position, and align properly to achieve an installation flush with the finished surface.

3.3 JOINT TREATMENT AND FINISHING

A. General:

1. Inspect areas to be joint treated, verifying that the gypsum wallboard fits snugly against supporting framework.

2. In areas where joint treatment and compound finishing will be performed, maintain a temperature of not less than 55 degrees for 24 hours prior to commencing the treatment, and until joint and finishing compounds have dried.

3. Apply the joint treatment and finishing compound by machine or hand tool.

4. Provide a minimum drying time of 24 hours between coats, with additional drying time in poorly ventilated areas.

B. Embedding compounds:

1. Apply to gypsum wallboard joints and depressed fastener heads in a thin uniform layer.

2. Spread the compound not less than 3" wide at joints, center the reinforcing tape in the joint, and embed the tape in the compound. Then spread a thin layer of compound over the tape.

3. After this treatment has dried, apply a second coat of embedding compound to joints and fastener heads, spreading in a thin uniform coat to not less than 6" wide at joints, and feather edged.

4. Sandpaper between coats as required.

5. When thoroughly dry, sandpaper to eliminate ridges and high points.

C. Finishing Compounds:

1. After embedding compound is thoroughly dry and has been completely sanded, apply a coat of finishing compound to joints and depressed fastener heads.

2. Feather the finishing compound to not less than 12" wide.

3. When thoroughly dry, sandpaper to obtain a uniformly smooth surface, taking care to not scuff the paper surface of the wallboard.

D. Screw Heads: To be depressed slightly and to have at least 3 coats of spackle, each coat applied at same time as the spackling of joint and to be thoroughly dry before application of succeeding coats.

E. Where Gypsum Board to Receive Vinyl or Other Coverings: Leave all surfaces clean and in acceptable conditions to receive subsequent finish work of other trades.

3.4 CORNER TREATMENT

A. Internal Corners: Treat as specified for joints, except fold the reinforcing tape lengthwise through the middle and fit neatly into the corner.

B. External Corners:

1. Install the specified corner bead, fitting neatly over the corner and securing with the same type fasteners used for installing the wallboard.

2. Space the fasteners approximately 6" on centers, and drive through the wallboard into the framing or furring member.

3. After the corner bead has been secured into position, treat the corner with joint compound and reinforcing tape as specified for joints, feathering the joint compound out from 8" to 10" on each side of the corner.

3.5 OTHER METAL TRIM

A. General:

1. The Drawings do not purport to show all locations and requirements for metal trim.

2. Carefully study the Drawings and the installation, and provide all metal trim normally recommended by the manufacturer of the gypsum wallboard approved for use in this work.

3.6 CLEANING UP

A. In addition to other requirements for cleaning, use necessary care to prevent scattering gypsum wallboard scraps and dust, and to prevent tracking gypsum and joint finishing compound onto floor surfaces.

B. At completion of each segment of installation in a room or space, promptly pick up and remove from the working area all scrap, debris, and surplus material.

END OF SECTION

SECTION 09 30 14

CERAMIC TILE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Furnish all tools, equipment, materials, supplies, accessories and perform all labor to install ceramic tile work indicated on the Contract Drawings and as hereinafter specified.

1.3 QUALITY ASSURANCE

A. Referenced Specifications and Standards:

1. Material, installation and workmanship shall conform to the Tile Council of America Specifications as follows:

a. Glazed Ceramic Tile: A137.1

2. Ceramic Tile Institute: "Standards of the Tile Trade."

1.4 ACTION SUBMITTALS

A. Submit the manufacturer's list of items proposed to be used or provided under this Section.

B. Submit the manufacturer's standard palette showing the various tile colors and textures available.

C. Submit the manufacturer's data, specifications and installation instructions for all products of this Section.

D. Certificates:

1. Furnish a Master Grade Certificate signed by this tile manufacturer at time of shipping stating type and quantities and by the Contractor who has installed the tile.

2. Furnish certification by the grout manufacturer that the products used meet or exceed the standards of the American National Standards Institute.

3. Certificate of Grade: "Standard Grade" tile in accordance with American National Standards Institute Specifications for Ceramic Tile, A137.1-1967 (ANSI-AN-4).

E. Samples:

1. Required: Two pieces of each type, size and color of tile, to be submitted to the Owner for approval.

2. Ceramic Tile: Wall tile and trim.

3. Provide samples of standard grout colors by manufacturer. Each sample shall bear the manufacturer's name and color designation.

1.5 QUALITY ASSURANCE

A. Source Limitations for Tile: Obtain tile of each type and color or finish from one source or producer.

1. Obtain tile of each type and color or finish from same production run and of consistent quality in appearance and physical properties for each contiguous area.

B. Source Limitations for Setting and Grouting Materials: Obtain ingredients of a uniform quality for each mortar, adhesive, and grout component from one manufacturer and each aggregate from one source or producer.

C. Mockups: Build mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.

1. Build mockup of each type of floor tile installation.

2. Build mockup of each type of wall tile installation.

3. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.6 PRODUCT HANDLING

A. Deliver materials in manufacturer's original unbroken containers with legible labels identifying brand name and contents.

1. Tile cartons shall be grade-sealed by manufacturer in accordance with ANSI A137 with grade-seals unbroken.

2. Grout shall contain hallmarks certifying compliance with referenced standards.

B. Deliver mastic grout in containers ready for use.

C. Store all materials in a dry location under cover in a manner to prevent damage or contamination.

D. All tile materials shall be free from chips, cracks, scratches, pits, discoloration or other defects. Damaged or defective materials will be rejected.

E. Deliver mosaic tile in 12-inch x 12-inch or 12-inch x 24-inch sheets.

1.7 JOB CONDITIONS

A. Install mortar and set and grout the tile, only when the temperature is at least 50oF and rising.

B. Protection: Protect adjacent surfaces against damage during progress of the work of this Section.

C. Coordination and Cooperation: Coordinate work of this Section with work of other trades. Perform work without delay to the work in progress.

PART 2 - PRODUCTS

2.1 CERAMIC TILE

A. General: Provide ceramic tile and accessories complying with Tile Council of America Specification 137.1, in colors and patterns as noted on the contract drawings.

B. Subject to the Architect's review of action submittals for compliance with specified requirements, provide products indicated on the drawings, or other acceptable product may include the following:

1. Mosa Tile
2. Walker Zanger
2. American Olean
3. DalTile Co.

C. Wall Tile: Standard grade, square edge, dust pressed, machine made, bright or matt glazed, field tile and matching base with integral corners and terminals.

D. Mosaic tile shall comply with the requirements of Floor Score Standard.

2.2 INSTALLATION MATERIALS

A. Mortar Sand: ASTM C 144.

B. Portland Cement: ASTM C 150, Type I or II.

C. Hydrated Lime: ASTM C 207, Type S; or ASTM C 206.

D. Portland Cement Mortar: ANSI 108.1B

E. Latex Portland Cement Mortar: Sand-cement mortar mix gauged with Laticrete 38 Acrylic Admix or Custom Building Products Acrylic Mortar Admix.

F. Latex Portland Cement Mortar for Shower Areas: Laticrete 226 Thick Bed Mortar Mix Gauged with Laticrete 3701 Mortar and Grout Admix.

G. Latex Portland Cement Bond Mortar: Laticrete 317 Floor & Wall Thinset gauged with Laticrete 3701 Admix, or Custom Building Products Master Blend mixed with Acrylic Mortar Admix.

H. Latex Portland Cement Bond Mortar over Waterproof Membrane: Laticrete 317 Floor & Wall Thinset gauged with Laticrete 3701 Admix.

I. Waterproof Membrane: Thin, cold-applied, single component liquid with embedded reinforcing fabric equal in performance characteristics to Laticrete 9235 Waterproof Membrane.

J. Reinforcing Wire Fabric: 2-inch x 2-inch, 16 x 16 gage, galvanized electrically welded wire mesh, ASTM A 185.

K. Latex Portland Cement Grout: Laticrete Sanded Grout (1500 Series) or Unsanded Grout (1600 Series, for joints smaller than 1/8").

L. Cleavage Membrane and Wall Backing Paper: ASTM D 226, Type I (No. 15) 15-pound asphalt-saturated felt.

M. Backer Rod for sealants (for ceramic mosaic fields): Polyethylene foam, closed-cell, non-gassing, flexible and compressible, 3/16" diameter.

N. Cleaner and Sealer:

1. Cleaner and sealer shall be from one manufacturer, acceptable to tile and grout manufacturers. To establish quality, the Specification is based on Aqua Mix Inc. Equivalent products from Miracle Sealants Co. or Watco Tile and Brick may be provided.

2. Cleaner: Aqua Mix Concentrated Tile Cleaner, neutral phosphate-free cleaner, or Custom Building Products Tile Lab Concentrated Tile/ Stone Cleaner.

3. Sealer: Aqua Mix Penetrating Sealer, fungus- and bacteria-resistant, stain-resistant, and slip-resistant as specified for tile, or Custom Building Products Tile Lab Surface Gard.

O. Sealant for Ceramic Mosaic Tile: Provide Pecora 898 Silicone Sanitary Sealant or Laticrete Latasil NS, or equal. Color as selected by the Arhitect.

PART 3 - EXECUTION

3.1 EXAMINATION AND PREPARATION

A. Examine substrates, areas, and conditions where tile will be installed for compliance with requirements for installation tolerances and other conditions affecting performance of installed tile. Verify that all vents, drains, piping, and other projections through substrate have been installed. Proceed with Work only after all conditions are in compliance.

B. Verify that substrates for setting tile are firm; dry; clean and within flatness tolerances required by relevant ANSI A108 tile installation standards.

C. Substrates to receive wall tile shall be:

1. Provide scratch coat of portland cement plaster or cementitious backing panels for thin set application.

D. Verify that installation of grounds, anchors, recessed frames, electrical and mechanical units of work, and similar items located in or behind tile has been completed before installing tile.

E. Verify that joints and cracks in tile substrates are coordinated with tile caulked- joint locations; if not coordinated, adjust as required by the Architect.

F. Do not install tile until construction in spaces is completed and ambient temperature and humidity conditions are being maintained to comply with referenced standards and manufacturer's written instructions.

G. Protect adjacent surfaces during progress of the Work of this section.

3.2 TILE INSTALLATION, GENERAL

A. Lay tile in grid pattern, unless otherwise indicated. Align joints when adjoining tiles on base, walls, and trim are the same size. Lay out Work and center tile fields in both directions in each space or on each wall area. Adjust to minimize tile cutting. Provide uniform joint widths, unless otherwise indicated.

B. For tile mounted in sheets, make joints between tile sheets the same width as joints within tile sheets so joints between sheets are not apparent in finished Work.

C. Extend Work into recesses and under or behind equipment and fixtures to form a complete covering without interruptions, unless otherwise indicated. Terminate Work neatly at obstructions, edges, and corners without disrupting pattern or joint alignments.

D. Accurately form intersections and returns. Perform cutting and drilling of tile without marring visible surfaces. Carefully grind cut edges of tile abutting trim, finish, or built-in items for straight aligned joints. Fit tile closely to electrical outlets, piping, fixtures, and other penetrations so plates, collars, or covers overlap tile.

E. Locate expansion, control, contraction or isolation joints and other sealant-filled joints, directly above joints in concrete substrates, at horizontal and vertical changes in plane, or where indicated during installation of mortar beds. Do not saw-cut joints after installing tiles.

F. Prepare and clean joints to be caulked, and apply sealants as recommended by the product manufacturer.

G. Conform to manufacturers printed instructions, and applicable requirements of ANSI and TCA Standards.

3.3 TILE INSTALLATION, WALLS

A. Clean scratch coat surface of loose or foreign materials, fog spray with water, and install brown coat mortar bed over scratch coat to a thickness not less than 3/8” and not greater than 3/4 inch. Once started, wall mortar installation must continue until wall is completely floated. Discard any batch not floated and finished within ½ hour of mixing. As soon as wall mortar is dried to sufficient hardness but still in a plastic condition, firmly rub down with wood float and scribe all plane interfaces the full depth.

B. Cover cure with 40 weight. Kraft paper for 72 hours minimum.

C. Install tile over properly cured setting bed, waterproof membrane, or cementitious backing panels using "thin-set" method with latex portland cement bond mortar, in accordance with manufacturer's printed instructions and ANSI A108.5. Make sure substrate is completely clean and free of dust. Ensure that bond coats do not intrude into joints to be caulked.

D. Lay out the Work so tiles will be centered on each wall or section of wall in order to minimize tile cuts. Lay out tile wainscots to next full tile beyond dimensions indicated. Spot setting bed with mortared tile, set plumb and true, to accurately indicate plane of finished tile surfaces.

E. Horizontal joints shall be level, vertical joints plumb with surfaces true and plumb, edges of tiles flushed.

F. Rub exposed cuts smooth with a fine stone; no cut edge shall be set against a fixture or adjoining surface without a 1/16 inch joint to be caulked.

3.4 GROUTING

A. Prior to starting, ensure that all wall tile surfaces are clean and any excessive bond mortar is scraped and vacuumed from joints (approximately 2/3 depth of tile should be open for grouting). Follow manufacturer’s instructions for mixing grout. Once grout Work commences, proceed until complete wall area is finished using one batch of grout.

B. Latex portland cement grouting: Dampen tile surface and joints with water using sponge, but leaving no puddles in joints. Force grout into joints using sufficient pressure on rubber float so as to fill joints completely, and scrape excess grout off tile surface with rubber float. Smooth or tool grout to uniform joint finish. Do not over water.

C. Curing latex Portland cement grout: Remove final grout haze with clean soft cloth, and cover with 40-weight kraft paper to cure. Leave paper in place for protection. Cover wall surfaces with 40-weight kraft paper for 72 hours.

3.5 CLEANING AND SEALING

A. If grout scum is not visible on tile surface after curing, clean tile surface with clear water. Remove and replace cracked, broken or defective tile with proper material.

B. Apply penetrating sealer in accordance with manufacturer’s instructions using a dense sponge applicator, paint pad, sprayer or brush. Avoid overlapping, puddling, and rundown. Completely wipe surface dry within 3 to 5 minutes using cotton or paper towels; do not allow sealer to dry on tile. After 2 hours, test surface by applying water droplets to surface. If water is absorbed, apply a second coat. Avoid surface traffic for 24 hours.

3.6 JOINT SEALANTS

A. Ensure joints to be caulked are free and clear of all setting and grouting materials and construction debris. Keep foot traffic off newly installed caulking for a minimum of 48 hours or protect with hardboard strips.

B. Install sealants in accordance with the product manufacturer's recommendations.

END OF SECTION

SECTION 09 30 23

WATERPROOFING MEMBRANE BENEATH CERAMIC TILE

PART 1 - GENERAL

1.1 SUMMARY

A. Furnish and install waterproofing membrane beneath ceramic tile as indicated on the drawings and specified, including floors and walls from floor to ceiling.

1.2 SUBMITTALS

A. Product Data: Manufacturer's data, standard specifications, and other technical information for each product specified. Include installation instructions:

1.3 WARRANTY

A. For waterproofing, manufacturer shall provide a 10 year material warranty for waterproofing installation, tile setting, and grouting materials.

PART 2 - PRODUCTS

2.1 FLUID WATERPROOFING MEMBRANE BENEATH CERAMIC TILE

A. Portland Cement Mortar Bed for Shower Areas: Laticrete 226 Thick Bed Mortar Mix Gauged with Laticrete 3701 Mortar and Grout Admix or on-site mix per ANSI A108.1A with Custom Building Products Thin-Set Mortar Admix, or equal.

B. Provide Cold fluid-applied, single component liquid with embedded reinforcing fabric by manufacturer: Laticrete Hydro Ban Waterproof Membrane or Custom Building Products Red Guard Waterproof Membrane, or equal.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install waterproof membrane where indicated and in all shower walls and floors in accordance with TCNA Standards. Extend membrane up wall mortar or backing board from floor to ceiling. Ensure that layers of membrane are fully inserted into clamping ring of floor drain. After membrane installation and before tile setting, install pea gravel around sub drain to prevent blockage of weep holes and place mortar to proper level for setting tile.

END OF SECTION

SECTION 09 35 44

SILICATE BASED CONCRETE FLOOR SEALERS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Furnish and apply silicate based concrete sealers as indicated on the drawings and specified.

1.3 ACTION SUBMITTALS

A. Product Data: Submit product data, including chemical properties and percentage of solids, for each product.

B. Submit following Informational Submittals:

1. Manufacturer's Instructions: Application instructions, including surface preparation and application rates for each type of substrate, methods, and techniques.

1.4 WARRANTY

A. Warrant applied sealer system to be free of defects related to material deficiency and workmanship for 5 years.

B. Warranty period begins at date of Substantial Completion.

PART 2 - PRODUCTS

2.1 SILICATE BASED CONCRETE SEALERS

A. Products: Subject to review of action submittals by the Architect for compliance with requirements, provide the product named on the drawings or an Architect accepted product of one of the following:

1. Chemex Aqua Seal.
2. Prosoco Inc.
3. Pecora Corporation.
4. Tamms Industries, Inc.
5. Tnemec Inc.

B. Concrete Sealer shall be a clear water-based, sprayable, penetrating, inorganic silicate-base solution It is used to cure, harden, seal and dustproof interior and exterior horizontal concrete (fresh or cured) surfaces. It complies with the Federal and Army Corp Of Engineers specifications for concrete surface treatment. It also shall have been USDA and FDA approved for use as a concrete floor sealer in food processing facilities.

C. The sealer shall be recommended by its manufacturer for use on unpainted or unsealed new or existing concrete floors, decks, docks, ramps, pavement and parking structures. New concrete must be at least 7 days old. It is a water-based product that can be applied in areas where solvent-based sealers are hazardous, and possess the following attributes:

1. Cures, seals, hardens and dustproofs.
2. Environmentally Friendly.
3. No solvent vapors while spraying.
4. Resists the penetration of oil, chemicals and the deteriorating effects of salt and water.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that surfaces are clean, dry, dust free, and free of efflorescence, oil or other matter detrimental to sealer application.

B. Verify that joint sealant work in adjoining surfaces is complete prior to applications of sealers. Delay application until sealants have cured.

C. Proceed with installation only after unsatisfactory conditions have been corrected to meet the manufacturer's recommendations and construction documents.

3.2 PREPARATION

A. Provide protection as necessary to protect adjacent materials and surfaces from dirt, dust, and other surface or physical damage.

B. Remove loose particles, foreign matter, and oil by method which will not affect sealer application.

C. Prepare surfaces in accordance with manufacturer's directions.

3.3 APPLICATION

A. General: Apply materials in accordance with manufacturer's printed instructions.

B. Liquid Penetrating Sealer:

1. Apply sealer using low pressure sprayer in multiple coats at coverage rate not less than that recommended by manufacturer to obtain penetration and full coverage.

2. Do not allow flooding or puddling of material on surface.

3. Do not dilute or alter material as packaged.

4. Sealer Locations: As indicated on the drawings. Also include exposed concrete on interior stairs, corridors and decks, electrical and telephone rooms, storage rooms, laundry, and other areas not specifically designated.

END OF SECTION

SECTION 09 51 00

ACOUSTICAL CEILINGS

PART 1 - GENERAL

1.1 SUMMARY

A. Provide all labor, materials and equipment necessary to install acoustical ceilings in rooms as noted in “Finish Schedule” indicated on the Contract Drawings and hereinafter specified:

B. Related Sections: Documents affecting work of this Section include, but are not necessarily limited to the GENERAL CONDITIONS, SUPPLEMENTARY CONDITIONS and Sections in DIVISION 01 - GENERAL REQUIREMENTS of these Specifications.

1.2 QUALITY ASSURANCE

A. Use adequate numbers of skilled craftpersons who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

B. Design of Ceiling Suspension System shall meet or exceed the minimum requirements of Section T-21-4701 (e) of Title 21, California Administrative Code.

C. Installation of the suspended ceiling system shall be done by applicators approved by the ceiling manufacturer.

1.3 STANDARDS

A. Acoustical Materials: Federal Specification SS-5-118, Class A.

B. Suspension Systems:

1. For Materials: ASTM C635
2. For Installation: ASTM C636

C. Uniform Building Code with the Los Angeles City 1992 Amendments. Supplements for lateral bracing requirements.

D. Terminology and Performance: AIMA Bulletin "Performance Data, Architectural Acoustical Materials.

1.4 SUBMITTALS

A. General: Comply with applicable provisions of SUBMITTALS of DIVISION 01 - GENERAL REQUIREMENTS of these Specifications.

B. Manufacturer's Data: Submit manufacturer's printed data and specifications and installation instructions for all materials proposed for use.

C. Samples: Submit one full size acoustical panel of specified material including 12-inch long samples of suspension system components.

D. Shop Drawings: Submit shop drawing detailing ceiling layout, suspension methods and interface with plaster ceiling and wall materials.

E. Materials Listing: Submit materials list of items proposed to be provided under this Section.

F. Certification: Furnish written proof that specified suspension system is a U.L. approved designed assembly with approved fixture protection.

G. Manufacturer’s certification that products meet or exceed Specification requirements.

1.5 PRODUCT HANDLING

A. Delivery: Deliver acoustical materials to the job-site in the manufacturer's original unopened packages or containers with brand name and type clearly marked.

B. Storage of Materials: Handle materials carefully and store them under cover in dry, waterproof enclosure where directed by the City Engineer or the Consultant. Immediately before installation, store acoustical units for not less than 24 hours at the same temperature and relative humidity at the spaces in which they will be installed.

1. Store all components to provide suitable protection against deleterious effects from exposure to moisture, direct sunlight, or other causes.

2. Handle all components to preclude damage. Take special precaution to prevent damage to acoustical ceiling unit edges and corners.

3. Comply with manufacturer’s Material Safety Data Sheets for delivery, storage, and handling of components.

C. Protection: Use all means necessary to protect the work and materials of all other trades.

D. Replacements: In the event of damage, immediately make all repairs and replacements necessary to the approval of the City Engineer or the Consultant, at no added cost to the City.

1.6 VERIFICATION OF CONDITIONS

A. Verify dimensions in the Contract Drawings with field conditions prior to submitting Shop Drawings. Contractor to accept full responsibility for inaccuracies built into the Work. Contractor's start of Work of this Section shall imply this acceptance of job conditions.

B. Contractor shall inspect related work and surfaces; report in writing to the City Engineer or the Consultant those conditions which would prevent the proper execution of Work of this Section. Any needed remedial work shall be arranged for and be done by the appropriate trade prior to starting Work of this Section as directed by the City Engineer or the Consultant at no added cost to the City.

C. Prior to installation, the following conditions must exist:

1. All windows and exterior doors in place and roof watertight.

2. Work of all wet trades completed and thoroughly dried to installation of any system components.

3. Mechanical and Electrical trades shall have completed their work above ceiling lines prior to acoustical ceiling systems installation. Coordinate with Mechanical and Electrical trades prior to start of installation.

1.7 CLEAN-UP

Upon completion of Work of this Section, remove all surplus materials, equipment, tools, and debris from the job-site.

1.8 ENVIRONMENTAL CONDITIONS

Maintain a uniform temperature of at least 60 degrees F and not more than 85 degrees F and relative humidity of not more than 70 percent continuously before, during and after installation of acoustical units. Ensure that interior finish work is completed and dry before installation. Ensure that mechanical, electrical and other work above the ceiling line are completed and approved prior to the start of acoustical ceiling installation.

1.10 GUARANTEE

Provide the City with a written guarantee in accordance with provisions of Section 28 in the GENERAL CONDITIONS against failure of materials or workmanship for two (2) years.

PART 2 - PRODUCTS

2.1 EXPOSED TEE GRID SUSPENSION SYSTEM

A. Complete System Composed of the Following Components:

1. Hanger and/or Lateral Bracing Wires: Cold drawn, galvanized steel No. 12 gage wire.

2. Main Tee Runner Member: Commercial quality cold-rolled steel, 1-1/2-inch-high with double web and rectangular bulb and with 15/16-inch-wide exposed flange with web punched as necessary to receive interlocking cross member and hanger wires.

3. Cross Tee Member: As above specified for runner member, except that web not being punched but extended and off-set to overlap runner member flanges and be flush with exposed flanges of runner member.

4. Perimeter Supports: Cold-rolled commercial quality steel channel or angle or "Z" section as indicated on the Contract Drawings, exposed flanges to receive lay-in acoustical panels shall be at least 1-inch-wide.

5. Finish: Framing members, supports, and accessories to be electro-zinc coated; exposed flanges and/or surfaces to receive a shop applied low sheen white enamel finish.

B. Acceptable Manufacturers:

1. Chicago Metallic Corp;., 5501 Downey Boulevard, Vernon, California 90058, phone (213) 582-1100.

2. Equal products of other manufacturers when approved in advance by the City Engineer or the Consultant.

3. Provide L. A. City Building and Safety Approved Research Report No. And date.

2.2 CONCEALED "T" GRID SUSPENSION SYSTEM

A. Materials:

1. Hangers Wires and Lateral Bracing Wire: Cold drawn galvanized steel, No. 12 gage wire.

2. Suspension Members (General: Fabricated of commercial quality cold-rolled steel.

3. Main "T" Shaped Runners: 1 ½ inch high with rectangular bulb at top of each web with 15/16 inch wide flange, web to have punched holes at 12-inches on center to receive hanger wires and cross spline members; bulb to have provisions to receive the "V" shaped struts.

4. Cross Splines (Non-Structural): "T" shaped, 7/8-inch or 1-inch-high with 3/4-inch-wide flat bottom flanges with taped ends for bearing on main "T" runner flanges for easy removal and replacement.

5. Access Cross Splines (Downward Acting): "T" shaped with bi-parting removable portion having a "see-through" tab projecting 1/4-inch below face of tile for identification, which triggers the access, is painted white, and requires no special tool or device to easily remove the bi-parting portion and shall be easily reinstalled by snapping back in place.

6. Cross Splines (Structural): Same size and shape of non-structural cross spline (specified above in 2.01(d), except that the ends are designed to self-lock to main "T" runner web; shall be removable and independent of its opposing cross spline member.

7. Struts (For Spacing and Stabilizing Main "T" Runners): Shall be "V" shaped, 1-inch in depth and with two (2) slots at ends of their 4-foot-1-inch length; designed to engage and lock to bulb section of main "T" runner. Edges of struts to be hemmed for additional strength and stiffness and shall receive a locked key inserted through punched holes in the hollow bulb of the "tee" member.

8. Flat Splines: 1-inch-wide with hemmed edges for stiffness or a 1-inch normal wide ribbed filler stub designed for fitting within the kerfs of acoustical tile or panels.

9. Border or Perimeter Trim: Angle or channel shaped with exposed flanges shaped as indicated on the Contract Drawings 3/4-inch-wide with 3/8-inch by ½-inch reveal. Verify if a reveal is indicated on the Contract Drawings.

10. Finish: All members electro-zinc coated, exposed flanges of perimeter or border trim to be shop coated with a baked-on low sheen white enamel, reveal to be coated with a baked-on flat black enamel.

11. Provide light frames for recessed lights fixtures finished to match tile color.

2.3 GYPSUM BOARD BACKING MATERIALS

A. Gypsum Board: Gypsum wallboard, ASTM C36, 5/8-inch thickness for 1-hour fire resistive rating of 3/8-inch thickness in non-fire rated areas as approved by the City.

B. Nails: 6d cooler type.

C. Tape: United States Gypsum "Perf-A-Tape," or equal.

D. Cement: United States Gypsum "Perf-A-Tape" Cement, or equal.

E. Exposed Border or Perimeter Trim: Commercial quality cold-rolled steel, electro-galvanized coated with exposed surfaces painted with a low sheen white enamel, shapes as indicated on the Contract Drawings.

F. Tile Adhesive: As recommended by the tile manufacturer, shall readily adhere to plaster or gypsum board, shall remain semi-plastic when set, and will not fail when subjected to a 400 degrees F. room temperature for 30 minutes.

2.4 SOUND ISOLATION SUSPENSION SYSTEM MATERIALS

A. Isolators: Mason Industries SH-220A

B. Hangers: No. 8 soft annealed hanger wires securely attached to building structure placed in concrete or fastened to "L" shaped bracket secured to underside of steel decking by approved means. Hanger wires shall be threaded through predetermined hole in 2-inch x 2-inch x 2-inch size "L" bracket.

NOTE: Verify if hangers exist and are secured to underside of fireproofed steel floor decking, provide added hanger wires as needed.

C. Structural Studs: 4-inch 16-gage steel channel stud placed directly in saddle hanger attached to isolator.

D. Screw Channel: Donn Product, size 7/8-inch x 2-inch-wide or equal.

E. Backerboard: 5/8-inch thick 2-foot x 8-foot size as manufactured by U.S. Gypsum Co or equal.

F. Insulation: 1-inch thick blanket having 3/4-inch density; Pioneer-Flintkote No. PF-335 Blanket Insulation; or equal.

2.5 ACOUSTICAL MATERIALS (As Applicable)

A. General:

1. All tile, panel or board to comply with Federal Specification SS-S-118B, Class 25 (incombustible).

2. Noise Reduction Coefficient: Not less than 0.65 N.R.C. as determined from tests and computations made in accordance with the Standard Method of the Acoustical Materials Association on factory-coated material, with mounting equivalent to and application similar to the required work pursuant to ASTM C-423.

3. Color: White, factory coated on exposed surfaces and on beveled edges.

4. Light Reflection: Not less than 75 percent with white factory surface coating pursuant to ASTM C-523.

5. Ceiling Sound Transmission Class (CSTC), 25% pursuant to AMA 1-11.

6. Time-Rated Fire Resistance Assembly: UL Design Number and ASTM E413 packages of acoustical material must be or appropriate UL classification marking.

B. Adhesive: As specified by the tile manufacturer. Comply with ASTM D-1779 and have a listed flame spread 25 Class U.L. rating pursuant to ASTM E84.

C. Acoustical Sealant: As recommended by acoustical ceiling unit manufacturer.

PART 3 - EXECUTION

3.1 GENERAL EXECUTION

A. Coordination: Work of this Section to be coordinated with work of other trades, especially lath and plaster work, accordian folding doors, mechanical and electrical work.

1. Where lighting fixtures are to be installed within the suspension system, fixtures are to be installed under this Section. Consult with the fixture manufacturer prior to fixture manufacture in order to properly coordinate that work with work of this Section.

B. General Installation Procedures: (As applicable)

1. Best practice of the trade.

2. Accurate alignment of suspension system.

3. Accurate alignment of tile boards or panels with straight joint lines.

4. Finished exposed surfaces of tiles, boards, or panels in continuous contact with flanges of suspension system members.

5. Finished surfaces of tiles, boards or panels, and exposed surfaces of suspension members to be clean, without blemishes, discoloration, or damage.

6. All joints closed and hairline.

7. Edges square and in tight contact with adjoining tile or panels.

8. Fit beveled edges in tight contact with border trim; miter trim back of bevels.

9. Align the joints on vertical surfaces with joints in ceiling tile, where occur.

10. Install acoustical ceiling systems requiring seismic restraints pursuant to ASTM E580, CISCA Recommendation and Governing Codes. See Subsection 3.2 of this Section.

3.2 INSTALLATION OF EXPOSED GRID SUSPENSION SYSTEM:

A. General: In accordance with approved Shop Drawings and Details and the Contract Drawings; and best practice of the trade with maximum deflection of framing members not exceeding 1/360 of span of such member. Independently support light fixtures,

weighing more than 56 pounds, from the structure above. Suspension system shall be installed in accurate alignment with building walls and partitions.

B. Hanger Wires: Secure to construction above with approved attachment and secure to main "T" runner spaced 4-feet along length of such member and for 6-inches from end.

C. Lateral Bracing: As required by the Los Angeles City Building Code, and ASTM E 580 as noted on the Contract Drawings or approved Shop Drawings. Place bracing wire in four equal directions from each lateral bracing point on the main "T" runner and extend to the structure above at maximum 45 degree angle from the horizontal. Coordinate the lateral bracing with the mechanical and/or electrical work and other equipment in the attic spaces.

D. Main "T" Runner Members: Space 4-feet on center and secure to hanger and lateral bracing wires in level position. Where suspension system does not require lateral bracing as prescribed by the Los Angeles City Building Code secure ends of such main "T" members to the structure by means of suitable clip angles. Off-set flanges of main "T" runners at wall supports so as to be flush with exposed flange of wall support angle or channel.

E. Cross Members: Attach to main "T" runner member at 24-inch spacings against lateral pullout and make exposed bottom flanges flush with exposed flanges of main "T" runner to form a 24-inch by 48-inch grid pattern.

F. Boarder of Wall Supports: Secure to wall surfaces and/or other architectural features as indicated on the Contract Drawings in level position, with exposed flanges mitered at corners.

3.3 INSTALLATION OF PANELS IN EXPOSED GRID SUSPENSION SYSTEM

A. Application: By representative of the panel manufacturer.

B. Installation of Panels: Lay panel within the exposed "T" suspension system, with continuous and uniform bearing on suspension system main "T" runner, cross "T" members and on border support flanges to provide 100 percent access to attic spaces. At wall supports provide border tile springs to keep border panel units aligned with field panel units where such border units are smaller than the grid pattern. Use approved type of concealed splines to maintain panel units in a level plane.

1. Furnish and install diffuser and light fixtures as specified in Electrical and Mechanical Sections.

2. Finish exposed surfaces of panels shall be continuous contact with flanges of suspension system members.

3. Finished surfaces of panels and exposed surfaces of suspension members to be clean, without blemishes, discoloration or damage.

4. Neatly scribe acoustical ceiling units at abutting surfaces and at all penetrations or projections when moldings are not acceptable.

C. Attic Accesses: Provide and install in corners of panel unit permanent type markers (Sex-bolt type fasteners or approved equal) to identify location of required attic access to mechanical equipment within attic spaces. Paint exposed ends of such markers a color as directed by the City Engineer or the Consultant.

3.4 INSTALLATION OF CONCEALED SUSPENSION SYSTEM

A. General: In accordance with approved Shop Drawings and details on the Contract Drawings. Maximum deflection of framing members not to exceed 1/360 of the span of such framing components. Independently support light fixtures weighing more than 56 pounds from the structure above.

B. Main "T" Runners: Space 4-feet on center, as indicated by hanger wires spaced 4-feet, along length of such members and located maximum 6-inches from perimeter walls. Secure ends of main "T" runners, not laterally braced, by means of suitable clip angles.

C. Strut Members: Locate perpendicular to main "T" runners, space 4-feet on center, snap in place to main "T" runner bulb section to stabilize the runners and keep them properly spaced 4-feet on center.

D. Structural Cross "T" Splines: Located to support light fixtures (weighing less than 56 pounds) parallel to and spaced 12-inches from other cross splines and locked into the web of the main "T" runners.

E. Cross "T" Splines: Space 12-inches on center perpendicular to main "T" runner with ends bearing only on the "T" runner flanged and not secured thereto.

F. Access Cross Spline: Run parallel to and 12-inches from other cross splines, locate removable portions where access is required to the area or where flagged by the Contractor to get a mechanical equipment in the attic spaces.

G. Flat Splines: Locate within the tile or panel kerfs in direction parallel to the main "T" runners.

H. Lateral Bracing: As required by the Los Angeles City Building Code, as noted on the Contract Drawings and the approved Shop Drawings. Splay bracing wires in four equal directions from each lateral bracing point on the main "T" runner members and extend to the structure above at maximum 45 degree angle from the horizontal. Coordinate the lateral bracing with mechanical and electrical work and equipment in attic spaces.

I. Border or Perimeter Trim: Secure to wall surfaces or other architectural features as indicated on the Contract Drawing in level position with exposed flanges mitered at the corners.

3.5 INSTALLATION OF SOUND ISOLATION SUSPENSION SYSTEM

A. Location: As indicated on the Contract Drawings.

Install all previously mentioned component parts to construct isolated suspension ceiling from which hereinbefore specified suspension systems are hung as a finished ceiling.

B. Space ceiling isolators 4-feet in one direction and 10-feet in the other direction as indicated on the Contract Drawings.

C. Insert 4-inch channels in the hangers as shown on the Contract Drawings.

D. Securely wire screw channels to 4-inch channels at 2-foot spacings.

E. Install insulation blankets on the top side of screw channels as shown on the Contract Drawings.

F. Attached 5/8-inch x 2-foot x 8-foot backerboard to the underside of screw channels with screws at not less than 16 inches on center. Apply backerboards in a staggered pattern.

G. Calculate the load value of building materials to be installed below the isolators so that the deflection of the isolators (after the complete load is applied) will form a uniform ceiling height throughout various areas shown on the Contract Drawings.

H. Remove and adjust any irregularities in the ceiling levelness to make the finished ceiling in a true, flat and level plane.

3.6 INSTALLATION OF GYPSUM BOARD BACKING

A. In accordance with manufacturer's directions and complying with requirements of the Los Angeles City Building Code.

B. Install board with long dimension at right angles to the support framing with end joints staggered and secured in place at 6-inch centers with nails or at 12-inch centers using screws along board edges and to intermediate supports.

C. Cement and tape joints only for fire-resistive construction as recommended by the board manufacturer.

3.7 INSTALLATION OF TILE IN CONCEALED SUSPENSION SYSTEM

A. Application: By representative of the tile manufacturer.

B. Installing Tile: In a square pattern on ceiling area with tile joints in a continuous lines parallel to walls, symmetrical about room centerlines, in accordance with approved Shop Drawings.

C. Attic Accesses: Provide and install in corners of tile or panel units permanent type markers (sex-bolt type fasteners or approved equal) to identify location of required attic access to mechanical equipment within attic spaces. Paint exposed ends of such markers a color as directed by the City Engineer or the Consultant.

3.8 INSTALLATION OF TILE OR PANELS IN EXPOSED GRID SUSPENSION SYSTEM

A. Application: By representative of the tile or panel manufacturer.

B. Installation of Tile or Panel: Lay tile or panel within the exposed "T" suspension system, with continuous and uniform bearing on suspension system main "T" runner, cross "T" members and on border support flanges to provide 100 percent access to attic spaces. At wall supports provide border tile springs to keep border panels or tile units aligned with field tile or panel units where such border units are smaller than the grid pattern. Use approved type of concealed splines to maintain tile or panel units in a level plane.

C. Attic Accesses: Provide and install in corners of tile or panel units permanent type markers (sex-bolt type fasteners or approved equal) to identify location of required attic access to mechanical equipment within attic spaces. Paint exposed ends of such markers a color as directed by the City Engineer or the Consultant.

3.9 INSTALLATION OF TILE ON GYPSUM BOARD OR PLASTER BACKING

A. By adhesive method in accordance with manufacturer's directions in square pattern with all joints in continuous lines, parallel to walls, any symmetrical about room centerlines. Carefully scribe tile to fit against wall surfaces and other architectural features.

B. Make all tile surfaces level and flush with adjoining tile units.

C. Cover all exposed edges of acoustical tile with factory painted metal trim. Miter all corners of such metal trim. Locate trim as indicated on the Contract Drawings.

3.10 FIRE-RATED ASSEMBLIES

A. Comply with UL Design Number for acceptable component and hanger wire spacing, number and size of acoustical panels, fixture protection and other installation requirements.

B. Hold-Down Clips: Two per locking cross-tee, for ceiling panel weighing less than 1 lb. per sq. ft. For access panels to accessible hold-down clips.

3.11 ADJUSTMENTS

A. Make adjustments in ceiling system as necessary to ensure compliance with this Specification.

B. Remove and replace damaged or soiled acoustical ceiling units.

3.12 CLEANING AND REPAIRING OF FINISHED WORK

A. Remove completely all discoloration finger prints and foreign matter.

B. Touch-up abrasions where practicable to match factory finish as recommended by the tile manufacturer, subject to approval of the City Engineer or the Consultant.

C. Replace damaged tile with new tile where touch-up is impracticable or unsatisfactory to the City Engineer or the Consultant. If tile is to be replaced, remove old adhesive from gypsum board backing or the gypsum plaster backing, by approved methods prior to installation or replacement tile to the full satisfaction of the City Engineer or the Consultant.

D. Repainting shall be with a paint type and application method recommended for use over metal surfaces.

E. Remove debris which may have been caused during installation of this Work.

END OF SECTION

SECTION 09650

RESILIENT FLOORING

PART 1 - GENERAL

1.1 SUMMARY

A. All labor, materials and equipment necessary to installation of resilient flooring and base indicated on the Contract Drawings and herein specified.

B. Related Sections: Documents affecting work of this Section include, but are not necessarily limited to the GENERAL CONDITIONS, SUPPLEMENTARY CONDITIONS and Sections in DIVISION 01 in GENERAL REQUIREMENTS of these Specifications.

1.2 SUBMITTALS

A. Samples: Comply with applicable provisions of SUBMITTALS of DIVISION 01 - GENERAL REQUIREMENTS of these Specifications.

1. Sheet flooring

2. Base

3. Vinyl tile flooring

B. Product Data: Within 60 calendar days after the Contractor has received the City's "Notice to Proceed", submit:

1. Materials list of items proposed to be provided under this Section;

2. Manufacturer's specifications flooring and pattern layout and other data needed to prove compliance with the specified requirements;

3. Samples of each item, color, and pattern available in the specified grades from the proposed manufacturers.

4. Manufacturer's recommended installation procedures which, when approved by the City Engineer or the Consultant, will become the basis for accepting or rejecting actual installation procedures used on the Work.

5. Maintenance Instructions: Submit 2 copies of the Manufacturer’s “Recommended Maintenance Practices” for each type of resilient flooring and accessory required.

1.3 QUALITY ASSURANCE

A. Labor: Use adequate numbers of skilled laborers who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

1.4 PRODUCT HANDLING

A. Delivery and Storage: Deliver materials to the job-site and store in their original unopened containers with all labels intact and legible at time of use indicating type, style,

color and manufacturer's name. Store materials at the job-site, protected from weather, located where temperatures can be maintained at a constant 70 degrees F. as recommended by the manufacturer for storing and installation and as directed by the City Engineer.

B. Protection: Use all means necessary to protect materials of this Section against damage before, during and after installation and to protect installed work and materials of other trades.

C. Replacements: In the event of damage, immediately make all repairs and replacements necessary to the approval of the City Engineer or the Consultant and at no added cost to the City.

D. Guarantee: Comply with requirements of Section 28 of the GENERAL CONDITIONS of these Specifications.

1.5 PROJECT CONDITIONS

A. Environmental Requirements: In areas to receive resilient flooring maintain temperatures between 70 and 90 degrees F. for not less than 48 hours before and after installation of resilient flooring. Following the 48 hour period maintain temperature at 55 degrees F. until completion of Contracted Work.

1.6 CLEAN-UP

A. After completion of the Work and just prior to final inspection, thoroughly clean tile floors and accessories. Apply wax and buff, with the type of wax, number of coats, and buffing procedures recommended by the tile manufacturer.

B. Remove and dispose of all rubbish and debris resulting from work of this Section and leave the work areas in a clean condition.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

A. Colors and Patterns: As selected by the City Engineer or the Consultant from standard colors and patterns available from the approved flooring manufacturers of the specified types.

B. Provide resilient flooring with colors and patterns as selected by the City Engineer or Consultant from standard colors and patterns of the approved manufacturer of the specified type.

2.2 VINYL TILE

A. Material: Vinyl with color and pattern running throughout entire tile thickness, factory waxed with non-slip and non-yellowing wax conforming to Fed. Spec. SS-T-312B, Type IV.

B. Colors and Patterns: As selected by the City Engineer from the manufacturer's standard colors and patterns or as noted on the Contract Drawings.

2.3 CUSHION SHEET VINYL

A. Material: .125-inch gage, 6-foot width, in rolls, equal to vinyl corlon with cushion cord backing in colors and/or pattern as selected by the City Engineer or the Consultant.

2.4 BASE MATERIALS

A. Rubber or Vinyl: Top set type except where stretched carpet occurs in which case shall be non-coved top set type conforming to Federal Specification SS-W-402, Type I.

1. 1/8-inch thickness and height as indicated on the Drawings.

2. Furnish premolded exterior and interior corner units.

3. Color shall be as noted on the Contract Drawing or as selected by the City Engineer or the Consultant from manufacturer's standard colors.

B. Metal Base: Milcor No. 675-5 top-set type or equal.

2.5 MISCELLANEOUS MATERIALS

A. Adhesive: As recommended by the manufacturer of the resilient floor and base materials. Adhesive shall be waterproof and stabilized type. Asphalt emulsions and other non-waterproof type adhesives will not be acceptable.

B. Reducing Strips: Standard vinyl floor reducer, thickness to suit abutting floor covering material, 1 1/4 inches wide, color to match that of top-set base.

C. Concrete Slab Primer: A non-staining type as recommended by the manufacturer of the resilient material to be applied over it.

D. Metal Thresholds: "Chromedge" No. 233, satin finish aluminum as manufactured by B & T Metals Co. Los Angeles, California, or equal.

E. Metal Threshold Anchors: "Phillip" "Red Head" stainless steel, threshold flat head anchors 1/4-inch wide, color to match that of top-set base.

F. Cap Moldings for Turned-Up Sheet Vinyl Base: "Chromedge No. 11" satin finished aluminum, manufactured by B & T Metals Co., Los Angeles, California or equal.

G. Metal Edging: "Chromedge No. 5 TA" with chromalite finish, manufactured by B & T Metals Co., Los Angeles, California or equal.

H. Wax: Federal Specification P-W-155, 16% Concentration, water emulsion base.

I. Other Materials: All other materials, not specifically described but required for a complete and proper installation of the work of this Section shall be as recommended by the manufacturer of the resilient materials used and approved by the City Engineer or the Consultant.

PART 3 - EXECUTION

3.1 EXAMINATION

A. General: Examine the areas and conditions under which resilient flooring and base is to be installed. Correct conditions detrimental to the proper and timely completion of the work. Do not proceed until detrimental conditions have been corrected.

B. Surfaces: Shall be smooth, level and at the required finish elevation without more than 3 mm (1/8") in 3m (10'-0") variation from level or slopes shown.

C. General Workmanship: In accordance with best practices of the trade to provide a complete and first class installation.

3.2 TIMING AND COORDINATION

Do all work only upon completion of all wet and painting operations, when building is completely closed in and when moisture content of building air temperatures and relative humidity are within limits as recommended by the floor covering manufacturer. Coordinate floor covering work of this Section with work of other trades.

3.3 PREPARATION

A. Subfloors:

1. Contractor responsible for suitability of sub-surfaces to receive floor covering base materials. Substrate to be smooth, level at required finish elevation and without more than 1/8" in 10 feet variation from slopes or levels indicated on the Drawing.

2. If required, grind concrete subfloor surfaces as necessary to remove trowel marks and other surface irregularities.

3. Fill cracks and/or irregularities with plastic filler as recommended by manufacturers of resilient materials.

4. Cleaned of grease, dirt, paint and other foreign matter.

5. Size or prime subfloor as recommended by manufacturers of resilient materials necessary for proper bond.

6. Start of laying resilient flooring tile and base will indicate acceptance of concrete subfloor surface conditions.

7. Surfaces to be dry when flooring and base materials are installed.

3.5 INSTALLATION

A. General: (As applicable)

1. Install materials only after finishing operations, including painting, have been completed and after permanent heating system is operating.

2. Verify that moisture content of concrete slabs, building air temperature, and relative humidity are within the limits recommended by the manufacturers of the materials used.

3. Maintain reference markers, holes, and openings that are in place or plainly marked for future cutting by repeating on the finish surface as marked in the sub-floor. Use chalk or other non-permanent marking device.

4. Cutting and Fitting: To be accurate and neat.

5. Pattern: Square, all flooring joints and continuous and parallel to walls; no borders; symmetrical about center lines of rooms. (No tile to be cut to a length less than 2 of the full length of the tile. Lay tile pattern in only one direction) or lay tile checkerboard fashion with pattern reversed in alternate tiles.

B. Floor Tile: Bond to floor surfaces with adhesive in strict compliance with manufacturer's recommendations. Tightly butt units to vertical surfaces, nosings, edgings and thresholds. Scribe as necessary around obstructions to produce neat joints. Place tile tightly laid, even and in straight parallel lines. Extend units into toe spaces, door reveals and into closets and similar spaces.

C. Sheet Vinyl Flooring:

1. Cut sheet material into required lengths and sizes.

2. Layout and cut to achieve minimum number of seams and for pattern match between abutting edges. Double-cut if required.

3. Lay cut sheets flat and allow to come to room temperature prior to installation.

4. Install the sheets, and roll the floor surface to work wrinkles and air pockets out past the outer edges.

5. Fit the sheet vinyl neatly and tightly into breaks and recesses, against bases, around pipes and penetrations, under saddles and thresholds, and around permanent cabinets and equipment.

6. Where Integral Base Is Called For:

a. Provide cove strip to ease transition at intersection between floor and wall;

b. Cut, fit, and miter-weld at internal and external corners.

c. Cap exposed edge with metal trim securely fastened in place, with top edge of trim level, and with all trim joints mitered.

D. Base:

1. Application of Resilient Base: Bond top-set base to wall surface with adhesive, use preformed base sections at all internal and external corners. Install running base tightly on top of resilient flooring with top edge exactly even with top edges of premolded corners.

2. Application of Metal Base: Install top set over edges of floor covering material tight against wall surface in longest possible lengths, attached to pre-set clips, in level and plumb position. Provide shop-fabricated internal and external corner units as necessary.

E. Continuity Through Doorways:

1. Join tile of adjacent rooms appropriately through doorways, to provide continuous tile floor covering, as approved by the City Engineer or the Consultant.

2. Install reducing strips where resilient flooring is at one side of doorways and base concrete on other side.

F. Reducing Strips: Provide at unprotected exposed edges or resilient flooring or at doorways.

1. Provide in single lengths full width of and at centerline of doors.

2. Adhesively bond in place with floor covering manufacturer's approved adhesive and tightly abutt exposed edges of resilient flooring.

3. Fit end edges to door frames and abutting surfaces.

4. Make top surface flush with adjoining floor covering.

G. Metal Edging: Provide at exposed edges of resilient flooring and at doorways, secured on single length with countersunk screws (of material matching that of the edging) into suitable shields into concrete floors or with an adhesive as recommended by the edging manufacturer.

H. Metal Edging at Turned-Up Base: Adhesive apply to wall surface in level position at proper height to receive turned-up sheet vinyl flooring material or as otherwise directed by the manufacturer.

I. Thresholds: Anchor metal thresholds with not less than three (3) Phillips "Red Head" stainless steel, threshold, flat head anchors 1/4-inch diameter by 2 inches long.

3.6 CLEANING AND PROTECTING

A. Cleaning: After completion of work of this Section and just prior to inspection, clean and remove excess adhesive and other blemishes from exposed surfaces, using neutral cleaner and wax and buff as recommended by the manufacturer of the resilient flooring materials.

B. Protecting: Protect finished work from damage by subsequent construction operations as directed by the City Engineer or the Consultant until completion of Contracted Work. Where possible, lock rooms following installation of resilient flooring and cleaning operations.

END OF SECTION

SECTION 09 65 17

ENGINEERED RUBBERIZED FLOORING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Furnish and install engineered rubberized flooring as indicated on the drawings and specified.

B. Performance Requirements: provide engineered rubberized flooring that has been manufactured and installed to maintain performance criteria stated by manufacturer without defects, damage or failure.

1.3 ACTION SUBMITTALS

A. General: Submit listed submittals in accordance with Conditions of the Contract and Division 1 Submittal Procedures Section.

C. Product Data: Submit product data, including manufacturer's guide specifications product sheet, for specified products.

D. Shop Drawings: Submit shop drawings showing layout, profiles and product components, including anchorage, accessories, finish colors, patterns and textures.

E. Samples: Submit selection and verification samples for finishes, colors and textures.

F. Quality Assurance Submittals: Submit the following:

1. Certificates: If required, certification of performance characteristics specified in this document shall be provided by the manufacturer.

2. Manufacturer's Instructions: Manufacturer's installation instructions.

G. Closeout Submittals: Submit Operation and Maintenance Data: Operation and maintenance data for installed products in accordance with Division 01 Closeout Submittals (Maintenance Data and Operational Data) Section. Include methods for maintaining installed products and precautions against cleaning materials and methods detrimental to finishes and performance.

1.4 QUALITY ASSURANCE

A. Qualifications:

1. Installer Qualifications: Installer experienced in performing work of this section who has specialized in installation of work similar to that required for this project.

a. Certificate: When requested, submit certificate indicating qualification.

2. Manufacturer's Qualifications: Manufacturer capable of providing field service representation during construction and approving application method.

B. Mock-Ups: Install at project site a job mock-up using acceptable products and manufacturer-approved installation methods. Obtain Owner and Architect's acceptance of finish color, texture and pattern, and workmanship standard.

1. Maintenance: Maintain mock-up during construction for workmanship comparison; remove and legally dispose of mock-up when no longer required.

2. Incorporation: Mock-up may be incorporated into final construction upon Owner's approval.

C. Pre-installation Meetings: Conduct pre-installation meeting to verify project requirements, substrate conditions, manufacturer's instructions and manufacturer's warranty requirements.

1.5 DELIVERY, STORAGE & HANDLING

A. General: Comply with Division 1 Product Requirements Sections.

B. Ordering: Comply with manufacturer's ordering instructions and lead time requirements to avoid construction delays.

C. Delivery: Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.

D. Storage and Protection: Store materials at temperature and humidity conditions recommended by manufacturer and protect from exposure to harmful weather conditions.

1.6 PROJECT CONDITIONS

A. Temperature Requirements: Maintain air temperature in spaces where products will be installed for time period before, during and after installation as recommended by manufacturer.

B. Field Measurements: Verify actual measurements/openings by field measurements before fabrication; show recorded measurements on shop drawings. Coordinate field measurements and fabrication schedule with construction progress to avoid construction delays.

1.7 WARRANTY

A. Project Warranty: Refer to Conditions of the Contract for project warranty provisions.

B. Manufacturer's Warranty: Submit, for Owner's acceptance, manufacturer's standard warranty document executed by authorized company official. Manufacturer's warranty is in addition to and not a limitation of, other rights Owner may have under Contract Documents.

1. Warranty Period: 3 years commencing in Date of Final Completion.

PART 2 - PRODUCTS

2.1 ENGINEERED RUBBERIZED FLOORING

A. Product: Subject to compliance with specified requirements, the flooring shall be the product indicated on the drawings or a substitution product that has been evaluated and accepted by the Architect, or products manufactured by one of the following manufacturers (subject to review and acceptance by the Architect), may also be approved for installation:

1. Mondo USA Inc.
2. Top Joy Sports Inc.
3. Dinoflex Group Ltd, or equal

B. The flooring shall be a vulcanized system composed of a sealing skin, rubber strike layer and a honeycomb shaped comfort layer.

C. Colors: As selected by the Architect.

2.2 ACCESSORIES

A. Resilient Edge strips: Homogeneous rubber or EPDM rubber composition, tapered or bullnose edge, color to match flooring, or as selected by Architect from standard colors available; not less than 1” wide.

B. Adhesives (Cements): Waterproof, stabilized type as recommended by flooring manufacturer to suit material and substrate conditions.

C. Concrete Slab Primer: Non-staining type as recommended by flooring manufacturer.

D. Leveling and Patching Compounds: Latex type as recommended by flooring manufacturer.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Compliance: Comply with manufacturer’s product data, including product technical bulletins, product catalog installation instructions and product carton instructions for installation.

B. Site Verification of Conditions: Verify substrate conditions, which have been previously installed under other sections, are acceptable for product installation in accordance with manufacturer’s instructions.

C. Surface Preparation: As recommended by the flooring manufacturer.

D. Finish Color/Textures/Patterns: Match the approved mockups.

E. Cleaning: Remove temporary coverings and protection of adjacent work areas. Repair or replace damaged installed products. Clean installed products in accordance with manufacturer's instructions prior to Owner's acceptance. Remove construction debris from project site and legally dispose of debris.

F. Protect installed product and finish surfaces from damage during construction.

END OF SECTION

SECTION 09 67 70

VAPOR EMISSION AND ALKALINITY TESTING FOR ADHERED FLOORING

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Provide testing of moisture vapor emission and alkalinity (pH) as specified.

B. Product data: Submit technical data and specifications. List of materials proposed to be provided under this Section.

C. Test reports: Submit vapor emission and alkalinity test reports.

PART 2 PRODUCTS

2.1 VAPOR EMISSION AND ALKALINITY (pH) TESTING KIT MANUFACTURER

A. Subject to compliance with specified requirements, provide products from the following sources (or equal):

1. Vaprecision Testing Systems
2. Sinak Corp.

PART 3 EXECUTION

3.1 TESTING

A. Conduct 3 vapor emission and alkalinity tests for the first 1,000 sq. ft. of floor area and one additional test for each 1,000 sq. ft. thereafter.

B. Vapor emission testing:

1. Test in accordance with ASTM E 1907.
2. Report test results in pounds per 1,000 sq. ft. in 24 hours.

C. Alkalinity (pH) testing: Using a pH pencil, draw a small "x" on the surface (approximately 2" x 2"). Pour a small amount of distilled water over the "x" and allow to stand for 30 - 60 seconds. Using the color chart that comes with the pH pencil, determine the alkalinity of testing area.

D. Do not install finish flooring if moisture emission and pH range exceeds flooring materials manufacturers' requirements.

END OF SECTION

SECTION 09 67 90

RESILIENT WALL BASE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Installation of resilient wall base indicated on the drawings and specified.

1.3 ACTION SUBMITTALS

A. Product data. Submit descriptive literature.

B. Samples: Submit samples of base.

C. Submit manufacturer's recommended installation procedures.

PART 2 - PRODUCTS

2.1 RESILIENT WALL BASE

A. Subject to compliance with specified requirements, base shall be the product of the manufacturer indicated on the drawings or an “or equal” product of one of the following:

1. Roppe Corp.
2. Burke Co.
3. Tarkett North America Inc.

B. Base shall conform to ASTM F1861, 1/8-inch thickness and of the profile and height as indicated on the drawings.

1. Furnish pre-molded exterior and interior corner units.
2. Color shall be as selected by the Architect.

C. Adhesive shall be as recommended by the manufacturer of the base materials. Adhesive shall be waterproof and stabilized type. Asphalt emulsions will not be acceptable.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install materials as recommended by the product manufacturer, and only after finishing operations, including painting, have been completed. Bond the top-set base to wall surface with adhesive, use preformed base sections at all internal and external corners. Install running base tightly on top of flooring with top edge exactly even with top edges of premolded corners.

END OF SECTION

SECTION 09 78 83

INDOOR ATHLETIC GAMES LINES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Furnish and install indoor athletic game lines as indicated on the drawings and specified.

1.3 SUBMITTALS

A. Shop Drawings: Submit Shop Drawings, indicating location, extent, color and texture of game line markings.

B. Material Samples: Submit color samples for approval.

1.4 QUALITY ASSURANCE

A. Game lines, colors, widths and configurations shall be in accordance with NCAA Guidelines.

B. Accurately layout the game lines in dimensions that are true to their theoretical values. Straight lines shall be perpendicular and parallel. Curved lines shall be accurate in radius.

PART 2 - PRODUCTS

2.1 INDOOR ATHLETIC GAME LINES

A. Paint: Subject to compliance with specified requirements provide water emulsion-based Dura-Strip paint as manufactured by TMT-Pathway, or equal. Paint by Frazee, Dunn-Edwards, and Dulux may also be acceptable.

B. Provide commercial quality, 100 percent acrylic emulsion, water thinned paint, containing no alkyds butadiene styrene or vinyls. A minimum amount of necessary additives such as pigment dispersants and anti-foaming agents will be accepted. The use of driers will not be permitted.

1. Color: Furnish paint in colors as noted on Drawings or as directed. The paint must dry to an adherent film with no appreciable discoloration in sunlight or with age.

2. Pigment and Vehicle: Opaque portion of white paint shall be treated rutile titanium dioxide, 3 pounds per gallon, mixed with 100 percent acrylic polymer dispersed in water.

3. Minimum Requirements of Total Solids: 51 percent by weight.

4. Maximum Pigment Content: 36 percent by weight.

5. Consistency: Minimum grind fineness of 4 with a iscosity in krebs units, minimum 80 and maximum 95.

6. Drying Time: 30 to 60 minutes.

PART 3 EXECUTION

3.1 INSTALLATION

A. Prior to application of paint, allow the pavement to properly cure. Clean and prepare in accordance with paint manufacturer's written recommendations.

B. Provide mechanical equipment to install paint in a uniform, straight or curved pattern, without holidays and other defects. Ragged or crooked lines will not be acceptable.

C. Do not permit traffic until paint has completely cured.

D. Install 2 coats in thickness recommended by manufacturer.

E. Athletic Court Lines: Unless directed otherwise by the Architect, conform to the following:

1. Letters and numbers: 2 inches or 2 1/2 inches, white.

2. Where 2 different sets of lines overlap, one set shall be white and the other set shall be yellow.

END OF SECTION

SECTION 09 86 00

ANTI-GRAFFITI COATING

PART 1 - GENERAL

1.1 SUMMARY

A. Provide all labor, materials, equipment and services to apply anti-graffiti coatings on interior and/or exterior masonry wall surfaces and elsewhere where noted or indicated on the Contract Drawings, as specified hereinafter and as needed for a complete and proper installation.

B. Related Sections: Documents affecting work of this Section include, but are not necessarily limited to the GENERAL CONDITIONS, SUPPLEMENTARY CONDITIONS and Sections in GENERAL REQUIREMENTS in DIVISION 01 of these Specifications.

1.2 SUBMITTALS

A. Comply with pertinent conditions in the SUBMITTALS of DIVISION 01 - GENERAL REQUIREMENTS of these Specifications.

B. Product Data: Within 45 calendar days after Contractor has received the City's "NOTICE TO PROCEED" or award of Contract submit the following:

1. Materials list of items proposed to be provided under this Section;

2. Manufacturer's specifications and other data needed to prove compliance with the specified requirements;

3. Manufacturer's recommended installation procedures which, when approved by the City Engineer or the Consultant, will become the basis for accepting or rejecting actual installation procedures used on the Work.

C. Applicator shall submit to the City Engineer or the Consultant a prewarranty application form to verify amounts of materials to be used.

1.3 QUALITY ASSURANCE

A. Contractor shall contact the manufacturer prior to bidding the work so as to become familiarized with current costs, application procedures and notification requirements.

B. Use adequate numbers of skilled workers who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the Work of this Section.

C. Material and application shall comply with Rule 66, Los Angeles County Air Pollution Control District and Rule 1113 of the South Coast Air Quality Management District.

D. Applicator shall complete and file a "Job Report" with manufacturer certifying conformance of application procedures and quantities to the manufacturer's requirements.

E. Applicator Qualifications: Engage an applicator who is approved by the manufacturer and who employs only persons trained for the application of graffiti-resistant coatings.

F. Mock-Ups 1: Prior to application to the building, apply graffiti resistant coating to 2 of the brick or concrete block mock-up to show effect on appearance. Do not apply graffiti resistant coating to the building until the mock-up is approved by the Consultant.

G. Mock-Ups 2: Prior to application to the building, apply graffiti resistant coating to a 16 sq. ft. Area of the building, as selected by the City Engineer or Consultant to show effect on appearance. Do not apply graffiti resistant coating to the remainder of the building until the mock-up is approved by the Consultant.

1.4 PRODUCT HANDLING

A. Deliver materials to the job-site in satisfactory sealed containers with labels intact with manufacturer's name, brand name, type of material and batch number.

B. Store materials in suitable location where directed by the City Engineer, in original unopened containers in compliance with manufacturer's printed instructions.

C. Inspected for approval before containers are opened and any condemned materials to be removed from the job-site.

D. Protect anti-graffiti coating materials from exposure to weather or damage caused by other construction operations.

1.5 GUARANTEE

The Contractor shall conform to provisions of Section 28 of the GENERAL CONDITIONS and furnish the City with a written guarantee, which guaranties that during a period of two (2) years from date of completion and acceptance of the work, the coating will not turn white, peel, chip or crack, and that the Contractor will without additional cost to the City, promptly make any repairs required as a result of ordinary wear and tear of the elements, and further guaranties that any defective material or work shall be properly repaired or replaced without additional cost to the City.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MATERIALS

A. Materials shall be the products of one manufacturer and be either the ones upon which the design is based on the products of the manufacturer approved in advance by the City Engineer or the Consultant in accordance with applicable conditions in the GENERAL CONDITIONS.

B. Material shall be the appropriate type as recommended by the manufacturers (hereinafter named) or provide an equal product of another manufacturer approved in advance by the City Engineer or the Consultant.

C. Material must be approved for use in the City of Los Angeles and must have a Research Report Number as issued by the City of Los Angeles.

2.2 ACCEPTABLE PRODUCTS

A. "Super-Kote A-G5" Sealer manufactured by Ven-Chem Company Inc. P.O. Box 3186, Santa Barbara, California, phone (805) 967-7600 or “Monochem Permashield” by Frazee Paint Co. Research Report No. 28080, phone (800) 826-9048.

B. The "Graffitirasor Systems" manufactured by Rainproof Systems, City of Commerce, CA 90022, Research Report No. 25035, phone (213) 887-8761.

C. “Vandal Guard” by Rainguard Products Co., 821 W. Hyde Park Blvd.; Inglewood, CA 90302, phone (310) 670-2953.

2.3 MATERIAL PERFORMANCE CRITERIA (AS APPLICABLE)

A. Completed graffiti protection shall include the following performance criteria:

1. Shall have a flat nonglossy appearance.

2. Shall be nonyellowing and contain no waxes, urethanes or other yellowing resins.

3. Shall cause little or no change in the appearance of the treated surface.

4. Shall allow moisture vapor transmission.

5. Can be cleaned a minimum of five times.

6. Shall be renewable and repairable.

7. Be 98% effective in removing all graffiti on masonry surfaces.

8. Dirt pickup shall not be increased by coating.

9. Manufacturer will warrant product performance.

10. Product shall be VOC compliant.

11. Conform to all State and City waste disposal regulations including but not limited to those involving Proposition 65.

12. Product shall be capable by manufacturer's literature of withstanding 5 years exterior exposure without significant loss of protection, other than spot restoration of areas attacked by graffiti, cleaned, and recoated per written instructions of manufacturer.

13. Anti-graffiti treatment must be resistant to rain, weather, abrasion, peel, ultra-violet, and be clear and non-yellowing.

14. Anti-graffiti treatment should be able to withstand repeated removal of all types of paint and other graffiti materials with little or no defacement of or change to the original surface.

B. Any submitted product must be applied to sample area and have the test listed under "C" below performed.

C. After application of materials, a field demonstration or test will be performed to the satisfaction of City Engineer which will include:

1. Spray paint applied to material to simulate graffiti attack.

2. Attack allowed to stand 14 days before removal.

3. Removal by manufacturer's recommended process shall determine that at least 98% of the graffiti has been removed.

2.4 EQUIPMENT

All clear materials shall be applied by airless spray equipment. Tip size .015-.021

PART 3 - EXECUTION

3.1 SURFACE CONDITIONS

Examine the areas and conditions on which materials of this Section will be applied. Correct conditions detrimental to timely and proper completion of the work. Do not proceed with contracted work of this section until such detrimental conditions are corrected at no added cost to the City.

3.2 ENVIRONMENTAL CONDITIONS

A. Do not proceed with application of anti-graffiti materials when the ambient temperature is less than 45 degrees F., when low temperature of 40 degrees F. or less is predicted within a period of 24 hours, or if rain is expected in the next 24 hours.

B. Do not apply materials in rainy conditions or within 5 days after surfaces have become wet from rainfall or other moisture.

3.3 INSPECTION

Applicator shall notify manufacturer's representative a minimum of 72 hours prior to scheduled application for field inspection.

3.4 APPLICATION

A. Preparation of Surface (As applicable):

1. Do not commence application until surface is structurally sound, clean, dry, and free from excess dust, loose paint, greasy stains and efflorescence.

2. Form oils should be completely removed.

3. All cracks, voids, beeholes or mortar shrinkage shall be properly repaired and primed if necessary to make the surface uniform.

4. Allow substrate to dry and age at least 3 weeks before applications of anti-graffiti coating.

5. Porous concrete block should be sealed with approved "Rainproof Acryseal WD" or Monochem Aquaseal HD a minimum of 48 hours before application of anti-graffiti coating material.

6. If using "Graffitibase" material over a previously paint coated surface apply a small amount in an inconspicuous place to check for lifting.

7. Remove existing graffiti with "WipeOut" graffiti remover or approval equal. "WipeOut" product of National Chemsearch, Irving Texas, phone (1-(800)-527-9921).

8. Applicator/Contractor to use the application tools and methods as recommended by the coating manufacturer and approved by the City Engineer or the Consultant.

9. Applicator/Contractor is responsible for daily application of a small test area on surface to be coated before starting daily general application to assure desired results, especially if there have been temperature changes during application.

B. Application of Anti-Graffiti Coating:

1. Coverage: Apply materials at rate per square foot recommended by the material manufacturer.

2. Application Sequence: Apply two coats of the material "Graffitibase" followed by one coat of "Graffiticatcher" in compliance with manufacturer's specifications and recommendations.

a. A minimum drying time of two hours should be allowed between the first and second coats of "Graffitibase".

b. A minimum drying time of 4 hours should be allowed between the "Graffitibase" and the "Graffiticatcher".

3. Anti-graffiti coating process should achieve a non-yellowing, durable, clear film completely protecting the substrate from penetration of paint, ink, crayons, dirt, air pollutants, grime and similar materials and help maintain and protect the original appearance of the surface.

4. "Graffitibase" material should be applied with a "crosshatch" method of several horizontal passes followed immediately by vertical passes to build up a heavy wet film to insure sufficient uniformity. This is considered one coat and the same method is repeated for the second coat to build a minimum dry film thickness of 3 mils. Spray large areas in sections so overlap occurs before previously coated areas have dried.

a. Start application at top of wall and work down surface. Schedule work so that the stopping point each day falls at an opening, column or corner.

5. "Graffiticatcher" should be applied with a "crosshatch" method of several horizontal passes followed immediately by vertical passes to build up a film to insure sufficient uniformity. This is considered one coat.

C. Protection: Applicator shall be responsible for protection of this and all adjacent work from damage during application with dropcloths or other suitable materials.

3.5 CLEAN-UP AND REPAIRS

A. Required Clean-Up: Contractor shall carefully remove all protection materials from adjacent surfaces and any residue resulting from this operation. Completely remove oversprays and spills as soon as possible before curing and excess materials from the job-site.

B. Repairs: Any soiling of the work of this section shall be repaired by the installer of the anti-graffiti material as approved by the City Engineer or the Consultant at no added cost to the City.

END OF SECTION

SECTION 09 90 00

PAINTING

PART 1 - GENERAL

1.1 SUMMARY

A. Furnish all tools, equipment, materials, supplies and perform all labor required to paint the work indicated or noted on the Contract Drawings and hereinafter specified.

B. "Paint" as herein specified, means coating systems, materials including primers, emulsions, epoxies, enamels, sealers, fillers and other liquid materials which, when spread in a thin layer, solidifies into a film that obscures the surface on which it is applied. These materials can be used for surface preparation and as prime, intermediate or finish coats. The painting application shall also include all necessary operations including proper surface cleaning and preparation, removal of existing substrates and/or paint material, protection of non-painted surfaces, scaffolding and proper clean-up during and after painting. Other painting work may be included or specified in other parts of the Specifications or Contract Documents.

C. All steel and other metal surfaces that are exposed to the weather shall be painted with HIGH PERFORMANCE COATINGS as specified in Section 09 96 12. Non weather exposed surfaces shall be painted as specified in this Section 09 90 00.

D. The painting works include, but are not necessarily limited to, the following:

1. Ferrous metal surfaces including the pipings that are not galvanized or primed.

2. Galvanized metal surfaces, and sheet metal including roof drains, roof gutters, downspouts, scupper, etc.

3. Factory-primed, or factory-applied, or factory baked-on enamel finished metals.

4. Interior gypsum board wall and ceiling surfaces.

5. All contact surfaces of dissimilar metal materials.

6. Sign painting.

7. Exposed and concealed structural steel.

8. All exhaust pipes or smoke stacks, canvas-covered or insulated pipes to match the adjacent painted wall surfaces.

9. Mechanical, security and/or electrical equipment, electrical light standards, transformer, and conduits without complete factory finish, or specified to be painted over in the field.

10. Duct and equipment supports, and interior surfaces of ducts visible through grilles and registers.

11. All caulking, sealant and firestopping that are exposed to view.

E. All factory-applied primers and factory-applied or factory baked on enamel must conform to the requirements shown in this Section.

F. The following painting and coating works are specified or indicated elsewhere. Contractor shall verify prior to the bid and provide necessary coordination and complete the painting and coating works.

1. Parking Lot Striping.

2. Galvanize Repair in Metal Work in Divisions 5 and 8.

3. The stain and transparent coating systems.

G. Work Not To Be Primed Or Painted Unless Specified Otherwise:

1. Steel members to embedded in concrete or mortar, steel surfaces within ½ inch of the toe of the welds.

2. Metal surfaces with factory applied or baked-on enamel finish, or specified not to be painted over.

3. Marble and tile.

H. Related Sections: Documents affecting Work of this Section include, but are not necessarily limited to the GENERAL CONDITIONS, SUPPLEMENTARY CONDITIONS, and Sections in GENERAL REQUIREMENTS in DIVISION 01 of these Specifications.

1.2 QUALITY ASSURANCE

A. Paint Applicator: Use adequate number of skilled employees who are thoroughly trained and experienced in the necessary crafts and completely familiar with the specified work, all applicable codes, regulation and safety requirements and methods needed for proper execution of work of this Section.

1. For any painting work to be performed at the manufacturing plant and in compliance with all provisions of the applicable rules and regulations, the fabricator/applicator must provide all necessary emission plans approved by the local governing agencies and equipment including an approved air pollution control system consisting of collection and control devices which reduce the VOC emissions from the applications of the specified paint materials by an equivalent or greater amount than the VOC limits specified in the applicable rules and regulation.

B. Paint Coordination:

1. Prior to Bid and during the course of construction, review other Sections of the Project Manual to verify the sealers, primers and finishes and other coating to be used and assuring compatibility of the total coating system for the various substrates. Contractor shall contact the manufacturers and applicators so as to become familiar with the painting systems and application procedures. Prior to the approval of submittals and beginning of the painting application, conduct a pre-installation meeting and additional meeting when necessary, at the site attended by the City Engineer, Contractor, Applicator and Manufacturers to discuss the proposed materials, surface preparations and application processes to establish all necessary coordination and operation procedures.

2. Provide finish coats that are compatible with the prime coats actually used. Area where required protective coatings or waterproofing sealers, use only paint systems compatible with the protective coatings or waterproofing sealers.

3. Furnish data on the characteristics of the specific finish materials to assure that compatible prime coats are used.

4. Provide compatible primers. Remove the non-compatible primers and reprime as required.

5. Notify the City Engineer or Consultant in writing of anticipated problems in using the specified coating systems over priming or sealer coats supplied under other Specification Sections.

5. Schedule the painting operations to prevent any disruption of and by other trades.

7. The areas of removal, repair, surface preparation, new finish or coating as indicated on the Contract Documents are for reference only. The areas of work may increase upon completion of the removal, repair and surface preparation. Contractor shall review the site condition carefully prior to the bid and include in the Contract bid price all incidental costs including all contingencies for the complete painting and coating work. No additional adjustment in payment shall be allowed for any increase of painting or coating work due to the removal, repair and surface preparation.

C. References, Standards, Codes and Regulations:

1. Work, equipment and materials must conform to following, but not necessarily limited to, References, Standards, Federal, State and local laws and regulations including the Los Angeles City Building Code and applicable Amendments. Current manufacturer's materials safety data sheets for all materials must be on the job-site at all times.

2. Where those requirements conflict with this Section, comply with the more stringent provision.

a. All material formulation and their application shall comply with the current applicable regulations of the State of California Department of Public Health, California Air Resources Board (CARB), Southern Calif Air Quality Management District (SCAQMD), and the Environmental Protection Agency (EPA) for the airborne or solvent emissions and industrial waste disposal. All paint containers to be properly labeled. Provide the City Engineer with “Certificate of Compliance” if requested.

b. Comply with requirements of OSHA, Safety And Health Standards for Construction (29CFR1926) requirements specified in this Section and elsewhere in the Project Manual. Protect all workers of other trades, occupants, or passersby from any airborne or solvent emission.

c. Regulatory changes may affect the formulation, availability, or use of specified coatings. Confirm availability of the specified paint materials and other coatings to be used or available under the emission averaging provision or other exemption rules prior to job going out to bid and before start of painting work.

d. Los Angeles Department Of Building And Safety (LADBS) Research Report.

e. The Society For Protective Coating (SSPC), formerly Steel Structures Painting Council, 40 24th Street, 6th floor, Pittsburg, PA 15222, (412) 281-2331, (877) 281-7772, www.sspc.org.

f. Standard Specifications For Public Works Construction (SSPWC).

g. American Society Of Testing And Materials (ASTM).

D. Shop Inspection: Required for all items to be fabricated, factory-primed or factory-applied finish offsite.

1.3 SUBMITTALS

A. General: Comply with applicable provisions in DIVISION 01 - GENERAL REQUIREMENTS of the Project Manual. Contractor shall coordinate with other trades and obtain information required for the Submittal. City Engineer or Consultant will return and will not review any submittal requiring coordination with other submittals until such other submittals or required information are received by the City Engineer or the Consultant.

B. Product Data and Shop Drawings:

1. Submit manufacturer's printed product data and material specifications needed to prove compliance with the specified requirements. The Contractor must identify on separate submittal of all material manufactured outside the State of California.

2. Submit materials list of all items proposed to be provided under this Section including all cleaning agents and materials for surface preparation; Paint Finish and Color Schedules including respective locations and thicknesses, application rates and amounts of required stock material. All items must be provided with catalog names and numbers of the paint types. Paint Finish Schedules shall also identify works to be factory-primed and to be re-primed in the field. Identify materials that are available under the emission averaging provisions or other exemption rules, and also to be applied In the manufacturing plant by using an air pollution control system to reduce the VOC emissions. Provide painting locations, which will receive waterproofing sealer treatment, anti-graffiti and other protective coatings.

3. Submit Manufacturer’s recommended methods of surface testing (including the alkalinity test), demolition, material mixing, surface preparation and cleaning for painting works to be provided under this Section and their prospective locations.

4. Submit list of equipment, operation procedures and pressures proposed to be used under this Section. Coordinate and submit all protection plans or safety controls against any airborne emission or exposure during the demolition, surface preparation and painting works.

5. Submit methods of testing of total film thickness.

6. Submit manufacturer prepared certifications of substrate materials as suitable to receive sealers or primers and paints, and succeeding anti-graffiti coatings.

7. Scaffolding Plans: All scaffolding shall be designed by a California State Licensed Engineer retained by the Contractor and/or conform to applicable safety and code requirements.

C. Samples:

1. Color Samples: Required for each type of paint material and color, four 8 1/2-inch x 11-inch swatches, to be submitted to the City Engineer or the Consultant for approval.

2. For stain or natural finish on wood, samples shall be submitted on each type and quality of wood used on the project as approved by the City Engineer or the Consultant.

3. Actual painting or other finish coating shall not commence until samples and mock-ups are approved and are on file at the job-site.

4. Mock-up: Prior to application to the structures or intended surfaces, coordinate and apply each paint system and anti-graffiti coating to a 16 sq. ft. area of the building, as selected by the City Engineer or Consultant to show effect on appearance. Demonstrate in the presence of the City Engineer and the Architect Consultant the proposed methods of surface cleaning and preparation. Do not apply the paint system to structures or intended surfaces until the mock-up is approved by City Engineer. When it deems necessary, coordinate and apply preceding waterproofing sealer treatment as required by the Contract, to the mock-up panels prior to painting. Apply succeeding anti-graffiti coating as required by the Contract to the mock-up panels after the painting.

1.4 PRODUCT HANDLING

A. Delivery: Deliver materials to the job-site in factory sealed and properly labeled containers bearing manufacturer's name, type of paint and instructions for mixing and/or reducing.

B. Storage: Store paint materials in suitable dry, clean and well ventilated locations. Precautions shall be taken for the prevention of fire. Do not store outdoors or deliver paint material to site more than 15 days before the painting work.

C. Inspection: Required for approval before containers are opened. Non-approved materials shall be removed from the job-site.

D. Protection: Required of all paint materials from exposure to weather or from damage as caused by other construction operations. Protect all surfaces not be painted. Mask-off where necessary and the over spray is prohibited.

E. Factory-primed, factory-applied or factory baked-on enamel finished metal or equipment shall be protected during shipment and handling by suitable padding, blocking and the use of canvas or dunnage. Do not expose any metal or equipment to weather prior to painting or installation. [Do not wrap hook or chain around the steel during any lifting operation.] [Do not use nylon string that can cause abrasion to the metal coating.]

1.5 JOB CONDITIONS

A. Do not apply paint material when surface temperatures and the surrounding air temperatures are below 50 degrees F. Do not apply paint material on damp or wet

surfaces, unless otherwise permitted by the manufacturer's printed instructions as approved by the City Engineer or the Consultant.

B. Perform no painting when the relative humidity is above 85 percent or when the dew point is less than 5 degrees F variance between the air/surface temperature.

C. Do not apply primer or sealer or paint material unless moisture contents are below the following limits. Any to be painted or stained wood items with moisture contents exceeding the limits indicated below at the time of delivery to the job site shall be rejected and immediately removed from the job site:

1. Plaster and gypsum: 8 percent
2. Concrete and masonry: 12 percent
3. Wood: 12 percent

Contractor shall measure moisture content of surfaces using a probe type electronic moisture meter approved by the City Engineer.]

D. Do not apply materials during fog, rain or mist or when inclement weather is expected within a period of 24 hours, or the dry time specified by the manufacturer following a rainfall.

E. Insure proper ventilation to outside during all interior painting operations. Forced air ventilation shall be provided to reduce the concentration of air contaminant to a safe limit. Air circulation and exhausting of solvent vapors shall be continued until the coatings have fully cured.

F. Provide adequate permanent or temporary lighting during all painting operations.

1.6 SAFETY REQUIREMENTS

A. Comply with all safety and health requirements of the "Federal Labor Standards" and in applicable Section in the GENERAL CONDITIONS of Project Manual. It is the responsibility of the Contractor to establish appropriate safety and health practices. Contractor shall provide in accordance with the reviewed safety plans, all temporary partitions or enclosures, respiratory protection, equipment, materials, personnel monitoring and other means necessary to protect their personnel and building occupants or area occupants, and passers-by from contact with airborne emission from the demolition or other preparatory work.

B. All persons engaged in sanding, scraping or removing old paint; spraying operations or handling flammable or toxic materials shall wear protective apparel including eye and face protection devices, air purifying halfmasks or mouth piece respirators with appropriate filter.

C. Any empty container or cloth like waste materials which might constitute a fire or health hazard shall be placed in a closed metal container, removed or destroyed by an approved method at end of each day's operations. Paint thinner or solvent shall not be stored in a room scheduled to receive resilient flooring or other sensitive materials, or near source of flame or heat.

D. Paints, stains, wood preservative finishes and related materials may be considered as hazardous and shall be handled and disposed of in accordance with code requirements.

1.7 GUARANTEE

A. The Contractor shall conform to provision of of the General Requirements and furnish the City with written guarantee, during the submittal process and at completion of the work, which guarantees for a period of 2 years from the date of acceptance of the project against any defect, peeling, chipping or crack and that Contractor will without additional cost to the City, promptly make any repairs required as a result of defect or ordinary wear and tear.

1.8 SUPPLEMENTAL INFORMATION:

A. Color Boards or Color Charts for this project prepared by the Consultant Architect are made available for inspection and during the course of construction.

PART 2 - PRODUCTS

2.1 MATERIALS

A. General: All painting products shall be first line premium material, unless specified otherwise, commercial line or product line materials shall be deemed unacceptable. Only the approved products specified herein shall be used in this project. All paints shall be factory-mixed. Paint by aerosol or spray can is not acceptable.

1. Paint pigments shall be fully ground, maintaining soft paste consistency, capable of being readily and uniformly dispersed to complete homogeneous mixture. Paints shall have good flowing and brushing properties and be capable of drying or curing free of streaks and sags. Provide paints with the colors selected by the Consultant Architect from the color chip samples submitted by the Contractor.

2. High temperature paints shall be used for protection of metal surfaces of furnaces, heat exchangers, boilers, exhaust mufflers and piping as well as other surfaces continuously or intermittently exposed to high temperatures. The high temperature paint shall withstand minimum high temperatures of 1,000 F.

3. All paint products shall be in compliance with the Volatile Organic Compound (VOC) limits specified in the rules and regulations of the local governing agencies including the South Coast Air Quality Management District (SCAQMD). No person shall manufacture, supply, sell or apply any paint products which exceeded the VOC contents allowed by the regulations.

   All factory-applied primers or other paint materials on wood products shall be in compliance with the VOC limits and rules specified in SCAQMD's Rule 1136 – WOOD PRODUCTS COATING of the Regulation No XI – SOURCE SPECIFIC STANDARDS.

4. All factory-applied primers or factory baked-on enamels or other paint materials on metal shall be in compliance with the VOC limits and rules specified in SCAQMD's Rule 1107 – COATING OF METAL PARTS AND PRODUCTS of the Regulation No. XI – SOURCE SPECIFIC STANDARDS. All factory-applied primers, factory baked-on enamels and all other field-applied finish coats or spot prime paint materials shall be the products of the same manufacturer. The primers, intermediate and finish coats in each painting system of any location shall be compatible.

5. All field applied paint products shall meet or not to exceed the applicable VOC Limits of SCAQMD's Rule 1113 – ARCHITECTURAL COATINGS of the Regulation No. XI – SOURCE SPECIFIC STANDARDS, latest edition:

Products	VOC Limits (g/liter)
Clear Wood Finishes Varnish Sanding Sealers Sprayed Lacquer	 350 275, eff. 7/1/06 350 275, eff. 7/1/06 275
Clear Brushing Lacquer	275
Pigmented Lacquer	275
Specialty Primers	350 100, eff. 7/1/06
Shellac Clear Pigmented	 730 550
Stains Stains, Interior	250 100, eff. 7/1/07
Waterproofing Sealers	250 100, eff. 7/1/06
Waterproofing Concrete/Masonry Sealers	400 100, eff. 7/1/06
Wood Preservatives Below-Ground Other	 350 350
Rust Preventative Coatings	400 100, eff. 7/1/06
Industrial Maintenance (IM) Coating High Temperature IM Coating Zinc Rich IM Primers	250 100, eff. 7/1/06 420 340 100, eff. 7/1/06
Pre-Treatment Washer Primers	420
Primers, Sealers and Under-Coaters	200 100, eff. 7/1/06
Quick-Dry Primers, Sealers and Under-Coaters	200 100, eff. 7/1/06
Quick-Dry Enamels	250 50, eff. 7/1/06
Flat Coatings	100 50, eff. 7/1/08
Non-Flat Coatings	150 50, eff. 7/1/06
Multi-Color Coating	250
Fire-Retardant Coatings Clear Pigmented	 650 350
Bond Breakers	350
Concrete Curing Compounds	350
Dry Fog Coatings	400
Fire-Proofing Exterior Coatings	350
Floor Coatings	100 50, eff. 7/1/06
Graphic Arts (Sign) Coating	500
Japans/Faux Finishing Coatings	350
Magnesite Cement Coatings	450
Mastic Coatings	300
Metallic Pigmented Coating	500

Recycled Coatings	250
Roof Coatings	50
Roofing Coating, Aluminum	100
Roof Primer, Bituminous	350
Swimming Pool Coatings Repair Other	 340 340
Traffic Coatings	150

B. Approved Manufacturers:

1. Ameron International, 13010 Morris Road, Suite 400, Alpharetta, GA 30004, (678) 393-0653, (800) 926-3766, (800) 826-9048, www.ameroncoatings.com, distributed by Frazee Paint & Wallcovering.

2. Benjamin Moore & Co., 51 Chestnut Ridge Road, Montvale, NJ 07645, (201) 573-9600, (800) 344-0400, www.benjaminmoore.com.

3. Carboline Company, 350 Hanley Industrial Court, St. Louis, MO 63144-1599, (314) 644-1000, (800) 848-4645, www.carboline.com.

4. The Flecto Company, Inc., 1000 45th Street, Oakland, CA 94608, (510) 655-2470, (800) 635-3286.

5. Dunn-Edwards Paints, 4885 E. 52nd Place, Los Angeles, CA 90040, (888) 337-2468, (800) 488-5722, www.dunnedwards.com.

6. Frazee Paint & Wallcovering, 181 South Rosemead Blvd., #A, Pasadena, CA 91107, (800) 826-9048, www.frazeepaint.com.

7. Jasco Chemical Corporation, 1102 E. Washington Ave., P.O. Box 715, Santa Ana, CA 92701, (888) 345-2726, www.jasco-help.com.

8. McCloskey Paints, Division of Valspar Corp., 1191 S. Wheeling Road, Wheeling, IL 60090, (847) 541-9000, (800) 345-4530, www.valspar.com.

9. Okon, Inc., 6000 W. 13th Ave., Lakewood, CO 80214, (303) 232-3571, (800) 237-0565, distributed by Dunn-Edwards Paints, www.okoninc.com.

10. Tnemec Coating, Inc., 6800 Corporate Drive, Kansas City, MO, 64120-1372, (800) 863-6321, www.tnemec.com.

11. Valspar Corp., Architectural Customer Services, 1191 S. Wheeling Road, Wheeling, IL 60090, (800) 845-9061, www.valspar.com.

E. Miscellaneous Materials: Provide cleaning agents, neutralizer and other materials as may be required for the cleaning and preparation of surfaces to be painted or stained as recommended by the manufacturer and as approved by the City Engineer or the Consultant. Do not use thinner to thin, mix or prepare paint materials.

1. Thinner: As recommended by the Paint Manufacturer for tool cleaning.

2. Paste Wood Filler: Fed. Spec. TT-F-336

3. Spackle: Interior and exterior, regular weight spackle surface compound, manufactured by The Muralo Company or approved equal. The Muralo

Company, 148 E. 5th Street, Bayonne, NJ 07002, (800) 631-3440, www.muralo.com..

4. Rust Remover: Manganese Phosphate No. 7 by Armett Assoc.

5. Cleaner, Degreaser, Neutralizer: Provide as part of Contract of types as suitable and will not cause any harm or damage to the substrate or texture or any adhesion problem.

6. Paint Removal Materials: Chemical types, as suitable and approved by the City Engineer or Consultant.

7. Graffiti Remover: Use hot and high pressure water or power wash and approved graffiti remover where required.

8. Wood Consolidants: Abatron, Inc. “Liquid Wood” and “Wood Epox”. Other suitable materials shall be approved by the City Engineer or the Consultant. Wood Consolidants shall be of the resin types, either Epoxies or Polyesters, and shall be delivered to the job site in the original sealed containers.

9. Coating Between Dissimilar Materials:

   a. For dissimilar metals, use non-sag polysulfide or polyurethane caulking conforming to Federal Specification TTS-230 Type II TT-P-664 to prevent galvanic or corrosive action.

   b. For aluminum in contact with concrete, mortar, masonry or absorptive materials subject to wetting, use heavy bituminous or asphalt-base emulsion coating conforming to ASTM D1187 – STANDARD SPECIFICATION FOR ASPHALT-BASE EMULSIONS FOR USE AS PROTECTIVE COATING FOR METAL.

10. Concrete, Masonry, Stucco, Plaster Repair Materials: Conform to the applicable Sections of the Specifications and approved submittals.

11. Existing Fungus and Mold: Solution composed of 3 ounces trisodium phosphate, one ounce household detergent, 1 quart 5% hypochlorite sodium solution and 3 quarts of warm water. Rinse thoroughly with fresh water.

12. Other Materials: Linseed oil, solvents and other materials not specified but required to achieve required finishes shall be of high quality, and approved by the City Engineer or the Consultant prior to starting work.

2.2 APPLICATION EQUIPMENT

A. For application of the approved paint, use only such equipment as is recommended for application of the particular paint by the manufacturer and as approved by the City Engineer or the Consultant.

B. Prior to use of application equipment, verify that the proposed equipment is actually compatible with the material to be applied, and that integrity of the finish will not be jeopardized by use of the proposed equipment.

C. Spraying equipment for paint finish shall be airless spraying machine with water trap and tip size of 0.017. Inspect spray tip each day for wear and replace worn tip.

D. Brush shall have a good quality natural or synthetic bristle. Roller shall have a good quality natural or synthetic cover. Brush and rollers shall conform with approved manufacturer's recommendation and Section 310-1.2 - APPLICATION of SSPWC.

E. For specified clear brushing lacquers, brushing application shall be used and any use of spray equipment shall be prohibited.

PART 3 - EXECUTION

3.1 SURFACE CONDITIONS

A. Prior to the submittal processes and the painting works, examine the areas and conditions under which work of this Section will be performed. Provide minimum one test for every 3,000 square feet of each of the concrete, masonry, gypsum, stucco and plaster surfaces for alkali with phenolphthalein. Provide removal and cleaning procedures, and correct any condition detrimental to timely and proper completion of the work. Do not proceed until all detrimental conditions are corrected.

B. Remove fungus and mold from surfaces with a solution with composition indicated hereinbefore to the satisfaction of the City Engineer. Rinse thoroughly with fresh water.

C. Remove all ridges, high spots and weld spatter; repair unsound substrates and, correct surface defects which may adversely affect the work of this Section without additional cost to the City. Retest surface areas for alkali after cleaning or neutralizing.

D. Verify that all flashing and caulking materials have been installed properly.

E. All dry, loose, cracked and defected putty or glazing compound shall be removed and provided with new.

F. Any waterproofing sealers that have been applied to protect structures from moisture penetration with exceeded lapse time for the succeeding paints shall be re-tested and re-coated as directed by the City Engineer with no additional cost to the City.

3.2 PROTECTION

A. Contractor shall mask off all adjacent surfaces not to be painted and shall repair or replace damaged area with new work subject to the approval of the City Engineer at no added cost to the City.

B. Furnish sufficient drop cloths, shields and protective equipment to prevent spray or splatter from fouling surfaces not be painted.

C. Remove all fixtures, attachments, signs, electrical plates, surface hardware and related fittings and disassemble all furniture requiring the restoration works prior to commencement of painting work and carefully store, clean, refurbish, refinish and reinstall such items on completion of painting work in each area.

D. Protect all surfaces, equipment and fixtures from damage resulting from use of fixed, movable and hanging scaffolding planking and staging. Repair damage resulting from inadequate protection at no added cost to the City.

3.3 MATERIALS PREPARATION

A. General:

1. Mix and prepare paint materials in strict accordance with procedures submitted and approved by the City Engineer or the Consultant. Mix paint materials in whole unit sizes and do not attempt to mix a partial unit of paint material.

2. When materials are not in use, store in tightly covered containers as supplied.

3. Maintain containers used in storage, mixing and application of paint in a clean condition, free from foreign materials and residue.

B. Stirring:

1. Stir materials with mechanical mixers or power agitator before application, producing a mixture of uniform density.

2. Do not stir into the material any film which may form on the surface, but remove the film and, if necessary, strain the material before using.

3.4 SURFACE PREPARATION OF PAINT AND SEALER

A. General:

1. Perform surface preparation and cleaning in strict accordance with the procedures approved by the City Engineer or the Consultant. Any use of abrasive blasting, air blasting, water blasting, detergent washing, and scrubbing, acid etch or abrasion with power cleaning tools shall be submitted and obtain the approval of the City Engineer in advance. Remove all splashes, ridges, high spots and clean of all dirt, dust, debris, mill glaze, grease, rust, soot, oil, stain, efflorescence and other foreign materials in accordance with the requirements specified herein and elsewhere.

2. Patch nail holes, voids and cracks or other defects permissible under this Contract with appropriate repair compound. All repairs shall be sanded to feather edges and textures to match adjacent area. All surface smoothness and final textures must be obtained and all repaired areas shall be primed with appropriate primer before painting.

3. All new and existing wood surfaces shall be removed of any paint, sealer or stain; sanded and treated until sound surfaces are obtained prior to staining.

4. Crevices, joints, seams and connections of exterior hollow metals, pipes, tubes and posts shall be capped, welded, sealed and watertight in accordance with Contract Documents.

5. Clean and rinse each surface to be painted prior to applying surface treatment or paint as specified herein. All curing agents, bond breaker or form release agents must be removed and surface cleaned before any paint system is applied.

6. Remove oil, grease passivator or stabilizers from all metal surfaces with clean cloths and approved cleaning solvent or detergent of low toxicity and flash point in excess of 200 degrees F, prior to start of mechanical cleaning and surface treatment.

7. Provide surface treatments where required. Spot prime repaired surfaces with the primers as specified herein.

8. All surfaces must be completely dry and dust free and protected from corrosion and oxidation before priming and painting. Do not exceed the lapse time recommended between the surface preparation and painting work.

9. Dissimilar Materials: Apply protective coatings specified hereinbefore. The protective coatings shall be not be visible to the public view.

10. Provide excavation and surface preparation and paint all exterior walls or structures from minimum six inches below the final grades. Backfill and compact trenches upon completion.

11. Semi-transparent film applied to pipes, tubing and conduits at the mill is not to be considered a shop-applied prime coat. For pipes, tubing and conduits to be painted, remove and clean off semi-transparent film, and apply specified primer prior to application of subsequent coat.

12. Schedule the cleaning and painting so that dust and other contaminants from the cleaning process will not fall onto wet newly painted surfaces.

13. Contractor shall be responsible for unsatisfactory work due to improper surface conditions.

B. Preparation of Metal Surfaces:

1. On aluminum and galvanized surfaces specified to be painted, use solvent for the initial cleaning and then mechanically clean to recommended surface profiles. Retreat the surface thoroughly with etching type solution as specifed.

   For galvanized surfaces, remove rust by approved method without damaging or removing the galvanizing. Repair all damaged galvanized coating where required prior to cleaning. Clean and rinse off all cleaning solution completely before proceeding with surface treatment and painting. Conform to the requirements of Subsection 310-3 - SURFACE PREPARATION FOR PAINTING GALVANIZED SURFACES of the Standard Specifications for Public Works Construction(SSPWC). Allow to dry thoroughly before application of paint.

2. On Shop-Primed or Factory-Coated Metal:

   a. Maintain prime coat during the delivery, storage and installation. Protect metal from corrosion or oxidation at all time. Cleaned of dust, dirt and other foreign matter.

   b. Spot coat field connections, welds, soldered joints and burned and abraded areas with same material used for shop priming prior to final paint.

3. Copper Pipe: Rub with steel wool to remove the polish and mill coating and clean with solvent.

C. Preparation of Gypsum Plaster and/or Drywall Surfaces:

1. Fill cracks, holes or other imperfections with suitable joint compound and finish flush with adjoining surfaces. Joint compound shall not be over-thinned and shall be sanded even.

2. To be cleaned of dust dirt, and other surface contamination and be thoroughly dry.

D. Preparation of Portland Cement Plaster Surfaces:

1. Fill cracks, holes and other imperfections with suitable patching plaster, finish flush and match adjacent surfaces.

2. To be treated as recommended by the manufacturer of paint to be applied.

3. To be cleaned of dust, dirt, efflorescence, encrustations and be thoroughly cured and dry.

E. Concrete, Masonry, CMU and Stucco:

1. All concrete, masonry, and stucco surfaces shall be cured at least 30 days before any sealer or paint coat. Remove dust, dirt, grease, bond breaker or other foreign matter by approved methods.

2. Repair minor holes and cracks permissible under this Contract and neutralize all alkalis. Remove all efflorescence. .

3. All existing unsound, hollow or defective masonry joints shall be raked out to depth of ½ inch with pointed mortar. All cracks which exceeds 1/64 inch wide shall be repaired with mortar or approved epoxy grout.

4. Repair concrete voids or pockets permissible under this Contract with approved structural grouts and/or epoxy.

3.5 APPLICATION AND WORKMANSHIP OF PAINT SYSTEM

A. General:

1. Unless specified otherwise all application shall be executed by first class trade painters in accordance with Section 310 – PAINTING of the SSPWC, and the Contract provisions set forth in this Contract, and in accordance with the approved methods by using application equipment and techniques best suited for substrate and type of material being applied.

2. Adequately ventilate freshly painted interior areas to allow entrance of fresh air circulation for at least 24 hours after application of paint.

3. Paints shall not be applied when temperature is below 50 F or when environmental conditions are unfavorable to application or drying of paint materials.

4. All wood and metal work to be hand brushed to produce an even film surface. All large surfaces may be rolled. All exposed ceiling structures and other surfaces where hand brushed work would be inferior may be sprayed as approved by the City Engineer or the Consultant.

5. Thoroughly back paint all surfaces of items that will be concealed or inaccessible after installation.

6. Use approved clean up solvent for tool or equipment cleaning at prescribed intervals during the application process and at the end of the work day.

B. Workmanship:

1. Each coat shall be even, with uniform color and texture.

2. Finish painted surfaces shall be free from sags, brush marks, dirt, cloudy or mottled surfaces, scratches, cracks or other blemishes and thin coating on arises.

3. Mixing of paint materials: Thoroughly stir, strain and keep at a uniform consistency during application in accordance with manufacturer's directions. Do not mix together materials of different manufacturers.

C. Coats:

1. The number of coats and total film thickness specified herein are the minimum that shall be applied to produce the specified workmanship.

2. Apply additional coats when the undercoats or other conditions show through the finish coat, or if required to obtain complete and uniform coverage and approved results.

3. Each coat in full coverage shall be measured for the wet film thickness and obtain the required approvals of the City Engineer before each succeeding coat is applied.

4. Undercoats to be dry and hard before application of succeeding coat and to be tinted to approximate color of finish coat.

5. Prime and succeeding coats for each finish to be products of the same manufacturer unless otherwise specified, indicated or authorized by the City Engineer or the Consultant.

6. Unless specified otherwise, the total film thickness or application rate or coverage for each paint system shall be submitted for review during the submittal process. The actual total film thickness of each coat shall not be less that the minimum film thickness specified below or recommended by the manufacturer, whichever is greater. If application rate or coverage is specified, each application shall not be greater than the rate or coverage specified herein or recommended by the manufacturer, whichever is lesser. Contractor shall include all contingencies in the bid and any increased paint thickness or materials for satisfactory results shall be done at no additional cost to the City.

   a. Primer, Sealer and Undercoat: Minimum wet film thickness of 4.0 mils for each coat.

   b. Concrete Filler: Minimum wet film thickness of 16.0 mils for each coat.

   c. Intermediate and Top (Finish) Coats: Minimum wet film thickness of 3.5 mils for each coat.

   d. Lacquer, Varnish, Sanding Sealer: Minimum wet film thickness of 3.5 mils for each coat.

   e. Combined Stain and Sealer: 100 sq. ft. per gallon.

f. High Temperature Primer and Top Coat: Wet film thickness of 4.75 mils for each coat. Do not exceed specified wet film thickness. Remove excess coating thickness by abrading, otherwise cracking may occur.

g. Coating subject to Pedestrian Traffic: Wet film thickness of 4.0 mils for each coat.

8. Excessively thick coats of paint will not be permitted.

9. All repaired area of existing painted surfaces shall be sealed and painted with total film thickness to match adjacent area to ensure total surface smoothness. Any additional or new finish coat shall be in accordance with the total film thickness or application rate as specified hereinbefore.

D. Colors:

1. As selected by the City Engineer or the Consultant or as noted on the Contract Drawings and in the approved Color Schedule and Sample submittals.

2. Each coat shall provide a proper ground coat for the succeeding coat and differing appreciably in tint from the preceding coat. Finish coats to match approved samples.

E. Touch-Up Painting: Required, all areas or items scratched, marred or defaced in any manner by Contractor's operations as directed by the City Engineer or the Consultant, at no added cost to the City.

1. If shop or factory-applied finish on any equipment furnished by the Contractor is damaged in shipment or during construction operations, equipment shall be refinished by the Contractor to the satisfaction of the City Engineer or the Consultant, at no added cost to the City.

2. One can of touch-up paint shall be provided for each different color of factory-applied finish, which is to be the final finish surface of the product.

3.6 PROTECTION AND CLEAN-UP

A. Following completion of painting in each space or area, reinstall the removed items or new works with care by using employees skilled in the necessary trades. Protect all surfaces from dust, damages or human contact prior to final acceptance. For surfaces requiring other succeeding coating or treatment, protect surfaces from dust, dirt or other contamination. At End of Each Day's Work: Return materials and equipment to the storage area. Remove paint or oil-saturated cloths from the job-site daily or hang out flat and singly to dry.

C. Final Clean-Up: Restore surfaces, not to be painted to original condition if soiled; remove over-spray, coating spots, oil or stain on adjacent surfaces; repair all damage to adjacent surfaces or facilities resulting from the work to the satisfaction of the City Engineer at no additional cost to the City; remove from the job-site all tools, equipment, rubbish and debris; leave the premises in a broom clean condition.

END OF SECTION

SECTION 09 92 18

PAINTED GRAPHICS ON PAVEMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Furnish and install painted graphics on pavements as indicated on the drawings and specified.

1.3 ACTION SUBMITTALS

A. Preliminary Illustrations: Two or three renditions may be required to attain approval of graphic designs. The designer shall prepare shop drawings based on the approved rendition.

B: Shop Drawings: Work with surveyors to establish lines and curvatures with precision. Submit Shop Drawings, indicating the exact locations of graphics, extent, colors and texture of game line markings.

C. Material Samples: Submit colors samples for approval.

1.4 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra paint materials that match products applied and that are packaged with protective covering for storage and identified with labels describing contents, including material, finish, source, and sign location on building.

1. Quantity: Furnish Owner with an additional three percent, but not less than one gallon of each material and color applied.

1.5 MOCK-UPS

A. Prepare mockups of painted graphics for each type of sign material and substrate indicated and each color and finish required to demonstrate aesthetic effects and to set quality standards for materials and execution. Duplicate appearance of approved Sample submittals.

1. Locate mockups on in-place pavements where directed by Architect.

2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.

3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

B. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit installation of signage in exterior locations to be performed according to manufacturers' written instructions and warranty requirements.

C. Accurately layout the game lines in dimensions that are true to their theoretical values. Straight lines shall be perpendicular and parallel. Curved lines shall be accurate in radius.

1.5 PROJECT MANAGER/ARCHITECT (PM/A)

A. The PM/A shall perform project coordination activities and will exercise oversight of painted graphics, particularly in the elements and qualities of aesthetics, including, but not limited to, the following:

1. Provide typical overall coordination of the Work.

2. Coordinate product selections for compatibility.

3. Provide overall coordination of temporary facilities and controls.

4. Coordinate painting and paving operations.

5. Review rough sketches and drawings that will serve as guidance to the final drawings.

6. Coordinate sequencing and scheduling of the Work. Include the following:

a. Initial Coordination Meeting: At earliest possible date, arrange and conduct a meeting with all participating parties for sequencing and coordinating the Work; negotiate reasonable adjustments to schedules.

b. Approve Schedules: Distribute copies of approved schedules to participating parties.

7. Approve photographic documentation completed graphics.

B. PM/A will monitor protection of the finished graphics and manage the close-out of the painting activities.

PART 2 - PRODUCTS

2.1 PAINTED GRAPHICS ON PAVEMENTS

A. Paint: Subject to review of action submittals for compliance with specified requirements provide water emulsion-based Dura-Strip paint as manufactured by TMT-Pathway, or equal. Paint by Frazee, Dunn-Edwards, and Dulux will also be acceptable.

B. Provide commercial quality, 100 percent acrylic emulsion, water thinned paint, containing no alkyds butadiene styrene or vinyls. A minimum amount of necessary additives such as pigment dispersants and anti-foaming agents will be accepted. The use of driers will not be permitted.

1. Colors: Furnish paint in colors as approved on Shop Drawings. The paint must dry to an adherent film with no appreciable discoloration in sunlight or with age.

2. Pigment and Vehicle: Opaque portion of white paint shall be treated rutile titanium dioxide, 3 pounds per gallon, mixed with 100 percent acrylic polymer dispersed in water.

3. Minimum Requirements of Total Solids: 51 percent by weight.

4. Maximum Pigment Content: 36 percent by weight.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Prior to application of paint, allow the pavement to properly cure. Clean and prepare in accordance with paint manufacturer's written recommendations.

B. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

C. Provide tools, apparatus, and mechanical equipment to install paint in a uniform, straight or curved pattern, without holidays and other defects. Ragged or crooked lines will not be acceptable.

D. Do not permit traffic until paint has completely cured.

END OF SECTION

SECTION 09 96 23

GRAFFITI-RESISTANT COATINGS

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Work includes anti-graffiti coating.

1.3 SUBMITTALS

A. Provide submittals in accordance with Division 01.

B. Samples: Submit Samples of coating system.

C. Product Data: Submit anti-graffiti coating manufacturer's technical data and installation instructions, recommended coverage rates for types of surfaces to be treated, and evidence that coatings conform to requirements specified. Submit evidence of code approvals.

D. Furnish Samples on the same materials to which coating will be applied on. Indicate satin or flat finish. Coat one-half of each Sample, with the other half non-coated.

E. Installer: Submit written evidence the installer for the Work of this section has completed at least five projects of similar complexity within the past five years.

F. Certificate and Summary Statement: Before Substantial Completion, submit a certificate stating that coatings applied conform to reviewed submittals and specified requirements. Provide a summary statement setting forth the following:

1. Number of square feet of each surface treated with coating, classified as to the kind of material treated, open pore or closed pore type, and whether vertical or horizontal.

2. The number of gallons of each type, class, or grade of coating required to treat involved surfaces, based on the number of square feet of each type and orientation of the material the coating was installed on.

3. Total gallons of each coating type, class, or grade installed.

G. Maintenance Instructions: Furnish manufacturer's recommended graffiti removal instructions, and recommendations for recoating. Furnish names and addresses of cleaning firms and of suppliers of maintenance materials.

H. Maintenance Material: Furnish five gallons of each product specified.

1.4 QUALITY ASSURANCE

A. Manufacturer's Observation: Start coating application under the observation of the coating manufacturer’s technical representative. Notify Project Inspector and coating manufacturer at least 72 hours before starting installation.

B. Preliminary Tests: Perform tests on each kind of surface to be treated to establish the actual application rates required to provide the surfaces resistant to defacing and meet warranty requirements. Tests shall demonstrate the coating does not yellow, darken, mottle, or discolor any treated surface and those surfaces to be treated are dry. Established application rates shall not be less than those recommended in the coating manufacturer's technical data for the kind and surface orientation of the material.

C. Compliance with Regulations: Materials shall comply with the current rules and regulations of the local air quality management district, with the rules regarding volatile organic compounds, and with FDA rules and regulations for dangerous materials in coatings.

D. Materials shall meet requirements of SCAQMD regarding emission of solvents and other pollutants.

E. Qualifications of Manufacturer: Anti-graffiti coating shall be product of a manufacturer who has been regularly engaged in manufacturing anti-graffiti coatings for at least 5 years. Manufacturer shall supply references of at least five satisfactory installations in which anti-graffiti coating has been in service for at least five years.

1.5 DELIVERY, STORAGE AND HANDLING

A. Deliver coating materials to the Project site in containers bearing name and batch number of manufacturer, with seals intact.

1.6 PROJECT CONDITIONS

A. Protection: Install temporary coverings and protection, and do not allow coating to contact plastic, planting soil, plants, asphaltic paving, roofing membranes, or other materials that are likely to be damaged by coating.

B. Weather Conditions: Do not install coating during windy, wet, or excessively hot or dry weather conditions.

1.7 WARRANTY

A. Manufacturer shall provide a five year material warranty.

B. Installer shall provide a one year application warranty.

PART 2 - PRODUCTS

2.1 ACCEPTABLE PRODUCTS

A. Permashield, by Monopole Inc.: Either of the following products (Matte or High Gloss), as selected by the ARCHITECT:

1. Permashield Premium 5600 over Aquaseal ME12, Permanent Graffiti Control, Monopole Inc., ND Graffiti Shield System, Rainguard VandlGuard System, or equal. Matte finish.

2. Permashield Premium 5650 over Aquaseal ME12, Permanent Graffiti Control, Monopole Inc., ND Graffiti Shield System, Rainguard VandlGuard System, or equal. High gloss finish.

B. Coval Anti-Graffiti coating by Coval Molecular Coatings.

2.2 PROPERTIES

A. Coatings shall not darken or discolor the treated surfaces and shall be non-toxic, compatible with standard polymer type sealing materials, conforming to AQMD 1113, and certified by manufacturer as suitable over paint finish.

B. Colors of opaque materials shall match adjoining colors, or shall be selected from manufacturer's custom colors.

PART 3 - EXECUTION

3.1 PREPARATION

A. Do not start installation of coating if conditions are present that prevent or interfere with the correct preparation of surfaces or installation of coating system.

B. Remove dust, dirt, oil, grease, other deleterious substances and stain, and efflorescence and laitance from surfaces. Repair cracks and holes over 1/16 inch size. Spot prime cracks and holes 1/16 inch size and smaller and prime horizontal surfaces other than soffits with a heavy duty coating supplied by same coating manufacturer. Mask and protect adjoining surfaces and glass, unless coating is harmless and easily removed.

3.2 APPLICATION

A. Install the anti-graffiti coating to surfaces indicated on drawings.

B. Test graffiti resistant coating in an inconspicuous location to ensure adhesion and performance.

C. Apply the anti-graffiti coating to surfaces indicated on drawings per manufacturer’s recommended application methods and thicknesses.

3.3 CLEANING

A. Remove rubbish, debris, and waste materials and legally dispose of off the Project site.

3.4 PROTECTION

A. Protect the Work of this section until Substantial Completion.

END OF SECTION

SECTION 10 17 00

SOLID PHENOLIC TOILET COMPARTMENTS

PART 1 GENERAL

1.1 SUMMARY

A. Furnish and install solid phenolic toilet compartments as indicated on the drawings and specified.

B. LEED Goal #1: The project requirements are to use a minimum of 25% of the building materials that contain in aggregate a minimum weighted average of 20% post-consumer and /or 40% of post-industrial recycled content.

C. LEED Goal #2: The project requirements are to maximize use of locally manufactured products (within 500miles).

D. LEED Goal #3: The Contractor shall only use adhesives and sealants that meet or exceed the VOC (Volatile Organic Compounds) limits of South Coast Air Quality Management District (SCAQMD) Rule #1168 in the building.

1.2 SYSTEM DESCRIPTION

A. Design Requirements: Design and fabrication shall conform to requirements of ADA and CBC.

B. Toilet Compartments: Provide overhead braced floor supported type units consisting of solid phenolic pilasters, panels and doors; plated steel leveling devices with stainless steel covers; aluminum overhead braces, and stainless steel fittings, hardware and fastenings necessary for complete installation.

C. Urinal Screens: Provide wall hung type consisting of solid phenolic screen panels and stainless steel fittings and fastening necessary for complete installation.

1.3 SUBMITTALS

A. Comply with requirements of Section 01022 – ENVIRONMENTAL PROCEDURES for submittal and documentation of environmentally sensitive materials per LEED goals listed above.

B. Shop Drawings: Submit Shop Drawings indicating complete layout, elevations of partitions, thickness of solid phenolic panels, fastenings, proposed method of anchoring, size and spacing of anchors, details of construction, hardware, fittings, mountings, method of assembly, other related items, and installation details.

C. Product Data: Submit manufacturer's technical data for materials, fabrication, finishing, fastenings, hardware, and installation details.

D. Material Samples:

1. Submit full range of Samples of phenolic chips for initial color selection. Chips shall be at least 2 inches x 3 inches.

2. Submit Samples of hardware and fasteners.

E. Certificates: Furnish manufacturer's certification that materials meet or exceed Specification requirements.

1.4 QUALITY ASSURANCE

A. Comply with the following as a minimum requirement:

1. ASTM A167-92b: Stainless and Heat Resisting Chromium Nickel Steel Plated

2. ASTM E 84-91a: Surface Burning Characteristics of Building Materials

3. Chemical Resistance: Panels to meet or exceed Scientific Equipment Furniture Association's (S.E.F.A.) list of 49 standard chemicals.

4. Consistency:

a. Panels to have uniform thickness (+0.03").

b. Panels to have uniform flatness (maximum difference of 0.03") for 10' span.

1.5 DELIVERY, STORAGE AND HANDLING

A. Deliver materials to Project site with manufacturer's labels intact and legible, in sealed containers. Materials shall be kept dry.

B. Provide all means necessary to protect compartments and screens.

1.6 COORDINATION

A. Field Measurements: Secure field measurements before preparation of Shop Drawings and fabrication where possible, for proper and adequate fabrication and installation of the work.

B. Furnish inserts and anchorage built into other construction for installation of toilet compartments and urinal screens.

1.7 GUARANTY-WARRANTY

A. In accordance with Section 01611, the Contractor shall and does hereby warrant and guaranty that all work executed under this Contract be free from defects of materials and workmanship for a period of one year from the date of final acceptance of the project by the Board of Public Works, except certain specific items of work, materials and equipment requiring a guaranty or warranty for a greater period of time is specified.

PART 2 PRODUCTS

2.1 SOLID PHENOLIC TOILET COMPARTMENTS

A. Solid Phenolic Panels: Subject to compliance with specified requirements, partitions shall be by Bradley, or a substitution that has been evaluated by the Architect and determined to be acceptable, and as manufactured by one of the following:

1. Trespa Athlon DSQ panels, Trespa North America Ltd.
2. Pionite Phenolic Panels.
3. Santana Products.

B. Fabricators:

1. Allen Lewis Partitions.
2. Partition Systems Inc.
3. Lam-Tec Industries, Placentia.
4. Santana Products.

C. Hardware:

1. Galaxy Hardware.
2. Capitol Partitions.
3. Santana Products.

D. Toilet compartments panels, doors, pilasters and urinal screens.

1. Core: Phenolic impregnated Kraft papers. Panel shall be at least 93 pounds per cubic foot to ensure full saturation of Kraft core.

2. Face Sheet: Separate sheet of clear melamine over decorative papers impregnated with melamine resin and integrally compression molded with the core.

3. Fire Resistance: The panels shall have the following surface burning characteristics and smoke generation values in accordance with UL classification and labeling in accordance with ASTM E 84 tests and shall be self-extinguishing.

   a. Flame spread: Maximum 30 for 3/4 inch thick panels; 30 for 1/2 inch thick panels.

   b. Smoke developed: Maximum 70 for 3/4 inch thick panels; 85 for 1/2 inch thick panels.

4. Panels shall be UL registered and labeled.

5. Panel shall be resistant to cleaning solvents and uric acid.

6. Product/Material Specification:

   a. Modulus of Elasticity: 1.5 million psi minimum
   b. Shear Strength: 2,000 psi minimum
   c. Compressive strength: 24,000 psi minimum.
   d. Water Absorption: 3% maximum
   e. Use Temperature: 350° F maximum
   f. Surface and Edges: Non-porous
   g. Material Resistance: Will not support fungus or bacteria

E. Stainless Steel: ASTM A167, Type 304.

F. Concealed Fasteners and Leveling Devices: Zinc or cadmium coated steel.

2.2 CHARACTERISTICS

A. Doors shall be minimum 3/4 inch thick, panels minimum 1/2 inch thick, pilasters minimum 3/4 inch thick and screens minimum 1/2 inch thick. Edges shall be machined to a radius of 0.125 inch; exposed surfaces shall be free of fabrication marks.

2.3 FABRICATION

A. Pilasters and Doors: Flush, formed of 3/4" thick solid phenolic panels.

1. Door Dimensions: Unless otherwise indicated, furnish 24" wide in-swinging doors for standard toilet compartments, 36" wide clear opening out-swinging doors when located at the end, and 36" wide clear opening out-swinging doors when located at the side for stalls equipped for use by the physically disabled

2. Anchorage Devices: Provide galvanized steel anchorage devices, complete and threaded rods, washers, and leveling adjustment nuts at pilasters, to permit connection to floor slab. Furnish devices, which are designed to support pilasters from structure without transmitting load to floor fill.

3. Overhead Bracing: Provide anti-grip, decorative, heavy duty, extruded aluminum head rail with clear anodized finish.

B. Panels and Urinal Screens: Flush, formed of 1/2" thick solid phenolic panels. Height and width as indicated in drawings.

2.4 HARDWARE

A. Hinges: Provide 11 gauge Cast Stainless Steel Hinge. Hinge shall be cast of type 304 stainless steel and shall have a Satin finish. Hinge shall be gravity type for self-closing action and shall be fully adjustable up to 360 degrees. Pivot pin shall be made of type 304 stainless steel. Only stainless steel components shall be used in the construction of the Hinge. Plastic inserts are unacceptable. Hinges shall provide emergency access by lifting the door. Hinges shall be pre-drilled for mounting to door and plaster with Stainless Steel through-bolts. Stamped stainless steel is not acceptable.

B. Strike and Keeper with Emergency Access: Provide heavy duty cast stainless steel with a satin finish. The strike and keeper shall be 2.50” high, with the mounting holes at 1.50” on center, and the wall thickness shall be a minimum of .125”. The strike and keeper shall have an integral rubber bumper door stop. The stock number shall be molded into the back of the strike and keeper for ease in identification. Furnish one per door. Stamped stainless steel is not acceptable.

C. Slide Latch: Provide heavy duty cast stainless steel with a satin finish. The slide latch shall be surface mounted. The slide bar shall be .150” thick, 1.020” wide and 3.720” long. Latch shall have an internal stainless steel buffering spring to prevent damage when door is inadvertently slammed against the latch. Mounting holes are to be spaced at 3.50” on center. Latch knob is to be riveted to the slide bar and then welded to insure that the knob will not come off. The stock number shall be molded into the back of the slide latch for ease identification. Furnish one per door. Stamped stainless steel is not acceptable.

D. Coat Hook: Provide heavy duty cast stainless steel with a satin finish. Coat hook and bumper shall be 2.340” high, 1.230” wide and shall protrudes out from the door 3.05”. The hook portion shall have a finished diameter of .250” thick. The stock number shall be molded into the back of the Coat Hook and Bumper for ease in identification. Furnish one per door. Stamped stainless steel is not acceptable.

E. Door Stop: Provide heavy duty cast stainless steel with a satin finish. Plated Zarnac Door stops are unacceptable. Door Stop shall have a 2.125” base diameter and shall protrude 1.80” from the Wall. The bumper at the end of the Door Stop shall be .250” thick. The diameter of the shaft shall be .6875”. The stock number shall be molded into the back of

the Door Stop for ease in identification. Furnish one for each Disabled Accessible door. Stamped stainless steel is not acceptable.

F. Pull Handle: Provide heavy duty cast stainless steel with a satin finish. Plated Zamac Door pulls are unacceptable. Pull Handle shall protrude from the face of the door .940" and shall be 4.735" long. The Pull Handle shall have mounting holes drilled and tapped for 10/24 threads at 3.50" on center. The Pull Handle shall be .655" wide and shall be mounted back to back with the Slide Latch. The stock number shall be molded into the back of the Pull Handle for ease in identification. Stamped stainless steel is not acceptable.

G. Pilaster Shoes: Conform to ASTM A 1678, Type 302/304 stainless steel, minimum 3" high, 15 gauge, finish with No. 3 Directional polish, attached with Stainless Steel Through Bolts.

H. Continuous Brackets: Provide full height extruded 6063-T5 Aluminum with a satin anodized finish. The minimum weight shall be 1.685 pounds per lineal foot. Inside opening of Bracket shall be 0.50" for panels, 0.75" for pilasters. All holes for mounting to wall and panel/pilaster shall be pre-drilled. Holes are to be spaced at 9" on center along the full length of the Bracket for a total of twelve holes for mounting to the wall and seven holes for mounting to the panel/pilaster. Each Bracket is to have a minimum wall thickness of .125".

I. Overhead Bracing (Headrail): Provide continuous heavy duty extruded 6063-T5 Aluminum Headrail with anti-grip profile. Head rail shall have integral reinforcing channel and curtain track. Head rail shall have Satin Anodized finish. Provide Head rail corner brackets, wall brackets, and herd rail end caps as required. The head rail and head rail brackets shall have a minimum wall height of 2". The head rail and head rail brackets shall have a minimum wall height of 2". The minimum wall thickness of the head rail and head rail brackets shall be .125".

J. Chrome-plated, non-ferrous cast alloy material shall not be furnished for hinges, brackets, locks, latches and other fittings and accessories.

PART 3 EXECUTION

3.1 EXAMINATION

A. Before covering wall framing with finish materials, examine framing to ensure that backing plates and structural framing have been installed in such position as to receive all attachment screws.

B. Verify spacing of plumbing fixtures to ensure compatibility with installation of compartments.

C. Do not start the Work of this section until all deficiencies have been corrected.

3.2 INSTALLATION

A. Install partitions and screens as shown in the Shop Drawings and in accordance with manufacturer's instructions and as specified. Install straight, level and plumb.

B. No evidence of drilling, cutting or patching shall be visible in finished Work.

C. Fasten panel brackets securely to walls and ceilings with recommended anchoring devices.

D. Fasten panels and pilasters to brackets with through bolts and nuts.

E. Fasten urinal screen panels to walls with 2 panel brackets, minimum.

F. Provide 1/2 inch spaces between wall surface and panels or pilasters.

G. Provide for adjustment of floor variations with non-breakable plastic shoes on pilasters. Conceal floor fastenings in pilaster shoes.

H. Furnish each toilet compartment door with top and bottom hinges, and door latch.

I. Install door strike keeper on each pilaster in alignment with door latch.

J. Furnish each toilet compartment door with one coat hook and bumper.

3.3 TOLERANCES OF INSTALLED WORK

A. Maximum Variation from Plumb or Level: 1/8 inch.

B. Maximum Misplacement from Intended Position: 1/8 inch.

3.4 ADJUSTING AND CLEANING

A. Hardware Adjustment: After installation, adjust hardware for proper operation. Install hinges on in-swinging doors to hold open approximately 30 degrees from the closed position when unlatched. Install hinges on out-swinging doors to return to the fully closed position. Adjust doors so that bottoms of doors are level with the bottoms of the pilasters when the doors are in the closed position.

B. Adjust and align door hardware to uniform clearance at vertical edges of doors. Clearance space shall not exceed 1/4 inch.

C. Cleaning: Clean compartments, hardware, and doors before Substantial Completion and leave free from imperfections. Remove protective coverings.

END OF SECTION

SECTION 10 41 42

CITY SIGNS AND LOGOS ETCHED ON GLASS(DESIGN-BUILD)

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Furnish and install City signs and logos etched on glass (design-Build) as indicated on the drawings and specified.

B. Graphic Design: Graphic design shall be performed with professional skill and precision. The result shall be true to the Owner's conceptual design, of uniform geometry and aesthetic appearance. Glass thicknesses indicated on Drawings are for detailing only. Confirm glass thicknesses by analyzing in-service conditions.

1.2 DEFERRED SUBMITTAL AND APPROVAL REQUIREMENTS

A. The Contractor shall engineer, design, fabricate, manufacture, and install the City signs and logos etched on glass as the object of the deferred submittal approval, and shall pay all costs associated with obtaining permits for the signs and logos.

B. Submit to the Architect for review product data, illustrations, shop drawings and samples.

1.3 QUALITY ASSURANCE

A. Mockups: Build mockups to verify selections made under samples Submittals to demonstrate artistic, aesthetic effects and qualities of materials and execution.

1. Build mockup of size, dimensions, and location that are acceptable to the Architect.

2. Approval of mockups must be by the Architect in writing.

3. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless such deviations are specifically approved by Architect in writing.

4. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

B. Preliminary Conference: Before starting installation of signs and logos, conduct conference at Project site. Review methods and procedures for performance including, but not limited to, the following:

1. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
2. Review methods and procedures related to sign and logo installation.

3. Review temporary protection requirements for sign and logo assembly during and after installation.

C. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of the signs and logos that fail in materials or workmanship within a 3-year warranty period.

1. Failures include, but are not limited to, the following:

a. Deterioration of finishes beyond normal weathering.
b. Deterioration of colors and sign lamination.

D. Glazier Qualifications: Engage an experienced glazier and graphic artist who have completed glazing similar in material, design, and extent to that indicated for this Project and with a record of successful in-service performance.

PART 2 - PRODUCTS

2.1 CITY SIGNS AND LOGOS ETCHED ON GLASS

A. Manufacturers: Subject review of submittals by the Architect for compliance with requirements, provide products by one of the following (or equal):

1. Architectural Glass Art Inc.
2. Benheim: S.A. Benheim Co., Inc.
3. Creative Central.
4. Dlubak Studios.

B. Uncoated, Clear, Heat-Treated Float Glass: ASTM C 1048, Condition A (uncoated surfaces), Type I (transparent glass, flat), Class 1 (clear), unless otherwise indicated, Quality q3 (glazing select), Kind FT (fully tempered) where indicated.

C. Acid-Etching Process: Fabricate acid-etched glass with hydrofluoric and hydrochloric acid according to manufacturer's standard process. Etching shall match the approved sample.

D. Provide sign and logo components required for a complete assembly including trim, clips, flashings, sealants, gaskets, fillers, closure strips, and similar items. Match material and finish of exposed panels.

E. Uniformity Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved mock-ups. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved mock-ups and are assembled or installed to minimize contrast.

PART 3 – EXECUTION

3.1 INSTALLATION

A. Comply with combined recommendations of the graphic artist, manufacturers of glass, sealants, and glazing materials. Protect glass from edge damage during installation.

END OF SECTION

SECTION 10 44 30

DISABLED ACCESSIBILITY PARKING SIGNAGE

PART 1 - GENERAL

1.1 DESCRIPTION

A. Furnish and install disabled accessibility signage as indicated on the drawings and specified herein.

B. Related Work Sections: Documents affecting work of this Section include, but are not necessarily limited to the GENERAL CONDITIONS, SUPPLEMENTARY CONDITIONS, GENERAL REQUIREMENTS in Division 1 and other Section of the Project Manual.

1.2 QUALITY ASSURANCE

A. Labor: Use adequate number laborer's who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for the proper performance of the work of this section.

B. Codes and Regulations: In accordance with the following documents:

1. American National Standards Institute (ANSI), ANSI A117.1, latest edition - Providing Accessibility and Usability for Physically Disabled People.

2. State of California, Code of Regulations, Title 24, Chapter 11B – Accessibility to Public Buildings, Public Accommodations, Commercial Buildings and Publicly Funded Housing, Section 1129B.5 – Identification of Parking Spaces for Off-Street Parking Facilities.

3. Los Angeles City Building Code and Amendment.

1.3 SUBMITTALS

A. Product Data: Within 45 calendar days after the Contractor has received the City's Notice-To-Proceed, submit list of material, product data of items proposed to be provided under this Section.

B. Shop Drawings: Submit drawings including elevations of each type of sign; dimensions, details, and methods of mounting; shape and thickness of materials; and details of construction.

1.4 PRODUCT HANDLING

A. Protection: Protect the concrete footing, the posts and signs before, during and after installation. Protect from the paving operations.

B. Delivery: Deliver all items to be built into concrete footing in time so as not to delay construction and installation operations.

C. Storage: Properly store all material until time for installation.

PART 2 - PRODUCTS

2.1 STANDARD PRODUCTS

A. Signs shall be as manufactured by [Western Highway Products Inc., or equal.

B. Signs shall be complete with lettering, framing, and related components for a complete installation. Materials and equipment shall be the standard product of a manufacturer regularly engaged in the manufacture of the products. Items of equipment shall essentially duplicate equipment that has been in satisfactory use at least 2 years prior to bid opening.

2.2 MATERIAL AND FABRICATION

A. Posts: Provide two-piece, 2 inches x 2 inches x 1/9 inch thick x9 feet high galvanized steel tabular post and sleeve. Post shall be designed to accept panel framing system and shall be designed to permit attachment of panel framing system without exposed fasteners. Caps shall be provided for each post.

B. Panel Framing System: Panel framing consisting of galvanized steel sections and interlocking track components shall be designed to interlock with posts with concealed fasteners. Top and bottom framing members shall be removable to permit panel removal.

C. Panels: Modular message panels shall be provided in sizes, not less than 18 inches wide x 27 inches high, and as shown on contract drawings. Constructed of reflective sheeting laminated to 18-gage heavy duty sheet steel and silk screened in transparent blue with “Disabled Symbol” and the appropriate message in white. Panels shall be designed to be interchangeable. Panels with metal return sheeting shall have welded corners, ground smooth.

2.3 FINISHES

A. Post finish shall be semi-gloss baked enamel or two-component acrylic polyurethane.

B. Metal panel framing system finish shall be baked enamel or two-component acrylic polyurethane, as standard with the sign manufacturer.

2.4 GRAPHICS

A. Graphics and message shall be applied to panel using the silkscreen process. Silkscreened images shall be executed with photo screens prepared from original art. No handcut screens will be accepted. Original art shall be defined as artwork that is a first generation stencil of the original specified art. Edges and corners shall be clean. Rounded corners, cut or ragged edges, edge buildup, bleeding or surfaces pinholes will not be accepted.

At least one parking sign with “Disabled Symbol” plus the message “Van Accessible” shall be provided. Other accessible parking signs shall be provided with “Disabled Symbol”.

An additional sign shall also be posted in a conspicuous place at the entrance and it shall state the following:

> “Unauthorized vehicles parked in designated handicapped space not displaying distinguishing placards or license plates issued for physically disabled persons

may be towed away at owner's expense. Towed vehicles may be reclaimed at (address) or by telephone (number)".

The blank spaces are to be filled in with appropriate information as a permanent part of the sign by the Contractor.

B. Graphics, message, and colors shall be in accordance with ANSI A117.1. The type face shall be Helvetica medium. All lettering shall not less than one (1) inch in height.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Signs shall be installed at locations shown on the drawings, plumb and true. Bottom of the sign shall be 80 inches above the finish grade of the parking lot or floor.

B. Permanent mounting shall be provided by fastening to 12 inch post sleeve embedded in concrete foundations. Foundations shall be not less than 12 inches in diameter and 24 inches deep with the top one inch above the paving two inches above the finish grade. The top of the foundation shall be shaped/sloped to drain water away from the post. Concrete shall have a minimum compressive strength of 2500 psi at 28 days. Metal sleeve shall be installed 2 inches in the concrete foundation above about the top of concrete and secured with the post; all subgrade, base course and paving shall be compacted and placed around the foundation.

C. Mount sign on the wall or the fence at height noted on the contract drawings in plumb and level position and secured in place with concealed fasteners.

3.2 PROTECTION AND CLEANING

A. The work shall be protected against damage during construction. Keep the signage clean until final acceptance of the work.

END OF SECTION

SECTION 10 52 20

FIRE EXTINGUISHERS, CABINETS, AND ACCESSORIES

PART 1 GENERAL

1.1 SUMMARY

A. Furnish and install fire extinguishers and fire extinguisher cabinets as indicated on the Contract Drawings and in these Specifications as needed for complete and installation.

1.2 RELATED WORK

A. Documents affecting the Work of this Section include, but are not necessarily limited to the GENERAL CONDITIONS, SUPPLEMENTARY CONDITIONS and Sections in DIVISION 1 of these Specifications.

1.3 SUBMITTALS

A. Comply with applicable provisions of SUBMITTALS SECTION 01330 of DIVISION 1 - GENERAL REQUIREMENTS of these Specifications.

B. Product Data: Within 40 calendar days after the Contractor has received the City's "Notice to Proceed" submit the following:

1. Product data for each type of product specified.

2. For fire extinguisher cabinets include rough-in dimensions, details showing mounting methods, relationships of box and trim to surrounding construction, door hardware, cabinet type and materials, trim style, door construction, panel style, and materials.

1.4 QUALITY ASSURANCE

A. Single-Source Responsibility: Obtain fire extinguishers and cabinets from one source from a single manufacturer.

B. Coordination: Verify that fire extinguisher cabinets are sized to accommodate fire extinguishers provided by City under separate contract of type and capacity indicated.

C. NFPA Compliance: Fabricate and label fire extinguishers to comply with NFPA 10, "Standard for Portable Fire Extinguishers."

D. UL-Listed Products: Fire extinguishers UL-listed and bear UL “Listing Mark” for type, rating, and classification of extinguisher.

1.5 GUARANTY-WARRANTY

A. In accordance with Section 01611, the Contractor shall and does hereby warrant and guaranty that all work executed under this Contract be free from defects of materials and workmanship for a period of one year from the date of final acceptance of the project by the Board of Public Works, except certain specific items of work, materials and equipment requiring a guaranty or warranty for a greater period of time is specified.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Basis of design: Larsens architectural series. Manufacturers offering products that comply with specified requirements include:

1. J.L. Industries.
2. Larsen's Manufacturing Co.
3. Modern Metal Products by Muckle.
4. Potter-Roemer, Inc.
5. Samson Metal Products, Inc.
6. Walter Kidde, Division of Kidde, Inc.
7. Watrous, Inc.

2.2 FIRE EXTINGUISHERS

A. Provide fire extinguishers for each extinguisher cabinet, in colors and finishes selected by Architect from manufacturer's standard, which comply with requirements of governing authorities.

1. Fill and service extinguishers to comply with requirements governing authorities and manufacturer.

2. Abbreviations indicated below identify extinguisher types related to UL classification and rating system and not necessarily to type and amount of extinguishing material contained in extinguisher.

B. Multipurpose Dry Chemical Type: UL-rated 2-A:10-B:C,5-LB and 10-BC, 5-LB, nominal capacity.

2.3 MATERIALS

A. Cold-Rolled Steel Sheet: Carbon steel, complying with ASTM A 366, commercial quality, stretcher leveled, temper rolled.

2.4 FIRE EXTINGUISHER CABINETS

A. General: Provide fire extinguisher cabinets where indicated, of suitable size for housing fire extinguishers of types and capacities indicated.

B. Construction**:** Manufacture's standard enameled steel box, with trim, frame, door, and hardware to suit cabinet type, trim style, and door style indicated. Weld all joints and grind smooth. Miter and weld perimeter door frames. Provide locks to all cabinets. Provide two (2) keys for each cabinet lock.

C. Cabinet Type: Suitable for semi-recessed or recessed mounting conditions as indicated on the drawings, of the following types:

1. Semi-Recessed: Cabinet box (tub) semi recessed in walls of sufficient depth to suit style of trim indicated. 4" max. recess into CMU where CMU wall occurs.

2. Recessed: Suitable box (tub) recessed in walls of sufficient depth to suit style of trim indicated. Recess into stud walls.

D. Door Material and Construction: Manufacturer's standard door construction, of material indicated, coordinated with cabinet types and trim styles selected.

1. Fire Rated: Provide fire rated fire extinguisher cabinets when located in one (1) hour walls. Fabricated in accordance with UBC 43-6 (ASTM E814-88).

2. Enameled Steel: Manufacturer's standard finish, hollow steel door construction with tubular stiles and rails. Color to be Frazee 7272 W Candleglow or as selected by the City Engineer.

E. Identification: Identify fire extinguisher in cabinet with lettering spelling "FIRE EXTINGUISHER" applied to door. Provide lettering to comply with requirements indicated for letter style, color, size, spacing, and location or, if not otherwise indicated, as selected by the City Engineer.

1. Application Process: Silk screen. Color: Black letter.

F. Door Style: Manufacturer's standard design, with locking hardware.

1. Center-Glass Panel: Clear break glass, ASTM C 1036, Type I, Class 1, Quality q3, 1/8-inch thick.

PART 3 EXECUTION

3.1 INSTALLATION

A. Install items included in this section in locations and at mounting heights indicated, or if not indicated, at heights to comply with applicable regulations of governing authorities.

B. Prepare recesses in walls for fire extinguisher cabinets as required by type and size of cabinet and style of trim and to comply with manufacturer's instructions. Recess cabinet into stud wall. Do not increase metal stud or metal furring width to recess cabinet.

3.2 ADJUSTING, CLEANING, AND PROTECTION

A. Adjust cabinet doors that do not swing or operate freely.

B. Refinish or replace cabinets and doors damaged during installation.

C. Provide final protection and maintain conditions that ensure that cabinets and doors are without damage or deterioration at the time of Substantial Completion.

3.3 DEMONSTRATION

A. Demonstrate proper installation and performance of fire extinguishers to the City Engineer and Local Fire Marshal.

END OF SECTION

SECTION 10 70 00

METAL LOCKERS AND BENCHES

PART 1 - GENERAL

1.1 SUMMARY

A. Work Included: Provide and install all metal lockers and benches indicated on the Contract Drawings and in these Specifications.

B. Related Sections: Documents affecting work of this Section include, but are not necessarily limited to the GENERAL CONDITIONS, SUPPLEMENTARY CONDITIONS and Sections in DIVISION 01 - GENERAL REQUIREMENTS of these Specifications.

1.2 PRODUCT HANDLING

A. Deliver all specified items to the job-site, handle and store until time for installations in a manner preventing damage of any kind as directed by the City Engineer or the Consultant.

1.3 SUBMITTALS

A. Shop and Erection Drawings: Prior to fabrication and delivery of metal lockers and bench to the job-site submit Shop and Erection Drawings in conformance with provisions in SUBMITTALS in DIVISION 01 - GENERAL REQUIREMENTS showing materials, fabrication, assembly and erection details, backing details and methods of anchoring metal lockers and bench to the structure, submit color charts for color selection.

PART 2 - PRODUCTS

2.1 GENERAL

A. Metal Lockers:

1. Type: Standard Single or double tier louver with individuals sloping tops, complete with hat shelf, hooks and coat hanger rods and flat key lock, for mounting on concrete base, Lyon Metal Products, Republic Steel Products, Renco Products or equal.

2. Size: Each locker 18-inches wide x 21-inches deep by 72-inches high or 12-inches wide x 12-inches deep by 24-inches high.

3. Materials:

a. Body framing of minimum 16 gage annealed patent-leveled steel sheet free from buckles, scales and surface imperfections.

b. Backs, sloping or standard flattop, bottoms and shelving of 24 gage sheet steel.

c. Door and door frame of 16-gage sheet steel.

4. Construction:

a. General: Substantially, fabricated and rigid unit type for grouping together; all steel bolted or welded construction as standard with manufacturer.

b. Body: Adequately flanged for upright sheets, backs, tops and bottom shelves. End panels of metal lockers which will be exposed to be without holes.

c. Door and Frame: Adequately flanged and with stamped louvers top and bottom; with vertical edges reinforced for hardware.

d. Shelves: Formed steel sheet, with rolled or beaded front edge; provide one for each locker, locate approximately 9-inches from top of locker.

e. Finishing Strips: Formed steel sheet with flanges for attachment to metal lockers and to wood stud walls. Strips shall be full height of the lockers.

5. Finish: All unplated ferrous metal surfaces to be given factory applied coating of baked-on enamel neutral color for concealed parts and manufacturer's standard color as indicated on the Contract Drawings or as otherwise selected by the City Engineer or the Consultant.

6. Hardware:

a. Hinges: Five knuckle type, 14-gauge steel, 3 per door, welded to door frame and riveted to side flange of the door.

b. Latching Device: Positive automatic pre-locking type, 3 locking points with rubber silencers at each latching bar, straight lift operation, handle to be chromium plated zinc die cast metal.

NOTE: Handle for ADA lockers to be accessible approved type.

c. Lock: Built-in steel flat key level tumbler type, Master No. 171-0 or R381-1/2 LMK for each locker by Locker Manufacturer, provide 2 keys for each lock, all locks individually keyed; but masterkeyed.

d. Hooks: One combination single-prong ballpointed hook and coat rod holder on each side; hooks cadmium plated and free from sharp edges or corners. Provide each locker with electrunite tubing coat hanger rod.

e. Number Plates: Polished chromium plated with bright background and black etched numerals minimum 3/8-inches high, consecutively numbered as indicated on the Drawings or as otherwise directed by the City Engineer or the Consultant.

B. Locker Room Benchs:

1. Seat Member: Vertical grain Douglas Fir lumber 9 2-inches wide x 1-1/4-inches thick by length indicated on the Contract Drawings, with all corners and edges rounded and with factory applied natural varnish finish.

2. Pedestals: 1-5/8 inch O.D. Standard Steel pipe with welded on 12-gauge adjustable top clamp or 9-inch x 9-inch square heavy steel flange at top and bottom with four anchoring holes for securing seat to the pedestal and securing

the pedestal to the floor. Pedestal assembly to have two coats of a factory applied baked-on enamel of color to match that of the metal lockers.

3. Shop Drawings: Required.

PART 3 - EXECUTION

3.1 GENERAL INSTALLATION

In accordance with Contract Drawings and reviewed and approved Shop Drawings and manufacturer's directions installed by the manufacturer or authorized representative, as approved by the City Engineer or the Consultant.

A. Metal Lockers:

1. Install in plumb position in straight alignment and set closely together and flush with adjoining units.

2. Mount each locker on and secure to raised concrete pad and attach to wall surface with suitable anchors.

3. Attach number plates to each locker unit in consecutive order as directed by the City Engineer or the Consultant.

4. Install all locker units complete with all specified hardware.

5. Finishing Strips (side and for top sloping closures) shall be installed and secured to lockers as necessary to completely close any open spaces between lockers and between lockers and walls.

6. All installed lockers shall be left in operable condition upon completion of this Section. Adjust doors and latches to operate easily without binding.

B. Locker Room Bench:

1. Locate as indicated on the Contract Drawing properly centered and aligned with metal lockers and shall have an overall height of 18-inches.

2. Pedestals: Two pedestals shall be located and spaced to receive wood seat member, set plumb and secured to tile floor with four approved 5/16-inch x 1 3/4-inch fasteners.

3. Wood Seat Members: Securely anchor to the pedestals so as to be level and aligned with metal lockers. Conceal all fasteners.

3.2 CLEAN-UP

A. Remove all resulting excess materials, equipment, rubbish ad debris from the job-site. All spaces used by the Contractor to be left in a clean and safe condition.

END OF SECTION

SECTION 10 80 00

TOILET ROOM ACCESSORIES

PART 1 - GENERAL

1.1 SUMMARY

A. Provide toilet and shower room accessories where indicated on the Contract Drawings, as specified herein, and as needed for complete and proper installation.

B. Related Sections: Documents affecting work of this Section include, but are not necessarily limited to the GENERAL CONDITIONS, SUPPLEMENTARY CONDITIONS and Sections in DIVISION 01 - GENERAL REQUIREMENTS of these Specifications.

1.2 QUALITY ASSURANCE

A. Qualifications of Manufacturers: Products shall be produced by manufacturers regularly engaged in the manufacture of toilet room accessories and with a history of successful production acceptable to the City Engineer or the Consultant.

B. Acceptable Manufacturers: Except as otherwise specified, provide products manufactured by Bobrick Washroom Equipment, Charles Parker Co. or Bradley Corp. (Washroom Accessories Division), or equal..

1.3 SUBMITTALS

A. Product Data: Submit for approval manufacturer's data for each item specified in this Section complying with provisions of SUBMITTALS in DIVISION 1 - GENERAL REQUIREMENTS of these Specifications.

1. Complete material listing of all items proposed to be furnished and installed under this Section.

2. Manufacturer's specification and other data required to demonstrate compliance with specified requirements.

3. Manufacturer's recommended methods of installation.

4. Complete descriptive data on fasteners proposed for each type of wall or partition construction, recommended mounting locations and mounting instructions.

B. Shop Drawings: Submit for approval for each item specified under this Section. Indicate location of backing required to attach to wall or ceiling-support items.

C. Samples: If requested by the City Engineer or the Consultant, submit one full size sample of each specified item. After approval samples may be installed if they are identified and their locations are noted.

D. Non-Stock Items: When so specified submit complete Shop Drawings to the City Engineer or Consultant for approval.

1.4 PRODUCT HANDLING

A. Delivery: Deliver all specified items to the job-site in manufacturer's unbroken containers properly identified with manufacturer's name, product name and model number and safely store where directed by the City Engineer or Consultant until time for installation.

B. Protection: Use all means necessary to protect materials and/or items of this Section before and after installation and the work and materials of all other trades.

C. Replacements: In the event of damage to specified items immediately make all repairs and replacements necessary to the approval of the City Engineer or Consultant at no added cost to the City.

1.5 REFERENCES

A. ANSI A117 - 1986 Specifications for making buildings and facilities accessible to and useable by physically-handicapped people.

B. U.B.C. Chapters 5 and 33 Regulations for the handicapped.

C. Title 24, California Code of Regulations, Parts 2, 3 and 5.

D. ADA, Accessibilities Guidelines for Buildings and Facilities Federal Register Volume 56, Number 144, Rules and Regulations.

E. Fair Housing Amendments Act of 1988, Accessibilities Guidelines, Federal Register Volume 56, Number 44.

PART 2 - PRODUCTS

2.1 GENERAL

A. Anchors and Fasteners: Provide anchors and fasteners capable of developing a retaining force commensurate with the strength of the accessory to be mounted or installed and well suited for use with supporting construction. Where exposed fasteners are permitted, provide vandal proof type fasteners with finish matching the accessory item.

B. Finish: All accessory items shall have stainless steel satin finish.

2.2 TOILET ROOM ACCESSORIES (As Applicable)

A. Subject to compliance with specified requirements, accessories shall be as manufactured by Bobrick, or equal. After evaluation by the Architect, substitutions that have been evaluated by the Architect and determined acceptable may also be approved for incorporation in the project. Toilet room accessories shall be as indicated on the Contract Drawings, or if not so indicated, toilet room accessories shall be as specified hereinafter.

B. Grab Bars: Straight stainless steel bars with peened non-slip gripping surface and with two attachments.

1. On Wall Behind Toilet: Bobrick No. B-5507.
2. On Side Wall Adjacent to Toilet: Bobrick No. B-2606.
3. On Shower Wall: Bobrick No. B-62616.

C. Combination Seat Cover Dispenser And Toilet Tissue Dispenser: Bobrick No. B-3474, recessed unit dispenses 1000 seat covers and two rolls of toilet tissues.

D. Framed Mirror: Bobrick No. B-292-2430 with stainless steel frame and with shelf to project out 5-inches and have 3/4-inch return edges or sizes indicated on the Contract Drawings.

E. Soap Dish in Shower: Bobrick No. B-665 recessed dish and bar, stainless steel with polished finish.

F. Paper Towel Dispenser: Bobrick No. B-263 surface mounted, type stainless steel with satin finish.

G. Folding Shower Stall Seat: Bobrick No. 5171 slotted phenolic right or left hand seat, color as selected from manufacturer's standard selections, stainless steel frame and mounting bracket with self locking mechanism and with slotted phenolic seat 32-inches wide projecting 23 inches out from wall when in level position and 18-inches from the floor.

H. Shower Curtain Rod: Bobrick No. B-207 Stainless Steel Rod with concealed mounting, 20 gauge rod, type 304 stainless steel with satin finish, 1-inch diameter with 1 5/8 inch diameter chrome plated polished brass flanges, rod length inches. Flanges attached to concealed wall brackets.

I. Shower Curtain: Bobrick No. 204-2, opaque matt white vinyl, of width to suit shower stall opening x 72 inches high, with heat sealed grommets along top edge of curtain at 6-inches on center and with side and bottom edges hemmed and fitted with 7 or more type 304 stainless steel hooks Bobrick No. 204-1 for 1-inch O.D. shower curtain rod.

J. Soap Dispenser: Bobrick No. B-88, surface mounted, stainless steel hood and translucent shatterproof liquid soap container.

K. Waste Receptacle: To be furnished and installed by the City.

L. Sanitary Napkin-Tampon Vendor: Bobrick No. B-2802, stainless steel construction, surface mounted type, 25-cent operation, holds 15 napkins and 21 tampons.

M. Combination Seat Cover Dispenser, Napkin Disposal and Toilet Tissue Dispenser: Bobrick No. B-3574, recessed type to fit within 4-inch deep x 16-inch wide x 29 2-inch wall opening, dispenses 1000 seat covers, 2 rolls of toilet tissues, constructed of 22 gauge type 304 stainless steel with satin finish, or Bobrick No. B-3579, same as specified above, surface mounted type.

N. Towel Bar: Bobrick No. B-674, 3/4-inch diameter bright polished stainless steel x 18-inch length for location on partition outside shower stall.

O. Medicine Cabinet:

1. Type: Hall-Mack No. P-1626 steel cabinet with hinged mirror (with chrome-plated trim) and three (3) glass shelves.

2. Finish: Vitreous porcelain enamel finish fused to the cabinet body.

P. Hair Dryer: Bobrick No. B-2307, surface mounted and high speed type for location in Women's Locker Room. *Specifier to verify color and power requirements.

Q. Swimsuit spinner: Suitmate water extractor.

2.3 OTHER MATERIALS

Provide other materials, not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the City Engineer's or Consultant's approval.

PART 3 - EXECUTION

3.1 INSPECTION

Examine the areas and conditions under which Work of this Section will be installed. Correct detrimental conditions to the proper and timely completion of the work. Do not proceed until detrimental conditions have been corrected.

3.2 COORDINATION

Throughout construction of substrate surfaces, use all means necessary to ensure proper and adequate provisions for concealed support devices and for finished openings to receive Work of this Section.

3.3 INSTALLATION

A. General:

1. Locate accessories as indicated on the Contract Drawings or as otherwise directed by the City Engineer or the Consultant.

2. Securely attach accessories to adequate supports with concealed approved vandal - proof fasteners.

3. Install accessory items as per manufacturer's recommendations, mount flush and plumb with adjacent wall surfaces.

4. Installation and locations shall comply with State of California (CAL/ABL) California Architectural Barriers Laws and the ADA (Americans with Disabilities Act).

5. Install each item in its proper location, firmly anchored into position, level and plumb, and in accordance with the manufacturer's recommendations.

B. Adjustment: Before final inspection, inspect each accessory item installation for rigid and secure installation. Take necessary adjustment action for rigid and secure installations.

END OF SECTION

SECTION 10 82 14

PREENGINEERED ROOFTOP EQUIPMENT SCREENS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Furnish and install preengineered rooftop equipment screens and indicated on the drawings and specified, complete with structural support.

B. Design Criteria: Contractor shall be responsible for the structural design of all materials, assembly and attachments to resist wind, suction and uplift loading at any point without damage or permanent set.

1. Framing shall be designed in accordance with the California Building Code (CBC) to resist the wind loading imposed at 100 mph.

2. ASCE 7: Conform to the Minimum Design Loads for Buildings and Other Structures; American Society of Civil Engineers.

1.3 SUBMITTALS

A. Product Data: For each type of product indicated. Include Manufacturer's product data including performance data, preparation instructions and recommendations, storage and handling requirements and recommendations, and installation methods.

B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.

C. Samples: Submit sample of screen to show blades, vertical supports, finish, and color.

D. Qualification Data: For qualified Installer.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: The Installer shall be manufacturer's authorized representative who is trained and approved for installation of units required for this Project.

B. Welding Qualifications: Qualify procedures and personnel according to:

1. AWS D1.1/D1.1M, "Structural Welding Code – Steel".
2. D1.2/D1.2M, "Structural Welding Code – Aluminum."
3. D1.3, "Structural Welding Code - Sheet Steel."

C. Preinstallation Conference: Conduct conference at Project site.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Store products in manufacturer's unopened packaging until ready for installation.

B. Store materials in a dry area indoors, protected from damage and in accordance with manufacturer's instructions.

C. Handling: Protect materials and finishes during handling and installation to prevent damage.

D. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

1.6 PROJECT CONDITIONS

A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

B. Field Measurements: Verify actual dimensions of construction contiguous with horizontal wall screens by field measurements before fabrication.

PART 2 - PRODUCTS

2.1 PREENGINEERED ROOFTOP EQUIPMENT SCREENS

A. Basis-of-Design Product: Subject to compliance with requirements, provide the product indicated on the drawings or an “or equal” product of one of the following:

1. Roofscreen Mfg Inc.
2. Spinnaker Screening Systems.
3. Eclipse Screens Systems.
4. Atlas Equipment Screens.

B. Fabrication: Dimensions, style, and profiles shall be as indicated on the drawings.

C. Assembly:

1. Factory assembled screen components. Mechanically fastened construction.

2. Anchorage shall be concealed and not visible on the exterior face of the screen.

D. Plates, shapes, and bars shall conform to ASTM A36.

E. Square or rectangular tubing shall be hot formed, welded or seamless, conforming to ASTM A500, Grade B.

2.2 FINISHES SHALL BE AS SELECTED BY THE ARCHITECT

A. High-Performance Finish: Finish rooftop screens at the place of manufacture. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

1. Provide powder coat finish, or

2. Siliconized polyester finish.

B. Finishes shall have the following minimum physical properties:

1. Humidity Resistance: 1000 hours.

2. Salt-Spray Resistance: 1000 hours.

C. Color: As selected by the Architect from manufacturer’s full line of colors.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install screens at locations indicated on the drawings and without roof penetration, in accordance with manufacturer's instructions.

B. Install screens in the style indicated, and in alignment with adjacent work.

3.2 CLEANING

A. Clean screen surfaces in accordance with manufacturer's instructions.

B. Touch-up, repair or replace damaged products before Final Completion.

END OF SECTION

SECTION 11 31 03

APPLIANCES AND EQUIPMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Furnish and install appliances and equipment as indicated on the drawings and specified.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product indicated. Include rated capacities, operating characteristics, dimensions, furnished accessories, and finishes for each appliance.

B. Samples: For each exposed product and for each color and texture specified, in manufacturer's standard size.

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For qualified Installer.

B. Product Certificates: For each type of appliance and equipment, from manufacturer.

C. Field quality-control reports.

D. Warranties: Sample of special warranties.

1.5 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For each appliance and equipment to include in operation and maintenance manuals.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: An employer of workers trained and approved by manufacturer for installation and maintenance of units required for this Project.

B. Source Limitations: Obtain appliances and equipment from single source and each type of item from single manufacturer.

C. Regulatory Requirements: Comply with the following:

1. NFPA: Provide electrical appliances and equipment listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

2. ANSI: Provide gas-burning appliances and equipment that comply with ANSI Z21 Series standards.

D. Preinstallation Conference: Conduct conference at Project site.

1.7 WARRANTYS

A. Special Warranties: Manufacturer's standard form in which manufacturer agrees to repair or replace appliances, equipment, or components that fail in materials or workmanship within specified warranty period, except as qualified below:

1. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 APPLIANCES AND EQUIPMENT SHALL BE AS INDICATED ON THE DRAWINGS

A. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

B. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions, with Installer present, for compliance with requirements for installation tolerances, power connections, and other conditions affecting installation and performance of appliances and equipment.

B. Examine roughing-in for piping systems to verify actual locations of piping connections before appliance installation.

C. Prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.

D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. General: Comply with manufacturer's written instructions.

B. Utilities: Comply with plumbing and electrical requirements.

3.3 FIELD QUALITY CONTROL

A. Perform tests and inspections.

1. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect components, assemblies, and equipment installations, including connections, and to assist in testing.

B. Tests and Inspections:

1. Perform visual, mechanical, and electrical inspection and testing for each appliance equipment according to manufacturers' written recommendations. Certify compliance with each manufacturer's appliance-performance parameters.

2. Leak Test: After installation, test for leaks. Repair leaks and retest until no leaks exist.

3. Operational Test: After installation, start units to confirm proper operation.

4. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and components.

C. An appliance or equipment will be considered defective if it does not pass tests and inspections.

D. Prepare test and inspection reports.

3.4 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain appliances and equipment.

END OF SECTION

SECTION 11 44 72

OWNER FURNISHED CONTRACTOR INSTALLED (OFCI) APPLIANCES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. The Contractor shall install OFCI appliances as indicated on drawings or as directed by the Owner.

1.3 SUBMITTALS

A. Notification: Within 30 calendar days after notice to proceed, submit to the Owner a schedule in quadruplicate giving desired dates for delivery of OFCI appliances. The schedule shall be subject to revision and written approval of the Owner. Approved dates of delivery shall be confirmed thirty days prior to delivery, by the Contractor.

1.4 COORDINATION

A. Coordinate OFCI-related construction activities included under various Sections of these Specifications to assure efficient and orderly installation of the OFCI Work.

1. Where installation of the OFCI appliance is dependent on preparatory installation of other components, either before or after the OFCI installation, schedule activities in the sequence required to obtain the best results.

2. Where availability of space is limited, coordinate installation of OFCI appliances to assure maximum accessibility for required maintenance, service and repair.

3. Make adequate provisions to accommodate appliances scheduled for later installation.

1.5 DELIVERY

A. When the specifications require OFCI appliances, the appliances will arrive at the site of the work freight prepaid by the Owner. Under this arrangement the supplier, owns goods in transit, and files any claims for loss that may occur during shipment. The Contractor shall be responsible for unloading and handling OFCI from the truck tailgate, and will bear the cost for loss or damage during unloading. The Contractor shall sign the receipt as evidence delivery of the OFCI appliances.

B. The Contractor shall retain sufficient materials handling equipment and personnel to accomplish the unloading of OFCI appliances without delay. All charges by the trucking company due to delay shall be paid by the Contractor.

C. Upon receipt of OFCI appliances, the Contractor shall open delivery containers, uncrate, unpack, and remove wrappings, and inspect the shipment to ensure that all materials, including accessories, have been received, and that all appliances are complete and in undamaged condition. Promptly report loss, defect, or damage to the Owner. When loss

or damage is not caused by the negligence of the Contractor, the Owner will repair or replace damaged appliances at no cost to the Contractor. Damage due to the negligence of the Contractor shall be made good and whole at the sole cost and expense of the Contractor.

1.6 STORAGE

A. Store OFCI materials in a protected manner that will preserve appliances from loss or damage due to the weather, fire, pilferage, or any other cause. Store materials on raised platforms, off the ground, in enclosures, or under tarpaulins.

PART 2 PRODUCTS (NOT APPLICABLE)

PART 3 EXECUTION

3.1 INSTALLATION

A. General: Comply with OFCI appliance manufacturer's installation instructions and recommendations. The Contractor shall assemble, install and connect OFCI appliances. Assemble components, connect piping, make electrical connections and perform all other work required for operation or use of OFCI appliances.

B. Built-In Equipment: Securely anchor OFCI appliances to supporting structures with concealed fasteners. Verify that clearances are adequate for proper functioning and rough openings are completely concealed.

C. Free Standing Equipment: Place units in final locations after finishes have been completed in each area. Verify that clearances are adequate for proper operation of equipment.

D. Mechanical Services: Provide gas lines, hot and cold water service, HVAC, and other mechanical services required for the proper operation and use of OFCI appliances. Refer to Division 15 for mechanical requirements.

E. Electric Power: Provide electric current of the proper characteristics, wiring, connections, junction boxes and receptacles required for operation of OFCI appliances. Refer to Division 16 for electrical requirements.

3.2 ADJUST AND CLEAN

A. Testing: Test each OFCI appliance to verify proper operation. Make necessary adjustments.

B. Accessories: Verify that standard accessory appliances have been furnished and installed.

C. Cleaning: Remove packing material from OFCI appliances and leave units in clean condition, ready for operation.

END OF SECTION

SECTION 12 28 74

CYCLOOPS BICYCLE RACKS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Provide cycloops bicycle racks as indicated on the Contract Drawings and these Specifications and as needed for a complete and proper installation.

1.3 ACTION SUBMITTALS

A. Submit descriptive literature, illustrations and technical data. Include installation instructions.

B. Samples: Submit sample of factory applied finish for approval.

PART 2 - PRODUCTS

2.1 SERPINTINE BICYCLE RACKS

A. Manufacturer: Subject to review of action submittals by the Architect for compliance with requirements bicycle racks shall be the product indicated on the drawings or an Architect-approved substitution by one of the following:

1. Thomas Steele Inc.
2. Columbia cascade Company.
3. Canterbury International.
4. L.A. Steelcraft.
5. American bicycle Security Co.

B. Rack shall accommodate not less than the number of bicycles indicated on the drawings.

C. Material: Rack shall be formed from ASTM Schedule 40, or AISI MT1010, electric welded, minimum 14-gage, color coated. Units shall be equipped with grout cover escutcheon.

D. Finish: Colors shall be as selected by the Architect from the manufacturer's standard colors.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install the bicycle racks in accordance with the manufacturer's recommendations as approved by the Architect, properly aligned, plumb and secure. Rack shall permit embedment in concrete to a minimum depth of 10" below finished grade. Prior to application of finish, each embedded leg shall be factory drilled to accept a minimum 6" long No. 4 reinforcing bar to be horizontally inserted 3" from the base.

END OF SECTION

SECTION 12 63 13

SKATING RINK SEATING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Furnish and install skating rink seating, including concrete footings, as indicated on the drawings and specified.

1.3 REFERENCES

A. ASTM A36 - Standard Specification for Carbon Structural Steel.

B. ASTM A123 - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.

C. ASTM A307 - Standard Specification for Carbon Steel Bolts (Ordinary Strength Bolts).

D. ASTM A500 - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.

E. ASTM A529 - Standard Specification for High-Strength Carbon-Manganese Steel of Structural Quality.

F. ASTM A572 - Standard Specification for High-Strength Low-Alloy Columbium-Vanadium Structural Steel.

G. AWSD1.1, Structural Welding Code-Steel.

H. AISC, American Institute of Steel Construction Code of Standard Practice for Steel Buildings and Bridges.

1.4 OWNER'S PROJECT REQUIREMENTS

A. Rink seating shall be designed by a registered structural engineer licensed in the State of California.

B. Comply with the provisions of ICC 300, Standard on Bleachers, Folding and Telescoping Seating, and Grandstands.

1. Uniformly distributed live load of not less than 100 pounds per square foot of gross horizontal projection.

2. Parallel sway load of 24 pounds per linear foot of seats, applied to seat lengths, designed to resist a horizontal swaying force; and in a direction perpendicular to length of seats, 10 pounds per linear foot of seat plank.

3. Grandstands structure shall be designed and constructed to resist as a minimum the lateral seismic forces set forth in the CBC. Horizontal wind load, including live load, shall not be less than 30 pounds per square foot of gross vertical projection.

4. Seat and foot board members shall be designed for live loads of not less than 120 pounds per linear foot.

5. Elements of grandstands structure and their attachments, permanent nonstructural components and their attachments, and the attachments for permanent equipment supported by the grandstands structure shall be designed and constructed to resist the total seismic forces prescribed in the CBC.

6. Railings and guardrails shall be able to resist a lateral load of 50 pounds per lineal foot applied horizontally at right angles to the top rail.

7. The mounting of guardrails and handrails shall be such that the completed railing and supporting structure are capable of withstanding a single concentrated load of at least 200 pounds applied in any direction at any point along the top.

8. Intermediate rails, balusters and panel fillers shall be designed to withstand a horizontally applied normal load of 50 pounds on an area equal to 1 square foot, including openings and space between rails.

9. Stair treads and aisle stair treads shall be designed to resist a minimum concentrated load of 300 pounds on an area of 4 square inches.

C. Aisles: Placement of aisles shall meet local code requirements and shall be located to obtain maximum number of seats in grandstands. Aisle planks shall be securely fastened to their supports.

D. Exits: Shall be provided for installation to accommodate spectator movement at specified locations.

E. Footing design shall be based on allowable soil pressures indicated on Drawings or in the soils report. Footings shall extend a minimum of 18 inches below finish grade unless otherwise required or indicated. Comply with requirements of Division 03 for cast-in-place concrete.

1.5 SUBMITTALS

A. Drawings: Indicate locations, dimensions, assembly and anchoring details. Indicate size and location of concrete footings and steel reinforcing. Indicate locations and dimensions of aisles.

B. Calculations: Submit engineering design calculations, signed and sealed by a registered structural engineer licensed in the State of California.

C. Product Data: Submit complete Product Data for system components.

D. Product Sample: Submit one 18-inch long seat sample.

E. Installation Instructions: Submit manufacturer's complete printed installation instructions.

F. Manufacturer’s Mill Certificate: Submit, certifying that products meet or exceed specified requirements.

1.6 QUALITY ASSURANCE

A. Qualifications of Manufacturer: Grandstands shall be the product of a manufacturer regularly engaged in manufacture of grandstands for at least five years. Provide references of five satisfactory installations in which grandstands have been in service for three or more years.

B. Design, fabricate, and install steel members in accordance with AISC - Design, Fabrication, and Erection of Structural Steel for Buildings.

C. AWS D-1.1 Code - Welding in Building Construction. Welders shall be AWS certified.

D. Source Quality Control: Mill Test Certification.

E. Mockups: Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for fabrication and installation.

1. Build mockups of area of bench seating, including finishes and accessories.

2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.

3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.7 DELIVERY, STORAGE AND HANDLING

A. Deliver components packaged to avoid any damage.

B. Stack materials on site and cover with suitable weather tight covering. Panels shall not be stored in contact with materials that cause staining. Materials having defects or damages that effect appearance, serviceability or use will be rejected.

1.8 WARRANTY

A. Manufacturer shall provide a five year material, fabrication, and installation warranty.

PART 2 - PRODUCTS

2.1 EXTERIOR STADIUM GRANDSTAND SEATING

A. Grandstands shall be American Seating Inc. “Sports Seating 507 Series” or a substitute product of one of the following that has been evaluated by the Architect and determined acceptable:

1. Steel Stadiums.
2. All Star Bleachers, Inc.
3. E & D Specialty Stands, Inc.

B. Seats and backs shall be of high density polyethylene, contoured, and integrally colored. Colors shall be as selected by the Architect.

C. The structure shall be elevated framed type. Framework shall be prefabricated angle frames spaced at maximum of 6-foot intervals and connected by cross braces. Structural steel members shall be of adequate size and location and reinforced as required to carry required design loads.

OR

D. The structure shall be elevated type Steel Beam construction with wide flange columns, stringers and cross beams, connected by structural steel cross bracing angles. Structural steel members shall be of adequate size and location and reinforced as required to carry required design loads.

E. Structural Steel:

1. Structural Steel members shall conform to ASTM A36, A572 Grade 50, A529 Grade 50 or A500 Grade B.

2. Threaded Fasteners: ASTM A307.

3. Anchor Bolts: ASTM F1554.

4. Galvanizing: Steel members shall be galvanized per ASTM A123.

F. Footboards, decking, stair and ramp planks shall be 2-inch by 10-inch, 0.078 thick, mill finish aluminum extrusions closed interlocked tongue & groove with risers, and welded. Risers shall have a nominal thickness of 0.090 inches. The plank surface shall have a non-slip anti-skid fluted design. Exposed ends of aluminum planks shall be furnished with an extruded aluminum end cap with matching design. Stair and aisle treads and landings shall have a 2-inch wide contrasting color painted strip located maximum 1 inch from the nosing.

G. Guardrails shall be furnished at front, back, and ends of grandstand and at exits, entry stairs and ramps, and at any other location indicated in the drawings. Guardrails shall be of adequate size, location and height to satisfy local codes and specified design loads. Railing material shall be clear anodized aluminum.

1. Guardrails shall be 1 5/8-inch outside diameter anodized aluminum rails and posts with end caps and with chain link infill panels. Chain link fabric shall be 2-inch by 9 gage, galvanized. Aluminum tubing shall be 1/8 inch thick, mill finish.

OR

2. Guardrails shall be 1 ½-inch by 1 ½-inch posts with top and bottom members with 3/4 inch square vertical pickets welded in place to prevent the passage of a 4-inch sphere. Aluminum tubing shall be 1/8 inch thick, mill finish.

H. Handrails for stairs, ramps and aisles shall be not less than 1-1/4 inch and not more than 1 ½-inch outside diameter anodized aluminum. Provide aluminum connecting brackets.

I. Provide required fasteners and connectors. Fasteners for aluminum components shall be galvanized steel. Bolts shall be provided with slit-beam locknuts to prevent loosening of the assembly due to vibration.

J. Accessibility Signs:

1. International Symbol of Accessibility: Provide International Symbol of Accessibility sign for each disabled-person location, attached to front of bleacher in truncated area. If two wheelchairs are provided next to each other, provide one sign for each. ISA shall be a minimum of 4 inches square.

2. Companion Seat Sign: Provide one visual sign with text “RESERVED FOR COMPANION SEATING” for each disabled-person location, attached to front of first row of bleachers. Text height shall be a minimum of 1 inch.

3. Post visual sign in ticket offices indicating availability of seats for disabled persons and companion seat. Sign shall include the International Symbol of Accessibility.

K. Concrete: Comply with requirements of Division 03.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions for compliance with requirements for construction tolerances, material properties as they affect anchors and fasteners. Do not proceed with installation until unsatisfactory conditions have been corrected.

B. Verify that concrete footings have reached the design strength prior to grandstands erection.

3.2 ERECTION

A. Install the exterior stadium grandstand seating in accordance with Shop Drawings, Design Drawings, Specifications, and manufacturer's instructions.

3.3 CLEANUP

A. Remove rubbish, debris and waste materials and legally dispose of off the Project site.

3.4 PROTECTION

A. Protect the Work of this section until Substantial Completion.

END OF SECTION

SECTION 32 93 17

CONCRETE FILLED PIPE BOLLARDS (TBD BY DWP)

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Furnish and install fixed concrete filled pipe bollards (galvanized steel pipe guard posts) as indicated on the drawings and specified.

B. The bollard design, materials of construction, layout, locations, dimensions, and profiles will be subject to the direction of the City Department of Water and Power.

1.3 SUBMITTALS

A. Submit shop drawings showing materials and installation bollards.

1.4 FIELD MEASUREMENTS

A. Make field measurements to ensure that bollards are installed in the proper location, and in correct relationship to the adjacent facilities. Where bollards are designed to protect other construction, check actual dimensions to verify the suitability of positioning.

PART 2 - PRODUCTS

2.1 FIXED CONCRETE FILLED PIPE BOLLARDS

A. Provide galvanized and prime coated, standard weight steel pipe as specified in ASTM A53. Embed or anchor posts in concrete.

B. Concrete Footings: Provide Class 500-6-2500 concrete prepared as prescribed in Section 201-1 "Concrete, Mortar and Related Materials" of the Standard Specifications for Public Works Construction (SSPWC).

C. Nonshrink, Nonmetallic Grout: Premixed, factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with CE CRD-C 621, by Dayton Superior Corp., Master Builders, W. R. Meadows, Inc, Sonneborn Building Products Div., U.S. Grout Corp., or equal.

D. Paint fixed bollards with primer and 2 coats of enamel, colors as directed by the Architect.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install fixed bollards in accordance with the approved shop drawings. Anchor after posts have been inserted into holes, fill annular space between post and the cavity wall with nonmetallic grout.

END OF SECTION

SECTION 12 93 26

TRASH BINS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Furnish and install trash bins as indicated on the drawings and specified.

B. Size dimensions, and capacity shall be as indicated on the drawings or as directed by the Owner.

1.3 ACTION SUBMITTALS

A. Submit product data. The data submitted shall fully describe trash bins, their materials of construction, parts, and maintenance instructions.

PART 2 - PRODUCTS

2.1 TRASH BINS

A. Trash bins shall be all welded steel containers designed to contain trash and refuse generated from residential occupancies. The containers shall be standard commercial-industrial type, of heavy duty not less than 0.1046" thick (12 gauge) steel construction, leakproof, and designed for mechanized truck mounted fork lift handling. Containers shall conform to Federal Specification OO-R-2741.

B. Containers shall roll on wheels with positive breaking and locking devices to prevent inadvertent movement. Equip bin with 1 1/2" plugged drain hole. Containers shall be primed rust resisting materials that are standard with the manufacturer. The exterior shall be finished coated with industrial enamel. The interior shall be finished with a polymeric coating to resist leaking.

C. The bins shall be equipped with operable lids, hinges, and hasp for padlocking. Rollers shall be lubricated. Bent, damaged, leaking, rusting, and otherwise defective containers shall be repaired and repainted or replaced by the Contractor at no cost to the Owner.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install trash bins as recommended by the manufacturer. Instruct the Owner's representative of any information required for sustaining the serviceability and usefulness of the bins. Install bins in the last part of the construction period to preclude use of the bins for construction disposal purposes. Do not put construction refuse in the trash bins.

END OF SECTION

SECTION 13 18 00

ICE SYSTEM GENERAL

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. All necessary and incidental labor and materials for the construction and installation of a fully operable ice system, including refrigeration plant, one indoor ice rink floor, piping, electrical, and other related items as further specified in later sections of this Specification.

2. General construction procedures.
3. General system and control design criteria.
4. Motor control panel.
5. Refrigerant charge.
6. Refrigerant leak sensor.
7. Quality assurance.
8. Warranty.

1.2 RELATED SECTIONS

A. Related Work Specified Elsewhere:

1. Conditions of the Contract and Division 01 Sections apply to work of this Section.
2. Section 13 18 13.01 - Ice Rink Floors.
3. Section 13 18 14.02 – Packaged Chillers
4. Section 13 18 14.08 - Evaporative Condenser.
5. Section 13 18 14.12 - Pumps.
6. Section 13 18 14.13 - Waste Heat Recovery Systems.
7. Section 13 18 14.14 - Chemical Treatment System.
8. Section 13 18 14.15 - Ice System Insulation.
9. Section 13 18 14.16 – Ice System Piping Specialties.
10. Section 13 18 14.17 – Ice System Piping and Fittings.
11. Section 13 18 14.18 – Ice System Valves and Accessories.
12. Electrical Specification Sections.

1.3 SUBMITTALS

A. General:

1. The Contractor shall submit complete shop drawings for all equipment and materials to the Engineer prior to fabrication and installation.

2. All submittals shall be in conformance with Division 01.

B. Complete fabrication shop drawings of the entire system, accessories, and equipment.

C. Literature and Drawings, including dimensions, weights, required electrical wiring, control diagrams.

D. Recommendations, procedures, and requirements for coordination with the work of other trades on the Project, complete wiring, piping, and control diagrams covering field installation.

1.4 OPERATING AND MAINTENANCE MANUALS

A. Submit three copies of the final approved Operation and Maintenance Manuals to the Engineer. See Division 1 specification sections for general procedures and requirements for the Operation and Maintenance Manuals.

1.5 RECORD DOCUMENTS

A. Maintain and submit record documents as described in Division 1 specification sections.

1.6 GENERAL REQUIREMENTS

A. Refrigeration System Design Criteria:

1. Pipe sizing for the refrigeration system shall be the responsibility of the Contractor, unless specifically indicated on the Drawings. The piping shall be sized so as not to reduce the capacity or efficiency of the system below specified current or future design criteria.

2. The Contractor shall be responsible for locating isolation valves and service/purge valves adjacent to all components that require service regardless of whether or not they are shown on the Drawings.

3. General Design Criteria Summary:

Number of Equal Size Rinks	One
Refrigerated Rink Surface Size	200’-1” by 85’-1”, w/28’-1/2” Rad.
Refrigeration Tonnage	140 Tons
Compressor Sat. Disch. Temp.	95 Degrees F
Primary Refrigerant	R-513A
Secondary Refrigerant	40% Ethylene Glycol Solution
Secondary Refrigerant Average Aver. Circulation Temperature	17 Degrees F, Range 15 Degrees F to 18 Degrees F
No. Screw Compressors	2 – Rotary Screws
Horsepower – Mini Screws Each	Two 200 H.P.
No. Equal Size Rink Circulation Pumps	Two
Rink Circulation Pump Capacities	1,238 GPM at 83 ft. head each
Rink Circulation Pump H.P.	Two 40 H.P.
Nominal Size Rink Floor Piping	5/8 Inch O.D. (1/2 Inch I.D.)
Type of Rink Piping	High Density Polyethylene
Pipe Spacing	1-1/2 Inches O.C. Max.
Condenser Fan H.P.	One 7.5 H.P.
Condenser Recirculation Pump H.P.	Two 7.5 H.P.
Snow Melt Pump H.P.	One 1.5 H.P.
Sub-Soil Heat Pump H.P.	One 2 H.P.
Total Connected H.P.	506.0 H.P.

B. Refrigeration System Control Design Criteria:

1. The Ice System Contractor shall provide the detailed design and installation of all refrigeration and ice system controls. Control design and installation shall be performed by experienced technicians specializing in ice rink refrigeration control systems, who have designed and installed a minimum of 5 similar control systems in the last 5 years.

2. Sequence of Operation: Refrigeration system shall automatically control the temperature of the ethylene glycol solution pumped through the rink floors to an adjustable return set-point temperature. In general, compressors will be controlled by the combined rink return glycol set-point temperature, the evaporative condenser fan and pump by compressor discharge head pressure, the rink circulation pumps by automated variable speed control, and the chiller refrigerant level by electronic level probe control.

3. Control system shall automatically adjust the flow rate of the chilled ethylene glycol solution to each rink to provide an adjustable return set-point temperature. Variable speed drives on each rink circulation pump shall automatically adjust pump output to provide the desired return set-point temperature for each rink. Rink pumps for each rink shall operate at a minimum 500 GPM at all times.

4. Compressors shall be controlled and staged as per manufacturers recommendations.

5. The condensing pressure shall be controlled by cycling the evaporative condenser variable-speed fan and water pump as described in Section 13 18 14.08.

6. Waste heat recovery systems shall be controlled as specified in Section 13 18 14.13.

C. Motor Efficiencies:

1. All motors shall have a minimum nominal efficiency in percent which meets or exceeds the requirements of Section 13 18 15.02.

1.7 ICE SYSTEM CONTRACTOR QUALIFICATIONS AND QUALITY ASSURANCE

A. Ice System Contractor shall have responsible design and construction personnel with a minimum 10-years experience on comparable Projects.

1. Ice System Contractor shall be in full conformance with any applicable codes or ordinances regarding licensing of ammonia or other high-pressure pipefitters.

2. Ice System Contractor must provide the Engineer a listing of comparable projects and must supply certified evidence of at least 5 ice rink system installations similar to these Specifications that have been operating for a minimum of 5 years. This list shall include the names of the facilities, locations, Owner and/or Engineer, and the names of qualified operating personnel who can give accurate data on the operating history of the system. This information shall be provided to the Engineer immediately after the Bid Date, and will be considered prior to award of the Contract.

B. Codes: All labor, materials, services, and equipment furnished and installed by the Contractor shall be in accordance with the latest published codes applicable to the project location in Maryland for the proposed refrigeration system installation, including the following:

1. International Fire Code.

2. National Electric Code.
3. International Building Code.
4. International Mechanical Code with Amendments.
5. ANSI/ASHRAE 90.1-2004.
6. OSHA.
7. ANSI/ASHRAE Standards 15 and 34.
8. American Standard Code of Refrigeration Piping ASA B31.5.
9. American Standard Code for Pressure Piping ASA B31.1.
10. American Standard Code for Pressure Vessels.
11. ANSI/IIAR Standard 2, Current Edition
12. Any applicable city, county or state codes and ordinances.

1.8 WARRANTY

A. The Contractor shall provide a full 1-year materials and labor warranty on all Work and all materials, in addition to all standard equipment warranties provided by the equipment manufacturers.

1.9 DELIVERY, STORAGE AND HANDLING

A. The Contractor shall deliver all materials and equipment to the Site and shall be responsible for storage and security of all materials and equipment.

B. Store all materials off the ground and covered to avoid any damage by atmospheric conditions.

C. Conform to all applicable Division 01 Specification requirements.

PART 2 - PRODUCTS

2.1 REFRIGERANT LEAK DETECTION SYSTEM

A. Provide an ammonia leak detection system for the Mechanical Room.

B. Manufacturer: Gas Guardian 6 as manufactured by Calibration Technologies, Inc., Ph. 866.394.5861, or approved equal.

C. Leak detection system shall be capable of continuously monitoring the air in the Mechanical Room and in the vent relief main for the presence of R-717 ammonia. System shall meet ASHRAE 15 Standard and all applicable local codes.

D. Leak detection system kit shall include monitor/control panel with power supply, sensors (3), 3-conductor sensor cables, and remote horn/strobes with 12-volt wiring (4), calibration kit, uninterruptable power supply, and shall include the following features:

1. Alarm condition shall trigger an alarm light, internal beeper, and relay contact outputs.

2. Three adjustable alarm levels with assignable relays and alarm delays.

3. A setback function using different alarm set-points and alarm delays.

4. Provide one low range electrochemical sensor module with 3-wire cable. Range to be 0 to 250 ppm. Power input 24VDC, 350 mAMP.

5. Provide one high range catalytic bead sensor module with 3-wire cable. Range to be 0 to 2% (20,000 ppm). Power input 24VDC, 250 mAMP. 5 to 7-year life, annual calibration. Sensor to be supplied in a NEMA 3RX enclosure.

6. Alarm log shall retain time and level of alarm.

7. Six SPDT relays for remote alarming and connections to:

   a. Exhaust fan control circuit.
   b. Three remote visual strobe/horns.
   c. Refrigeration system shutdown.
   d. Expansion modules available for future connections

8. Self-contained remote horn/strobe units (3 units) to provide minimum 99dB @ 10 feet sound output. High intensity xenon bulb with blue lens. 24 volt DC supply voltage. NEMA 4X enclosure.

9. Provide one calibration kit which includes the flowing:

   a. Calibration manuals for all types of sensors provided for the system.
   b. Norprene tubing and calibration cups
   c. 0.8 LPM regulator with pressure gauge
   d. One 1.7 liter cylinder with 250 ppm R-513A refrigerant gas.

2.2 R513A REFRIGERANT

A. Provide operating charge of R-513A primary refrigerant. Operating charge shall be defined to be the recommended operating charge for the flooded chiller, evaporative condenser, all liquid and suction lines, waste heat exchangers, the compressors, plus the high-pressure receiver manufacturer's recommended sealing charge.

2.3 CIRCULATION FLUIDS

A. Circulation fluid for the ice rink floors and cooling system shall be a 40% by volume solution of inhibited ethylene glycol and deionized water. Circulation fluid for the ice rink subsoil heat systems and the snowmelt system shall be a 30% by volume solution of inhibited ethylene glycol and deionized water. Fluid shall be Dowtherm SR-1 Inhibited Ethylene Glycol-based Heat Transfer Fluid or approved equal.

B. The fluid shall be an industrial heat transfer fluid designed for use in HVAC systems.

C. The fluid shall contain corrosion inhibitors, buffers, and antifoam agents. Automotive antifreeze, uninhibited glycol, or field/distributor-inhibited solutions are not acceptable.

D. Fluid properties of the 40% glycol/water mix for the ice rink floors, cooling system, and subsoil and snowmelt heating system shall conform to the following:

1.	Freezing point	-13 degrees F.
2.	pH	8.0 to 10.0.
3.	Specific gravity	1.065 at 50 degrees F.
4.	Weight	66.47 lbs/CF at 50 degrees F.
5.	Specific heat	0.82 BTU/lb degrees F at 50 degrees F.
6.	Thermal conductivity	0.234 BTU/hr-ft degrees F at 50 degrees F.
7.	Viscosity	4.1 cps at 50 degrees F.

E. The water used to mix the solutions shall be deionized and shall contain no more than 100-ppm calcium carbonate hardness, 50-ppm calcium plus magnesium ions, or 50-ppm chloride plus sulfate ions. Domestic tap water shall not be used.

F. Tags shall be attached near the system fill points containing the following information:

   1. Date of original system charge.

2. Descriptions of fluid, including manufacturer's name, address, and phone numbers.
3. Freezing point.
4. Total system gallons.
5. Reference to Material Safety Data Sheet.

G. Provide testing agency sampling, testing, and certification of the above mixtures after startup of the systems. Tests of each system shall include as a minimum solution pH, specific gravity, calcium carbonate hardness, calcium plus magnesium ions, and chloride plus sulfate ions.

2.4 SIGNAGE

A. Refrigeration system signage shall be provided in conformance with the International Mechanical Code, the International Fire Code, ASHRAE 15, and NFPA 704. Signs shall be permanent, engraved plastic, weatherproof construction. Signs to be provided shall include, but not be limited to:

1. System description signs indicating the name and address of the installer, refrigerant number and amount of refrigerant, the lubricant identity and amount, and the field test pressure applied. Signs shall be mounted adjacent to both doorways into the Mechanical Room.

2. System warning signs, reading "MACHINERY ROOM – AUTHORIZED PERSONNEL ONLY. ENTRY IS FORBIDDEN WHEN THE REFRIGERANT LEAK ALARM HAS BEEN ACTIVATED, EXCEPT BY THOSE PERSONNEL TRAINED IN THE EMERGENCY PROCEDURES REQUIRED." Signs shall be mounted adjacent to all doorways into the Mechanical Room.

3. Emergency refrigeration system shut-down and ventilation system controls located outside the Mechanical Room shall be identified as to their functions.

4. Emergency shutdown procedures, including precautions to be observed in case of a breakdown or leak shall be displayed. The precautions shall address instructions for shutting down the system in case of emergency, the name, address, and day/night telephone numbers for obtaining service, and the name, address, and day/night telephone numbers of all City, State, and Federal Agencies to be contacted in the event of a reportable incident. Signs shall be mounted adjacent to all doorways to the Mechanical Room.

2.5 REFRIGERATION EQUIPMENT MOTOR CONTROL PANEL

A. Electrical motor control panel for all refrigeration equipment shall be provided and installed by the Ice System Contractor.

B. Motor control panel shall contain motor starters and feeders for all refrigeration system components. Variable speed drives for the rink circulation pumps and condenser fan may be mounted in the panel or remotely, at the Contractors option. Each starter shall be furnished with a run light, and auxiliary contacts as required. All power wiring for all refrigeration equipment shall be provided by the Ice System Contractor. All control wiring and related conduit between the panel and field devices, including but not limited to the pumps, microprocessor control systems, solenoid valves, pressure switches, and sensors shall also be designed, furnished, and installed by the Ice System Contractor.

C. The motor control panel shall comply with all applicable provisions of Section 13 18 15.06.

D. Finish shall be white enamel inside and gray outside over phosphatized surfaces.

E. The refrigeration controls shall be incorporated in the panel, and shall include the following:

1. Running Lights and Hour Meters for:

a. Rink Circulation Pumps (2)
b. Compressors (4)
c. Condenser Fan (1)
d. Condenser Pump (1)
e. Sub-soil Heat Pumps (1)
f. Snowmelt Circulation Pump (1)

2. Control Switches for:

a. Rink Circulation Pumps (2 - On/Off/Auto)
b. Compressors (4 – Off/Automatic)
c. Condenser Fan (1 – Hand/Off/Automatic)
d. Condenser Pump (1 – Hand/Off/Automatic)
e. Sub-soil Heat Pump (1 - On/Off)
f. Snowmelt Circulation Pump (1 – On/Off)

3. Pressure controllers for condenser fan cycling.

4. Pressure controls for condenser pump cycling.

5. Low temperature and no-flow safety cutout controls.

6. Isolated alarm contact for high return brine temperature. Alarm level shall be operator adjustable. An automatic dialer device shall be provided to alert the system operators of a high glycol temperature condition.

7. The system controls shall be designed so that the emergency remote control located outside the Mechanical Room will stop the action of all refrigeration system components, and close the solenoid operated “King Valve” located between the receivers and the chillers, as required by the International Mechanical Code, International Fire Code, and ASHRAE 15. The remote controls shall be installed at locations shown on the Drawings.

8. To prevent over-pressurization of the R-513A system high side, an automatic crossover connection shall be provided between the system high and low sides, as shown on the drawing schematics. In the event that a high-pressure condition is encountered, a solenoid valve shall open to allow the high pressure to vent to the low side and the refrigeration system shall be automatically shut down.

2.6 PUSH BUTTON DEVICES

A. Heavy duty, oil-tight, 30.5 mm with NEMA A600 contacts; Allen-Bradley 800T, General Electric CR104P, Square D Class 9001 Type K, Westinghouse PB1 line, or approved equal.

B. Green start operators. Red stop operators.

C. Knob lever selector switch operators.

D. Transformer type indicating lights with red lens.

2.7 LOW TEMPERATURE SAFETY CUTOUT

A. Penn A19ABC-36 as manufactured by Johnson Controls, or approved equal.

2.8 IDENTIFICATION LABELS

A. All equipment and devices shall be identified with a laminated plastic nameplate that has white lettering of not less than 3/16 inch on a black background. Nameplates shall be attached with screws. Field mounted equipment such as transmitters and sensors shall be identified with stamped brass tags.

2.9 SYSTEM MANUAL SHUTDOWN CONTROL SWITCH

A. Manufacturer/Model: Square D Model 9001K15.

B. Control switch shall be break glass pushbutton style, NEMA 4, heavy duty, 30-millimeter size, furnished with enclosure and contact block.

PART 3 - EXECUTION

3.1 INSPECTION

A. The Contractor shall notify the Owner/Engineer a minimum of 5 days in advance for all inspections so that necessary inspections can be accomplished. Engineer will provide the Contractor with a listing of required inspections at the Preconstruction Conference.

3.2 MECHANICAL ROOM LAYOUT

A. The drawings show the refrigeration equipment laid out in a configuration where the chiller equipment is fully shop-assembled onto steel skids that are delivered to the site and connected to the rink transmission piping and electrical systems as necessary. Skid components shall be structural steel beams, tubes, angles, and channels sized and configured for stresses encountered during assembly, delivery, and long-term operation. All steel components shall be prepared, primed, and painted.

3.3 SYSTEM STARTUP AND COMMISSIONING

A. After pipe testing has been completed and approved and all piping has been thoroughly flushed with clean water to remove debris and contaminants, the secondary refrigerant systems (rink floors, transmission mains, and refrigeration system) shall be completely charged with the specified 40% ethylene glycol solution, and the waste heat systems (subsoil heat and snowmelt systems) shall be completely charged with the specified 40% ethylene glycol solution. All free air shall be removed from the piping systems through venting, pump cycling, and any necessary vacuum pumping. The Contractor shall be responsible for venting any free air from the systems for a period of 4 months after system startup.

B. Furnish a complete charge of R-513A refrigerant for the primary refrigeration system, plus any additional necessary to make up for any leaks to place this system into a leak-tight, oil-free, operating condition for the entire period of warranty.

C. Provide the services of equipment manufacturer factory-trained technicians for minimum 16-hours to completely check out and adjust mechanical unit operation.

D. Start-up and commissioning of all refrigeration system components shall conform to the requirements of ANSI/IIAR Standard 5-2013 Start-up and Commissioning of Closed-Circuit Ammonia Refrigeration Systems. Standard 5-2013 provides basic minimum requirements for the safe start-up and commissioning of completed closed-circuit mechanical refrigerating systems utilizing ammonia as the refrigerant. A printed copy of Standard 5-2013 shall be provided by the Contractor and shall remain on-site until the project is closed. Required start-up and commissioning documentation, both preliminary

and final, shall be submitted to the Engineer and Owner, and copies shall be included in the Operation and Maintenance Manuals.

E. Start refrigeration system and cool rink floors down to operating temperature over a 48-hour period.

F. Assist/instruct Owner's operating personnel in laying first ice sheets. Assistance shall include two trained persons for minimum 4 eight-hour days per rink, who shall operate and adjust the refrigeration equipment during the ice laying operation and assist/instruct the Owners staff with ice installation procedures.

G. Contractor shall paint rink surface white and install playing lines, goal creases, and other rink surface markings. Painting/marking products are described in Section 13 18 13.01.

H. Provide Owner's operating personnel with minimum 24-hours of hands-on instructions.

I. Review operation and maintenance material with Owner and staff at time of instructions.

3.4 SYSTEM SHUTDOWN

A. Contractor shall provide system shutdown service following the first season of use. Contractor shall coordinate shut-down date with the Owner.

B. Provide Owner's operating personnel with 8 hours of hands-on instruction on shutdown procedures. Shutdown services to be provided shall include:

1. Move all R-513a refrigerant into the receiver vessel and close valves to isolate from system.

2. Turn off all equipment components.

3. Lubricate all equipment, change compressor oil and filter.

4. Inspect all equipment, and repair or replace defective components.

5. Check all fluid levels and fill to proper operating levels if necessary.

3.5 WORK INCLUDED

A. Ice System Contractor shall provide all materials and perform all work required to complete the ice systems, including but not limited to the following:

1. Provide trenching, backfill, compaction, piping, and insulation for transmission mains from the Mechanical Room to the rinks and all other items identified in the Project documents.

2. Verify tolerances of rink subgrade soil and concrete rink perimeter slabs prior to starting work. The rink subgrades will be graded flat except for header trenches at the rink centerlines.

3. Furnish and install sub-soil drainage piping systems.

4. Furnish and install sub-soil heat supply and return headers, and related heat piping on the rink subgrades.

5. Provide and install backfill over heat piping, including compaction and fine grading for ice rink insulation.

6. Furnish and install rink floor insulation and vapor barrier beneath refrigerated surfaces.

7. Furnish and install rink refrigeration piping and headers, spacers, and sand for complete refrigerated ice rink floors as shown on the Drawings.

8. Insulate refrigeration equipment and piping as specified and shown on the Drawings.

9. Furnish and install refrigeration system, including premanufactured chillers, evaporative condenser, rink circulation pumps, motors, chiller controllers, and all related controls, tanks, valves, piping, and hangers.

10. Furnish and install auxiliary heating systems utilizing waste heat from the refrigeration system to provide heat for the sub-soil heating systems and snow melting system.

11. Install concrete pads for the equipment in the Mechanical Room, if equipment isn't installed on steel skid frames.

12. Provide all specified testing.

13. Furnish and install primary and secondary refrigerant charges.

14. Provide 1-year project warranty as specified.

15. Furnish and install the conduit runs and related control cables from the temperature monitors located in the Mechanical Room to the rink temperature sensors as shown on the Drawings.

16. Design, furnish, and install all refrigeration controls, a motor control panel, and other control equipment and electrical work. All electrical work and materials shall comply with sections 13 18 15.01 through 13 18 15.08.

17. Furnish and install a refrigerant leak detection system for the Mechanical Room, as well as controls to automatically shut down operation of the refrigeration system.

18. Provide pressure relief valve and piping system, as shown on Drawings.

19. Provide controls outside the doors into the Mechanical Room to manually shut-down the refrigeration system. Contractor shall include in his bid the design and construction of appropriate control and power systems as necessary.

20. Provide and install refrigeration system safety signage.

21. Provide specified system startup, commissioning, and shutdown services.

3.6 COORDINATION OF WORK

A. The Contractor shall make every effort to cooperate and coordinate with all other contractors working on the Site.

3.7 PERMITS

A. The Contractor shall be required to apply for, obtain, and pay for all permits necessary for the completion of the Work.

3.8 LEAK DETECTION SYSTEM

A. Monitor/control panel shall be mounted outside the Mechanical Room at the location indicated on the Drawings.

B. Sensors shall be mounted inside the Mechanical Room at locations near the chillers and as approved by the Engineer.

C. Self-contained remote horn/strobe units (4 units) to be installed on the wall inside the Mechanical Room and at the exit doors just outside the Mechanical Room.

D. The Contractor shall provide all interconnections into related systems, including the refrigeration shutdown, and the fan starter.

E. Start-up and adjust operation of components in conformance with manufacturer's written instructions. Set alarm levels in conformance with ANSI/IIAR 2-2014 standards. Provide written start-up verification report to Engineer, including alarm level settings and indication that all controls, sensors and alarms are operating properly.

F. Start-up and commissioning of all leak detection components shall conform to the applicable requirements.

3.9 EQUIPMENT CLEANING

A. Thoroughly clean equipment of all temporary protective coatings and foreign materials prior to assembly or erection.

B. Clean external surfaces or erected equipment of oil, grease, dirt, or other foreign material.

C. Touch up paint, primer, and filler as required on all equipment, piping, and vessels.

3.10 SEISMIC CODE CONFORMANCE

A. Installation and design of all components of the ice system shall conform to applicable seismic requirements.

B. To ensure conformance of the system with the applicable seismic standards, the Ice System Contractor shall retain a qualified Maryland Registered Engineer to inspect the ice system component installation, to evaluate whether the installation meets the seismic standards, to provide design details as necessary to correct any non-conforming component, and to issue signed reports describing necessary corrections and certifying conformance of the completed system. The Seismic Engineer's inspections shall occur after the reviewed systems are installed, but prior to installation of insulation that would obstruct adequate review or installation of additional anchorages and bracing. At the Ice System Contractor's option, the Seismic Engineer may also be involved in initial planning and installation of the ice systems.

C. Designs of seismic anchorages and bracing, as well as inspection reports, shall be submitted to the Project Engineer for review in the form of Shop Drawings. Scheduling of the required seismic inspections and shop drawing submittals shall allow sufficient time for review by the Project Engineer as well as the Owner. The review submission must take place a minimum of 2 weeks prior to planned installation of the correction measures, to allow for plan review. Additional time may be necessary if submissions are deficient.

D. All costs for seismic code conformance, including engineering costs and installation of anchorages and bracing, shall be included in the project Bid.

3.11 VIBRATION

A. All pumps, compressors, and motors shall be designed and furnished such that the finished installation operates within acceptable vibration limits. No excess vibration will be allowed for any possible operating condition.

B. If, in the opinion of the Engineer, the amount of vibration of any pump, compressor, or motor is in question, then the Contractor shall be responsible for hiring an experienced vibration company, Electrical Mechanical Services, General Electric, or approved equal to perform vibration testing. A certified test report shall be submitted to the Engineer and include complete test results, calculations, and sketches of locations of field measurements.

C. If the certified test results do not indicate compliance with the manufacturer's recommended limitations and industry standards, the manufacturer and Contractor shall be responsible to correct the problem by whatever means is necessary. Modifications proposed shall be submitted to the Engineer for approval.

END OF SECTION

SECTION 13 18 13.01

ICE RINK FLOORS

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Rink floor grading and materials.

B. Sub-soil drainage system.

C. Sub-soil heating system.

D. Insulation and vapor barrier.

E. Rink floor design and installation criteria.

F. Ice rink perimeter expansion joint.

G. Ice painting and marking.

1.2 RELATED SECTIONS

A. Related Work Specified Elsewhere:

1. Conditions of the Contract, Supplemental Conditions, and Division 01.
2. Section 13 18 00 – Ice System General
3. Section 13 18 14.16 – Ice System Piping Specialties.
4. Section 13 18 14.17 – Ice System Piping and Fittings.
5. Section 13 18 14.18 – Ice System Valves and Accessories.

1.3 SUBMITTALS

A. Submit survey of subgrade elevations before installing sub-soil heat piping.

B. Submit gradations of the clean sand to be placed below the insulation for approval by the Engineer.

C. Submit survey of finished rink piping elevations.

D. Shop drawings and samples of the piping, tubing, headers, spacers, insulation, and vapor barrier shall be submitted as required in Section 13 18 00.

1.4 QUALITY ASSURANCE

A. Shall be as required in Section 13 18 00.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Shall be as required in Section 13 18 00.

PART 2 - PRODUCTS

2.1 NON-EXPANSIVE GRANULAR FILL

2.2 NON-EXPANSIVE GRANULAR FILL BELOW ICE FLOOR

A. Non-expansive fill: The material shall be sound, durable particles of pit-run or washed sand with 100 percent of the material passing the #4 sieve, less than 50 percent passing the #40 sieve, and not more than 8 percent passing the #200 sieve. Screenings from stone crushing will also be acceptable provided the material meets the gradation requirements stated.

2.3 SUB-SOIL DRAINAGE SYSTEM

A. Drainage Piping and Fittings:

1. Drainage piping shall be schedule 40 PVC perforated drainage pipe with drainage holes located along the bottom of the pipe. Size shall be as shown on the drawings.

2. Stone that wraps the piping shall be a ¾" washed crushed stone.

3. Geotextile fabric wrapping for the crushed stone shall be a medium weight non-woven geotextile filter cloth.

4. Prefabricated fittings shall be used for all connections, fittings, and accessories. All fittings and components shall be provided by the same manufacturer as the drainage piping.

B. Outlet Piping:

1. Piping between the perforated drainage pipe and the storm sewer system shall be Schedule 40, PVC with solvent welded joints and size in accordance with the drawings.

2. A PVC backwater valve/observation assembly shall be installed on outlet piping downstream from the perforated drainage piping. Provide PVC access sleeves to ground level, with gasketed cover. Oatey Product No. 43906, or approved equal.

2.4 ICE RINK PIPE MATERIAL

A. Pipe material shall be high-density virgin polyethylene, PE4710 resin for the transmission and header piping. Piping using PE3408 resin is not acceptable.

B. Minimum density of header piping shall be 0.959 gm/cc, as measured using ASTM test method D4883.

C. Working pressure rating for header piping shall be minimum 200 psi (DR11) for 3" and 8" piping.

D. Rink floor pipe shall be high density black polyethylene.

E. Minimum pipe dimensions in inches shall conform to the following:

Nominal O.D.	1 Inch	3 Inches	8 Inches
Actual O.D.	1.315	3.500	8.625
Wall thickness	0.12	0.206	0.507
Actual I.D.	1.055	3.063	7.54
Weight, Lb./Ft	0.201	0.937	5.68

F. All piping and tubing connections shall be by fusion welding. Welds shall be performed by personnel fully trained and experienced in the required procedures.

2.5 ICE RINK FITTING MATERIAL

A. Material shall be high-density virgin polyethylene using resin compatible with and fusible to the specified piping.

B. Butt Heat Fusion Fittings shall conform with ASTM D3261 (latest edition).

C. Socket-Type fittings shall conform with ASTM D2683 (latest edition).

D. Return bends shall be fabricated from high-density virgin polyethylene to centers shown on Drawings. Return bends may be fabricated from two 90 degree bends or may be single piece 180 degree bends.

E. All fittings shall be manufactured not field/shop fabricated.

F. Minimum density of fitting material shall be 58 lbs/ft3 (0.955 gm/cc).

G. Maximum working pressure rating shall be at minimum equal to the rating of the pipe.

H. Service Saddles:

1. Shall conform to the above requirements.

2. Shall be socket-type fittings with a minimal restriction equal to the actual I.D. of the pipe.

2.6 FLOOR INSULATION

A. Insulation Material: 2 layers of 1-1/2 inches thick extruded polystyrene, ASTM C578 (latest edition), Type IV. 4’-0” x 8’-0” square edge sheets.

B. Mastic: Dow Chemical Company General Purpose Mastic No. 11.

C. Vapor Barrier/Slip Sheet: 6 mils thickness clear polyethylene sheeting. Provide in rolls of maximum width and length to minimize seams. Supply with compatible 2” to 3” width poly tape for taping all holes and seams.

2.7 TUBING/REINFORCEMENT SUPPORTS

A. Approved Manufacturers: Hunter Wire Products Ltd or approved equal.

B. Style: For sand surface floor, functioning as tubing spacers.

C. Wire Material: 0.1875-inch plain steel wire, no coating.

D. Base Plate: Continuous, 3-inches width, 24-gauge cold rolled steel.

E. Length Per Support: 6 feet.

F. Tie Wire: Black annealed wire, 16 gauge or heavier.

2.8 PERIMETER JOINT MATERIAL

A. Expansion Joint Material:

1. 1-inch-thick perimeter insulation, ASTM C578 (latest edition), Type IV.

2.9 CIRCULATION FLUID CHARGES

A. Sub-Soil Heating and Snowmelt Systems (Warm): 40 Percent by volume ethylene glycol solution (glycol/water).

B. Refrigeration Floor (Cold): 40 Percent by volume ethylene glycol solution (glycol/water).

C. See Section 13 18 00.2.4 for additional circulation fluid requirements.

2.10 ICE FLOOR AND SUB-SOIL TEMPERATURE SENSORS

A. Sensors: 3-wire RTD 100-ohm platinum as manufactured by Pyromation, Omega Engineering, or approved equal.

B. Control Wire: 3/C #18, 100 percent shielded with PVC jacket; Beldon 8770, or approved equal.

C. Conduit: PVC, Schedule 40.

D. Junction Box: Malleable iron conduit body with malleable iron cover with gasket.

2.11 ICE FLOOR AND SUB-SOIL TEMPERATURE MONITORS

A. Approved Manufacturers: Omega Engineering, Inc., Model DP460.

B. Provide a total of four units per rink constructed. Two monitors for ice floor temperature display and two monitors for sub-soil temperature display.

2.12 ICE PAINTING AND MARKING MATERIALS

A. Ice Paint: Shall be Jet-Ice Super White 3000, or approved equal.

B. Markings: All hockey playing lines, goal creases, and other markings shall be Jet-Ice Easy-In woven cloth textile material, or approved equal. Markings shall be provided and installed in conformance with USA Hockey standards at shown on the Official Rink Diagram at: www.usahockeyrulebook.com/page/show/1018530-appendix-iv-official-rink-diagrams.

PART 3 - EXECUTION

3.1 INSPECTION

A. The Contractor shall notify the Engineer a minimum of 5-days in advance of the covering of any sub-soil heat or rink refrigeration pipe or tubing so that necessary inspections can be accomplished. The Engineer's authorized representative must have inspected, witnessed pressure testing, and approved of all piping systems prior to covering them with sand or concrete.

3.2 GLYCOL PIPING PRESSURE TESTS

A. The rink floor and sub-soil heat piping, tubing, headers, and transmission mains shall be tested before covering with sand.

B. Transmission piping shall be blanked off in the Mechanical Room to conduct testing on the floor grid, headers, and transmission mains as one complete system.

C. The Engineer shall witness the testing. Provide 3-days notice to allow the Engineer to be on the Site.

D. Testing Procedure:

1. Fill the piping system with water and bleed off any trapped air.

2. Polyethylene Pipe Testing:

   a. Preparation of Test:

      1) Apply a pressure of 75 psig to the entire piping system over a period of 3 hours. Add water to the system on an hourly basis to maintain the test pressure.

   b. Testing:

      1) After testing preparation is complete, maintain a pressure of 75 psig over a 3-hour period. Water shall not be added during this step.

      2) After the 3-hour testing period, drop the test pressure to 50 psig for 1 hour. The pressure shall then remain within 5 percent of the target pressure to indicate no leakage in the system.

      3) After the testing has been witnessed and approved, relieve pressure from the system. Pressure shall not continuously be applied to the system for more than 8 hours at 1.5 times the system pressure rating.

3. Before covering piping with sand, the system shall be pressurized to 50 psig and maintained at that pressure during placement of sand to provide visible evidence that the tubing has not been damaged due to the placement process.

3.3 FILLING AND GRADING

A. Uncertified fill in the area below the ice rink shall be removed to an elevation of 1'-0" below the subsoil heating pipe. The subdrain piping shall be placed as detailed in the drawings including crushed stone and filter fabric wrap. A geotextile filter fabric sock shall not be used.

B. Upon completion of the subdrain piping system the excavation shall be filled with the non-expansive granular fill to the elevation of the base of the subsoil heating pipe. Fill shall be compacted to at least 95% relative compaction. Prepare the subgrade to the elevation shown on the drawings with a maximum tolerance of ± 1/2 inch over the entire rink surface. The subgrade must accommodate a header trench for the subsoil heating and snowmelt pit across the full width of the rink as detailed on the drawings.

C. Upon approval of the subgrade, subsoil heating pipe and headers shall be installed in accordance with the drawings. After the subsoil heating pipe is installed and inspected, non-expansive granular fill shall be placed to the elevation of the bottom of the insulation layer. Fill shall be compacted to at least 95% relative compaction. Prepare the subgrade to the elevation shown on the drawings with a maximum tolerance of ± ¼ inch over the entire rink surface. The subgrade must accommodate a header trench for the cooling pipe across the full width of the rink as detailed on the drawings. This Contractor shall prepare a survey of the subgrade and transmit copies to the Engineer for verification of the subgrade installation prior to proceeding with installation of the vapor barrier and insulation.

3.4 SUB-SOIL HEATING GRID

A. Jointing shall be accomplished by fusion welding.

B. There shall be no joints in the heat tubing, except at the connections to the header.

C. The sub-soil heat piping shall be installed as shown on the Drawings and as outlined above.

D. The header piping shall be excavated slightly into the granular subgrade so that the connected tubing lies flat.

E. The sub-soil heat grid shall be covered with clean, non-expansive compacted fill, and fine graded to the elevation shown on the drawings, plus or minus ¼", over the entire rink surface. Testing of piping shall be performed and approved before covering the pipe with sand.

F. The sub-soil heating system shall be filled with 40% ethylene glycol circulation fluid.

3.5 FLOOR INSULATION

A. Insulation board shall be installed as indicated on the Drawings by mechanics skilled in the trade.

B. Joints shall be offset as detailed on the Drawings.

C. At trenches, top layer of insulation board shall be secured with mastic and wood or metal pins.

D. All cuts and miters shall be made by saw cutting.

E. Apply 6 mil thick clear polyethylene sheeting under and over the insulation, as shown on the drawings.

F. Overlap poly sheeting 12-inches in all directions.

G. Tape all joints of poly sheeting continuously with compatible tape.

3.6 TUBING SPACER/SUPPORTS

A. Spacers shall be installed 3 feet on center across the long dimension of the rink and overlapped at least two tubing runs for a continuous run across the short distance of the rink.

B. Fasten any piping not sufficiently held in place with nylon ties.

3.7 RINK FLOOR TUBING

A. All tubing shall be continuous. Joints will be allowed only at connections to headers and return bends.

B. Tubing shall be tied at each support with nylon or wire ties, unless supports incorporate an integral hold-down mechanism. Ends of ties are to be turned downward so as not to protrude above finished floor.

C. The interior piping at fusion welded joints, wherever possible, shall be visually inspected to verify joints are formed to manufacturer's specifications. All joints between the header, riser pipes, and the tees shall be inspected before fusion welding rink tubing to the tees to assure there is no blockage.

D. Tolerance:

1. All refrigerant piping shall be within +/- ¼ inch of the elevation shown on the Drawings.

2. Note: 4-inch width plastic shims shall be used below spacer/supports if necessary, for adjusting elevations of pipe supports.

E. Pressure testing of pipe shall be completed as specified before placing the sand. Pressure testing shall be at minimum 100 psi for a 2-hour period with no pressure loss. Pressure shall be maintained at a minimum of 40 psi throughout the duration of the ice rink floor construction.

F. The rink piping, transmission mains, and refrigeration system shall be filled with 40% ethylene glycol circulation fluid.

3.8 SAND FLOOR

A. General:

1. Rink cooling pipe shall be placed in one continuous operation. Installation of the rink floor piping in more than one sequence of operation may cause for rejection of the floor.

B. Pre-Placement Inspection and Tests:

1. Contractor: Before placing of sand, and all items to be embedded in sand. Notify other crafts to permit the installation of their work; cooperate with other trades in setting such work, as required.

2. Engineer: After completion of all installations by Contractor, all Work will be inspected by the Engineer prior to the placement sand. Contractor shall plan and coordinate the Work to provide 72-hours advance notice that the Work will be ready for the sand placement.

3. Tests:

a. All testing of the ice rink piping shall be completed as described elsewhere in these Specifications.

b. Contractor shall coordinate the proposed sand placement schedule to permit ample time for completion of tests and corrective measures, if required, and re-testing as necessary.

c. Prior to sand placement, a certified survey of top-of-pipe elevations shall be performed by a surveyor hired by the Contractor in a 12-foot grid pattern over the entire rink area and recorded in permanent format which identifies each elevation with its location in the rink. The surveyor shall prepare a report certifying that the piping is within the required ±1/4" tolerance at all locations checked. Copies of the surveyor's report shall be provided to the Engineer. All costs of the survey shall be paid by the Contractor.

4. Acceptance: Sand shall not be placed until authorization is furnished by the Engineer.

5. Two inches of non-expansive sand fill shall be placed over the piping as shown on the drawings. Sand shall meet the requirement specified in Part 2 above for non-expansive granular fill below ice floor.

3.9 TEMPERATURE MONITORING

A. Sensors, conduits, and cables to be installed in the rink as shown on the Drawings.

B. Install the temperature monitors inside the Mechanical Room.

3.10 ICE PAINTING AND MARKINGS

A. Install white ice paint over entire rink surface. A thin layer of ice shall be installed over the refrigerated rink floor, and the white ice paint shall be applied to the ice surface. Install ice paint in conformance with the paint manufacturer's instructions.

B. Install the fabric rink markings in conformance with the marking manufacturer's instructions and in conformance with USA Hockey regulations. Markings shall be installed over the white painted surface.

END OF SECTION

SECTION 13 18 14.05

ICE SYSTEM PREMANUFACTURED CHILLER

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Semi-hermetic, direct drive water-cooled rotary screw chillers with single or multiple compressors.

1.2 SUBMITTALS

A. Acceptable refrigerant on which chiller performance is based is HFO-513A. All proposals for chiller performance must include an AHRI approved selection for the specified refrigerant.

B. Submit drawings indicating components, assembly, dimensions, weights and loadings, required clearances, and location and size of field connections. Indicate equipment, piping and connections, valves, strainers, and thermostatic valves required for complete system.

C. Submit product data indicating rated capacities, weights, specialties and accessories, electrical requirements and wiring diagrams.

D. Submit manufacturer's installation instructions.

E. Submit performance data indicating energy input versus cooling load output from 100 to 25 percent of full load with constant entering condenser water temperature.

1.3 OPERATION AND MAINTENANCE DATA

A. Include start-up instructions, operation data, maintenance data, controls, and accessories. Include trouble-shooting guide.

1.4 REGULATORY REQUIREMENTS

A. Conform to AHRI Standard 550/590 for rating and certified testing of Water Chilling Packages using the Vapor Compression Cycle.

B. Conform to UL 1995 - Standard for Heating and Cooling Equipment, Safety Standard. In the event the unit is not UL approved, the manufacturer shall, at manufacturer expense, provide for a field inspection by an UL representative to verify conformance to UL standards. If necessary, contractor shall perform modifications to the unit to comply with UL, as directed by the UL representative.

C. Conform to ASME SECTION VIII Boiler and Pressure Vessel Code for construction and testing of unfired pressure vessels.

D. Conform to ANSI/ASHRAE STANDARD 15 safety code for mechanical refrigeration.

E. Unit shall bear the AHRI Certification Label for the specific type of water chiller as applicable.

F. Chiller manufacturer shall provide LEED-NC EA Credit Calculation for each chiller utilizing the factors specified by the U.S. Green Building Council based upon equipment life of 23 years.

1.5 HANDLING

A. Comply with manufacturer's installation instructions for rigging, unloading, and transporting units.

B. Protect units from physical damage. Leave factory shipping covers in place until installation.

1.6 WARRANTY

A. Provide a full parts warranty for one year from start-up or 18 months from shipment, whichever occurs first.

B. A 5-year motor/transmission/compressor warranty shall be provided based upon the RPM of the compressor as follows:

Compressor RPM	**Warranty Term**
0 - 10,000	1 year from start-up
10,001 and above	5 years from start-up plus annual oil and refrigerant analysis

C. Beginning at the expiration of the standard warranty, the original equipment owner shall be provided an optional extended [whole unit parts, whole unit labor, refrigerant, motor/transmission/compressor parts, motor/transmission/compressor labor] warranty.

1. The warranty shall extend beyond the initial standard warranty up to the end of the [2 - 5] year.

2. See extended warranties for additional warranty details.

D. A quote for a 10-year parts, labor, and refrigerant warranty must be supplied by the manufacturer to provide a comparative value of confidence in reliability. This quote must be of the manufacturer's warranty; third party insurance/warranty quotes are not acceptable.

E. When startup of the purchased equipment will be delayed beyond six months after shipment, an optional delayed startup warranty shall be provided to postpone the commencement date of the standard parts warranty for up to one full year from the date of startup. This will also defer the commencement of any additional purchased warranties. This warranty must be ordered before startup.

1.7 MAINTENANCE SERVICE

A. All inspections and service of units shall be accomplished by factory trained and authorized servicing technicians.

B. All labor for leak checking the chiller according to the manufacturer's IOM and documentation must be included.

C. In conjunction with and supporting Factory warranty OEM shall furnish complete factory authorized service and maintenance of Applied Chillers for XX years from Date of Substantial Completion. All work shall be done by manufacturer's commercial warranty agent.

D. OEM shall provide and report quarterly, semiannual, and annual maintenance in compliance with or better than ASHRAE Standard 180-2008.

E. Include maintenance items as recommended in manufacturer's operating and maintenance data.

F. Submit copy of service call work orders and summary report to the Owner, including description of work performed, operating performance status and noted exceptions.

PART 2 - PRODUCTS

2.1 SUMMARY

A. The contractor shall furnish and install rotary screw or centrifugal water chillers as shown and scheduled in the plans. The units shall be installed in accordance with this specification and produce the specified tonnage per the scheduled data in accordance with AHRI Standard 550/590. The unit shall be AHRI certified as applicable.

B. Approved manufacturers:

1. Trane
2. Carrier
3. York
4. Daikin

2.2 COMPRESSOR AND MOTOR

A. Construct chiller using a semi-hermetic helical rotary screw compressor.

1. Statically and dynamically balance rotating parts.

2. Provide oil lubrication system with oil charging valve and oil filter to ensure adequate lubrication during starting, stopping and normal operation.

3. Provide compressor with automatic capacity reduction equipment consisting of capacity control slide valve or variable speed drive. Compressor must start unloaded for soft start on motors.

4. Provide crankcase heater and/or oil sump heater to evaporate refrigerant. Energize heater when compressor is not operating.

B. Chiller should be able to unload to 25 percent of full load tonnage with constant entering condenser water temperature.

C. The motor shall be semi-hermetic and either suction gas or liquid refrigerant cooled. Hot gas motor cooling is not acceptable. Open drives are not acceptable in positive pressure refrigerant systems due to the possibility of oil and refrigerant leaks at the shaft seal between the open motor and the compressor.

D. Manufacturers with speed increasing transmissions that exceed 10,000 RPM compressor speeds shall annually inspect the gears and bearings. A report shall be forwarded to the owner each year over the first five years to confirm completion.

E. If the manufacturer uses magnetic bearings a 20-year warranty on all chiller compressor capacitors must be provided

2.3 EVAPORATOR AND CONDENSER

A. The evaporator shall be built in accordance with ANSI/ASHRAE 15- Safety Code for Mechanical Refrigeration. Design, test, and stamp evaporator refrigerant side for 200 psig (1379 kPa) working pressure in accordance with ANSI/ASME SEC VIII.

B. Evaporator tubes shall be internally and externally enhanced. The tubes shall be securely supported at intermediate supports and physically expanded into both ends of the tube sheets. The evaporator tubes must also be removable from both ends to provide easy access for tube cleaning. The minimum evaporator tube wall thickness, root-to-root across the entire tube length shall be 0.025". It is unacceptable to provide this thickness at the intermediate supports only.

C. Provide evaporator waterbox designed for [150] [300] psig maximum waterside working pressure, with grooved pipe water connections. Waterside shall be hydrostatically tested at 1.5 times design working pressure.

D. Condenser tubes shall be internally and externally enhanced. The tubes shall be securely supported at intermediate supports and physically expanded into both ends. The condenser tubes must also be removable from both ends to provide easy access for tube changeouts or tube cleaning. The minimum condenser tube wall thickness, root-to-root across the entire tube length shall be [0.025"] [0.028"] [0.035"]. It is unacceptable to provide this thickness at the intermediate supports only.

E. Provide non-marine condenser waterbox designed for [150] [300] psig maximum waterside working pressure, with grooved pipe water connections. Waterside shall be hydrostatically tested at 1.5 times design working pressure.

F. Adjustable or float type refrigerant metering devices and thermal expansion valves (TXV) shall be inspected and adjusted by the manufacturer annually for the first five years of operation to assure equivalent reliability to an electronic expansion valve (EXV) system. A written report shall be forwarded to the owner each year over the first five years to confirm completion of calibration.

G. Units with multi-stage compressors shall incorporate an interstage flash vessel economizer in the refrigerant cycle.

H. Factory insulation will be Armaflex II or equal (k=0.28) and cover the evaporator and motor housing. Factory installed foam insulation will be used on the suction line, liquid level sensor and oil return system assembly.

1. If waterbox insulation is not factory installed, the additional cost for material and labor associated with field installation must be included in total chiller price.

2.4 REFRIGERANT CIRCUIT

A. All units shall have 1 refrigerant circuit with a single compressor. If manifolded compressors are provided, then individual compressor warranties must be provided for each compressor motor.

B. An electronically controlled expansion valve (EXV) is provided to maintain proper refrigerant flow.

C. Chiller shall be able to unload to 25% of capacity with AHRI relief and constant entering condenser water temperature.

D. Provide for each refrigerant circuit

1. Suction service valve
2. Discharge service valve
3. Liquid line shutoff valve
4. Filter

E. Isolation valves must be selected in order to be able to isolate the charge in the condenser.

1. Units operating with refrigerant having positive pressure at 75°F (HFC-134a & HFC-410-a) shall have the capability of storing the entire refrigerant charge in the condenser or shall have a pump-out system for each machine complete with a separate transfer pump, condensing unit and tank constructed in accordance with ASME Code for unfired pressure vessels bearing the National Board stamp. Pump-out systems shall be supplied and warranted by the machine manufacturer. Pump-outs shall comply with the following:

a. Pump-out tank(s) with ASME stamp capable of holding refrigerant charge when 80 percent full at 90F.

b. Separate charging connections for liquid and gas refrigerant.

c. Piping and valves between pump-out and chiller to be supplied and installed by installing contractor. Contractor shall provide all piping, electrical equipment, and wiring required. Refrigerant piping shall be Type K hard-drawn copper with wrought copper fittings. Valves shall be pack-less type suitable for refrigerant use.

2.5 CONTROLS

A. The chiller(s) shall be controlled by a microprocessor-based, proportional and integral controller to show water and refrigerant temperatures, refrigerant pressures and diagnostics. A dedicated chiller control panel with a clear language display is to be supplied with each chiller by the chiller manufacturer. The controller shall provide chiller capacity control in response to the leaving chilled water temperature.

B. Chiller shall be capable of communicating with a Tracer Summit building management system to optimize the total building operation.

C. The chiller control panel shall utilize an Adaptive Control Microprocessor which will automatically take action to prevent unit shutdown due to abnormal operating conditions associated with: evaporator refrigerant temperature, high condensing pressure and motor current overload.

D. In all of the above cases, the chiller will continue to run, in an unloaded state, and will continue to produce some chilled water in an attempt to meet the cooling load. However, if the chiller reaches the trip-out limits, the chiller controls will take the chiller off line for protection, and a manual reset is required. Once the "near trip" condition is corrected, the chiller will return to normal operation and can then produce full load cooling.

E. The chiller control panel shall provide control of chiller operation and monitoring of chiller sensors, actuators, relays, and switches. The panel shall be a complete system for stand-alone chiller control and include controls to safely and efficiently operate the chiller.

F. Manufacturer shall provide a compressor that is capable of unloading to an infinite amount of positions in order to provide water temperature accuracy of +/- 0.5 F°. In the event that the compressor unloads to finite steps, the manufacturer may provide nine (9) or more steps of unloading on each compressor or provide hot gas bypass (HGBP).

G. The chiller control panel shall provide leaving chilled water temperature reset based upon return water temperature.

H. A relay output to start the condenser water pump and/or enable the cooling tower temperature controls.

I. The chiller control panel shall provide a chilled water pump output relay that closes when the chiller is given a signal to start.

J. The chiller control panel shall have the ability to operate in variable evaporator flow applications. The chiller control must be able to operate with evaporator flow rate changes up to 10% during a 1-minute time period while maintaining 0.5F water temperature accuracy. The chiller control must also be able to operate with evaporator flow rate changes up to 30% during a 1-minute time period while maintaining 2F water temperature accuracy.

K. The chiller control panel is to be provided with the following digital type of pressure readouts:

1. Evaporator refrigerant pressure
2. Condenser refrigerant pressure

L. The front of the chiller control panel shall be capable of displaying the following clear language as standard:

1. Entering and leaving evaporator water temperature
2. Entering and leaving condenser water temperature
3. Chilled water setpoint
4. Electrical 3 phase current limit and percent RLA setpoint
5. Electrical 3 phase amp draw
6. Chiller operating mode
7. Condenser refrigerant temperature
8. Predefined on screen trending graphs
9. Elapsed time and number-of-starts counter
10. Chiller compressor run status relay
11. Diagnostics with time and date stamp
12. The control panel display shall identify the fault, indicate date, time, and operating mode at time of occurrence, and provide type of reset required and a help message. The historic diagnostic report shall display the last 20 diagnostics with their times and dates of occurrence
13. External chilled water and current limit setpoint 2-10VDC.
14. External chilled water and current limit setpoint 4-20mA.
15. Percent RLA output 2-10VDC

16. A relay output that shall energize whenever the unit is operating in a limit mode for an extended time period.

17. A relay output that shall energize whenever an alarm is active.

18. A relay output that shall energize whenever a compressor is running.

19. A relay output that shall energize whenever the chiller is operating in Adaptive Controls due to high head pressure.

2.6 STARTERS (LOW VOLTAGE)

A. The motor starters shall be Wye-Delta. Motor starters shall have a UL 1995 enclosure. Enclosure shall be constructed of 14-gauge steel minimum.

B. Starters shall be unit mounted with ventilating louvers.

C. Motor starters shall include incoming line provisions for the number and size cables shown on the drawings. Incoming line lugs shall be copper mechanical type. Connection directly to the contactors is not permissible.

D. Contactors shall be sized properly to the chiller full load and locked rotor currents. Contactors shall have double break main contacts with weld resistant silver cadmium faces. Auxiliary interlocks that interface with the control panel shall be low resistance having palladium silver contacts.

E. Each motor starter shall include a control power transformer with fused primary and secondary. Current transformers of the proper size, ratio and burden capacity shall be provided to provide a signal to the control panel and optional devices. Control relays shall be provided within the motor starter to interface with the control panel.

F. Power wiring within the starter shall be type MTW copper stranded 90-degree C. Power wire bends shall show no evidence of nicking or insulation degradation. Control wire shall be type MTW copper stranded 90-degree C.

G. Each starter shall include an advanced motor protection system incorporating electronic three phase overloads and current transformers. This electronic motor protection system shall monitor and protect against the following conditions:

1. Three phase overload protection

2. Overload protection during start-up

3. Phase imbalance

4. Phase loss

5. Phase reversal

6. Low voltage

7. Distribution fault protection consisting of three-phase, current sensing devices that monitor the status of the current. Distribution faults of 1-1/2 electrical cycle duration's shall be detected and the compressor motor shall be disconnected within six electrical cycles.

8. Under/over voltage protection

H. Alternately the advanced motor protection system can be furnished in the chiller control panel.

I. Each starter/control shall be designed and able to operate in temperatures up to 104 F (40 C).

J. All field supplied wires, bus bars, and fittings shall be copper only.

K. The following optional starter options shall be provided:

1. Circuit Breaker - Starter shall contain a circuit breaker. The disconnect handle shall be capable of being padlocked in the off position.

L. Amps (standard) and volts shall be displayed at the control panel or ammeters and voltmeters provided. Three ammeters shall be provided, one per phase. Ammeters shall be calibrated to indicate the inrush current. Three voltmeters shall be provided, each reading a phase-to-phase voltage.

M. Provide Short Circuit Current Rating (SCCR) and AIC rating (if applicable) of the switchgear that feeds the chiller for an Wye-Delta starter based on the corresponding power connection type. The Short Circuit Rating is the rating of the panel to withstand a short circuit of the specified amps. This rating is separate from the AIC rating of Circuit Breakers.

N. Service Conditions:

1. Operating ambient temperature of 14°F - 104°F (-10°C - 40°C).

2. Room ambient up to 95% relative humidity.

3. Elevation to 3300 feet (1000 meters). For every 300 feet (90 meters) above 3300 feet, the rated output current shall be decreased by 0.4% up to 9900 feet.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Provide for connection to electrical service. If oil pump is electric include the connection of the electrical to the oil pump.

C. Provide elastomeric isolation pads to reduce vibration transmission.

D. On units without unit mounted starters provide for connection of electrical wiring between starter and chiller control panel, oil pump, and purge unit.

E. Furnish and install necessary auxiliary water piping for oil cooling units and purge condensers.

F. Arrange piping for easy dismantling to permit tube cleaning.

G. Provide piping from chiller relief valve to outdoors. Size as recommended by manufacturer.

3.2 MANUFACTURER'S FIELD SERVICES

A. OEM startup is performed by factory trained and authorized servicing technicians confirming equipment has been correctly installed and passes specification checklist prior to equipment becoming operational and covered under OEM warranty. Compliance is required to preserve the factory warranty.

1. Included OEM Factory Startup:

    a. Centrifugal, Rotary Screw, Scroll Chillers

B. Applied Chiller manufacturers shall maintain service capabilities no more than 100 miles from the jobsite.

C. The manufacturer shall furnish an alternative price for [1] [5] [10] years.

D. The manufacturer shall furnish complete submittal wiring diagrams of the package unit as applicable for field maintenance and service.

END OF SECTION

SECTION 13 18 14.08

ICE SYSTEM COOLING TOWER

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Cooling Tower.

1.2 RELATED SECTIONS

A. Related Work Specified Elsewhere:

1. Conditions of the Contract and Division 01 Sections apply to work of this Section.
2. Section 13 18 00 – Ice System General.
3. Sections 13 18 14.02 through 13 18 14.13 – Refrigeration Equipment Specifications.
4. Section 13 18 14.14 – Ice System Chemical Treatment System.
5. Section 13 18 14.16 – Ice System Piping Specialties.
6. Section 13 18 14.17 – Ice System Piping and Fittings.
7. Section 13 18 14.18 – Ice System Valves and Accessories.
8. Electrical Specification Sections.

1.3 SUBMITTALS

A. Submit shop drawings, Operation and Maintenance Manuals, and/or all equipment and materials as required in Section 13 18 00.

1.4 WARRANTY/SERVICE

A. Shall be as required in Section 13 18 00.

1.5 QUALITY ASSURANCE

A. Shall be as required in Section 13 18 00.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Shall be as required in Section 13 18 00.

PART 2 - PRODUCTS

2.1 COOLING TOWER

A. Manufacturer: Korytko, Induced Draft, Counterflow Design, Model KDI-0606A-7.5-1 or approved equal.

B. Design Conditions:

1. Primary Refrigerant: R-513A.
2. EWT: 95 degrees F.
3. LWT: 85 degrees F
4. Wet Bulb Temperature: 72 degrees F.
5. Air Flow: 25,200 CFM
6. Fan Horsepower: 7.5 HP, 460V, 3 Phase, 60 Hz.
7. Spray Water Flow Rate: 464 GPM.

8. Single Circuit.

C. Construction:

1. Fully welded stainless-steel basin, 10-year warranty against leaks.
2. Sloped basin bottom for proper drainage and cleaning.
3. Bolted construction.
4. No field sealer tape or gasket required.
5. Square spray distribution system.
6. Aluminum belt driven fan blades.
7. Drift eliminators reduce pressure drop by up to 25%.
8. Drift loss of 0.0005% circulating water flow.
9. CTI Certified for Standard 136.
10. Cellular inlet louvers reduce light reduction ratio of 70:1 to reduce algae growth and reduce noise level by 3 decibels.

D. Variable Frequency Drive (VFD): Provide full VFD capacity control system that will automatically control the water pump and the speed of the fan motor to maintain stable condensing pressure. The system shall include:

1. Variable frequency drive module.
2. Condensing pressure transducer, to be installed in the condenser discharge piping.
3. Main circuit breaker and disconnect.
4. VFD fan motor bypass contactors.
5. Fan overload protection.
6. Fused water pump starter.
7. Hand-off-auto switches for VFD fan and pump.
8. 120V control power transformer.
9. NEMA 1 enclosure.

2.2 CONDENSER WATER PUMP

A. See Section 13 18 14.12 Pumps.

2.3 CONDENSER SUPPORT STRUCTURE

A. See structural drawings for support structure details. Contractor shall verify structure dimensions and anchor bolt locations are appropriate for the unit furnished.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install cooling tower in accordance with manufacturer’s recommendations.

B. Cooling tower shall maintain discharge pressure of compressors by cycling the cooling tower fan and water pump with pressure controls. The cooling tower fan shall be controlled by a variable speed drive. Controls shall be designed and set to initially start the fan, adjust the fan speed to the appropriate level, and to start the cooling tower water pump later only if the fan alone is unable to provide sufficient cooling.

C. Cooling tower shall be mounted on and securely bolted to the support structure detailed on the structural drawings. Cooling tower shall not be welded to the structure.

D. All piping to and from cooling tower shall be sloped to drain at minimum grades indicated on the drawings. Outlet refrigerant connections shall be trapped as shown on the drawings.

E. Install pressure relief valves on the R513A refrigerant piping circuit in conformance with ANSI.

F. Connect cold water make-up line to cooling tower basin make-up valve.

3.2 PAINTING/COATING

A. Touch-up damaged paint coatings.

B. Paint piping and accessories that are not shown to be insulated.

3.3 START-UP, COMMISSIONING, AND TRAINING

A. A factory trained service representative shall be present at the time the cooling tower is started, commissioned, and placed into service.

B. Start-up and commissioning of the cooling tower shall conform to Section 13 18 00 requirements, including requirements of ANSI Start-up and Commissioning of Closed-Circuit Refrigeration Systems. Required start-up and commissioning documentation, both preliminary and final, shall be submitted to the Engineer and Owner.

C. Manufacturer's representative shall provide training as specified in Section 13 18 00.

END OF SECTION

SECTION 13 18 14.12

ICE SYSTEM PUMPS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Horizontal, end suction, close-coupled centrifugal pumps for ice rink refrigeration system applications.

1.2 GENERAL REQUIREMENTS

A. Layouts, dimensions, and configurations shown on the Drawings are based on Grundfos pumps, and are general in nature.

B. Contractors are advised that because of manufacturer's variations in equipment design, changes from Drawings in piping arrangement and layout, electrical and control circuitry, and related dimensions of equipment foundation and anchorage details may be required for equipment installation.

C. Equipment requiring minor deviations in the system layout, such as minor piping revisions, will be acceptable; however, the Contractor shall include all costs associated with the deviation in his Bid. Should the deviation require revisions in the design of the facility, the Contractor shall reimburse the Owner for the cost of any redesign.

D. Pumping equipment materials, construction features, and performance specified herein are considered minimum requirements. Manufacturers shall incorporate specified requirements into standard products to fully conform to Specifications.

E. Pumps shall be non-overloading of nameplate horsepower over entire published pump performance curve.

1.3 RELATED SECTIONS

A. Related Work Specified Elsewhere:

1. Conditions of the Contract and Division 01 Sections apply to work of this Section.
2. Section 13 18 00 – Ice System - General.
3. Sections 13 18 14.01 through 13 18 14.13 – Refrigeration Equipment Specifications.
4. Section 13 18 14.15 – Ice System – Refrigeration System Insulation.
5. Section 13 18 14.16 – Ice System - Piping Specialties.
6. Section 13 18 14.17 – Ice System - Piping and Fittings.
7. Section 13 18 14.18 – Ice System - Valves and Accessories.
8. Electrical Specification Sections.

1.4 SUBMITTALS

A. Submit Shop Drawings, Operation and Maintenance Manuals, for all equipment and materials as required in Section 13 18 00.

1.5 WARRANTY/SERVICE

A. Shall be as required in Section 13 18 00.

1.6 QUALITY ASSURANCE

A. Shall be as required in Section 13 18 00.

1.7 DELIVERY, STORAGE AND HANDLING

A. Shall be as required in Section 13 18 00.

PART 2 - PRODUCTS

2.1 APPROVED MANUFACTURERS

A. Grundfos, Scot, ITT Bell & Gossett, Aurora, Taco, Armstrong, or approved equal.

2.2 DESIGN CONDITIONS

A. Conform to the following design criteria for the two Rink Cold Floor Pumps:

1.	Model:	Grundfos Series LF-40707 – 5” x 4” or equal
2.	Maximum Flowrate	1,283.0 gpm
3.	Total Dynamic Head	83 feet
4.	Maximum Pump Speed	3,550 RPM
5.	Min. Efficiency at Design Flow	68.93 percent
6.	Motor Size	40 HP
7.	Electrical	230/460 volt, 3 phase, 60 Hz
8.	Fluid	40% Ethylene Glycol

B. Conform to the following design criteria for the Cooling Tower Water Pump:

1.	Model:	Grundfos Series LF-40707 – 5” x 4”; close coupled or equal
2.	Maximum Flowrate	364 gpm
3.	Total Dynamic Head	40 feet
4.	Maximum Pump Speed	1,775 RPM
5.	Min. Efficiency at Design Flow	83.52 percent
6.	Motor Size	7.5 HP
7.	Electrical	230/460 volt, 3 phase, 60 Hz
8.	Fluid	Water

2.3 PUMP CONSTRUCTION

A. Pumps shall be close-coupled, single-stage, end suction centrifugal design with back pull-out, capable of being serviced without disruption of the pipe connections. Rink cold floor circulation pumps shall be of appropriate material construction for use with 40% ethylene glycol solution. Cooling tower water pump shall be of appropriate material construction for use with water.

B. Provide all accessories and specialties required for a complete installation.

C. Pumps shall be suitable for continuous operation at the conditions stated herein without excessive noise, vibration, heating, cavitation, or any damage to the pump.

D. Shafts shall be accurately matched and surface ground to ensure interchangeability of shafts and parts attached to the shaft.

E. Pump support shall accommodate all hydraulic thrust forces. No supplementary support shall be required or provided.

F. Materials and features not specified herein shall be the manufacturer's standard for the service intended.

G. Suction and discharge connections shall be furnished with 125-lb. flanges.

H. Provide pressure gauge connections on suction and discharge sides of each pump.

I. Each pump shall be factory tested and thoroughly cleaned and painted at the factory, prior to shipment.

2.4 PUMP MATERIALS

A. Volute:

1. Heavy duty cast iron, Class 30, integrally cast pedestal support, of sufficient thickness to withstand stresses at full operating pressure.

2. Pump shall be rated for a minimum 175-psi working pressure.

3. Provided with drain and vent plugs.

B. Impellers:

1. Protected by replaceable shaft sleeve. Cast bronze construction for water and glycol pumps.

2. Keyed to shaft with non-corrosive fasteners.

3. Statically and dynamically balanced.

C. Shafts:

1. Carbon steel C1045 machined and polished.

2. Maximum deflection of 0.002 inch at the seal face under a maximum load condition.

D. Bearings:

1. Heavy duty, grease lubricated, regreaseable, ball bearings shall have B10 minimum bearing life of 50,000 hours per AFBMA test procedure.

2. Replaceable without disturbing piping connections.

E. Seals:

1. Mechanical type with ceramic seat and carbon seal ring.

2. Internal flushing capabilities.

3. Seals shall be easily inspected and replaceable.

F. Wearing Ring:

1. Replaceable case wearing rings.

G. Motor:

1. Comply with all requirements of Section 13 18 15.02.

2. Maximum load shall not exceed motor nameplate rating at the unity service factor.

3. Shall be factory aligned and shall be realigned by Contractor after installation prior to start-up.

H. Baseplate:

1. Cast iron or fabricated steel with integral drain rim.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install pumps in strict accordance with manufacturer's instructions. Access/service space around pumps shall not be less than minimum space recommended by pump manufacturer and by mechanical codes.

B. Set pumps on concrete housekeeping pads.

C. Decrease line size at pump connections with suction diffusers where required, long radius reducing elbows or concentric reducers/increasers in the vertical piping, and eccentric reducers/increasers for horizontal piping. Install eccentric reducers/increasers with the top of the pipe level. All valves and piping specialties must be full line size. Support piping adjacent to pump such that no weight is carried on pump casings. For base mounted pumps, provide supports for elbows on pump suction and discharge piping 4-inches and over.

D. Provide air vent and drain valve on horizontal pump casings.

E. Provide valves as specified in the Contract Documents.

F. Electrical:

1. All electrical conduit, wiring, and controls required for the systems in this Specification shall be provided by the Contractor. All electrical components shall be laid out and installed by a licensed electrician.

G. Insulate pumps, piping, valves, etc. as specified in Section 13 18 14.15.

3.2 PAINTING

A. Touch-up damaged coatings with touch up kit provided by the pump manufacturer.

3.3 START-UP AND TRAINING

A. A factory trained service representative shall be present at the time when pumps are placed into service and before turned over to the Owner.

B. Manufacturer’s representative shall provide training as specified in Section 13 18 00.

END OF SECTION

SECTION 13 18 14.13

ICE SYSTEM WASTE HEAT RECOVERY

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Furnish and install waste heat recovery systems.

1.2 GENERAL REQUIREMENTS

A. General Description: The systems shall include heat exchangers, circulation pumps, compression tanks, piping, wiring, and controls.

B. System Design and Operating Criteria: The waste heat recovery systems shall utilize waste heat from the refrigeration system to provide the following:

1. Sub-Soil Heating: The sub-soil heating system shall function as a frost-deterrent by circulating the heated glycol solution in piping grids underneath the rink floors. The sub-soil recirculation pumps shall be manually controlled by the facility operator, based on the sub-soil temperature beneath the rink.

2. Snow Melting: The snow melt heating system shall melt the snow recovered during resurfacing. The system shall include all necessary equipment, materials, and controls to provide a complete operative system. The snowmelt recirculation pump is designed to operate continuously, circulating the glycol solution through the heat exchanger and the snow melt pit coil. Fluid temperature is controlled by the thermostatic solenoid valve, which stops the flow of refrigerant through the heat exchanger when the desired temperature is reached. The solenoid control valve shall automatically control glycol temperatures between an operator adjustable setpoint between 40 degrees F and
90 degrees F.

1.3 RELATED SECTIONS

A. Related Work Specified Elsewhere:

1. Conditions of the Contract, Supplemental Conditions, and Division 01.
2. Section 13 18 00 – Ice System - General.
3. Section 13 18 14.15 – Ice System - Refrigeration System Insulation.
4. Section 13 18 14.16 – Ice System - Piping Specialties.
5. Section 13 18 14.17 – Ice System - Piping and Fittings.
6. Section 13 18 14.18 – Ice System - Valves and Accessories.
7. Electrical Specification Sections.

1.4 SUBMITTALS

A. Submit shop drawings, Operation and Maintenance Manuals, and/or all equipment and materials as required in Section 13 18 00.

B. Testing agency certification of ethylene glycol charge.

1.5 WARRANTY/SERVICE

A. Shall be as required in Section 13 18 00.

1.6 QUALITY ASSURANCE

A. Shall be as required in Section 13 18 00.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Shall be as required in Section 13 18 00.

PART 2 - PRODUCTS

2.1 PIPING

A. As specified in Section 13 18 14.17.

2.2 WASTE HEAT SYSTEM PUMPS

A. Approved Manufacturers: ITT Bell & Gossett, Aurora, Armstrong, or approved equal.

B. Conform to the Following Design Criteria:

1. Warm Floor Pump - One Pump:

a.	Model:	Grundfos/Paco IO-20709-130008-1562P; 2.5” x 2”
b.	Flow Rate:	150 gpm.
c.	Total Dynamic Head:	35 feet.
d.	Maximum Pump Speed:	1,800 RPM.
e.	Maximum Motor Size:	2 HP.
f.	Electrical:	460 volts, 3 phase, 60 Hz.
g.	Minimum Efficiency:	59.3 percent
h.	Fluid:	40% Ethylene Glycol

2. Snow Melting System:

a.	Model:	Grundfos Series LF LC-12709; 1.5” x 1.25” close - coupled or equal.
b.	Flow Rate:	90 gpm.
c.	Total Dynamic Head:	35 feet.
d.	Maximum Pump Speed:	1,765 RPM.
e.	Maximum Motor Size:	1.5 HP.
f.	Electrical:	230/460 volts, 3 phase, 60 Hz.
g.	Minimum Efficiency:	61.54 percent
h.	Fluid:	40% Ethylene Glycol

C. Pumps shall be horizontal, end suction, single stage, and close-coupled.

2.3 HEAT EXCHANGERS

A. Approved Manufacturers: Kelvion or approved equal.

B. Conform to the Following Design Criteria:

1. Sub-Soil Heating System:

a. Capacity: 14 evaporator tons (168 MBTU/HR).
b. Refrigerant R513A.
c. Flow Rate of 40% Ethylene Glycol Solution: 150 gpm.
d. Glycol Temperature Out: 50 degrees F.
e. Glycol Delta Temp: 1.86 degrees F.

f. Condensing Temperature: 95 degrees F (hot R513A gas from compressors).
g. Maximum Pressure Drop: 1.0 PSI.

2. Snow Melting System:

a. Capacity: 36 evaporator tons (432 MBTU/HR).
b. Refrigerant R513A.
c. Flow Rate of 40% Ethylene Glycol Solution: 90 gpm.
d. Glycol Temperature Out: 88 degrees F.
e. Glycol Delta Temp: 11.6 degrees F.
f. Condensing Temperature: 95 degrees F (hot R513A gas from compressors).
g. Maximum Pressure Drop: 2.0 PSI.

C. Heat exchangers shall be flat plate heat exchangers built in accordance with ASME Section VIII, Div. 2.

D. Frame: A316 Grade 70 Carbon Steel.

E. Plates: AISI 316 Stainless Steel.

F. Gaskets: Main Body Sealing: Hot Side: Laser Welded Neoprene
Cold Side: Laser Welded EPDM

G. The ring gasket material Neoprene is not suitable for polyolester (POE) oil and polyvinylether (PVE) oil. Please check the compressor oil which is used and adjust gasket material as required.

H. Vessels shall have a relief valve connection. Connection shall include relief and purge valve. See Section 13 18 14.18.

I. Vent and drain connections with ball valves on heads.

J. Data plate shall display code compliance and capacity of vessel.

K. Shall be shop painted with one coat of primer.

2.4 COMPRESSION TANKS

A. Approved Manufacturers: ITT Bell & Gossett, John Wood Company, Wessel Company, Taco, Armstrong, or approved equal.

B. Tank capacity – as indicated on Drawing Schedules.

C. Horizontal, steel tanks stamped at 125-psi working pressure.

D. Tanks shall be constructed in accordance with Section VIII of the ASME Boiler and Pressure Vessel Code.

E. Shall have gauge glass with 1/2-inch gauge glass tappings and 1-inch NPT tappings.

F. Air Control Tank Fitting:

1. Shall be ITT Bell & Gossett tank fitting ATFL, Armstrong, or approved equal.

2. Cast iron body, copper tubes, brass vent tube plug, and stainless steel ball check.

G. Shall be shop painted with one coat of air-dry enamel.

2.5 SNOW-MELT COIL

A. Fabricate coil from stainless steel as shown on the Drawings. All connections shall be mechanically connected except for the flanged connections above the pit water level.

2.6 CIRCULATION FLUID

A. Circulation fluid for both the subsoil heating and snowmelt systems shall be a 40% by volume ethylene glycol and deionized water solution (glycol/water).

2.7 ACCESSORIES

A. All thermometers, gauges, valves, etc. shall be provided and installed as required and shown on the Drawing and in accordance to Sections 13 18 14.16 and 13 18 14.18.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install all pumps in strict accordance with manufacturer's instructions. Access/service space around pumps shall not be less than minimum space recommended by pump manufacturer and by the mechanical codes.

B. All valves and piping specialties must be full line size. Support piping adjacent to pump such that no weight is carried on pump casings.

C. Provide air vent and drain valve on horizontal pump casings.

D. Provide valves in locations specified in the Contract Documents. See Section 13 18 14.18 for valve specifications.

E. All piping, controls, and accessories shall be mounted from walls and ceilings in the Mechanical Room, or on structural steel equipment racks provided by the Contractor. Compression tanks and heat exchangers may be ceiling or rack mounted at the Contractor’s option.

F. The snow-melt coil shall be installed into concrete pit as shown on the Drawings. Actual pit dimensions shall be confirmed prior to manufacture of the coil.

G. Electrical:

1. All electrical conduit, wiring, and controls required for the systems in this Specification shall be provided by the Contractor. All electrical components shall be laid out and installed by a licensed Electrician.

2. Additional electrical requirements are described in the Electrical Specifications.

H. Insulate pumps, vessels, piping, valves, etc. as specified in Section 13 18 14.15.

3.2 PAINTING

A. Touch-up damaged coatings with touch up kit provided by pump manufacturer.

B. All piping, vessels, and other system components subject to rust or corrosion, and not provided with a factory finish, shall be field primed and painted with two coats of alkyd egg-shell enamel.

3.3 START-UP AND TRAINING

3.4 START-UP, COMMISSIONING, AND TRAINING

A. Factory trained service representatives shall be present at the time the heat exchangers and pumps are started, commissioned, and placed into service.

B. Start-up and commissioning of the heat exchangers and pumps shall conform to Section 13 18 00 requirements, including requirements of ANSI/IIAR Standard 5-2013 Start-up and Commissioning of Closed-Circuit Ammonia Refrigeration Systems. Required start-up and commissioning documentation, both preliminary and final, shall be submitted to the Engineer and Owner.

C. Manufacturer's representatives shall provide training as specified in Section 13 18 00.

END OF SECTION

SECTION 13 18 14.14

ICE SYSTEM CHEMICAL TREATMENT SYSTEM

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Water treatment system for cooling tower.

1.2 GENERAL REQUIREMENTS

A. Furnish and install complete and operating water treatment system for the cooling tower to control scale, corrosion, and biological growth. System shall include all required equipment, piping, and control wiring. The equipment shall consist of but not be limited to the following: conductivity controller with water meter-initiated pulse timer and flow through probe; bleed-off solenoid valve and Y strainer; chemical metering pump; chemical injection assembly; contacting head water meter.

1.3 RELATED SECTIONS

A. Related Work Specified Elsewhere:

1. Conditions of the Contract, Supplemental Conditions, and Division 01.
2. Section 13 18 00 – Ice System - General.
3. Sections 13 18 14.01 through 13 18 14.13 – Ice Rink Refrigeration Equipment.
4. Section 13 18 14.16 – Ice System - Piping Specialties.
5. Section 13 18 14.17 – Ice System - Piping and Fittings.
6. Section 13 18 14.18 – Ice System - Valves and Accessories.
7. Electrical Specification Sections.

1.4 SUBMITTALS

A. Shall be as required in Section 13 18 00.

1.5 WARRANTY/SERVICE

A. Shall be as required in Section 13 18 00.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Shall be as required in Section 13 18 00.

PART 2 - PRODUCTS

2.1 CONTROLLER

A. Approved Manufacturers: Lakewood Instruments Model 140 Water Treatment Controller or approved equal:

1. User friendly menu interface.
2. Scheduled fee, two relays for biocides or other chemicals.
3. Ball valve delay feature for accurate control of motorized ball valves.
4. One meter input: conductivity input, flow switch input, and 4-20 mA are standard features.
5. Removable power cord and receptacles for simple conduit installations.
6. Onboard selector switch for 120 or 240 VAC power.

7. LED indicators for power, alarm, and relay status.

2.2 CONTACTING HEAD METER

A. Approved Manufacturers: Morr Control, Inc., or approved equal:

1. 5/8-inch WM-1.
2. Contacting head to be calibrated to 10 to 100 gallons/contact.

2.3 BLEED-OFF SOLENOID VALVE AND Y STRAINER

A. A bleed-off assembly consisting of a solenoid valve and Y strainer which is sized to the specific system capacity and pressure is required.

B. The bleed-off solenoid valve shall be an ASCO Model 8210D, or approved equal, consisting of a brass body, NEMA 1 enclosure rated at 120 volts.

C. Bleed-off assembly shall include a throttling valve.

2.4 CHEMICAL FEED PUMP

A. Approved Manufacturers: Chem-Tech Series E700S or approved equal.

B. The chemical feed pump shall be an electronic metering positive displacement type pump.

C. The feed rate shall be adjustable while the pump is operating.

D. All polyethylene suction and discharge tubing shall be supplied, along with foot valve and injection valve.

E. Furnish and install corrosion resistant wall mounted shelf for feed pump.

2.5 INJECTION ASSEMBLY

A. Approved Manufacturers: Neptune Chemical Pump Company or approved equal.

B. A PVC injection assembly shall be installed for injection of chemicals into the condenser water line.

2.6 BIOCIDE FEEDER SYSTEM

A. Approved Manufacturers: Hydro Systems Company, Autodose Model 1070, or approved equal.

B. Biocide feeder shall include 7-day programmable controller and pump.

2.7 PIPING AND FITTINGS

A. As shown on the drawings.

2.8 WATER TREATMENT CHEMICALS

A. Provide a 1-year supply of the recommended formulas for the prevention of scale, corrosion, and biological growth in the open recirculating system. All formulations must be compatible with system construction materials and meet or exceed all environmental requirements.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Completely flush all systems before starting up.

B. Provide painted plywood mounting panel, with galvanized steel strut supports.

C. All electrical conduit, wiring, and controls required for the system in this Specification shall be provided by the Ice System Contractor. All electrical components shall be laid out and installed by a licensed Electrician.

D. Further electrical requirements are included in the Electrical Specifications.

3.2 START-UP, COMMISSIONING, AND TRAINING

A. Start-up and commissioning of the chemical treatment system shall conform to Section 13 18 00 requirements. Required start-up and commissioning documentation, both preliminary and final, shall be submitted to the Engineer and Owner.

B. Manufacturer's representative shall provide training as specified in Section 13 18 00.

3.3 WATER TESTING & CHEMICAL ADJUSTMENT

A. Provide water analysis after condensing system has been started up and is in full normal operation, and passivation is completed. Water analysis shall include, as a minimum, testing of:

Ca (as CaCO3)	Maximum level 1,000 ppm (parts per million)
Total alkalinity	Maximum level 1,000 ppm
SiO2	Maximum level 100 ppm
Cl^-	Maximum level 250 ppm
Conductivity	Maximum level 2,000 µS/cm (micro siemens per cm)

B. The number of operation cycles shall be determined by dividing the maximum allowed concentration of each parameter by the actual concentration level of each parameter found in the potable makeup water. Adjust chemical dosage rates and bleed-water release rates to achieve a minimum 10 operation cycles, without exceeding the maximum value for any parameter.

C. Provide documentation of water testing results to Owner and Engineer, certifying that system adjustments have been performed to achieve a minimum of 10 operation cycles.

END OF SECTION

SECTION 13 18 14.15

ICE SYSTEM INSULATION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Pipe and equipment insulation.

1.2 RELATED SECTIONS

A. Related Work Specified Elsewhere:

1. Conditions of the Contract and Division 01 Sections apply to work of this Section.
2. Section 13 18 00 – Ice System - General.
3. Section 13 18 14.05 – Ice System – Premanufactured Chiller.
4. Section 13 18 14.08 – Ice System – Cooling Tower
5. Section 13 18 14.12 – Ice System - Pumps.
6. Section 13 18 14.13 – Ice System Waste Heat Recovery
7. Section 13 18 14.17 – Ice System Piping and Fittings

1.3 SUBMITTALS

A. Submit shop drawings on all materials as required in Section 13 18 00.

1.4 WARRANTY/SERVICE

A. Shall be as required in Section 13 18 00.

1.5 QUALITY ASSURANCE

A. Shall be as required in Section 13 18 00.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Shall be as required in Section 13 18 00.

PART 2 - PRODUCTS

2.1 PIPING AND EQUIPMENT INSULATION

A. Manufacturers: Armstrong World Industries – Armaflex II, Ownes-Corning, Manville, DOW Knauf, Certainteed, or approved equal.

B. Use composite insulation systems (insulation, jackets, sealants, mastic, and adhesives) that have a flame spread rating of 25 or less and smoke developed rating of 50 or less, with the following exceptions:

1. Outdoor mechanical insulation may have a flame spread rating of 75 and a smoke developed rating of 150.

2. Pipe insulation that is not located in an air plenum may have a flame spread rating not over 25, and a smoke developed rating no higher than 150.

3. Materials shall be compatible and shall not contribute to corrosion, softening, or otherwise attack surfaces to which applied. Materials to be used on stainless surfaces shall meet ASTM C795 requirements.

C. Insulating materials shall be fire retardant, moisture and mildew resistant, and vermin proof. Materials or accessories containing asbestos will not be accepted.

D. Insulation shall be suitable to receive jackets, adhesives, and coatings as indicated.

E. Jackets shall have puncture resistance based on ASTM D781 Test Methods.

F. Vapor barriers shall have perm ratings based on ASTM E96 Procedure A.

G. Insulation Types:

1. Type 1, Rigid Fiberglass Insulation:

a. Inside Applications: Minimum nominal density of 3 lbs. per cubic foot, and thermal conductivity of not more than 0.23 at 75 degrees F mean temperature.

b. Vapor barrier cover shall be heavy-duty fire retardant material with glass fiber reinforcing and self-sealing lap, and white Kraft finish suitable for painting. Beach puncture resistance to be 50 units minimum. Vapor barrier shall be 0.001-inch aluminum foil adhered to the inner surface of the cover. Permeance shall not exceed 0.02 perms. Securing stapes must be coated with vapor barrier mastic.

2. Type 2, Block Insulation:

a. Polystyrene, ASTM C578, suitable for temperature to 180 degrees F maximum. Thermal conductivity shall not be more than 0.23 at 75 degrees F.

3. Type 3, Flexible Elastomeric Thermal Pipe Insulation:

a. Suitable for service from -40 degrees F to +220 degrees F.

4. Type 4, Urethane Pipe Insulation:

a. 2-pcf density, K-factor 0.13.

5. Type 5, Extruded Polystyrene:

a. 1.8 lb/cubic feet density, Dow Styrofoam, or approved equal.

H. Protective Jacket Types:

1. Type 2, PVC Jacket:

a. ASTM C921, 1-piece molded type fitting covers and sheet material, color as specified.

b. Minimum service temperature of 0 degrees F. Maximum service temperature of 150 degrees F.

c. Moisture vapor transmission ASTM E96; 0.002-perm inch.

d. Maximum flame spread ASTM E84; 25. Maximum smoke developed ASTM <E84; 50.

e. Thickness of 30 mil with brush-on welding adhesive connections. Cover adhesive mastic shall be compatible with insulation.

2. Type 3, PVC Jacket:

a. ASTM D1784, Grade 1. High impact seamless PVC jacket, color as specified.

I. Accessories:

1. All products shall be compatible with surfaces and materials on which they are applied, and suitable for use at operating temperatures of the systems to which they are applied.

2. Adhesives, sealants, and protective finishes shall be as recommended by insulation manufacturer for applications specified.

3. Insulation bands to be 3/4 inch wide, constructed of aluminum, or stainless steel. Minimum thickness to be 0.015 inch for aluminum and 0.010 inch for stainless steel.

4. Insulating cement to be ANSI/ASTM C195, hydraulic setting mineral wool.

5. Finishing cement to be ASTM C449.

6. Bedding compounds to be non-shrinking, and permanently flexible.

7. Vapor barrier coatings to be non-flammable, fire resistant, polymeric resin.

8. Wire mesh reinforcing shall be corrosion resistant metal with a hexagonal pattern.

PART 3 - EXECUTION

3.1 INSPECTION

A. The Contractor shall notify the Engineer a minimum of 5 days in advance of placing insulation so that necessary piping inspections can be performed.

B. Do not insulate systems or equipment that are specified to be pressure tested or inspected until testing and inspection have been successfully completed.

3.2 GENERAL INSTALLATION

A. Insulation, jackets or accessories shall only be installed under ambient temperatures or conditions recommended by the manufacturer of the material.

B. Insulation and jackets shall be provided as indicated in Schedules 3.03.I and 3.04.D. Schedules apply to both exposed and concealed applications, unless noted otherwise.

C. Install insulation with smooth and even surfaces, and on clean and dry surfaces. Poorly fitted joints or use of filler in voids will not be accepted. Provide neatly beveled terminations at all nameplates, uninsulated fittings, or at other locations where insulation terminates.

D. Use full-length material (as delivered from manufacturer) wherever possible. Scrap piecing of insulation will not be accepted.

E. Provide removable insulation sections to permit easy access, where inspection service or repair, are required.

F. Install jackets with longitudinal joints facing wall or ceiling.

G. Insulation shall be continuous through sleeves and openings except where partitions or assemblies are fire rated. Penetrations through rated assemblies shall be sealed with fireproofing insulation.

H. Provide a complete vapor barrier for insulation on the following systems:

1. Cold water make-up.
2. Cold glycol fluid.
3. Cold ammonia refrigerant.
4. Equipment and heat exchangers with an operating surface temperature below 65 degrees F.

3.3 PIPING, VALVES, AND FITTING INSULATION

A. Fittings and valves may be insulated with factory molded or built up insulation. Built up insulation must have the same thickness as adjoining insulation.

B. One piece insulated PVC covers may be used for fittings and valves if insulation thickness and thermal performance is the same as adjoining insulation. Seams, joints between PVC cover and adjoining pipe insulation and any staples or tacks used to secure seams in PVC covers must be covered with 2-inch wide, 10-mil PVC tape.

C. Provide inserts of high-density block insulation at hanger or support locations. Insert must be installed under the finish jacket on piping 2 inches and larger to prevent insulation from sagging or compressing at support points. Inserts shall be heavy density insulating material suitable for the operating temperature range of the system being insulated. Wood blocks will not be accepted. Insulation inserts shall not be less than the following lengths:

Pipe Size	Length
Through 2-1/2 inches	10 Inches
3 Inches to 6 Inches	12 Inches
8 Inches to 10 Inches	16 Inches
12 Inches and larger	22 Inches

D. Insulation shall be applied to piping with butt joints and longitudinal seams closed tightly.

E. Minimum acceptable lap on factory applied jackets shall be 2 inches, firmly cemented with lap adhesive.

F. All seams and butt joints must be sealed with an adhesive recommended by the insulation manufacturer. Vapor barrier mastic is required at all seams for ammonia piping.

G. Type 2, 3, 4, and 5 insulation shall be applied to piping with bonding adhesive and staggered joints. Fill all joints and seams with vapor barrier sealant.

H. On insulated piping with vapor barrier, insulate fittings, valves, unions, flanges, strainers, flexible connections, and expansion joints. Insulation for valves, unions, strainers, flexible connections, and expansion joints shall be removable for inspection and repair.

I. Insulation shall be provided for the exposed portion of the subsoil heat piping in the Mechanical Room, but not for the buried subsoil heat transmission mains. Provide and install pipe insulation as indicated in the following schedule:

Pipe Description	Insulation	Thickness	Jacket
Above Grade & Buried Cold Glycol Piping	Type 5	See below *	Type 2, white color
Ammonia Refrigeration Suction and Cold Liquid Piping	Type 5	See below *	Type 2, yellow color

***Pipe size**	**1/2 to 1-1/4 Inch**	**1-1/2 to 10 Inch**
Insulation Thickness	1-1/2 Inches	2 Inches

3.4 EQUIPMENT INSULATION

A. Where equipment is specified to be leak tested prior to operation, do not install insulation until testing and any necessary repairs have been successfully completed.

B. Insulation shall be applied to equipment shells with bonding adhesive and staggered joints. Fill all joints and seams with vapor barrier sealant.

C. Provide insulated boxes with protective jacket where access is required for cleaning, repair, or inspection. Boxes must be easily removable without causing damage to insulation or equipment.

D. Insulation shall not be provided for the subsoil heat pump, snowmelt pump or snowmelt heat exchanger. Insulation shall be provided for the subsoil heat exchanger (1" Type 3 without jacket). Provide and install equipment insulation as indicated in the following schedule:

Equipment	Insulation	Thickness	Jacket
Glycol Pumps	Type 3	2 Inches	None
Flooded Chiller, Surge Drum, Level Column	Type 5	2 Inches	Type 2, White.

END OF SECTION

SECTION 13 18 14.16

ICE SYSTEM PIPING SPECIALTIES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Expansion tanks, pressure gauges, thermometers, flow meters, and other piping specialties for refrigeration system.

1.2 RELATED SECTIONS

A. Related Work Specified Elsewhere:

1. Conditions of the Contract and Division 01 Sections apply to work of this Section.
2. Section 13 18 00 – Ice System - General.
3. Sections 13 18 14.02 through 13 18 14.13 - Refrigeration Equipment Specifications.
4. Section 13 18 14.15 – Refrigeration System Insulation.
5. Section 13 18 14.17 – Ice System Piping and Fittings.
6. Section 13 18 14.18 – Ice System Valves and Accessories.

1.3 SUBMITTALS

A. Shall be as required in Section 13 18 00.

1.4 WARRANTY/SERVICE

A. Shall be as required in Section 13 18 00.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Shall be as required in Section 13 18 00.

PART 2 - PRODUCTS

2.1 EXPANSION TANKS

A. Approved Manufacturers: ITT Bell & Gossett, John Wood Company, Wessel Company, Armstrong, or approved equal.

B. Capacity and Size: As shown on the schedules on the Drawings.

C. Tank must be designed, constructed, and stamped for 125 psig at 650 degrees F in accordance with Section VIII, Division I of the ASME Boiler and Pressure Vessel Code, and registered with the National Board of Boiler and Pressure Vessel Inspectors.

D. Tank shall have two 1/2-inch NPT gauge glass tappings in head and a minimum of two 1-inch NPT tapings in the shell.

E. Gauge glass shall be Henry Valve Company Type 824 or approved equal.

F. Air Control Tank Fitting:

1. Shall be ITT Bell & Gossett, or Armstrong tank fitting, or approved equal.

2. Cast iron body, copper tubes, brass vent tube plug, and stainless-steel ball check.

G. Tanks shall be painted with one shop coat of air-dry enamel.

2.2 PRESSURE GAUGES

A. Approved Manufacturers: United Instrument, McDaniel, Ashcroft, Marshalltown, or approved equal.

B. Design Conditions:

1. Gauges shall be scaled from 0 to 50 psi.

C. Shall be minimum 4-1/2-inch diameter, bronze bourdon tube type, glycerin filled, 1-percent full-scale accuracy gauges, with 1/2-inch stainless steel socket.

D. Case shall be stainless steel.

E. Lens shall be laminated safety glass and movement and bourdon tube shall be stainless steel.

F. Provide snubber and brass shut off Apollo ball valve with lever handle. Provide pipe nipples for handle clearance.

2.3 AUTOMATIC AIR VENTS

A. Approved Manufacturers: ITT Bell & Gossett No. 87, or approved equal.

B. Shall have combination 1/2-inch FPT and 3/4-inch MPT connection and Apollo ball valve.

2.4 REFRIGERANT STRAINERS

A. Approved Manufacturers: Hansen Technologies, ST Series, Sporlan Valve Company, or approved equal.

B. Shall include stainless steel screen and ductile iron or stainless-steel body.

C. Shall be easily serviceable in-line.

2.5 HANGERS

A. Approved Manufacturers: Grinnell Figures 108, 171, 174, 260, or equivalent by Crane, or approved equal.

B. Brackets: Grinnell Figures 194, 195, 199, or equivalent by Crane, or approved equal.

C. Clevis type sized to fit neatly over insulation; provide 12-gauge pipe saddles and inserts of high-density block insulation at all hangers for insulated pipe as specified in Section 13 18 14.15 Refrigeration System Insulation.

2.6 THERMOMETERS

A. Approved Manufacturers: Trerice CX series, Weksler, or approved equal.

B. Case and stem shall be adjustable.

C. Accuracy shall be ± one scale division.

D. Case: Bronze finish molded plastic case.

E. Non-breakable plastic front.

F. Scale: -40 degrees F to 110 degrees F.

G. Scale Size: 9 inches.

2.7 TEMPERATURE WELLS

A. Approved Manufacturers: Hoffman Specialty Series 1140 or approved equal.

B. Bulb: Copper.

2.8 THERMOCOUPLES

A. Suitable for use with temperature wells.

2.9 FLOW SWITCH

A. Approved Manufacturers: McDonnell & Miller.

B. Brass construction.

C. NEMA 4X enclosure.

D. Adjustable for flow sensitivity.

E. Maximum Pressure: 150 psi.

F. Maximum Temperature: 225 degrees F.

2.10 SUCTION DIFFUSER/STRAINER

A. Approved Manufacturers: ITT Bell & Gossett, Taco, Armstrong, or approved equal.

B. Body: Flanged, cast iron.

C. Straightening Veins: Steel or cast iron.

D. Orifice: Steel.

E. Strainer: 3/16-inch diameter openings, stainless steel.

F. O-Ring Seal: EPDM.

G. Maximum Working Pressure: 175 psi.

H. Adjustable pipe support.

I. Start-Up Strainer: 16 mesh bronze.

J. Provide removable magnetic inserts.

2.11 REPLACEABLE CORE REFRIGERANT FILTER

A. Approved Manufacturers: Henry Type V8000, or approved equal.

B. Shell: Steel corrosion resistant finish.

C. Cover Plate: Ductile iron, flanged.

D. Maximum pressure rating 275 degrees F.

E. Maximum Working Pressure Rating: 500 psi.

2.12 HIGH SIDE FLOATS

A. Approved Manufacturers: Hanson Technologies HT Series, or approved equal.

B. Operation: High side floats shall contain a direct float operated valve that allows liquid refrigerant to pass but prevents gas from flowing through.

C. Steel body, flanged housing for servicing, stainless steel float ball assembly, low friction composite slide valve, manual opening stem, and connections for oil drain and equalizer/purge lines.

D. Operating temperature -60 to +240 degrees F.

E. Maximum Working Pressure Rating: 400 psi.

2.13 FLOW METERS

A. Approved Manufacturers: RCM Industries 8000 Series or approved equal.

B. Flow meters shall be 8” diameter wafer style to measure flow based on pressure differential created across a calibrated nozzle.

C. Measurement Range: 330 to 2,000 GPM (6 to 1).

D. Bronze body construction, ±3% accuracy, ±1% repeatability.

E. Operation temperature range: -30°F to +212°F.

F. Flow meters shall provide a 4-20mA signal output proportional to flow for remote indication, as well as a local flowrate digital display with cabinet and power supply. Flowrate to be displayed in gallons per minute.

PART 3 - EXECUTION

3.1 INSTALLATION

A. All piping specialties shall be installed as shown on the Drawings, as described herein, and in accordance with manufacturer’s recommendation.

B. Expansion tanks shall be supported from the equipment skid framing, or hung from the building ceiling structure, with adequate supports and with gauge glass easily visible.

C. Air vents shall be placed at all high points in the system where air may collect and not be carried by the system.

D. Start-up strainers in the suction diffusers shall be removed after system start-up.

E. Pipe supports and hangers shall be sized and spaced in conformance to Appendix F in ANSI/IIAR 2. Provide additional supports near equipment as necessary so the equipment bears minimal load from the piping.

F. All piping shall be supported in such a way to eliminate swaying and vibration transmission.

END OF SECTION

SECTION 13 18 14.17

ICE SYSTEM PIPING AND FITTINGS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Piping and fittings for ice system.

1.2 RELATED SECTIONS

A. Related Work Specified Elsewhere:

1. Conditions of the Contract and Division 01 Sections apply to work of this Section.
2. Section 13 18 00 – Ice System General.
3. Section 13 18 13.01 – Ice Rink Floors.
4. Sections 13 18 14.02 through 13 18 14.13 - Refrigeration Equipment Specifications.
5. Section 13 18 14.14 – Chemical Treatment System.
6. Section 13 18 14.15 – Ice System Insulation.
7. Section 13 18 14.16 – Ice System Piping Specialties.
8. Section 13 18 14.18 – Ice System Valves and Accessories.

1.3 SUBMITTALS

A. Shall be as required in Section 13 18 00.

B. Submit results of all pressure tests.

1.4 WARRANTY/SERVICE

A. Shall be as required in Section 13 18 00.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Shall be as required in Section 13 18 00.

PART 2 - PRODUCTS

2.1 STEEL PIPE AND FITTINGS

A. Refrigerant and heat transfer fluid piping. All pipe and fittings shall conform to ANSI/IIAR 2.

B. Material:

1. Piping 1-1/2 inch diameter and smaller shall be Schedule 80 carbon steel.

2. Piping larger than 1-1/2 inch diameter shall be Schedule 40 carbon steel with welded joints, or Schedule 80 with threaded joints.

3. Carbon steel pipe shall be ASTM Standard A53 Grade A or B, Type E (electric resistance welded) or Type S (seamless); or ASTM Standard A106 (seamless). Standard A53 Type F piping is not permitted.

C. Joints:

1. Weld end type where-ever possible.

2. Minimize threaded joints.

D. Fittings:

1. ANSI 11.9 carbon steel welding type. Fittings shall match type of pipe – standard fittings for standard pipe and extra-heavy fittings for extra-heavy pipe.

2. Manufactured not field/shop fabricated.

E. Welds:

1. All welds shall be full penetration type welds. Pipe and fitting ends shall be beveled before welding.

2.2 PIPE HANGERS

A. See Section 13 18 14.16 Ice System Piping Specialties.

2.3 PIPE IDENTIFICATION

A. All piping shall be color-coded as required in Section 13 18 14.15 Refrigeration System Insulation.

B. All exposed interior piping shall receive pipe markers as specified below.

C. Pipe Markers:

1. Shall identify the exact name of the conveyed fluid and direction of flow.

2. Shall be provided for all Division 13 ice system piping included in this Project.

3. Shall be rolled, plastic-coated type markers.

4. Markers shall snap around entire circumference of pipe.

5. Markers shall be removable.

6. Markers requiring bonding, taping, adhesives, or other fastening devices shall not be allowed.

7. Markers shall conform to ANSI and OSHA requirements for marker size, marker color, legend size, and legend color.

8. Placement:

a. Interior and exterior.

b. Each pipe shall be labeled with a minimum of 2 markers in each room.

c. Markers shall be installed on all branch lines of all header pipes.

d. Markers shall be installed on all header lines between branches.

e. Where the same pipe goes through a wall or piece of equipment, markers on each side of wall are required.

f. Markers for chemical piping shall in no case exceed 10-foot spacing.

g. In no case, on all other piping, shall markers exceed 20-foot spacing.

PART 3 - EXECUTION

3.1 GENERAL INSTALLATION

A. Seal all pipe penetrations through fire-rated interior walls, ceilings, or floors with fire-rated sealant.

B. Provide drain lines and valves in locations necessary for complete drainage of the systems, including all low points in the piping system and equipment.

C. Install pipe supports as specified in Section 13 18 14.16.

D. All piping shall be supported in such a way to eliminate swaying.

3.2 INSTALLATION OF BURIED PIPE

A. Inspection:

1. Before placing the pipe in the trench, the pipe and fittings shall be inspected for defects. Any defective, damaged, or unsound material shall be rejected.

2. All foreign matter or dirt shall be removed from the inside of the pipe and fittings before it is lowered into its position in the trench, and shall be kept clean by approved means during and after laying. All openings along the line of the main shall be securely closed as directed, and in the suspension of work at any time, suitable stoppers shall be placed to prevent earth or other substances from entering the main.

3. No pipe shall be laid in water or when the trench conditions are unsuitable for such work, except by written permission of the Engineer.

3.3 BACKFILLING

A. All excavation in trenches shall be backfilled to the original ground surface. The backfilling shall begin as soon as practical after the pipe has been placed. Prior to any backfilling the excavation shall be cleaned of all trash, debris, organic material, and other undesirable material.

B. Backfilling and compacting shall be done as thoroughly as possible so as to prevent later settlement. Depositing of the backfill shall be done so the shock of falling material will not injure the pipe, insulation, or structures.

C. Granular material, or other suitable material as determined by the Engineer, free from rocks and boulders shall be deposited in the trench simultaneously on both sides of the pipe for the full width of the trench to a height at least 12 inches above the top of the pipe, shovel placed, and hand tamped to fill completely all spaces under and adjacent to the pipe.

D. Backfill material shall be compacted to at least 95 percent of the standard moisture density relationship of soils (ASTM D698). Under building foundations, floors, or structures the backfill material shall be compacted to 98 percent of the standard moisture density relationship of soils (ASTM D698).

E. In the event that natural, suitable, granular material is not encountered during the normal excavation of the trench, or when the material encountered is determined unsuitable by the Engineer for backfilling around the pipe as required, the Contractor shall provide and place such approved material.

F. Trench shall be backfilled with suitable material to obtain necessary compaction, with lift thickness as required, dependent on the type of roller used, but not to exceed 12 inches.

G. Any settlements greater than one inch as measured with a string line from one edge of the settlement to the other within the warranty period of this Contract shall be considered failure of the mechanical compaction and all overlying pavements shall be repaired by the Contractor at no cost to the Owner.

3.4 FLUID PIPING PRESSURE TESTS

A. The Engineer or his designated representative shall witness the testing. Provide 5 days notice to allow the Engineer to be on the Site.

B. Steel Pipe Testing Procedure:

1. Fill the piping system with water and bleed off any trapped air.

2. Testing:

a. Apply a pressure of 75 psig for a period of 24 hours.

b. After the 24-hour test has passed, increase the pressure to 100 psig for 10 minutes.

3. Protect all equipment during testing that is not rated for the specified pressure.

3.5 AMMONIA REFRIGERANT PIPE PRESSURE TEST

A. At the completion of the ammonia refrigerant pipe installation, the entire piping system shall be tested.

B. The Engineer shall witness the testing. Provide 5 days notice to allow the Engineer to be on the Site.

C. Testing: Piping systems shall be evacuated and leak tested in accordance with ASHRAE 15 and ANSI/IIAR-2 for ammonia systems.

3.6 PRIMARY REFRIGERANT CHARGING

A. After the piping system has been evacuated, the system shall be filled with ammonia refrigerant as specified in Section 13 18 00 to the optimum operating level.

3.7 INSULATION

A. Pipes and fittings shall be insulated. See Section 13 18 14.15.

3.8 PAINTING

A. All steel piping, hangers, supports, and accessories that are not specified to be insulated shall be field painted:

1. Surface Preparation: ST6 Blast.

2. Primer Coat:

a. 90G97 by Tnemec Company, Inc., or approved equal.
b. Thickness: 1 coat 2-1/2 to 3-1/2 mils.
c. Color: Manufacturer’s standard.

3. Intermediate Coat:

   a. Series 161 by Tnemec Company, Inc., or approved equal.
   b. Thickness: One coat 3 to 5 mils.
   c. Color: As specified by the Engineer selected from the Manufacturer's standard colors.

4. Finish Coat:

   a. Interior: Series 66 by Tnemec Company, Inc., or approved equal.
   b. Exterior: Series 74 by Tnemec Company, Inc., or approved equal.
   c. Thickness: One coat 3 to 5 mils.
   d. Colors: As specified by the Engineer, selected from Manufacturer's standard colors. More than one color may be selected.

END OF SECTION

SECTION 13 18 14.18

ICE SYSTEM VALVES AND ACCESSORIES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Valves and accessories for ice system.

1.2 RELATED SECTIONS

A. Related Work Specified Elsewhere:

1. Conditions of the Contract and Division 01 Sections apply to work of this Section.
2. Section 13 18 00 – Ice System General.
3. Section 13 18 14.12 – Pumps.
4. Section 13 18 14.15 – Ice System Insulation.
5. Section 13 18 14.16 – Ice System Piping Specialties.
6. Section 13 18 14.17 – Ice System Piping and Fittings.

1.3 SUBMITTALS

A. Shall be as required in Section 13 18 00.

1.4 WARRANTY/SERVICE

A. Shall be as required in Section 13 18 00.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Shall be as required in Section 13 18 00.

PART 2 - PRODUCTS

2.1 SOLENOID VALVES

A. Approved Manufacturer: Hansen Technologies, or approved equal.

B. Heavy-duty ductile iron body, pilot operated, steel-plated bonnet-cartridge.

C. Stainless steel piston, closing spring, solenoid tube, and pilot orifice with Teflon tapered seat.

D. Double seal manual opening stem.

E. Minimum Working Pressure: 400 psig.

2.2 REFRIGERANT CHECK VALVES

A. Approved Manufacturers: Hansen Technologies Type HCK, or approved equal.

B. Heavy-duty ductile iron body (ASTM A536) with steel cover.

C. Stainless steel or ductile iron piston, Teflon seat, and stainless steel closing spring.

D. Non-asbestos, graphite composite gaskets.

E. Plated steel stem with o-ring seal and graphite composite packing, manual opening.

F. Minimum Working Pressure: 400 psig.

2.3 SEALED MOTOR VALVES

A. Approved Manufacturers: Hansen Technologies MCV Motorized Control Valve, or approved equal.

B. Sealed motor operated valve, with controlled opening and closing to minimize liquid hammer.

C. Valve to be sized to conform with manufacturer's recommended capacity table.

D. Furnish valve manufacturer's recommended motor valve controller.

2.4 HAND EXPANSION VALVES

A. Approved Manufacturers: Hansen Technologies, Sporlan, or approved equal.

B. Ductile iron or cast steel body with frost shield. Ductile iron or steel bonnet with double seals constructed of neoprene o-ring or flat composite gasket.

C. Stainless steel stem with graphite composite plus neoprene o-ring seal.

D. Stainless steel ball bearings and Teflon seat disc.

E. Slotted stainless steel or zinc chromate plated steel throttling plug and zinc chromate plated steel packing nut.

F. Minimum Working Pressure: 400 psig.

2.5 REFRIGERANT PURGE VALVES

A. Approved Manufacturers: Hansen Technologies or approved equal.

B. Forged steel, zinc-plated body.

C. Stainless steel, polished stem, non-removable safety stem.

D. Graphite stem packing with neoprene o-ring.

E. Glass filled polymer seal cap with neoprene o-ring.

F. Minimum Working Pressure: 400 psig.

2.6 REFRIGERANT PRESSURE REGULATOR VALVE

A. Approved Manufacturers: Hansen Technologies or approved equal.

B. Ductile iron flanged body.

C. Steel, disc type piston with Teflon seal.

D. Manual opening stem, steel plated.

2.7 REFRIGERANT SHUT-OFF VALVES (GLOBE OR ANGLE)

A. Approved Manufacturers: Hansen Technologies or approved equal.

B. Ductile iron body (ASTM A536). Zinc chromate plated steel bonnet with double seals constructed of neoprene o-ring or flat composite gasket.

C. Stainless steel stem with graphite composite plus neoprene o-ring seal.

D. Stainless steel ball bearings with stainless steel ball retainer ring.

E. Compound PbSb seat disc with stainless steel disc retainer.

F. Packing Nut: Zinc chromate plated steel with graphite composite plus neoprene o-ring.

G. Handwheel: Zinc chromate plated handwheel.

2.8 AMMONIA PRESSURE RELIEF VALVES

A. Approved Manufacturers: Hansen Technologies, Henry, Shank, Parker, or approved equal.

B. Shall meet the requirements of the ANSI/ASHRAE 15 Safety Standard for Refrigeration Systems.

C. Stainless steel or ductile iron body ASTM A395.

D. Stainless steel piston, spring and seal insert.

E. Teflon disc, steel plated cap with neoprene o-ring.

F. Safe Working Pressure: 400 psig.

G. Each pressure relief valve shall be selected by the Contractor to conform to system requirements in conformance with ANSI/ASHRAE recommendations. Pressure setting shall be minimum 25 percent above the maximum operating pressure, but shall not exceed the pressure rating of the vessel or system protected. Pressure relief valves shall be selected to closely match the minimum relief capacities required. Where minimal relief capacity is required for small vessels and compressors, low capacity relief valves such as Shank Model No. 800 shall be used.

H. Pressure vessels 10 cubic feet volume or more, as well as elsewhere shown on the drawings, shall include dual pressure relief valves, with 3-way dual shut-off valve.

2.9 TRIPLE DUTY VALVES

A. Approved Manufacturers: ITT Bell & Gossett, Armstrong, or approved equal.

B. Operates as nonslam check valve, shutoff valve, and throttling valve.

C. Cast iron or flanged body, brass seat, and bronze disc with EPDM seat insert.

D. Stainless steel stem and spring, and Teflon-graphite packing.

E. Minimum Working Pressure: 175 psi.

2.10 NON-SLAM CHECK VALVES

A. Approved Manufacturers: Nibco, Stockham, or approved equal.

B. Cast iron flanged body, bonnet, disc plate, and disc cage, ASTM A126, Class B.

C. Cast bronze disc, seat ring, and hanger, ASTM B585, Alloy C84400.

D. Brass side plug, hanger pin, disc nut, disc bolt, ASTM B16, Alloy C36000.

E. Renewable Seat and Disc.

F. Minimum Working Pressure: 125 psi.

2.11 BALL VALVES

A. Approved Manufacturers: Apollo 70 Series or approved equal.

B. Bronze body, 316 stainless steel ball and Teflon seats.

C. Provide stem extensions on insulated piping.

2.12 BUTTERFLY VALVES

A. Approved Manufacturers: Stockham LG-512 wafer type, Pratt, Henry, or approved equal.

B. Cast iron body and stainless steel shaft.

C. Teflon, nylatron, or acetal bearings.

D. EPDM resilent seat.

E. Provide valve neck extension if needed for valves installed in insulated pipe.

2.13 VALVE TAGS

A. All valves to be tagged with non-ferrous metal or plastic tags fastened to valve stems.

B. Fasteners shall be non-ferrous, or corrosion proof.

C. The Contractor shall obtain from the Engineer the designation to be used for each valve.

2.14 VALVE CONTROLLER

A. Controller shall provide adjustable high-pressure cut-out control, with automatic reset, and shall function to open the automatic crossover connection solenoid valve and send a signal to shut-down the refrigeration system when the refrigeration high-side pressure exceeds 235 PSI. Controller shall be designed for operation with ammonia refrigerant.

B. Controller shall be Johnson Controls, Penn, or approved equal.

2.15 LIQUID DRAIN BALL VALVES

A. Steel body valve, with “Deadman” spring return handle ball valve, automatically returns to closed position when handle is released.

B. Valve shall be Hansen 89 Series or approved equal.

PART 3 - EXECUTION

3.1 INSTALLATION

A. All valves and accessories shall be installed as shown on the Drawings, as described herein, and in accordance with manufacturer’s recommendation.

B. Install solenoid valves with sufficient room above valves to remove coils.

C. Provide drain lines and valves in locations necessary for complete drainage of refrigeration system, including all low points in piping system and equipment.

D. Pipe all air release valves and pressure relief valve discharge ports to floor using appropriate diameter copper tubing.

E. Contractor shall provide power, wiring, and controls to all electrically serviced equipment specified herein. All final electrical connections shall be made to allow the equipment to operate for the intended purpose.

3.2 START-UP TRAINING

A. As specified in Section 13 18 00.

END OF SECTION

SECTION 13 18 16

ICE RINK DASHER BOARDS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Supply and install ice rink dasher boards with boxes, shielding, gates, netting, and accessories.

1.2 RELATED SECTIONS

A. Related Work Specified Elsewhere:

1. Conditions of the Contract, Supplemental Conditions, and Division 01.
2. Section 13 18 13.02 – Ice Rink Floors.

1.3 SUBMITTALS

A. The manufacturer/supplier shall prepare shop drawings that itemize sizes and materials, as well as construction details for installation.

B. Polyethylene and tempered glass samples, minimum 4” by 4” size, shall be submitted for Owner/Engineer selection of color and approval of quality.

1.4 QUALITY ASSURANCE

A. All materials shall be constructed, manufactured, and installed per Drawings and Specifications. All equipment and materials supplied shall be of the best grade material and construction. Manufacturer must have at least five installations in the past five years similar in construction to these Specifications. A list of these installations including names, addresses, contacts, and telephone numbers is to be included with requests for approval of manufacturers other than those listed in Paragraph 13 18 16.2.01.A below.

B. Any manufacturer proposing to Bid this Project and not listed in Paragraph 13 18 16.2.01.A shall supply a sample panel of proposed dasher system showing exactly how the system will be manufactured. Samples shall show how shield-mounting hardware will be attached to system, as well as samples of framing, facing, gate latches, hinges, and related hardware.

1.5 GUARANTEE

A. Manufacturer shall guarantee all equipment from defects in materials and/or workmanship for a period of 3-years from project completion.

1.6 DELIVERY

A. To be arranged to coordinate with Completion Date of the Project. Delivery date shall allow for sufficient installation time prior to Project Substantial Completion Date.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

A. New Dasher Board System:

1. Rink Systems, Inc.
2. Others by prior approval only.

2.2 MATERIALS AND EQUIPMENT

A. Demountable Frame Sections - Steel Framing:

1. Dasher panels shall be fabricated in demountable sections of nominal 8'-0" length and 3'-6" height. The design of all panels, whether straight section, curved section, or section in which a gate is located, shall be fundamentally similar. Each section shall be constructed of two horizontal 1-1/2" x 2" x 3/16" steel angles (or 2" x 2" x 3/16" steel angles) at the top and intermediate locations and one horizontal 1-1/2" x 2" x ¼" steel angle (or 2" x 2" x ¼" steel angle) used at the base location. An additional 1" x 1" by 0.083" steel tube (or 1" x 1-1/2" x 14-gauge steel tube) shall be used at the top rear location to aid in fastening the cap rail to the frame. All horizontal members shall be welded to a specially designed 11-gauge x 6" width steel end plates on each end of the panel. All vertical formed channels must have minimum ¾" return edges.

2. Each end plate shall have three matching holes to accommodate ½" diameter through bolts.

3. An additional 2" x 1-1/2" x ¼" steel angle (or 2" x 1-1/2" x ¼" steel angle) shall be welded to the back and bottom of each panel to form a continuous slot for anchoring panel to the floor.

4. An additional 1" x 2" x 0.083" steel tube shall be welded horizontally to the back of all panels to aid in fastening and supporting of the backer sheets. The location of this steel tube varies with location and sizing of backer sheets.

5. In panels over 5'-0" in length, an additional 1-1/2" x 3" x 14-gauge steel tube (or 2" x 3" x 0.120" steel tube) shall be welded at the center point of the panel vertically to add rigidity.

6. All steel angles and formed channels used to make up dasher panels and gates shall be pre-punched with slotted holes to allow expansion and contraction in the polyethylene dasher facing due to changes in temperature. Round holes and self-tapping screws are not acceptable.

7. Each panel is to be a completely welded assembly. After the construction of the framing, each panel is to be hot dip galvanized. Zinc or nickel plating is not acceptable.

8. The use of rectangular or square steel tubing for horizontal framing members or end vertical framing members is not acceptable unless specifically described in this specification.

9. Systems that require separate support posts or angle supports to support the dasher system are not acceptable.

B. Floor Anchors:

1. The Contractor shall supply all new inserts, anchors, and hardware required for the installation of the dasher boards around the perimeter of the rink. Installation of the anchors within the concrete slab formwork shall be by the Dasher Board Supplier. Anchors shall be 5/8" (or ¾" at the Contractor's option) diameter zinc-plated steel internally threaded inserts, as detailed on the drawings. Drilled-in or expansion anchors will not be acceptable.

2. The Contractor shall furnish ½" x 4" x 5" galvanized steel or aluminum hold down plates at each anchor.

3. Each anchor shall be supplied with a 2" length zinc-plated steel bolt and washer to fasten dasher board foot plate as well as corrosion resistant flush plugs to be utilized when dasher boards are removed. The number of flush plugs to be furnished shall be the number of anchors installed plus 10 percent. Flush plugs shall be removable with a hex type Allen wrench, not a Phillips or straight blade screwdriver.

C. Dasher Facing:

1. Dasher board facing shall be ½" (0.500"± 0.02") thickness stress relieved high-density virgin polyethylene.

2. Facing panels shall be one piece and cut to match length of demountable framing section.

3. Polyethylene to be furnished in a bright white color. Natural white is not acceptable. The color of all facing must match.

4. Reprocessed or reground polyethylene is not acceptable.

5. On panels that require red and blue lines, the facing shall be routed ¼" deep by the width necessary so that a ¼" thick red or blue panel of high-density polyethylene can be inserted into this area. Fastening the polyethylene red or blue line to the front of the white dasher panel or cutting the panels to insert a ½" thick line with a secondary backer is not acceptable.

6. The ½" polyethylene shall be attached to the horizontal angles with ¼" diameter Phillips flat head machine screws, flat washers, and ¼" nylon insert lock nuts where possible. Spacing of the ¼" diameter screws shall not exceed 1"-0" on center. Heads of screws shall be painted to color match dasher facing and kick plate. The use of self-tapping or sheet metal screws to attach dasher facing is not acceptable.

D. Backer Panels:

1. 3/8" thickness high-density polyethylene panels shall be attached to the back side of dasher board framework..

2. All polyethylene shall be attached to the framework with ¼" diameter by 1-1/4" Phillips flat head, Type F thread cutting screws.

3. Color of backer sheets shall be bright white.

E. Caprail:

1. High-density polyethylene caprail ¾" thickness shall be fastened to the top horizontal-framing members. Heads of screws to be painted to color match caprail. Spacing of the ¼" diameter screws (2 rows) shall not exceed 24" on center. The use of nylon rivets or sheet metal screws is unacceptable. The front and back edges of the caprail shall have smooth and radiused edges.

2. Caprail shall overhang backside of frame around the entire rink perimeter to match with backer sheets.

3. Color of caprail shall be selected by the Owner after the Bid. Manufacturer shall offer minimum 5 color choices, which shall include red, dark blue, light blue, yellow, and one other choice.

F. Skaters and Player Gates:

1. Four 30” wide player gates.

2. Two 30” wide penalty gates.

3. Four 30” wide box divider access gates.

4. Access gates and player gates shall be widths shown on the Drawings.

5. Gates shall be built into 8’-0” panels and shall be left or right-hand swing, as shown on the Drawings.

6. Gate panel framing and gate plugs shall be made of pre-punched slotted formed channels both vertically and horizontally, except at the bottom location where the two continuous parallel angles form a continuous slot identical to the standard panels.

7. The gate latch shall be equipped with a spring-loaded bolt or gravity operated double latch mechanism so that the gate may be closed and latched in a single movement.

8. The hinges for access and player gates shall be two adjustable, lift off type, welded to the frame. All hinge assemblies shall have grease fittings for easy lubrication.

9. All single swing access and player gates shall have one 3/8” thick x 3-1/2” wide x 4-1/2” long door stop welded to the gate frame. Skaters gate spring latches must be equipped with push button releases located on the caprail on the ice side of shielding so that the gate can be opened from the ice side.

10. Gates with shielding must be made to accept spectator shield mounting hardware.

11. Thresholds for access gates shall be 2”± ¼” above floor level.

12. Thresholds for team and penalty box gates shall be 8” ± ¼” above floor level.

G. Equipment Gates:

1. Shall be a one double leaf gate with a 10’–0” opening and three with a 6’-0” opening.

2. Gate panel framing shall be made of pre-punched slotted channels vertically and horizontally. All hinge assemblies shall have grease fittings for easy lubrication.

3. The equipment gate hinges shall be two adjustable, lift off type, welded to the frame.

4. Equipment gate latch is to be the sliding bar type 2” x 2” by 12-gauge square tubing or 2” x 2” solid rods with a large grasp handle.

5. Each equipment gate leaf shall lock into the steel threshold by means of ¾” x 12” long cane bolts.

6. Each equipment gate leaf shall be equipped with an adjustable spring-loaded caster.

7. The equipment gates shall be furnished with metal thresholds 1-1/2" high, with ½" white poly sills.

H. Hardware:

1. All steel hardware shall be galvanized or zinc plated for rust resistance after welding.

2. Hardware shall include hinges, latches, nuts, bolts, washers, and miscellaneous fastening devices necessary for complete installation.

I. Kickplate:

1. Kickplate shall be constructed of ½" thick high-density polyethylene 8" high

2. The top edge of the kickplate shall be beveled or shall have a ¼" radius or bevel.

3. The kickplate shall be fastened to the bottom of the dasher panel using ¼" diameter Phillips flat head machine screws. The heads of the screws are to be painted to color match the kickplate.

4. Color of kickplate shall be selected by the Owner after the Bid. Manufacturer shall offer minimum 3 color choices, which shall include light blue, yellow, and one other choice.

J. Thresholds:

1. Access, player, and equipment gates shall have white high-density polyethylene thresholds that can be removed and replaced when wearing occurs. Sills shall be 1" thickness for player gates, and minimum ½" thickness for access and equipment gates.

K. Spectator Shield Mounting:

1. Spectator shields on sides of rink shall include "supportless" style mounting slots. The support slots shall be furnished complete with base gaskets.

2. Spectator shields at the ends and radius of the rink shall include posts. Spectator shield mounting supports shall be round in design and of two-piece construction, made of solid architectural grade extruded aluminum with clear anodized finish. Support back shall be installed through a snug fitting contoured opening in the finished sill and secured at the bottom with a support-mounting bracket to the center stringer of the dasher panel. Installation of glass panels to be from the rink side with the vertical support within the dimensions of the boards, with no protruding anchors behind the boards. The supports are to be furnished complete with polyethylene shield gasketing. Total width of supports not to exceed 2-1/2".

3. Mounting hardware is to be removable so that the posts and spectator shielding can be removed without demounting or disassembling the dasher system. The round shield supports shall be attached at the center angle with a "J" fitting that extends a minimum of 1-1/4" below the center angle.

4. Gate shield mounting hardware shall be made of solid architectural grade extruded aluminum with clear anodized finish. It shall be of one-piece design to

allow the operation of gate sections. The supports are to be furnished complete with polyethylene shield gasketing.

5. The height of the supports shall be 1” below the proposed top of shielding height.

6. The spectator shield supports are to be nominally 48” apart, except at gates or similar openings in the dasher boards.

L. Spectator Shielding:

1. Shielding shall be clear float safety tempered glass, except the shielding used on the 10’-0” width equipment gates shall be ½” thickness clear acrylic. The shields shall have the top two corners clipped and all edges ground to minimize breakage and for safety in handling. Seamed edges are not acceptable. Clear polycarbonate clips shall be installed between top edges of adjacent shielding at supportless areas.

2. All shields shall be 48” nominal width, except at gates or similar openings in the dasher boards.

3. The height of all spectator shielding shall be 72” above dasher board top rails, as indicated on the drawings, plus the depth of the mounting channels at the supportless areas. Tempered glass panels on the ends and radius corners shall be 5/8” thick. All other panels shall be ½” thick.

4. Spectator shielding shall not be installed behind but at sides, but not in front of player boxes.

5. Spectator shielding shall be installed at front, and both sides of the penalty boxes and the scorer boxes.

6. Building contractor will install back walls of spectator boxes which team boxes shall butt into.

7. The spectator shielding corners at both ends of each player box shall include safety pads. Pads shall include shock-absorbing foam cores with heavy-duty 18-ounce reinforced fabric covering. Fabric color to be selected by Owner from the manufacturer’s standard colors. A minimum of 4 color options shall be provided.

8. The shielding section in front of the scorer boxes shall include a 2-1/2” diameter speak-hole located 5’– 0” above the ice level. All edges of the holes shall be ground smooth.

9. Extra tempered glass shielding shall be provided for Owner’s future replacement as follows. Quantities shown are per rink constructed:

   a. 3 shields for standard section, 5/8” thickness, 6’-0” height.
   b. 3 shields for standard section, ½”thickness, 6’-0” height.
   c. 2 shields for standard supportless section, ½”thickness, 6’-0” height.
   d. 1 shield for 3’–4” wide gate – 5/8” thickness, 6’-0” height.
   e. 1 shield for 3’–4” wide gate – ½” thickness, 6’-0” height.
   f. 1 shield for 2’–6” wide gate – ½” thickness, 6’-0” height.

   g. 1 shield (acrylic) for 5’–0” wide equipment gate – 1/2” thickness, 6’-0” height.

M. Boxes:

1. Boxes for each rink shall consist of two player boxes, two penalty boxes, and one official's box. Box dimensions shall be as shown on the Drawings.

2. Incorporated into the player box areas shall be shelves for the storage of player's water bottles. Shelves shall be 3/8" white polyethylene identical in color to the ½" dasher facing material and be constructed as detailed on the Drawings. Shelves shall be completely lined with 3/8" white polyethylene. Locate shelves along entire length of all player boxes, except at gates.

3. Backer panels of ½" high-density white polyethylene panels shall be attached to the backside of the dasher board framework inside the player boxes. Color shall be identical to that of the dasher facing panels. Panels will extend the full height of the dasher, except at shelf locations where panels shall terminate at the height shown on the Drawings. Panels shall be fastened to the framework using ¼" x 1-1/4" Phillips flat head, type F thread cutting screws.

4. A polyethylene scorer's table shall be installed in the official's boxes as shown on the Drawings. The color of the table shall be selected by the Owner after the Bid. Manufacturer shall offer minimum 4 color choices, which shall include red, dark blue, yellow, and one other choice.

5. Elevated flooring shall be furnished for the player, officials, and penalty box areas, as well as the landings and ramps for handicap access into the boxes. The elevated flooring shall be fabricated with aluminum or galvanized steel angle welded into frames 6-1/4" high. All flooring sections shall have adjustable bases welded to the bottom of the steel framework to allow the elevated floor sections to be leveled.

6. The metal framework shall be covered with ¾" treated plywood, Tek screwed in place, and covered with 3/4" black rubber loose-laid matting. Rubber matting shall be provided for all box floors and all ramps.

7. In the player boxes, two-tier framework shall be fabricated for a coaches' walkway behind the benches. The coaches' walkway shall be elevated 7" above standard box floor height. The construction of this walkway is to be identical to the elevated flooring in the boxes. The changes in elevation shall have ½" white poly covering.

8. At handicap access ramps, the metal framework and plywood decking shall be designed to slope from a height of 7" down to ¼" over an 8'-0" long run. Ramp framework and plywood decking shall be trimmed as necessary to provide the maximum ¼" lower end height.

9. Permanently mounted handrails shall be provided on one side of each handicap access ramp. Handrails shall be constructed of 1-1/4" galvanized steel schedule 40 piping (1.66" O.D.), with floor post-brackets at maximum 4'-0" spacing. Handrails shall include horizontal extensions 1'-0" beyond top and bottom edges of ramps.

N. Benches:

1. The benches used in the players and penalty box areas shall be made of 1-1/2" thickness x 9-1/4" width recycled plastic lumber. Color shall be selected by the Owner after the Bid. Manufacturer shall offer minimum 4 color choices.

2. Plastic benches shall be supported by full-length metal angle frames.

3. Lengths of benches shall be as shown on the Drawings.

4. All edges of the benches shall have ¼" radius edges.

5. Bench support post spacing shall not exceed 4'-0".

6. Removable sections of bench, each 2'-6" in length, shall be provided at locations shown on the drawings. Removable sections shall include leg supports that allow the benches to be positioned at any location.

O. Protective Netting:

1. Protective netting shall be installed on the spectator side, both ends, and all four radii of each rink. The netting shall extend from 6" below the top of shielding up nearly to the bottom of the arena roof structure. Netting height shall be as shown on the drawings.

2. Netting shall be made from black nylon, 1-3/4" mesh fabric, 125 lb minimum break strength. Net shall be bound on all sides and brass grommets shall be installed at maximum 24" centers.

3. 1" galvanized steel pipe shall be run continuously along the top edge of the netting. The tubing shall be connected to the arena roof structure with 3/16" galvanized steel cables at 8'-0" maximum spacing.

4. Netting shall be attached at the bottom and top edges as shown on the drawing details.

P. Shield Removal Cups:

1. Provide two suction cup glass-handling devices per rink constructed, to facilitate installation and removal of shielding, complete with storage cases.

Q. Angle Closure:

1. Provide 2" x 2" x 3/8" polyethylene angle closure along the spectator sides of the rinks as shown on the Drawing Details. The color of the closure angle shall be white.

R. Shielding/Dasher Board Carts:

1. Provide two heavy-duty shielding/dasher board transport/storage carts per rink constructed. The 4,000-pound capacity carts shall be of welded steel construction, with hot-dip galvanized finish, and shall include four 8" roller bearing wheels, two of which shall be lockable. Carts shall be minimum dimensions of 82" L x 44" W x 69" H. Accessories shall include rubber protection strips on bottom and upright supports, and hold-down bars with full-length riveted rubber strips. Carts shall be Groves Incorporated Heavy-Duty Transport Rack, Model TR4482, as sold by Becker Arena Products, or approved equal.

S. Hockey Goals

1. Provide two sets (4 goals total) per rink constructed. Goals shall be constructed of heavy-duty tubular steel with rounded corners. Goal inside dimensions shall be 4'-0" height x 6'-0" width. Goal main frames shall be painted red, and all other supporting structures shall be painted white. Each goal shall include an installed woven knotless nylon net (using white 6mm resin-dipped netting fabric), back

support pad, bottom pad, top pad, center pad, ballistic nylon skirt, and two freeze-in mounting posts.

T. Threshold Ramps:

1. Provide portable handicap access threshold ramps at all 3'-4" width player access gates (3 locations on each rink constructed). Ramps shall taper uniformly from ¼" to 1-1/2" height. Ramp dimensions shall be minimum 12-1/2" length x 43-1/4" width. Ramps shall be formed from 100% recycled black rubber, and shall be manufactured by Silver Spring, or approved equal. The ramp dimensions described herein are based on a 2" gate sill height and ½" rubber mat thickness below the ramps. If either the sill or mat thickness varies, the ramp dimensions shall be adjusted so there in no change in elevation greater than ¼" height after the ramps are in place.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Manufacturer shall construct, fabricate, and deliver all materials to Site per Drawings and Specifications. All materials shall be installed to provide a complete dasher board system, with all dasher boards and spectator shielding to be straight and true to line and properly braced. Installation shall be done under the direct supervision of a manufacturer-trained representative at all times. The use of installation subcontractors without full-time manufacturer-trained supervision is not acceptable.

B. Installation shall be in strict conformance with manufacturer's requirements and instructions. Erect units rigid, straight, level, plumb, and true with horizontal and vertical lines level, securely anchored in place. Whether shown on the Drawings or not, this Contractor shall provide all trim, scribes, fillers, and other accessory materials for a complete, finished installation. No defective, scratched, marred, or otherwise damaged equipment and materials shall be installed.

C. Dasher board panels shall be installed after the rink floor concrete has completed the specified wet cure period and has hardened sufficiently to allow construction traffic. Any specified concrete sealers or other surface finishes shall be applied and cured in accordance with the manufacturer's recommendations prior to start of the dasher board installation.

D. To insure player safety, the vertical gaps between adjacent facing panels and between adjacent kick plate panels will be measured after the dasher boards are installed, the ice rink floor is refrigerated, and the rink area is at its normal operating temperature. Gaps between adjacent panels shall be no more than 3/16" width. Where gaps exceed 3/16", the full adjacent facing panel or kick plate shall be removed and replaced with longer panels that will reduce the gap dimension below 3/16".

E. At all gate locations, vertical gaps between shielding panels and posts will be measured. Where gaps are over 3/8", the Contractor shall attach white polyethylene strips to the adjacent post in the appropriate thickness to reduce the gaps below 3/8".

F. Deliver extra shielding sections, shielding/dasher carts, hockey goals, flush anchor plugs, threshold ramps, and shield removal cups to Owner's operations staff at time of operation instructions.

3.2 ADJUSTMENTS

A. Put all items of equipment and systems through at least five complete cycles of operation, verifying that each item is properly installed and properly operating.

B. Adjust and lubricate gate hinges and latches to operate smoothly.

3.3 CLEANING

A. Clean all dasher board surfaces, removing all evidence of dirt, packaging materials, and protective wrappings.

B. Clean front and back surfaces of shielding, using commercial ammonia glass cleaner.

C. Replace all damaged materials, including scratched shielding.

END OF SECTION

SECTION 13 31 38

TENSIONED FABRIC SPRUNG STRUCTURE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Furnish and install tensioned fabric sprung structure as indicated on the drawings and specified, including the following:

1. Delegated design of tensioned fabric structures.
2. Structural supports.
3. Fittings for supports of tensioned fabric..
4. Tensioned fabric.

1.3 ACTION SUBMITTALS

A. Qualification Data: For Installer, fabricator and design engineer.

B. Delegated-Design Submittal: For assemblies indicated to comply with performance requirements and design criteria, including analysis data and drawings signed and sealed by the qualified professional engineer responsible for their preparation including:

1. Plans, elevations, sections, mounting heights, and frame assembly details

2. Frame member sizes and required wall thicknesses.

3. Welding requirements.

4. Details of bolted and pin connections for frame assembly.

5. Required sizes of bolts, pins, plates and tubing.

6. Verify the fabric meets minimum engineering requirements.

7. Details fabric attachment methods and identify thickness of all membrane plates, clamps and other attachment components.

8. Cable sizes and pretension requirements.

9. Anchor-bolt plans before foundation work begins. Include location, diameter, and projection of anchor bolts required to attach the tensioned fabric structures to foundation. Indicate column reactions at each location.

C. Product Data: Provide product criteria, characteristics, accessories, jointing and seaming methods, and termination conditions.

D. Shop Drawings:

1. Include plans, elevations, sections, mounting heights, and frame assembly details.

2. Preliminary member sizes with wall thickness.

3. Preliminary footing layout and foundation design.

4. Show intended fabric attachment hardware and details.

5. Identify direction, details and locations of fabric seams.

6. Show details of fabric dimensions including length of spans, sag curvature and actual shaded area.

E. Samples:

1. Tensioned Fabric: 8.5 inch x 11 inch samples of tensioned fabric for appearance, texture, finish and light transmittance.

2. Structure Finish: Manufacturer's standard sample size on metal for color, texture and gloss.

3. Accessories: One of each exposed accessory in selected color and finish.

F. Manufacturer's Installation Instructions: Indicate special preparation of substrate, attachment methods, and perimeter conditions requiring special attention.

G. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

H. Maintenance Data: For tensioned fabric structures including:

1. Methods for maintaining tensioned fabric structure fabrics and finishes.

2. Precautions about cleaning materials and methods that could be detrimental to fabrics, finishes, and performance.

1.4 QUALITY ASSURANCE

A. Fabric Manufacturer's Qualifications: Company specializing in manufacturing the products specified in this section with minimum 5 years of documented experience in tensioned fabric manufacture.

B. Designer Qualifications: Professional Structural Engineer with 5 years of documented experience in design of this work and licensed in the location of the project.

C. Fabricator/Installer Qualifications: Company specializing in performing the work of this section with minimum 5 years of experience on projects of similar size, complexity and fabric.

1.5 DELIVERY, STORAGE, AND HANDLING

A. As required by the manufacturer for a warrantable installation of the installed products to meet the Performance and Design Criteria.

1.6 WARRANTY

A. Fabric Manufacturer Warranty: Provide manufacturer's standard 15 year material replacement warranty for water resistance and tearing of fabric.

PART 2 - PRODUCTS

2.1 TENSIONED FABRIC SPRUNG STRUCTURES

A. Design is based on tensioned fabric structures being designed, engineered, fabricated and installed by Sprung Instant Structures Ltd., or an acceptable substitution by one of the following acceptable fabricators and installers.

1. Pfeiffer Fabritec Structures.
2. Structurflex Inc.
3. Robb Building Systems.
4. Birdair Inc.

B. Engineering, fabrication and installation of tensioned fabric structure and accessories shall conform to the following.

1. The structure must be a Stressed Membrane Structure of the dimensions and profiles indicated on the drawings.

2. The entire roof slope of the structure, including the peak, shall have a minimum slope of 26 degrees.

3. No exterior guy ropes or cables shall be used for anchoring the structure.

4. There will be no exposed exterior horizontal purlins.

5. The structure shall be completely clear-span with no interior supports of any description.

6. Any required miscellaneous steel components such as anchor bolts, cable bracing, base assemblies or attachment brackets must be *zinc plated* or *galvanized*.

7. All bolts used shall be zinc plated or galvanized with a minimum of Grade 5 specification.

8. All personnel doors and windows must be installed in such a way that the vertical and horizontal tension on the architectural membrane is maintained, at all times.

9. All personnel doors, especially fire exits, must come complete with a protective all weather hood system to shed snow and rain away from the front of doors.

10. The main structural support beams shall be continuous from the ground seal to the peak and manufactured in such a way that no eave will exist.

11. The structure shall be designed to meet the wind loads as outlined in; IBC 2018/CBC 2019, 110 mph, exposure ‘C’, Risk Category III.

12. The stressed membrane structure must be designed to shed all snow off the roof. (In accordance with the Alternative Design Section of the building code.)

13. All main structural arches and connecting purlins shall be 100% ALUMINUM utilizing a Single I-Beam and not to exceed 12 inches in depth.

14. All structural aluminum components must have the following minimum structural and mechanical properties.

Tension			Shear		Bearing
Ultimate	Yield	Elongation	Ultimate	Yield	Ultimate
KSI	KSI	%	KSI	KSI	KSI
38	35	10	23	21	80

15. The architectural membrane must not rest upon any part of the substructure and shall be installed in the aluminum frame and tensioned both vertically and horizontally to prevent wear and abrasion. Horizontal tension shall be maintained mechanically with horizontal purlins/spreaders that require no ongoing maintenance. The membrane shall be tensioned to a predetermined level of 20 pounds per lineal inch (pli) in the horizontal direction and 10 pounds per lineal inch (pli) in the vertical direction creating a tension field within the membrane.

16. All aluminum used in the structure shall carry a pro-rata guarantee of not less than 50 years.

17. The architectural membrane, when assembled and tensioned, shall be absolutely wrinkle free, and shall remain so indefinitely in hot and cold temperatures.

18. The structure shall be modular in design consisting of individual membrane panels which do not exceed 15 feet in width on the main center modules. (This minimizes future costs of repair and replacement of localized membrane damage and allows future expansion/reduction in reasonable sized modules.)

19. The structure shall be designed so that any section of architectural membrane may be removed or replaced within four hours using a maximum of four workers.

20. The individual architectural membrane panels on the center modules shall be one continuous section from one side, over the peak and down to the base at the other side and manufactured in such a way that no eave will exist.

21. The exterior architectural membrane shall be **TBD** in color and be complete with a blackout layer within the membrane.

22. All exterior architectural membrane on the structure shall come complete with a protective exterior Tedlar PVF film or a Kynar coating on the exterior surface of the membrane and a 25 year pro-rata guarantee. This membrane will possess the following minimum quality and fire rating specifications;

TEDLAR® COATED ARCHITECTURAL MEMBRANE	
Scrim Type	Polyester
Scrim Weight	4.3 oz/sq.yd.
Finish Coated Weight Method 5041	24.0 oz/sq.yd (+/-2)
Surface Protection	Tedlar® PVF Film
Tongue Tear Method ASTM D751 8” x 10” sample size	140/130 lbf
Trapezoid Tear	80/65 lbf

Method ASTM D4533	
Grab Tensile Method ASTM D751	400/350 lbf
Strip Tensile Method ASTM D751 Procedure B	300/240 lbf/in
Hydrostatic Resistance Method ASTM D751 Procedure A	500 psi
Dead Load Room Temperature 160°F/71°C ASTM D751	1 - 1/2" seam 120 lbf 60 lbf
Low Temperature ASTM D2136	LTC 1/3" mandrel, 4hr Pass @ -40°F
Adhesion ASTM 0751	10 lbf/in

FIRE RATINGS

1. California Fire Marshal — Flame Spread Index <25
2. National Fire Protection Association-701 — Smoke Development Rating <450
3. ASTM E84
4. CANULC-S-109
5. CAN/ULC-S-102

23. The structure shall be supplied with a complete insulation system within all roof and wall sections providing the following minimum specifications:

    a. 9" thick fiberglass blanket using formaldehyde free fiberglass insulation.

    b. FSK (Foil, scrim, kraft) facing on one side of the insulation blanket to provide both a vapor barrier and to help preserve radiant heat. System to include FSK tape to seal all insulation joints and to seal insulation to structure's supporting members.

    c. A white interior liner in a minimum 14oz coated polyester membrane, vertically and horizontally tensioned providing a secondary vapor barrier and clean unwrinkled interior finish to the insulation system.

    d. Interior and exterior thermal caps to be installed over the structure's supporting beams to minimize thermal transfer through the supporting member. Each thermal cap c/w neoprene wipers each side to complete thermal break.

    e. Peak to grade insulation retention system to ensure insulation will never creep or shift downward under its own weight.

24. Structure Supplier must be an established manufacturer with at least 3 years of experience in the design fabrication and delivery of structures with the same basic specifications as above. Structure supplier is to provide 5 examples of similar structures that have been erected. Contact names and numbers as well

as physical address of the 5 sites must be submitted. (Exact same size of the structure not required; however, structure must have the same basic accessories, such as insulation system, if specified above.)

25. Structure Supplier is to supply all specialized hand tools required for erection of the structure to be returned to Structure Supplier upon completion of erection.

26. Structure Supplier must supply a Technical Consultant on site for the full duration of the erection of the structure to provide information about structure assembly and erection to ensure structure is erected in accordance with its engineered design. All costs for the consultants' time, travel, meals and accommodation are to be included in the price submission.

27. Upon award of this contract, Structure Supplier is to supply detailed drawings and supporting calculations for the structure stamped by an engineer certified in the State of California.

C. The delegated engineer of design shall design tensioned fabric structure that complies with project specific local codes, submit drawings and specifications to the authorities having jurisdiction for plan checking, obtain all permits and pay all fees.

1. Design structure supporting the tensioned fabric to be self supporting and not rely on fabric for structural stability.

2. Design the precise interface geometry, determination, reaction loads imposed on structural steel framing, anchoring loads, connection details, interfaces and seam layouts.

3. Include large deflection numerical shape generation that will ensure a stable, uniformly stressed, three dimensionally curved shape that is in static equilibrium with the internal pre-stress forces and is suitable to resist all applied loads.

4. Use large deflection finite element method structural analysis of the membrane system under all applicable wind and seismic loads.

5. Design connections including bolt, weld and ancillary member sizing.

6. Consult biaxial fabric test specification; include interpretation and fabric compensation determination.

7. Include accurate generation of the two dimensional compensated fabric templates required to generate the three dimensional equilibrium shape.

D. Design tensioned fabric structure:

1. To withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated according to local code requirements and ASCE/SEI 7 including but not limited to live load, dead load, snow load, seismic loads, and wind loads.

2. In accordance with fabric manufacturer's requirements for warranted installation.

3. To allow for thermal movements from ambient and surface temperature changes of 120 deg F, ambient; 180 deg F, material surfaces.

4. To limit corrosion and prevent galvanic action by isolating metals and other materials from direct contact with incompatible materials.

5. To provide criteria on which the design is based:

a. Expected Fabric Life: Not less than 25 years.

E. Solar Reflectance Index (SRI): minimum values dictated by basis of design fabric, calculated in accordance with ASTM E1980, Approach II.

2.2 MATERIALS

A. Structure Supporting Tensioned Fabric:

1. General: Provide structural components and accessories in accordance with fabricator and /installers standard practice unless specified otherwise. Provide shapes and profiles indicated.

a. Dimensions and Profile: As indicated in drawings.

b. Final Finish Color: To be selected by Architect from manufacturer's full range.

c. Finish: Fabricator/Installers corrosive environment finish.

B. Aluminum Clamping System.

1. All structural aluminum clamping systems shall be Aluminum Association alloy 6061-T6 or alloy 6063-T6, or shall be EN AW-6060-T66.

2. Bent plates shall be formed and then heat-treated to T6 or T66, as applicable.

3. All structural “U Straps” shall be stainless steel, type AISI 316.

4. All structural aluminum clamping shall have the following finish as selected by the Architect.

a. Clear anodized per MIL-A-8625C Type 2, Class 1

b. Polyester thermosetting powder coating with a tri-glycidyl isocyanurate (i.e. TGIC) curing agent/hardener per AAMA 2603 to a thickness of 3 mils, white in color.

5. Structural sheet aluminum shall be ASTM alloy 5052-H32.

6. Non-structural sheet aluminum shall be ASTM alloy 1100 series.

7. Shall include bird wire deterrent system made of stainless steel grade 304

2.3 ACCESSORIES

A. All accessory materials required by the manufacturer for a warrantable installation of the installed products in a manner that meets the Performance and Design Criteria.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify existing conditions meet the manufacturer's requirements before starting work.

3.2 PREPARATION

A. Prepare surfaces to receive work in accordance with manufacturer's instructions.

3.3 INSTALLATION

A. General: Install all materials in accordance with manufacturer's instructions based on conditions present.

B. Structure Supporting Tensioned Fabric:

1. Clean and strip primed steel items to bare metal where site welding is required.

2. Supply setting templates to the appropriate entities for steel items required to be cast into concrete or embedded in masonry.

3. Install items plumb and level, accurately fitted, free from distortion or defects.

4. Provide for erection loads, and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.

5. Field weld components indicated.

C. Fittings: Install in accordance with delegated design documents and manufacturer's instructions.

D. Tensioned Fabric: Install in accordance with delegated design documents and manufacturer's instructions.

3.4 INSTALLATION TOLERANCES

A. Maximum Variation From Plumb: 1/2 inch per story, non-cumulative.

B. Maximum Offset From True Alignment: 1/2 inch.

C. Maximum Out-of-Position: 1/2 inch.

3.5 FIELD QUALITY CONTROL

A. Conduct performance tests in the presence of the Architect and the Manufacturer’s Representative to demonstrate that all components of the structural system operate properly in accordance with the engineering design.

B. An independent testing agency will perform field quality control tests, as specified in the California Building Code.

3.6 PROTECTION

A. Protect installed work as required by the manufacturer to maintain product performance, design criteria and warranty.

END OF SECTION

SECTION 21 13 13

FIRE PROTECTION SPRINKLER SYSTEM

PART 1 - GENERAL

1.1 THE REQUIREMENT

A. The CONTRACTOR shall furnish all tools, equipment, materials, and supplies and shall perform all labor required to complete the work as indicated on the Drawings and specified herein.

B. The Drawings indicate sprinkler coverage requirements. If any departure from the Drawings is deemed necessary by the CONTRACTOR, details of such departure and the reason therefore shall be submitted to the ENGINEER for review. No such departure shall be made without the prior written concurrence of the ENGINEER.

C. Work Included: Design, fabricate, install, and secure required approvals for a complete automatic fire protection sprinkler system and combined standpipe system as indicated on the Contract Drawings and in these Specifications. System shall be connected and placed in 100 percent reliable operating conditions. The following list of major items is for the convenience of the Contractor only and does not describe the complete scope of the work to be done.

1. Preparation of Shop Drawings by the Contractor and obtaining required permits and approvals, coordination, etc., starting supply from Detector Check Meter.

2. Piping, inside and outside building, including connections to water service drain connections and piping; valves, hangers, sleeves and accessories required for a complete installation.

3. Alarm check valve and alarm bell.

4. Sprinkler heads.

5. Pressure gauges.

6. Flow transmitter.

7. System control valve, vault and cover.

8. Fire Department connection.

9. Sleeves and escutcheons.

10. Concrete work.

11. Identification and labeling.

12. Tests.

13. Painting.

14. Disinfecting and flushing the system.

15. Approval.

16. Tamper Switch.

17. Fire Department Outlets.

18. Fire Hose Cabinets.

D. Service Connection: Make all arrangements with the proper authorities for the sprinkler main service including meter installation vaults and valves. See Civil and Plumbing Drawings for coordination. Contractor will pay all fees and charges. Fees and charges are not reimbursable by the CITY. Water for construction to be separately arranged and paid for by Contractor.

E. Openings: Provide as necessary for passage of pipes through walls, floors, partitions and other construction whether indicated on the Contract Drawings or not.

F. Cutting and Repairing:

1. Cutting: Only as authorized by the City Engineer.

2. Repairing: By appropriate craft persons to restore construction to a condition approved by the City Engineer.

G. Permits and Inspections:

1. Permits: As required by Los Angeles City Building and Safety and Fire Department; to be obtained and paid for by the Contractor, including plan check fees, except permits and costs otherwise provided for in these Specifications. Permits and Plan Check costs are not reimbursable by the CITY.

2. Inspections: Required of all installations prior to concealment and completion of the work; by the Los Angeles City Department of Building and Safety and the City Engineer. A final certificate of approval for the entire sprinkler system required.

1.2 SYSTEM DESCRIPTION

A. Description of the System: Protect entire Parking Structure by complete hydraulically calculated automatic fire sprinkler systems designed for ordinary hazard coverage and as required per NFPA (including levels 1, 2 and 3 of Parking Structure). Coordinate with Plumbing Drawings for sprinkler service line and riser locations. Provide combined standpipe system in parking garage with fire department outlets and fire hose cabinets at each stair landing or floor, as required by the Authority having jurisdiction.

B. Rules and Regulations: Make the complete installation in compliance with the requirements of the latest rules and regulations of the National Fire Protection Association, the State Fire Marshall's Office and the Los Angeles City Department of Building and Safety. The Drawings and Specifications shall take precedence only when their requirements are greater than that of the National Fire Protection Association.

1.3 RELATED WORK SPECIFIED ELSEWHERE

A. Section 09 90 00 Painting

B. Section 10 44 00 Fire Protection Specialties

C. Section 28 31 00 Life Safety Fire Alarm System.

1.4 REFERENCE SPECIFICATIONS, CODES AND STANDARDS

A. Comply with the reference specifications of the GENERAL CONDITIONS and GENERAL REQUIREMENTS.

1.5 CONTRACTOR SUBMITTALS

A. Submittals shall be made in accordance with the GENERAL REQUIREMENTS.

B. Shop Drawings and other submittals shall include the following:

1. Drawing Preparation: Submit complete Shop Drawings of standpipe and automatic fire sprinkler systems including sprinkler risers, sprinkler heads, hangers and supports, wiring diagrams and alarm system, and piping layouts, coordinated with lighting, plumbing and mechanical layouts, including a plot plan showing the location of supply connections, control valves, standpipe booster pump, Fire Department connections and related devices, and other equipment to be used, for approval to the local authorities having jurisdiction. It shall be understood that there will be no compensation to the Contractor for any changes made necessary to obtain approval from local authorities, with said approval indicated on each set thereof.

2. If any discrepancy between the fire sprinkler plan and actual field condition occur, the Contractor shall make the necessary modifications with the approval of City Engineer. Modification made shall be marked on the record drawings.

3. Underground plan and riser plan. Coordinate the location of sprinkler heads with the City Engineer and indicate on plans their relationship to lighting fixtures and structural beams. Fire sprinkler horizontal mains shall pass through structural beams and not below the beams, and branch piping shall be located between structural beams.

4. Submit dated, certified reports of the following tests:

a. Flow test.

b. Pressure Tests: Static and residual.

5. Submit Hydraulic Calculations.

6. Product Data for the following:

a. Indicator valves.

b. Other valves.

c. Fire Department connection.

d. Gauges.

e. Pipe and fittings.

f. Hangers.

g. Alarm and supervisory monitoring devices.

h. Alarm bell.

i. Sprinkler heads.

7. Miscellaneous Data:

a. Diagram of alarm panel face and concise explanation of visual signals thereon.

b. Concise instructions for emergency shutdown of each section of system and for entire system.

c. Valve chart locating and numbering all control valves and visually identifying area (section) controlled by each. Use color to permit rapid emergency comprehension.

d. Head removal and replacement instructions.

e. Manufacturer's data for each piece of equipment furnished.

8. Complete Working Drawings and Specifications of other trades will be furnished or will be available for the design and installation of this system. Carefully check these Drawings and Specifications. The Contractor shall in all cases consider the work of all other trades and shall coordinate his work with that of the ventilation, plumbing and electrical contractors so that the best arrangement of all equipment, piping, conduits, ducts, etc., can be obtained.

9. Call the attention of the City Engineer to any points of conflict between this work and that of the other trades, so that the conflict may be properly adjusted. Remove and reinstall any installed work which interferes with the work of other trades at the Contractor's expense when so directed by the City Engineer. It shall be understood that no extras to the Contract will be permitted to accomplish the above results.

10. Original Transparency: Provide the City Engineer with original transparencies (mylar) obtained by photocopy processing of "Record Drawings" specified herein.

11. Verify dimensions on the Drawings with field conditions. Inspect related work and adjacent surfaces. Report in writing to the City Engineer all inaccuracies and all conditions which prevent proper execution of this work.

12. Include construction details of pipe supports, sway bracing, anchors, inserts, trapeze hangers, equipment supports, and restraints with seismic calculations sized by a California Licensed Structural Engineer.

C. Certification: Submit one copy of California approved seismic bracing details.

D. Certificates of Approval: Upon completion of work of this Section, furnish the City Engineer with a certificate of approval from all legally constituted authorities having jurisdiction or in lieu thereof, a certified copy of same.

E. Record Drawings: Provide accurate dimension locations, including depths of piping, valves, and all equipment as installed, in strict accordance with applicable GENERAL CONDITIONS of these Specifications.

1.6 QUALITY ASSURANCE

A. Qualification of Contractor: The Contractor for the design and the installation of the automatic fire sprinkler system shall be duly licensed and regularly engaged in the installation of automatic sprinkler equipment as listed by Underwriters' Laboratories, Inc., or other nationally recognized testing laboratories.

B. Laborers: Use adequate numbers of skilled laborers who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the Work of this Section.

C. Codes and Regulations: In addition to complying with the requirements specified in these Specifications, the Contractor shall perform all fire sprinkler work in accordance with the following Codes and Standards:

1. National Fire Protection Association (NFPA) Standards 13, 14, 24, 70, 72 and 101.

2. American Water Works Association (AWWA).

3. Uniform Plumbing Code (UPC).

4. Uniform Fire Code (UFC).

5. Underwriter's Laboratories (UL).

6. American National Standards Institute (ANSI).

7. Factory Mutual (FM) Laboratories.

8. City of Los Angeles Fire Code.

9. State and/or City Fire Marshal's Requirements.

10. American Institute of Steel Construction Standards (AISCS).

11. American Society of Testing and Material (ASTM).

12. In the event of conflict between codes, the State and Municipal Codes shall govern. Where these Specifications or drawings call for describing materials, workmanship, or construction of a better quality, higher standard, or larger size than is required by the Codes and Ordinances, the Provisions of these Specifications and drawings shall take precedence over the requirements of those Codes and Ordinances.

13. Recommendations of the Fire Rating Bureau having jurisdiction.

D. Hydrostatic Tests:

1. Test system or parts of system at a minimum 200 psi hydrostatic pressure or system pressure plus 50 psi whichever is higher for a minimum of two hours with no change in pressure indicated.

2. Repair leaks.

3. Retest until all criteria are met.

E. Acceptance Tests:

1. Conduct code required flow tests of completed systems.

2. Leave system in operating condition.

1.7 SPARE PARTS

A. The CONTRACTOR shall obtain and submit from the manufacturer a list of suggested spare parts for each piece of equipment according to the provisions of **SPARE PARTS** of the GENERAL REQUIREMENTS. After approval, CONTRACTOR shall furnish such spare parts suitably packaged, identified with the equipment number, and labeled. CONTRACTOR shall also furnish the name, address, and telephone number of the nearest distributor for each piece of equipment. All spare parts are intended for use by the CITY, only, after expiration of the guaranty period. Any spare parts which the

ENGINEER permits the CONTRACTOR to use for startup activities shall be replaced by the CONTRACTOR prior to the CITY's acceptance of beneficial use of the equipment.

1. During the term of this Contract the CONTRACTOR shall notify the ENGINEER in writing about any manufacturer's modification of the approved spare parts, such as part number, interchange ability, model change or others. If the ENGINEER determines that the modified parts are no longer applicable to the supplied equipment, the CONTRACTOR at its expense shall provide applicable spare parts.

2. Provide wall mounted container, for following spare parts, in accepted location.

   a. Provide six of each type of head (temperature and size). Each piece shall be easily identifiable.

   b. Provide wrenches suitable for removing and replacing heads (one-head wrench for each type of head).

1.8 VALVE CHARTS AND INSTRUCTIONS

A. Provide framed, glazed copies of valve chart and emergency shutdown instructions as specified under Paragraph 1.5 B 7.b Miscellaneous Data. Mount to wall in acceptable location.

B. Operation Instructions: Upon completion and approval of the installed system, provide an experienced engineer to instruct the City's operators in all details in operating and maintaining the system. Provide seven (7) sets of typewritten operating instructions, part lists and service manuals of all equipment, wiring diagrams, control diagrams and test reports suitable bound.

1.9 DESIGN CRITERIA

A. Governing Standards and Codes: All work covered by this Section shall be performed in accordance with all CITY, county, state, and federal regulations and with applicable codes, laws, and regulations, including the following. In case of conflict between these specifications and any code, law, or regulation, the one which is most restrictive shall govern.

1. Los Angeles City Building Code (LABC).

2. National Fire Protection Association (NFPA).

3. Los Angeles City Electric Code (LAEC).

4. Underwriters' Laboratories, Inc. (UL).

5. Los Angeles City Plumbing Code (LAPC).

B. Design of Sprinkler Systems: NFPA 13 and Los Angeles City Plumbing Code requirements specified herein.

C. Water Distribution: Distribution shall be uniform throughout the area in which the sprinkler heads will open. Variation in discharge from individual heads in the hydraulically most remote area shall be between 100 and 200 percent of the specified density.

D. Density of Application of Water: Size pipe to provide the specified density when the system is discharging the specified total maximum required flow.

E. Sprinkler Discharge Area: Area shall be the hydraulically most remote 1,500-square foot area as defined in NFPA 13 and Los Angeles City Plumbing Code.

F. Outside Hose Allowances: Hydraulic calculations shall include an allowance for outside hose streams per Los Angeles City Plumbing Code and NFPA-13.

G. Friction Losses: Calculate losses in piping in accordance with the Hazen-Williams formula with 'C' value of 120 for steel piping, 150 for copper tubing, and 140 for cement-lined ductile-iron piping.

H. Location of Sprinkler Heads: Per Los Angeles City Plumbing Code and NFPA-13.

1.10 WARRANTY

A. General Warranty: Special project warranty specified in this Article shall not deprive the City of other rights the City may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by the Contractor under requirements of the Contract Documents.

B. Special Project Warranty:

1. All materials, apparatus, and equipment furnished and installed here under shall be new and free from all defects.

2. The Contractor shall guarantee the fire sprinkler system including equipment and labor for a period of one year form the date of final acceptance.

3. Should any trouble develop within one (1) year from date of acceptance of the work, due to faulty material and/or workmanship, the trouble shall be corrected by the Contractor without expense to the City.

PART 2 - PRODUCTS

2.1 GENERAL

A. Provide new and undamaged materials. Materials for similar uses shall be of the same type and same manufacturer unless otherwise approved by the City Engineer, U.L. approved and conforming AWWA Specifications as required.

2.2 MATERIALS

A. Pipe and Fittings:

1. Fire Service Main - Exterior (5 feet outside building):

a. Pipe and Fittings: Mechanical joint, cement-lined ductile iron.

b. Exterior Piping: Extend into building minimum of 18 inches before connecting to interior piping.

2. Fire Service Main - Interior Piping from Exterior Service up to Fire Sprinkler Alarm Check Valve:

a. Pipe: Schedule 40 black steel.

b. Fittings: 150-lb malleable iron, screwed or full flow fittings with restrained flexible couplings.

3. Drain Piping:

a. Pipe: Schedule 40 galvanized steel.

b. Fittings: Galvanized, malleable iron, screwed.

4. Fire Department Connection:

a. Pipe: Schedule 40 black steel.

b. Fittings: 150-lb malleable iron, screwed.

5. Reducing Fittings:

a. One-piece pipe size reducing fittings. Same specifications as other fittings for type of pipe.

b. Bushing reductions not acceptable.

B. Pipe Supports: Design and install pipe supports and bracing to comply with NFPA 13, and Los Angeles City Building code regarding seismic restraint. All piping support material shall be galvanized steel.

C. Valves:

1. All valves shall be UL listed for fire protection service and Factory Mutual approved.

2. Control Valves with Tamper Switch: Iron body gate valve, Class 125, 175 psi WSP, non-shock cold water, outside screw and joke (OS&Y), solid wedge, rising stem, flanged ends, malleable iron handwheel, locked open, with breakable shackle lock, U.L. listed or FM approved.

3. Drain and Test Valves: Bronze, gate, globe, or angle valves, 175 psi WSP, and U.L. listed or FM approved.

4. Check Valves: Iron body swing check valve, Class 125, 175 psi WSP, non-shock cold water, bolted cover, flanged ends, UL listed or FM approved, installed horizontally.

5. Indicator Valves: UL listed, locked open, with breakable shackle lock.

D. Alarm Check Valve: UL listed, installed on riser, suitable for variable pressure, complete with retard chamber and approved pressure switches for alarm bell and for electrical supervisory system.

E. Alarm Bell: UL listed, 10-inch round red enamel steel bell with 24 VDC electric motor, complete with suitable identification sign, activated by electric pulse from a flow switch. Provide with bell guard, cadmium plated wire cage with center hole for attachment to bell. Provide for each riser.

F. Paddle-type Water Flow Indicator Switches:

1. Paddle type, inserted into horizontal piping adjacent each section control valve. Paddle to actuate a pneumatic time-delay mechanism between the paddle stem and the microswitch to operate and either open or close an electrical circuit. Time delay to be adjustable from 0 to 90 seconds.

2. Microswitches to be rated at 7.5 amps, 120 volts, and wired to either open or closed circuit operation.

3. Paddle to be constructed of corrosion-resistant Monel "K" metal. The body to be constructed of cast metal with metal cover.

G. [Vane-type Water flow Indicator Switch: Water flow switch with retard, 175 lbs. Maximum static pressure rating, red tamper proof switch housing with flow paddle, adjustable pneumatic retard setting 0 to 70 seconds, two single pole, double throw micro switches to operate separate circuits, 10.0 amps. At 120 volts A.C., and U.L listed or FM approved type.]

H. Valve Supervisory Switches:

1. Provide U.L. listed tamper switches on all control valves with alarm signal to register on sprinkler alarm panel.

2. The switch shall initiate a supervisory signal upon a maximum of two turns of a valve wheel or closer of 10% whichever is less.

I. Sprinkler Heads:

1. Type: Miniature bulb type with Teflon spring type coated water seal or exposed eutectic solder link.

a. All heads shall be corrosion proof.

2. Configurations:

a. "Flush": Small pendant head partially concealed within the ceiling leaving only the link exposed, **[polished chrome plate finish] [white finish]**.

b. "Recessed": Small frame pendant head recessed into canopy which is recessed into ceiling, **[polished chrome plate finish] [white finish]**.

c. "Pendant": Small frame exposed head with exposed telescoping canopy which installs tight against ceilings. Provide protective devices when ceilings are less than 8 feet in height. The sprinkler shall be concealed pendant head, 1/2-inch orifice size, with brass plated cover escutcheon plate, **[brass finish] [polished chrome plate finish] [white finish]**, 155 degrees Fahrenheit rating, and U.L. listed.

d. "Sidewall": Special frame head, with adjustable canopy, for installation on vertical or near vertical surface. **[Horizontal sidewall standard coverage head] [Horizontal sidewall extended coverage head]**, 1/2-inch orifice size, **[brass finish] [polished chrome plate finish] [white finish]**, 155 degrees Fahrenheit rating, with mating brass plated escutcheon plate, and U.L. listed or FM approved type.

e. "Upright": Standard frame head for mounting in upright position above piping system. The sprinkler shall be upright head, 1/2-inch orifice size, **[black finish, 200 degrees Fahrenheit rating] [white finish, 155 degrees Fahrenheit rating]**, and U.L. listed or FM approved type.

3. Locations: Unless otherwise indicated:

a. Recessed: Finished service areas.

b. Sidewall: **[Standard Coverage] [Extended Coverage]** where required by NFPA 13 or by code.

c. Upright: Spaces without ceilings or in areas with exposed ceiling.

1) Spaces without ceilings or in areas with exposed ceiling, use 200 degrees Fahrenheit rating sprinkler heads.

d. High Temperature Fusible Links:

1) Heads within 12 inches of surface-mounted lighting.

2) Where otherwise indicated.

4. Sprinkler Guard: Provide where required.

5. Furnish and install one metal cabinet containing a stock of spare sprinkler heads of all types and ratings installed.

J. Sleeves: Provide sleeves for passage of pipe through floors, walls, and partitions. Provide appropriate type for purpose. Seal in an acceptable manner against water, fire, or sound, depending on type of construction penetrated.

1. For Use in Slab Construction: [Schedule 40 black steel pipe] [Type 316L stainless steel with a welded water-stop ring].

2. For Use in Concrete Walls: [Schedule 40 black steel pipe] [Type 316L stainless steel with a welded water-stop ring].

3. For Use through Waterproof Membranes: Cast iron or steel with non-puncturing flashing clamp device with corrosion resistant clamping bolts.

4. For Use in Lath and Plaster Partition and Ceilings: 24 gage galvanized iron or steel.

K. Fire Seal: Required wherever pipe penetrates through fire wall or floor to maintain a fire protective boundary. Install as per manufacturer's recommendations. Required to be U.L. listed.

L. Escutcheons: Provide at passage of pipe through walls, partitions, ceilings. Prime coated steel, split ring of set screw type, at concealed or service areas. Polished chrome cast brass split ring or set screw type when exposed to view.

M. Pressure Gauges:

1. U.L. listed or FM approved.

2. Stainless steel case, 4-1/2-inch dial with 1/4-inch male N.P.T. connection.

3. Glass enclosed dial with pressure range of 0-300 psi.

N. Identification:

1. Valves:

a. Signs/tags or noncorrosive material complying with NFPA 13.

b. Raised or incised lettering to indicate function of valve.

c. Raised or incised numbers corresponding to valve identification on valve chart.

d. Mount on piping immediately adjacent to valve or wire to valve body.

O. System Design Sign:

1. Locate adjacent to alarm check valves.

2. Identify system as hydraulically designed.

3. State Basis of Design: Discharge density over area of discharge.

P. Valve Locks:

1. Provide all-brass padlock(s) with break-away shackle, multiple locks keyed alike, master keyed to building key system, with chains, for each lockable control valve.

2. Provide to CITY two keys durably tagged and marked for identification.

Q. Fire Alarm Panel (FACP): The Panel shall be provided under Electrical Specifications Section 28 31 00 "Life Safety Fire Alarm Systems."

1. Provide sprinkler alarm panel of size required to register, indicate and transmit signals from alarm switches, flow switches, and tamper switches.

2. Provide in Panel: Relays, recording indicator lamps, alarm cancel switches, transformer required for this purpose. Provide contacts for signal to remote supervisory station.

3. All visual signals shall be properly identified/described by permanent labels on panel face.

R. Central Station: Contractor shall arrange and pay for connecting new FACP subpanel in Parking Structure to existing Edwards FACP located in the Police Station Telecom Room. Contractor shall pay in advance, one year of monitoring and maintenance service.

S. Booster Pump: All components listed on drawings for complete installation.

T. Identification Signs: All sign material shall be backed with minimum thickness of 1/8 inch. Lettering heights shall be 1/4-inch minimum. Lettering shall be white engraved on a red surface and shall be vertical capital letters. It shall be rigidly fastened to brackets which shall be fastened to equipment or walls in the proximity of the equipment.

U. Control Valve Vault and Cover: Construct in accordance with applicable Architectural Specifications and Los Angeles City Building and Fire Sprinkler Code and regulation standards.

V. Other Materials: Provide other materials, not specifically described, but required for a complete and proper installation, as selected by the Contractor subject to the approval of the City Engineer.

2.3 PREPARATION, LAYOUT, AND DETAILING

A. Underground Piping: (for piping material more than 5'-0" from building, see civil drawings)

1. Prior to trenching, obtain ENGINEER's acceptance of dimensioned location of riser(s), indicator valve(s), and fire department connection(s).

2. Provide anchors, thrust blocks, clamps, and tie rods to prevent joint separation at elbows, bends, and tees per NFPA 13.

3. Coat tie rods, clamps and bolts after installation with heavy coating of asphalt.

B. Risers: Arrange riser components as recommended in NFPA 13.

C. Overhead Piping: Provide/coordinate clearance for:

1. Installation of HVAC ductwork, heaters, fan coils and other installations.

2. Lighting fixtures.

3. Plumbing mains.

D. Pipe Support:

1. Provide hangers, supports, and bracing as recommended in NFPA 13. All hangers, supports, bracing, and anchors shall be galvanized steel. "All Thread" hanger rods will not be allowed. All hanger rods shall be solid rod threaded to fit each application.

2. Comply with code requirements for seismic bracing.

E. Drains:

1. Unless otherwise indicated, system and test drains shall discharge into receptors connected to a sewer or storm drain system.

2. Do not drain onto unpaved areas or areas which do not drain.

3. Coordinate installation of receptors with plumbing installer.

F. Miscellaneous Fittings:

1. Flow Indicator Switches: Locate in horizontal piping adjacent to section control valves and 18 inches clear of nearest fitting.

2. Alarm Bell(s):

a. Locate $\pm$ 11 feet above grade.

b. Obtain ENGINEER's acceptance of dimensioned location.

3. Valve Tamper Switches:

a. On OS&Y gate valves, locate switch on valve stem.

4. Alarm Panel: Obtain ENGINEER's acceptance of dimensioned location.

G. Concealment: Except where specifically indicated otherwise, conceal or prepare for concealment piping, fittings, etc., in those spaces where wall and/or ceiling surfaces are indicated or implied to receive present or future finish materials.

H. Heads:

1. Spacing/Coverage: As required by system design.

2. Layout with respect to:

a. Lighting fixtures.

b. Center of room/space.

c. Longitudinal axis of room/space.

3. Align heads in row(s) within ±1/2-inch of straight line.

4. Align heads laterally in adjacent rows to same tolerance of alignment.

5. Prevent interference of heads with door swing.

2.4 SEQUENCE OF OPERATION

A. Upon activation of any fire flow switch, the Fire Alarm Control Panel (FACP subpanel) shall:

1. Energize a red alarm light at the panel.

2. Activate the buzzer in the Panel.

3. Activate the fire alarm bell throughout the building.

4. Send a fire alarm to a remote Central Monitoring Station and existing FACP in Police Station.

B. All fire sprinkler valves including the alarm valve, control valve, underground control valves, and the backflow preventer valves shall be supervised with a tamper switch through the FACP. Upon detection of any trouble and supervisory alarm of the tamper switches, the FACP shall:

1. Energize a yellow alarm light at the panel.

2. Activate the buzzer in the panel.

3. Send a trouble alarm to a remote Central Monitoring Station.

C. Upon detection of any trouble and supervisory alarm of the fire Sprinkler system, including water flow switch and pressure operated switches, the FACP shall:

1. Energize a yellow alarm light at the panel.

2. Activate the buzzer in the panel.

3. Send a trouble alarm to a remote Central Monitoring station.

2.5 FIRE HOSE CABINETS

A. Steel box and door with steel frame, continuous hinge, welded corner seams, surface mounted, powder coated with an electrostatically applied thermally-fused, re-coatable white polyester finish **with break glass door**.

2.6 COMBINED STANDPIPE FIRE DEPARTMENT CONNECTIONS

A. **[FDC-1:]** Valve, Fire hose: Regular weight angle valves 2-1/2" for 300 psig working pressure. Cast brass, replaceable composition disc, rough chromium plated body with hand wheel cap and chain.

B. **[FDC-2:]** Valve, Fire Hose: Cast brass angle inlet body, 3-way outlet, with (3) 2-1/2" straight, caps and chains. Provide with pressure gauge.

C. **[FDC-3:]** Valve, Fire Hose: Ductile iron 4-way inlet with clapper body. UL and Factory Mutual End inlet and labeled cover plate.

D. **[FDC-4:] [Wall mount] [Freestanding]** ductile iron concealed siamese type with double clappers, plugs and chains, **[cast brass with polished brass] [polished chrome plated]** fittings, per fire department requirements, U.L. listed or F.M. approved type. Plate shall be labeled "AUTO SPKR" with plate labeled "COMBINED STANDPIPE", with test outlet and floor outlets.

PART 3 - EXECUTION

3.1 GENERAL

A. Surface Conditions: Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the work. Do not proceed until detrimental conditions are corrected.

B. Conceal all sprinkler lines within the building when structure permits. Install risers in janitor's room, heater rooms, supply rooms or similar service rooms whenever possible. Risers shall not obstruct access, use of maintenance of any other equipment within the building. Provide all mains and risers with fire sprinkler protection unless otherwise approved by the fire authorities having jurisdiction. Pipes inside the wall shall be concealed properly within the metal or wooden studs.

C. Equip pipe through ceilings at head locations with approved escutcheons. Unless otherwise designated, make all escutcheons identical.

D. Provide 280 degree F Blue Head sprinkler heads in heater rooms. Provide 165 degree F heads in all other locations, unless otherwise noted.

E. Furnish all signs, extra heads, special wrenches and cabinet for spare heads recommended and/or required by NFPA 13.

F. Provide the complete sprinkler system in accordance with NFPA 13. Show on plans complete fire sprinkler coverage of the entire building.

G. Do not cover up or enclose work until inspected, tested and approved by the City Engineer.

H. Replace defective pipe, fittings or joints with new materials. Repairing with dope, tar, cement or other materials not permitted.

I. Comply with all requirements of NFPA 13, NFPA 24, Fire Department requirements and Los Angeles City Building Code.

J. Unless otherwise shown on the plumbing plans, Fire Department inlet connection shall be located on the address side of the building and subject to approval by the City of Los Angeles Fire Department.

K. No pipe welding, hot and cold tapping works are allowed.

L. Attention is called to the requirements that the air conditioning, plumbing and electrical systems are to be installed in locations adjacent to sprinkler system piping, and that Contractor shall coordinate efforts with other trades doing work on the site to avoid interference.

3.2 INSTALLATION

A. Acceptances: Prior to installation, obtain following acceptances of proposed system design and equipment:

1. Los Angeles Fire Department.

2. Los Angeles Department of Building and Safety Mechanical Bureau.

B. Trench and Backfill:

1. Perform all trenching under the observation of the INSPECTOR, in accordance with requirements for "Earthwork". Compaction tests will be performed per direction of the INSPECTOR. No backfilling will be allowed until test results of pipe testing and compaction tests have been accepted by the INSPECTOR.

C. Underground Piping:

1. Provide detector check in vault.

2. Install thrust blocks.

3. Bed pipe solidly on grade.

4. Anchor to thrust blocks.

5. Extend pipe 6 inches minimum above floor at risers.

6. Install post indicator valves and fire department connections.

7. Partial backfill to further anchor pipe shall be installed prior to testing and flushing. Keep joints exposed to check leaks.

8. Seal openings and perform hydrostatic pressure test under required observation.

9. Flush underground system prior to installing risers.

D. Risers: Assemble components as recommended in NFPA 13.

E. Pipe Support: Install in accordance with requirements for "Pipe Supports " and as recommended in NFPA 13. Where NFPA standards exceed other requirements, comply with NFPA standards.

1. Support all horizontal piping at not to exceed 10-foot intervals, except for pipes of size 1-1/2-inch and larger which shall be supported at not to exceed 15-foot intervals, with approved hangers with rod supports and sway braces, installed according with NFPA requirements.

2. Support furred-in vertical piping by means of heavy wrought iron clamps or wall brackets.

F. Overhead Piping System:

1. Making Up Pipe:

a. Screwed Pipe:

1) Ream cut ends.

2) Cut threads so not more than 2-1/2 turns are exposed when joints are assembled.

3) Install with pipe paste applied to male threads only.

b. Welded Pipe:

1) On-site welding permitted only as recommended in NFPA 13.

2) Perform welding using only certified welders.

3) All welds are fusion welds.

4) Weld dimensions are times pipe wall thickness:

a) Width: 2-1/2 times.

b) Thickness: 1-1/4 times.

5) Clean welds of slag.

2. Slope:

a. Except for pendant drops, provide for drainage of entire system.

b. Prevent traps.

c. Prevent air pockets.

3. Flushing: Prior to installation of heads, seal openings and flush entire system to remove foreign matter.

4. Hydrostatic Test: All hydrostatic testing of piping will be performed in the presence of and approved by the INSPECTOR. The CONTRACTOR is responsible for providing testing as required and obtaining approval from the Los Angeles City Fire Department in addition to any testing and approval required by these specifications.

G. Disinfection:

1. Disinfecting Solution: Water solution containing chlorine at the minimum concentration of 50 parts per million.

2. Fill entire fire protecting system with disinfecting solution.

3. Allow to stand 6 hours minimum.

4. Flush system until chlorine content is at or below content of local water supply.

H. Heads:

1. Install swing joints required for exact alignment of heads.

2. Nipple length shall permit head to draw canopy tight against mounting surface without deforming canopy.

3. Canopies shall telescope to or be adjusted to midpoint in the adjustment range.

4. Replace nipples of incorrect length.

5. Heads shall draw snug against canopies.

I. Alarm Panel and System:

1. Install in acceptable location.

2. Connect wiring for:

   a. Alarm bells.

   b. Alarm switches.

   c. Flow switches.

   d. Valve supervisory switches.

3. Test systems for proper operation of switches, bell, indicator lights and output at supervisory service contacts. Make operational.

J. Identification: Install signs and tags in required locations prior to code required system test inspection.

3.3 CONCRETE WORK

A. Provide all concrete grade beams, anchor and thrust blocks and reinforcing steel under the Work of this Section. All concrete and reinforcing steel provided under the work of this Section shall be in accordance with that specified under requirements for "Cast-In-Place Concrete."

3.4 PIPING INSTALLATION

A. Lay underground piping to bear along its entire length. Securely brace or clamp all elbows, bends, etc., and provide with concrete thrust blocks in an approved manner.

B. Provide hangers and supports as required by Code.

C. Provide inserts in accordance with approved Shop Drawings.

D. Provide all necessary clamps and rods for proper support of sprinkler risers and underground piping, all in strict accordance with requirements of NFPA Pamphlets Numbers 13 and 24 and Los Angeles City Code.

E. Inspector's Test Pipe: As required by Code for each system, extended down to globe valve not more than 6-feet above the floor with discharge as shown on the approved Drawings. Make extension of the drain to an approved location a part of this Section.

F. Protective Painting: Prime coats all hangers and hanger rods as hereinafter specified under Sub-Section 3.6 - Painting.

G. Test Connections: As required by Code, in riser at point opposite drain connection and equipped with a side outlet globe valve. Provide an Underwriters' approved gauge, in one outlet. Discharge 2-inch drain to street gutter per code under this Section.

H. Drain automatic ball drip piping to nearest funnel drain or other approved receptor.

I. Joints: Make up screw joints with pipe paste applied to male threads only. Ream pipe as necessary to make bore at end pipe same diameter as within the pipe.

J. Reducers: Make reductions in pipe sizes with one-piece reducing fittings. Bushings will not be acceptable.

3.5 SLEEVES

A. Provide sleeves for all pipes passing through walls, floors, (except for framed opening) and lath and plaster partitions and ceilings. For concrete construction, set sleeves in forms before concrete is poured. Provide 1-inch clearance between sleeve and pipe. Where installed in firewalls, caulk space between pipe and sleeve with approved type fire seal.

B. In Slab Construction: Extend sleeves 2-inches above finished floor and seal upper surface with mastic.

C. In Concrete Walls: When installed in outside walls, caulk space between pipe and sleeve with approved caulking material with an outer surface sealed watertight.

D. Sleeves through Waterproof Membranes: Set sleeves in walls and slabs with waterproof membrane; caulk space between pipe and sleeve with approved caulking material with an outer surface sealed watertight.

E. Escutcheons: Furnish and install steel (Prime coated) set screw type escutcheons on all exposed pipes passing through walls, floors, ceilings and partitions.

3.6 PAINTING

A. Finished Painting: Provide finish painting except for items specified to be a factory finished, in accordance with Section 09 90 00 "Painting".

B. Protective Painting:

1. Except those made of stainless steel, protective coatings shall be provided in accordance with the requirements of Section 09 90 00 "Painting."

2. As soon as practical after installation (maximum time of seven days), apply a coat of rust preventive paint to all installed piping including fittings, iron valves, hanger rods and hangers, and accessible undercoated cast iron or steel supports. All materials shall be properly cleaned and free of all rust and scale and foreign matter before painting.

3.7 ACCEPTANCE INSPECTION AND TESTS

A. Preliminary Testing: Flush newly installed systems prior to performing hydrostatic tests in order to remove any debris which may have been left as well as ensuring piping is unobstructed. Upon completion of the system, subject all piping including the fire department connections as specified in NFPA 13, to a hydrostatic pressure of 200 pounds per square inch for a two-hour continuous period, and not have more than 2 pounds pressure loss during this period in any part of the system. Hydrostatically test system in the presence of the City Engineer or his designated representative. Test and flush underground water line prior to performing these hydrostatic tests.

B. Final Inspection and Testing: Subject system to tests in accordance with NFPA 13, and when all necessary corrections have been accomplished, advise the City Engineer to schedule a final inspection and test. Connection to the fire alarm system shall have been in service for at least ten days prior to the final inspection, with adjustments made to prevent false alarms. Furnish all instruments, labor and materials required for the tests and provide the services of the installation foreman or other competent representative of the installer to perform the tests. Correct deficiencies and retest system as necessary, prior to the final acceptance. Include the operation of all features of the systems under normal operations in test.

3.8 CLEANING

A. Thoroughly clean all equipment, trim and exposed piping, of cement, plaster, grease, oil spots, and foreign matter. Carefully wipe surfaces clean and scrape cracks and corners clean.

B. Completed Work: Leave in a neat, clean condition, ready for use.

C. Flush and disinfect fire sprinkler system in accordance with requirements of NFPA 13 and AWWA C651 as required.

3.9 TRAINING

A. Prior to final acceptance, the Contractor shall provide operation and maintenance training for not less than 8 hours to include FACP operation, trouble shooting procedures, and unique maintenance and safety requirements. The Contractor shall furnish a course outline, training manuals, and equipment necessary to conduct the training. The equipment used for instruction shall be equivalent to the equipment furnished under the Contract.

3.10 PROTECTION

A. Protect Work as necessary to prevent damage of any kind to materials and installation. Adequately cover fixtures and equipment during construction as required by the City Engineer.

3.11 FINAL CLEAN-UP

A. Comply with the reference specifications of the GENERAL EQUIREMENTS.

B. Remove all excess materials, equipment, rubbish and debris from the job-site. All areas used by the Contractor to be left in a clean and safe condition.

END OF SECTION

SECTION 22 00 00

PLUMBING, GENERAL

NTS:	This specification section requires careful review by the specifier. The specifier is required to modify the section according to the requirements of the project. Brackets indicate items to be checked, completed, edited, selected, or filled in. NTS notations and brackets should be removed in the final printing.

PART 1 - GENERAL

1.1 SUMMARY

A. Work Included: Provide all labor, materials and equipment for all plumbing work indicated on the Contract Drawings or in these Specifications, including but not limited to the major items listed as follows:

1. Service connections to sewer, water, storm drain and gas lines.

2. Installation of pipe, valves, and fittings.

3. Furnish and set all sleeves for pipes thru walls.

4. Flashing of pipe stacks.

5. Pipe coverings, insulation, and waterproofing.

6. Access panels for cleanouts, valves, and water hammer arrestors.

7. Sealing of all penetrations thru fire walls and floors.

8. Final connection to equipment specified in other sections.

9. Water for construction and temporary connections.

10. Grouting and cleanup.

B. Related Documents: Documents affecting work of this Section include, but are not necessarily limited to the GENERAL CONDITIONS, SUPPLEMENTARY CONDITIONS and Sections in DIVISION 1 of these Specifications.

C. Related Work:

1. [Excavation, Backfill and Compaction for Utilities 02318.]

2. [Grading 02310.]

3. [Site Sanitary Sewer System 02530.]

4. [Sprinkler Irrigation System in Section 02810.]

5. [Site Water Distribution Systems 02510.]

6. [Cast In Place Concrete Work in Section 03300.]

7. [Storm Drainage Systems 02630.]

8. [Painting of Exposed Piping, Equipment, and Canvas Covered Insulation in Section 09910.]

9. [Fire Protection Systems in Section 15030]

10. Electrical Conduit and Wiring, including Motor Starters for Plumbing Equipment in Division 16.

11. Basic Mechanical Requirements in Section [15010].

12. Basic Mechanical Materials And Methods in Section [15050].

1.2 QUALITY ASSURANCE

A. Use adequate numbers of skilled laborers who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

B. Without additional cost to the City, provide such other labor and materials as are required to complete the work of this Section in accordance with the requirements of governmental agencies having jurisdiction, regardless of whether such materials and associated labor are called for elsewhere in these Contract Documents.

C. Conform to applicable Codes and regulations.

D. In addition to the requirements of all governing codes, ordinances and agencies, conform to the requirements of the following codes and standards:

1. Latest Edition of Uniform Building Code with the City of Los Angeles Latest Amendments and Ordinances.

2. Uniform Plumbing Code, latest Edition with the City of Los Angeles Latest Amendments.

3. City Engineer's requirements.

4. State Fire Marshall/N.F.P.A.

5. Uniform Fire Code, latest Edition.

6. City of Los Angeles Fire department requirements.

7. California Administrative Code.

8. All requirements of Federal/OSHA

9. All other regulatory agencies having jurisdiction over this work.

E. Guarantees: Furnish a written guarantee form required under Division 1, against defects in materials and workmanship for one year. Guarantee shall include repair of damage to, or replacement (if so required) of any part of premises caused by water, oil, gas leaks or breaks in pipes, fixtures or equipment provided under this Section.

1.3 SUBMITTALS

A. Comply with pertinent provisions of Section [01330 – SHOP DRAWINGS/SUBMITTALS of DIVISION 1 – GENERAL REQUIREMENTS] of the Bid Documents.

B. Product Data: Within 40 calendar days after the Contractor has received the City Engineer's "Notice to Proceed", submit:

1. Design drawings, signed by a properly licensed engineer and showing proposed layout of the system;

2. Calculations demonstrating the adequacy of the proposed systems and its compliance with these Specifications;

3. Manufacturers' catalogs, Samples, and other items needed to fully demonstrate the quality of the proposed materials and equipment.

4. Material list of items proposed to be provided under this Section.

C. Record Drawings:

1. Comply with pertinent provisions of GENERAL CONDITIONS of these Specifications.

2. Include a copy of the Record Drawings in each copy of the operation and maintenance manual described below.

D. Upon completion of this portion of the Work, and as a condition of its acceptance, deliver to the City Engineer three copies of an operation and maintenance manual compiled in accordance with the provisions of the GENERAL CONDITIONS of these Specifications.

1.4 PRODUCT HANDLING

A. Except as otherwise approved by the City Engineer, determine and comply with manufacturer's recommendations on product handling, storage and protection.

B. Deliver products to the job-site in their manufacturer's original container, with labels intact and legible.

1. Maintain packaged materials with seals unbroken and labels intact until time of use.

2. Promptly remove damaged material and unsuitable items from the job-site, and promptly replace with material meeting the specified requirements, at no additional cost to the City.

C. The City Engineer may reject as non-complying such material and products that do not bear identification satisfactory to the City Engineer as to manufacturer, grade, quality and other pertinent information.

1.5 GENERAL REQUIREMENTS

A. Locations Indicated on Drawings: For purpose of clarity, the Drawings are generally diagrammatic omitting offsets and small details. Certain pipe runs are shown distorted to

avoid confusion. Where locations are fixed by dimension notations, follow as closely as possible consistent with proper installation.

B. Exact Location: As required for proper installation, avoid interference with architectural and structural features and work of other trades and to preserve head room and to keep openings and passageways clear. Arrange neatly and occupy minimum space; install piping parallel or at right angles to structures at the elevations indicated. Provide flanges and unions where required to permit servicing, removal and re-connection of each item of equipment.

C. Discrepancies or Errors: In case discrepancies or errors occur between plans, specifications, structural members, regulating codes, etc. Notify the City Engineer for instructions as directed in the GENERAL CONDITIONS of these Specifications.

D. Openings: Provide as necessary for passage of pipes through walls, floors, partitions, and other construction whether indicated on the Contract Drawings or not.

E. Cutting and Repairing:

1. Do no cutting of structural members without written authorization by the City Engineer. Where permitted, provide all reinforcement with repair materials as directed by the City Engineer.

2. Repairing: By appropriate craftpersons to restore construction to a condition as approved by the City Engineer and Contract Administration.

F. Protection of Work: Provide as necessary to prevent damage of any kind to materials and installation. Adequately cover fixtures and equipment during construction as required by the City Engineer.

G. Record Drawings: Provide accurate dimension locations including depths of underground piping, valves and cleanouts, and all control equipment as installed in strict accordance with provisions in GENERAL CONDITIONS of these Specifications.

H. Shop Drawings and Lists of All Materials, Fixtures and Equipment:

1. General: Submit for approval within 30 calendar days after the Contractor has received the City Engineer's "Notice to Proceed", in accordance with provisions of the GENERAL CONDITIONS of these Specifications, to assure ample time for checking and processing of the submittals by the City. Delays resulting from improper and untimely submittals shall be the responsibility of the Contractor. Start no construction work before approval of submittals.

2. Required Shop Drawings: Only required when proposing a substitute (different brand) except when specifically specified for an individual item.

3. Required List of All Materials, Fixtures, and Equipment: Provide complete list with names and addresses of manufacturers, catalog numbers, trade numbers, trade names, illustrations, and descriptive literature for each article. Underline all pertinent data for each item in each copy of catalog or brochure in which it is described. Note in letter of transmittal all variations in performance, design and installation. Identify each article in submittals with reference to Section Number and Subsection Number of this Section and the specified item.

4. Procure specified items after the 40 days from the Contract date.

5. Disapprovals: Delete articles disapproved by the City Engineer as not conforming to the Specifications or grade, and provide suitable articles in lieu thereof in conformity with Specifications. Start no purchasing or no work related to the submittals prior to approval of submittals.

6. Approval of Shop Drawings or other submittals will be general and will not relieve the Contractor of the responsibility for the proper fitting and construction of the specified work, nor from furnishing and performing work required by the Contract which may not be indicated on the shop drawings when approved as required by provisions of Section 11 in the GENERAL CONDITIONS of these Specifications.

7. Use Approved List for procurement without deviations, unless otherwise authorized by the City Engineer.

8. Modification of Contract Drawings: Furnish appropriate proposed revisions drawings prepared by a licensed Architect or Engineer for approval by the City Engineer. Required, in each case where proposed substitute material or equipment for proper installation will require changes to the design of the project on the Contract Drawings and make such drawings sufficiently complete for proper installation of substitute material or equipment and for construction by interested trades for the proposed revisions. Contractor shall bear the cost of the drawings and of the proposed revised construction.

I. Materials and Workmanship:

1. General: In conformity with Los Angeles City Plumbing, Industrial Waste, Pressure Vessel and Mechanical Codes, Underwriters' Laboratories, Los Angeles County, and California State Requirements.

2. Materials: To be recently manufactured and in perfect condition; materials for similar uses to be same type and manufacture unless otherwise approved.

3. Workmanship: In accordance with best trade practices.

J. Permits and Inspections:

1. Permits: Obtain and pay for permits as required by Uniform Plumbing and Mechanical Codes, 1997 Editions, with the City of Los Angeles 1996 Amendments.

2. Inspections Required: For all installations prior to concealment of the work, by the Los Angeles City Department of Building and Safety, and by the City Engineer. "Final Certificate of Approval" for the entire plumbing system required.

K. Maintenance and Operating Manuals: Provide the City with three (3) copies of neatly bound and indexed maintenance and operating manuals for all equipment as per provisions in the GENERAL PROVISIONS of these Specifications.

L. Closing in of Work: Do not conceal or close-in work until it has been inspected and approved by the City Engineer and authorities having jurisdiction. Contractor shall uncover prematurely covered or closed-in work before testing and inspection and shall re-conceal or re-close-in the work after testing and inspection, at no added cost to the City.

1.6 ACCEPTANCE OF WORK

A. Plumbing systems will not be considered for acceptance until the Contractor has completed disinfection of domestic water systems and all other work as hereinafter specified, including all testing work and has demonstrated to the City Engineer that all such systems operate properly in accordance with these Specifications and the standards herein referenced.

1.7 SERVICE CONNECTIONS

A. Sewer: Contractor to determine exact location of required connection and to be responsible for proper location of building drain and building sewer lines from buildings to street sewer main for most direct and suitable connection. Sewer permit and connection fees shall be arranged and paid by the Contractor. Sewer facility fee to be paid for by the City.

B. Water: Contractor to arrange for installation of water service meter and vault by Department of Water and Power and to pay all fees, charges and assessments. Water for construction shall be separately arranged for and paid for by the Contractor.

C. Gas: To gas meter at location shown on the Drawing; Contractor to arrange for installation of gas service meter and earthquake shut-off valve downstream of gas meter by Southern California Gas Company and to pay all fees, charges and assessments. Gas required for testing to be paid for by the Contractor.

D. Storm Drain: Contractor shall determine exact location of required connection and shall be responsible for proper location of on-site storm drains. Storm drain permit and connection fees to be arranged and paid for by site work Contractor.

PART 2 - PRODUCTS AND EXECUTION OR INSTALLATION

2.1 GENERAL

A. Isolate all bare copper piping from hangers, supports, or structures with prefabricated isolator consisting of steel shell with corrosion resistant coating and chemically treated hair-felt pad.

B. Wherever work penetrates any waterproofing, do so with care and make opening through such waterproofing absolutely watertight in a manner approved by the City Engineer.

C. Do not conceal or cover work until inspected, tested, and approved by the City Engineer. Should any work be enclosed or covered up prior to inspection and testing, the Contractor, at his expense, shall uncover the work, make necessary tests and corrections to proper conditions as approved by the City Engineer.

D. Replace defective pipes, fittings, or joints with new materials. Repairing with dope, tar, cement, or other materials not permitted.

E. All piping and equipment shall operate without objectionable noises or vibration, as determined by the City Engineer. Provide positive type isolators as hereinafter specified.

2.2 MISCELLANEOUS EQUIPMENT & MATERIALS

A. Couplings: Same material as pipe on which couplings are used.

B. Unions:

1. For Solder-Joint Piping: Wrought copper or cast bronze, close grained and nonporous, extra heavy type, 150-lb. working pressure, ground joint, individually tested by manufacturer.

2. For Screwed-Joint Piping: Galvanized malleable iron, brass to iron seat, 250-lb. working pressure female pattern, ground joint.

C. Hose Bibb Controls: Chicago Faucet No. 1771, ½-inch concealed control stops with lock-shield caps on concealed piping; gate valves on exposed piping.

D. Pressure Regulating Assembly:

1. Pressure Reducing Valve: With built-in bypass to reduce thermal expansion; assembled sized and piped as detailed on drawings; brass bolts and nuts used for assembly; to be Los Angeles approved type.

2. Pressure Gauge: Bourdon tube type, non-corrodible movement, 3-½-inch dial, re-calibrator design, 0 to 200-lb. range, ¼-inch IPS male bottom connection.

3. Relief Valve: McDonnell and Miller No. 240-1 in. - 125, set as 125 psi, conforming to ASME Code requirements.

2.3 SLEEVES

A. Required:

1. In Concrete Slabs: Standard weight galvanized steel pipe in forms before concrete is placed.

2. In Masonry and Concrete Walls and Footings: Set treated fiber rigid concrete sleeves or standard weight galvanized steel pipe, in forms before concrete is placed or built into masonry. See Structural Plans.

3. In Stud Walls: 24 gage galvanized iron or steel.

B. Clearance: Provide ½-inch between sleeve and pipe or covered pipe, extend sleeve in floor slabs 2-inches above finished floor and 4-inches above rough floor.

2.4 PIPE COVERING

A. Waterproofing Protection on Pipe:

1. Required Covering: Cover all copper and steel pipe and fitting embedded in ground, in concrete masonry, or solid plaster.

2. Material: Plastic tape approved by City of Los Angeles, Department of Building and Safety.

3. Hand Application:

a. Clean all materials thoroughly to the bare metal base, remove all grease and oil with a nonoily solvent; file or grind burrs, sharp edges, and rough spots smooth. Make all surfaces dry and dust free.

b. Spiral wrap pipes with uniform laps of plastic tape by hand, completing one layer with prescribed laps; reverse direction of wrapping and apply a

second layer in the same manner, again maintaining prescribed laps. All widths of tape, length of rolls, and dimensions of laps shall be as recommended by manufacturer in the manufacturer's material requirements table. Take care to insure a uniformly applied, tightly bonded tape, free of air pockets, voids and wrinkles.

4. Machine Application:

a. Clean as outlined above for hand application.

b. Spiral wrap uniformly by an approved manual or power driven machine with 50 percent laps and one over- wrap of 50/50/50# asphalt laminated kraft, either wet strength one side, or reinforced. All width of tape, length of rolls, and application as recommended by manufacturer in manufacturer's material requirements tablet. Exercise care to insure a uniformly applied, tightly bonded tape, free of air pockets, voids, and wrinkles.

5. Testing: Holiday detection testing prior to installation underground shall be required at the discretion of the City Engineer. Use a holiday detector set at 5,000 and 6,000 volts. Patch all holidays detected with a double "cigarette wrap" of No. 665 (15 mil) tape.

2.5 FLASHING OF PIPE STACKS

A. Required: For all pipes, passing through roof, comply with Specification Section 07620.

2.6 ACCESS PANELS

A. For Valves or Equipment Located Behind Ceramic Tile Walls: Provide 8-inch x 8-inch opening; stainless steel, beveled edge frame; stainless steel cover secured with flush-head screws; polished finish; vandal-proof screws where indicated or required.

B. For Valves, Clean-outs or Equipment Located Behind Finish Plaster Walls or Ceilings: Provide 8-inch x 8-inch minimum opening, 16-gage steel frame; 14-gagesteel door with concealed hinges arranged to open 180 degrees or to be removable and with Allen head locking device; with bonderized and prime coated finish.

C. Installation: Required for ready accessibility to all valves and water hammer arrestor unless installed, in pipe spaces or in readily accessible ceiling space.

D. Manufacturer's Reference Data: Required as noted in 1.3 of this Section.

2.7 STORAGE TYPE WATER HEATER/ EXPANSION TANK

A. Water heater tank: Glass lined with anode rods, AGA approved and listed, and State Energy Standard listed item.
B. Expansion tank: Steel shell, ASME designed, Pre-charged air chamber, Butyl diaphram, rigid polypropylene liner.
C. Capacity: As indicated on the Drawings.

D. Installation: Anchor to floor and with earthquake restraint (2-18 gage sheet metal bolt to wall as indicated on the drawings) . Connect to gas, water and vent lines.

E. Vent:

1. Carried vertically through roof as detailed on the Drawings.

2. In accordance with Los Angeles City Plumbing Code.

3. Type B, air insulated, double wall construction from flue collar or draft hood on water heater appliance through roof, size as indicated on the drawings; constructed of noncombustible corrosion-resistant materials; pipe and fitting as listed and approved by the Los Angeles City Heating Code and Underwriter's Laboratories, Inc. Where water heater manufacturer specifies pressurized double wall flue that includes combustion air, provide manufacturers recommended product.

4. Provide bird-proof vent cap, storm collar and 12-inch adjustable cone roof flashing constructed of galvanized steel outer casing and aluminum inner pipe.

F. Combination Temperature and Pressure Relief Valve: Resetting type constructed and listed to meet AGA and American National Standards Requirements. Install with temperature sensing element immersed in water within the top 6-inches of the tank with a 1-inch relief line to floor sink.

G. Manufacturer's Reference Data: Required as noted in 1.3 of this Section.

2.8 INSTANTANEOUS TYPE WATER HEATER

A. Electrical, wall mounted, UL approved, with flow restrictor.

2.9 FIRE SEAL

A. Required: Seal around pipe passing through fire-rated wall or floor to maintain fire rating.

B. Material: Fire-Seal, U.L. classified for fire rating three hours.

C. Manufacturer's Reference Data: Required as noted in 1.3 of this Section.

PART 3 - EXECUTION

3.1 GENERAL

A. Make all equipment and piping systems to operate without objectionable noise and vibration, as determined by the City Engineer. Do not interfere with other trades (electrical, mechanical, structural, etc.) to avoid noise and vibration transmission. Provide positive type isolators as herein after specified.

B. Surface Conditions: Examine all areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the work. Do not proceed until detrimental conditions are corrected.

3.2 INSTALLATION OF PIPE

A. Pipe Inside Building: Conceal with in building walls, partitions, furred spaces or ceilings except in mechanical equipment room, where indicated or possible and work into position without springing or forcing.

B. Underground Pipe Outside Building: Locate top of all pipes not less than 2-feet below finish grade, except where otherwise indicated on the drawings. Lay sewer pipe in a separate trench. Space all pipe lines at a minimum of 12-inches center to center with a

minimum of 2-feet horizontal distance from footing or wall, and above 45 degree downward line from the footing. Install all pipes in a straight line with neat appearance when completed. Take precautions to prevent damage to wrapped pipe. Trench bottom to be free of rocks and gravel. Lay pipe parallel or at right angles to building or property lines. Set drain lines on a firm foundation or sub-grade, true to line and grade. When entering building, water and gas pipes to rise above footing (with shut-off valve on riser) and go through the wall.

C. Soil and Waste Lines in Building: Provide a removable coupling at floor level where lines go underground; bring cast iron pipe up to waste connection of each fixture.

D. Gas Piping:

1. Install so that branch lines are tapped off tops of pipe valve end of main lines, valved to bleed off condensate that my form in pipe. Plug or cap valves.

2. Run main fuel line from meter to gas appliances. Provide gas service stop at all appliances.

E. Pipe Openings: Keep closed to prevent obstructions and damage during construction.

F. Grade or Slope:

1. Sanitary Piping and Other Drain Lines: Horizontal runs to have uniform fall of not less than 1/4-inch per foot; 1/8- inch in yard areas, and in ceiling spaces when approved by City Engineer.

2. Vent Piping: Grade to positively prevent accumulation of water or condensation.

3. Gas Piping: All lines to slope downward to meter, fixture, gas drip, or dirt leg.

G. Bends: Run drainage pipe as straight as possible, with long radius turns and offsets at angle of 45 degrees or less. Make changes in direction of all piping with fittings.

H. Clean-outs: To be located :

1. Where indicated on drawings. Exact locations as directed by the City Engineer.

2. At all horizontal offsets, or changes in direction of piping greater than 45-degrees.

3. At ends of all waste and sewer lines more than 5-feet in length.

4. At intervals of 50-feet for piping of4-inches and smaller, and 100-feet for larger piping.

5. At base of each vertical stack (waste, soil and storm drains).

6. After testing remove C.O. plug; apply water pump grease to male threads and replace hand tight.

I. Noises: Piping to be free from unusual noises due to flow of water under normal conditions.

J. Full-Length Sections of Pipe: Required for all pipe lines wherever practical; short sections with unnecessary couplings will not be allowed.

K. Floor and Ceiling Plates: Required where exposed pipes pass through walls, floors or ceilings; polished chromium-plated split-flange or one piece.

L. Hot and Cold Water Separation: Separate hot and cold water lines by at least 6-inches on parallel runs.

M. Expansion of Piping: Provide as required in all piping and for prevention of damage to pipe or insulation where expansion or contraction occurs.

N. Seismic Bracing: Provide lateral and longitudinal sway bracing required for all suspended piping in compliance with Drawing Details or as specified in Section 15240 – HVAC Equipment Seismic Restraints and Vibration Isolation.

O. Inspection:

1. By Contractor: All installations to determine that pipes are free from defective workmanship and that pipes and fittings are free from obstructions and are in their proper locations.

2. By Inspector and All Duly Constituted Authorities: All installations prior to concealment.

3.3 INSTALLATION OF VALVES AND FITTINGS

A. Care in Fitting and Installing Fixtures: Install all exposed plated or enameled connections to fixtures with special care to avoid tool marks or threads showing at fittings.

B. Unions: Required at each valve, at gas pressure regulator, and on connections to all equipment; to be of the same materials as fittings.

C. Water Hammer Arrestors:

1. Install water hammer arrestors indicated on the Drawings and in the following locations: (only non-ferrous arrestors may be used in copper water systems).

a. On water lines to service sinks, kitchen sinks, water closets and urinals.

b. Between the last two fixtures when three or more fixtures, other than those listed in (a) above, areas served by a common server.

2. When possible, arrestor shall be installed in the wall or furring. When arrestor is installed in wall or furring, furnish an access plate large enough to permit removal of the arrestor. The access plate shall be a minimum of 2" larger in each direction than the arrestor. See equipment list for sizes, makes and models or arrestors. Where not specifically offered in the Contract Documents installation shall be in accordance with the Plumbing and Drainage Institute Standard PDI-WH201.

3. Each fixture water line shall be provided with a dampening device. When such service is not provided by water hammer arrestors, provide an air chamber at each fixture supply. This shall be an 18" long vertical piece of capped pipe one size larger than the branch to a fixture. In lieu of individual air chambers, header air chamber may be used where header serves two fixtures. This shall be located at each end of the header and shall be a 36" length of vertical pipe, capped, not less than one pipe size larger than the header.

D. Reducing Fittings: Required only where changes in pipe sizes occur.

E. Prohibited Fittings: Screw or sand bushings; 90 degrees or 45 degrees street elbows, close nipples, long screws, bullhead tees, and special fittings, unless approved by the City Engineer.

F. Valves: Use gate, ball and butterfly valves for shut-off duty; globe, ball and butterfly for throttling bypass or manual flow control duty. Install on each branch line to one or more fixtures and on every underground branch line for complete control of the system. Place valves with stems horizontal wherever possible. Adjust, regulate, and pack glands before final acceptance.

G. Separate Control: Install valves at each fixture on hot and cold water to permit repairs without interference with any other fixture. Provide hose bibbs with individual control valves, except where otherwise indicated adjacent to and either concealed or exposed as indicated by location of hose bibb.

H. Dielectric Couplings or Flanges:

1. Required where copper pipe is joined to steel or iron pipe or equipment. Unions will not be allowed. Not required for bronze valves in steel lines or for caulked joints between copper and cast iron drainage lines.

2. Use couplings only on cold water installations.

3. Use flanges on all installations above 140 degrees Fahrenheit and made of material suitable for temperatures involved.

I. Exposed Toilet Flush Valves: Locate rough and finish 4-3/4 inches to right of center of valve to center of wheel handle angle stop, and 12-inches above top rim of bowl to center line of flush valve, locate oscillating handle to left facing bowl. Install sensor operated valves per manufacturer's recommendations.

J. All Flushometer Valves: Disassemble and lubricate with water pump grease and graphite before installation.

3.4 EQUIPMENT AND FIXTURE CONNECTIONS

A. General: Stub all piping out to the exact location and set symmetrical with the fixtures.

B. Water Headers Serving Water Closets: Shall be as indicated on drawings.

C. Water Headers Serving Urinals: Shall be as indicated on drawings.

3.5 ATTACHMENT OF FIXTURES

A. Required: Support and attach all fixtures hereinbefore specified properly and adequately to walls, ceilings, or floors in true right angles with floor and wall using adjustable fixture carrier as indicated on the Drawings or as specified.

B. To Concrete Backing: Machine bolts through concrete with nut and washer on space side, or with heavy expansion bolts of required length.

C. To Steel Stud Backing: Bolt to 4-inch x 1/4-inch steel plate; plate to be welded or clamped by U-bolts to steel studs.

D. Anchor Bolts, Sleeves, and Templates: Required: Anchor bolts for fixture attachment, steel pipe sleeves for bolt adjustment and templates for holding anchor bolts.

E. Toilets and Urinals: Set finish with approved type graphite ring and stainless plumber's putty.

F. Disassemble all flushometer valves and lubricate with water pump grease and graphite before installation.

G. Fixture Height for Handicapped Persons: As indicated on the Architectural and Plumbing Drawings.

H. Grouting and Cleaning:

1. Required between base of toilet bowl and floor and between back of all plumbing and wall areas.

2. Use hard, white, durable plaster materials filling all voids and cracks and provide adequate bearing surface mounting.

3. Before plaster materials have hardened, scrape a reasonable amount of plaster from void or crack allowing sufficient depression to receive caulking. Completely fill cracks or voids to a finished surface between all plumbing fixtures and walls or floors with "Tub-Caulk" manufactured by Miracle Adhesive Co., New York, New York or equal. Apply as recommended by the manufacturer.

4. Floor Sinks: Except in kitchen areas, install one-inch above finish floor and neatly grout all four sides.

I. Cleaning: Thoroughly clean all equipment, fixtures, trim, and exposed piping of cement, plaster, grease, and oil spots. Carefully wipe surfaces and scrape cracks and corners clean.

J. Polishing: Polish all exposed chromium-plated or nickel-plated surfaces, with clean cloths.

K. Completed Work: Leave in a neat, clean condition, ready for use.

L. Inspection:

1. By Contractor: Inspect all installations to determine that pipes are free from defective workmanship and that pipes and fittings are free from obstructions and are in their proper locations.

2. By City Engineer and All Duly Constituted Authorities: All installations prior to concealment.

3.6 PLUMBING CONNECTIONS TO EQUIPMENT SPECIFIED IN OTHER DIVISIONS

A. Fuel Gas: To gas roof-top package units with appliance gas service stops adjacent to equipment.

B. Drain: From air conditioning coils to sink tailpieces, material as specified in Water Supply Materials Subsection.

C. Final Connections: Required by the Plumbing Contractor to all appliances.

3.7 DISINFECTING OF WATER SYSTEMS

A. Required: For each hot water, cold water, and drinking water system, after all fixtures have been completely connected and are ready for operation.

B. Disinfecting Agent: Gas or liquid chlorine, as normally used for the chlorination of water systems. Calcium or sodium hypochlorite as approved by Federal and American Water Works Association procedures may be used.

C. Disinfecting Connection: Locate service cock or riser, 3/4-inch to 1-1/4-inch size, near water service entrance.

D. Procedure:

1. Remove all screens on faucets.

2. Flush all lines and fixtures thoroughly with clear water.

3. Adjust all faucets and outlets so that a trickle of water flows from each; water service supply valve to remain open.

4. Connect a hand-operated pump or other injection device to the disinfecting connection, the pump or device to provide a pressure greater than that of the water supply to the system.

5. Inject the disinfectant slowly and continuously at an even rate (not in slugs).

6. Check the effluent at each faucet and outlet with an orthotolidin solution while injection is continuing until the chlorine residual concentration indicates not less than 50 parts per million at all outlets.

7. Close all outlets including water service supply valve and disinfecting connection and hold for 24 hours.

8. After retention the chlorine residual concentration at most outlets when checked with an orthotolidin solution to be not less than ten parts per million. If less, disinfecting procedure to be repeated.

9. If check is satisfactory, flush all disinfected systems with clear water until chlorine residual concentration when checked with an orthotolidin solution to be not greater than that of the incoming water supply.

E. Bacteriological Analysis:

1. Upon completion of final flushing after retention period, obtain and test a water sample by a recognized laboratory acceptance to the City Engineer.

2. A written report to be submitted by the laboratory to the City Engineer showing:

a. Name and location of job and date sample was obtained.

b. That the coliform aerogenes are negative.

c. That the total plate count is less than 100 bacteria per cubic centimeter.

d. That the water is safe to use.

F. Costs: All cost of the materials, equipment, and application, including water charges and laboratory fees, shall be borne by the Contractor.

3.8 BACK SIPHONAGE PROTECTION

A. Protect water supplies of all plumbing fixtures against back siphonage in the event of a vacuum in the piping system.

B. Locate discharge outlets of all supply faucets for lavatories and sinks so as to clear the top of overflow rim at least 1-inch.

C. Install approved hose bibb vacuum breaker at each hose bibb, recessed and exposed.

D. Equip toilet flush valves with approved vacuum breakers. Install at the height required by the Los Angeles City Plumbing Code.

E. Atmospheric type backflow preventers required for lawn sprinkler systems and are shown on the Landscaping Drawings.

F. Reduced Pressure Type Backflow Preventer: Los Angeles City approved type.

G. Vacuum Breaker Assembly: Required for interceptor connection.

H. All backflow prevention devices shall be approved by the City of Los Angeles, Department of Building and Safety and Los Angeles County Health Department and other official agencies having jurisdiction. Use test devices designed for testing, so tested by a certified tester, paid for by the Contractor. Submit certification to the "General Maintenance Superintendent", General Services Department, prior to acceptance of the project. Such certification shall in no way nullify the warranty of such device or equipment. Perform all tests in the presence of the City Engineer or his duly appointed representative.

3.12 TESTS

A. Sanitary Systems: In accordance with Uniform Plumbing Code, 1999 Edition with the City of Los Angeles 2001 Amendments.

B. Roof Drain System: Similar to tests on sanitary system.

C. Water Systems: Minimum hydrostatic pressure of 250 psi for a period of four hours.

D. Gas Piping: In accordance with Uniform Plumbing Code, 1999 Edition with the City of Los Angeles 2001 Amendments.

E. Supervision: Make all tests in the presence of the City Engineer and demonstrate all fixtures and equipment to function satisfactorily and to the approval of the City Engineer. Provide and pay for all equipment, materials, and labor necessary for tests.

3.13 EMERGENCY REPAIRS

A. The City reserves the right to make emergency repairs as required to keep equipment in operation, without voiding the Contractor's guarantee bond, nor relieving the Contractor of his responsibilities during the bonding period.

END OF SECTION

SECTION 22 05 10

BASIC MECHANICAL MATERIALS AND METHODS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following basic mechanical materials and methods to complement other Division 15 Sections.

1. Piping materials and installation instructions common to most piping systems.

2. Concrete equipment base construction requirements.

3. Equipment nameplate data requirements.

4. Labeling and identifying mechanical systems and equipment is specified in Division 15, Section [15390] "Building Mechanical Identification."

5. Field-fabricated metal and wood equipment supports.

6. Installation requirements common to equipment specification sections.

7. Cutting and patching.

8. Touch-up painting and finishing.

B. Pipe and pipe fitting materials are specified in piping system Sections.

1.3 DEFINITIONS

A. Pipe, pipe fittings, and piping include tube, tube fittings, and tubing.

B. Finished Spaces: Spaces other than mechanical and electrical equipment rooms, furred spaces, pipe and duct shafts, unheated spaces immediately below the roof, spaces above ceilings, unexcavated spaces, crawl spaces, and tunnels.

C. Exposed Interior Installations: Exposed to view indoors. Examples include finished occupied spaces and mechanical equipment rooms.

D. Exposed Exterior Installations: Exposed to view outdoors, or subject to outdoor ambient temperatures and weather conditions. Examples include rooftop locations.

E. Concealed Interior Installations: Concealed from view and protected from physical contact by building occupants. Examples include above ceilings and in duct shafts.

F. Concealed Exterior Installations: Concealed from view and protected from weather conditions and physical contact by building occupants, but subject to outdoor ambient temperatures. Examples include installations within unheated shelters.

1.4 SUBMITTALS

A. General: Submit the following in accordance with Conditions of Contract and Division 1 Specifications Sections.

B. Product data for following piping specialties:

1. Mechanical sleeve seals.

2. Identification materials and devices.

C. Samples of color, lettering style, and other graphic representation required for each identification material and device.

D. Shop drawings detailing fabrication and installation for metal and wood supports and anchorage for mechanical materials and equipment.

E. Coordination drawings for access panel and door locations.

F. Prepare coordination drawings according to Division 1 Section Submittals" to a 1/4 inch equals 1 foot scale or larger. Detail major elements, components, and systems of mechanical equipment and materials in relationship with other systems, installations, and building components. Show space requirements for installation and access. Show where sequence and coordination of installations are important to the efficient flow of the Work. Include the following:

1. Proposed locations of piping, ductwork, equipment, and materials. Include the following:

a. Planned piping layout, including valve and specialty locations and valve stem movement.
b. Planned duct systems layout, including elbows radius and duct accessories.
c. Clearances for installing and maintaining insulation.
d. Clearances for servicing and maintaining equipment, including space for equipment disassembly required for periodic maintenance.
e. Equipment service connections and support details.
f. Exterior wall and foundation penetrations.
g. Fire-rated wall and floor penetrations.
h. Sizes and location of required concrete pads and bases.

2. Scheduling, sequencing, movement, and positioning of large equipment into the building during construction.

3. Floor plans, elevations, and details to indicate penetrations in floors, walls, and ceilings and their relationship to other penetrations and installations.

4. Reflected ceiling plans to coordinate and integrate installations, air outlets and inlets, light fixtures, communication systems components, sprinklers, and other ceiling-mounted items.

G. Welder certificates signed by Contractor certifying that welders comply with requirements specified under "Quality Assurance" Article of this Section.

1.5 QUALITY ASSURANCE

A. Qualify welding processes and operators for piping according to ASME "Boiler and Pressure Vessel Code," Section IX, "Welding and Brazing Qualifications."

1. Comply with provisions of ASME B31 Series "Code for Pressure Piping."

2. Certify that each welder has passed AWS qualification tests for the welding processes involved and that certification is current.

B. ASME A13.1 for lettering size, length of color field, colors, and viewing angles of identification devices.

C. Equipment Selection: Equipment of greater or larger power, dimensions, capacities, and ratings may be furnished provided such proposed equipment is approved in writing and connecting mechanical and electrical services, circuit breakers, conduit, motors, bases, and equipment spaces are increased. No additional costs will be approved for these increases, if larger equipment is approved. If minimum energy ratings or efficiencies of the equipment are specified, the equipment must meet the design requirements and commissioning requirements.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver pipes and tubes with factory-applied end-caps. Maintain end-caps through shipping, storage, and handling to prevent pipe-end damage and prevent entrance of dirt, debris, and moisture.

B. Protect stored pipes and tubes from moisture and dirt. Elevate above grade. When stored inside, do not exceed structural capacity of the floor.

C. Protect flanges, fittings, and piping specialties from moisture and dirt.

1.7 SEQUENCING AND SCHEDULING

A. Coordinate mechanical equipment installation with other building components.

B. Arrange for chases, slots, and openings in building structure during progress of construction, to allow for mechanical installations.

C. Coordinate the installation of required supporting devices and set sleeves in poured-in-place concrete and other structural components, as they are constructed.

D. Sequence, coordinate, and integrate installations of mechanical materials and equipment for efficient flow of the Work. Coordinate installation of large equipment requiring positioning prior to closing in the building.

E. Coordinate connection of mechanical systems with exterior underground and overhead utilities and services. Comply with requirements of governing regulations, franchised service companies, and controlling agencies.

F. Coordinate requirements for access panels and doors where mechanical items requiring access are concealed behind finished surfaces.

G. Coordinate installation of identifying devices after completion of covering and painting, where devices are applied to surfaces. Install identifying devices prior to installation of acoustical ceilings and similar concealment.

PART 2 - PRODUCTS

2.1 PIPE AND PIPE FITTINGS

A. Refer to individual piping system specification Sections for pipe and fitting materials and joining methods.

B. Pipe Threads: ASME B1.20.1 for factory-threaded pipe and pipe fittings.

2.2 JOINING MATERIALS

A. Refer to individual piping system specification Sections in Division 15 for special joining materials not listed below.

B. Pipe Flange Gasket Materials: Suitable for the chemical and thermal conditions of the piping system contents.

1. ASME B16.21, nonmetallic, flat, asbestos-free, 1/8-inch maximum thickness, except where thickness or specific material is indicated.

a. Full-Face Type: For flat-face, Class 125 cast-iron and cast-bronze flanges.

b. Narrow-Face Type: For raised-face, Class 250 cast-iron and steel flanges.

2. ASME B16.20 for grooved, ring-joint, steel flanges.

3. AWWA C110, rubber, flat face, 1/8-inch thick, except where other thickness is indicated; and full-face or ring type, except where type is indicated.

C. Flange Bolts and Nuts: ASME B18.2.1, carbon steel, except where other material is indicated.

D. Solder Filler Metal: ASTM B 32.

E. Flanged, Ductile-Iron Pipe Gasket, Bolts, and Nuts: AWWA C110, rubber gasket, carbon steel bolts and nuts.

F. Couplings: Iron body sleeve assembly, fabricated to match outside diameters of plain-end, pressure pipes.

1. Sleeve: ASTM A 126, Class B, gray iron.

2. Followers: ASTM A 47, Grade 32510 or ASTM A 536 ductile iron.

3. Gaskets: Rubber.

4. Bolts and Nuts: AWWA C111.

5. Finish: Enamel paint.

G. Copper tubing:

1. Joining for copper pipes 4 - inch and smaller; no lead, City of Los Angeles (approved type) for all copper pipe above ground under.
2. Sil-Fos silver alloy for pipe underground and for piping above ground having a continuous street main pressure of 100-lbs or more.

3. Wire solder only; paste mixed solder not permitted.

H. Flux: As recommended by manufacturer of solder.

2.3 PIPING SPECIALTIES

A. Escutcheons: Manufactured wall, ceiling, and floor plates; deep-pattern type, where required to conceal protruding fittings and sleeves.

1. Inside Diameter: Closely fit around pipe, tube, and insulation of insulated piping.

2. Outside Diameter: Completely cover opening.

3. Cast Brass: One-piece, with set-screw.

   a. Finish: Rough brass.
   b. Finish: Polished chrome plate.

4. Cast Brass: Split casting, with concealed hinge and set-screw.

   a. Finish: Rough brass.
   b. Finish: Polished chrome plate.

B. Dielectric Fittings: Assembly or fitting having insulating material isolating joined dissimilar metals, to prevent galvanic action and stop corrosion.

1. Description: Combination of copper alloy and ferrous; threaded, solder, plain, and weld neck end types and matching piping system materials.

2. Insulating Material: Suitable for system fluid, pressure, and temperature.

3. Dielectric Unions: Factory-fabricated, union assembly, for 250 psig minimum working pressure at 180 deg F temperature.

4. Dielectric Flanges: Factory-fabricated, companion-flange assembly, for 150 or 300 psig minimum pressure to suit system pressures.

5. Dielectric-Flange Insulation Kits: Field-assembled, companion-flange assembly, full-face or ring type. Components include neoprene or phenolic gasket, phenolic or polyethylene bolt sleeves, phenolic washers, and steel backing washers.

   a. Provide separate companion flanges and steel bolts and nuts for 150- or 300-psig minimum working pressure to suit system pressures.

6. Dielectric Couplings: Galvanized-steel coupling, having inert and non-corrosive, thermoplastic lining, with threaded ends and 300 psig minimum working pressure at 225 deg F temperature.

7. Dielectric Nipples: Electroplated steel nipple, having inert and non-corrosive, thermoplastic lining, with combination of plain, threaded, or grooved end types and 300 psig working pressure at 225 deg F temperature.

C. Mechanical Sleeve Seals: Modular, watertight, mechanical type. Components include interlocking synthetic rubber links shaped to continuously fill annular space between pipe and sleeve. Connecting bolts and pressure plates cause rubber sealing elements to expand when tightened.

D. Sleeves: The following materials are for wall, floor, slab, and roof penetrations:

1. Steel Sheet-Metal: 24 gage or heavier, galvanized sheet metal, round tube closed with welded longitudinal joint.

2. Steel Pipe: ASTM A 53, Type E, Grade A, Schedule 40, galvanized, plain ends.

3. Cast-Iron: Cast or fabricated "wall pipe" equivalent to ductile-iron pressure pipe, having plain ends and integral water stop, except where other features are specified.

4. Wall Penetration Systems: Wall sleeve assembly, consisting of housing, gaskets, and pipe sleeve, with 1 mechanical-joint end conforming to AWWA C110 and 1 plain pipe-sleeve end.

   a. Penetrating Pipe Deflection: 5 percent without leakage.
   b. Housing: Ductile-iron casting having waterstop and anchor ring, with ductile-iron gland, steel studs and nuts, and rubber gasket conforming to AWWA C111, of housing and gasket size as required to fit penetrating pipe.
   c. Pipe Sleeve: AWWA C151, ductile-iron pipe.
   d. Housing-to-Sleeve Gasket: Rubber or neoprene, push-on type, of manufacturer's design.

5. Cast-Iron Sleeve Fittings: Commercially-made, sleeve having integral clamping flange, with clamping ring, bolts, and nuts for membrane flashing.

   a. Underdeck Clamp: Clamping ring with set-screws.

2.4 IDENTIFYING DEVICES AND LABELS

A. General: Manufacturer's standard products of categories and types required for each application as referenced in other Division 15 Sections. Where more than single type is specified for listed application, selection is Installer's option, but provide single selection for each product category.

B. Equipment Nameplates: Metal nameplate with operational data engraved or stamped; permanently fastened to equipment.

1. Data: Manufacturer, product name, model number, serial number, capacity, operating and power characteristics, labels of tested compliances, and similar essential data.

2. Location: An accessible and visible location.

C. Stencils: Standard stencils, prepared for required applications with letter sizes conforming to recommendations of ASME A13.1 for piping and similar applications, but not less than 1-1/4-inches-high letters for ductwork and not less than 3/4-inch-high letters for access door signs and similar operational instructions.

1. Material: Fiberboard.

2. Material: Brass.

3. Stencil Paint: Standard exterior type stenciling enamel; black, except as otherwise indicated; either brushing grade or pressurized spray-can form and grade.

4. Identification Paint: Standard identification enamel of colors indicated or, if not otherwise indicated for piping systems, comply with ASME A13.1 for colors.

D. Plastic Duct Markers: Manufacturer's standard laminated plastic, color coded duct markers. Conform to following color code:

1. Green: Cold air.

2. Yellow: Hot air.

3. Yellow/Green: Supply air.

4. Blue: Exhaust, outside, return, and mixed air.

5. For hazardous exhausts, use colors and designs recommended by ASME A13.1.

6. Nomenclature: Include following:
   a. Direction of air flow.
   b. Duct service (supply, return, exhaust, etc.).

E. Plastic Equipment Markers: Laminated-plastic, color-coded equipment markers. Conform to following color code:

1. Green: Cooling equipment and components.

2. Yellow: Heating equipment and components.

3. Yellow/Green: Combination cooling and heating equipment and components.

4. Brown: Energy reclamation equipment and components.

5. Blue: Equipment and components that do not meet any of above criteria.

6. For hazardous equipment, use colors and designs recommended by ASME A13.1.

7. Nomenclature: Include following, matching terminology on schedules as closely as possible:

   a. Name and plan number.
   b. Equipment service.
   c. Design capacity.
   d. Other design parameters such as pressure drop, entering and leaving conditions, and rpm.

8. Size: Approximate 2-1/2 by 4 inches for control devices, dampers, and valves; and 4-1/2 by 6 inches for equipment.

I. Lettering and Graphics: Coordinate names, abbreviations, and other designations used in mechanical identification, with corresponding designations indicated. Use numbers, lettering, and wording indicated for proper identification and operation/maintenance of mechanical systems and equipment.

1. Multiple Systems: Where multiple systems of same generic name are indicated, provide identification that indicates individual system number as well as service such as "Boiler No. 3" and "Air Supply No. 1H."

PART 3 - EXECUTION

3.1 PIPING SYSTEMS - COMMON REQUIREMENTS

A. General: Install piping as described below, except where system Sections specify otherwise. Individual piping system specification Sections in Division 15 specify piping installation requirements unique to the piping system.

B. General Locations and Arrangements: Drawings (plans, schematics, and diagrams) indicate general location and arrangement of piping systems. Indicated locations and arrangements were used to size pipe and calculate friction loss, expansion, pump sizing, and other design considerations. Install piping as indicated, except where deviations to layout are approved on coordination drawings.

C. Install piping at indicated slope.

D. Install components having pressure rating equal to or greater than system operating pressure.

E. Install piping in concealed interior and exterior locations, except in equipment rooms and service areas.

F. Install piping free of sags and bends.

G. Install exposed interior and exterior piping at right angles or parallel to building walls. Diagonal runs are prohibited, except where indicated.

H. Install piping tight to slabs, beams, joists, columns, walls, and other building elements. Allow sufficient space above removable ceiling panels to allow for ceiling panel removal.

I. Install piping to allow application of insulation plus 1-inch clearance around insulation.

J. Locate groups of pipes parallel to each other, spaced to permit valve servicing.

K. Install fittings for changes in direction and branch connections.

L. Install couplings according to manufacturer's printed instructions.

M. Install pipe escutcheons for pipe penetrations of concrete and masonry walls, wall board partitions, and suspended ceilings according to the following:

1. Chrome-Plated Piping: Cast-brass, one-piece, with set-screw, and polished chrome-plated finish. Use split-casting escutcheons where required, for existing piping.

2. Uninsulated Piping Wall Escutcheons: Cast-brass or stamped-steel, with set-screw.

3. Uninsulated Piping Floor Plates in Utility Areas: Cast-iron floor plates.

4. Insulated Piping: Cast-brass or stamped-steel, with concealed hinge, spring clips, and chrome-plated finish.

5. Piping in Utility Areas: Cast-brass or stamped-steel, with set-screw or spring clips.

N. Sleeves are not required for core drilled holes.

O. Install sleeves for pipes passing through concrete and masonry walls, concrete floor and roof slabs, and where indicated.

P. Install sleeves for pipes passing through concrete and masonry walls, gypsum-board partitions, concrete floor and roof slabs, and where indicated.

1. Cut sleeves to length for mounting flush with both surfaces.
   a. Exception: Extend sleeves installed in floors of mechanical equipment areas or other wet areas 2 inches above finished floor level. Extend cast-iron sleeve fittings below floor slab as required to secure clamping ring where specified.

2. Build sleeves into new walls and slabs as work progresses.

3. Install large enough sleeves to provide 1/4-inch annular clear space between sleeve and pipe or pipe insulation. Use the following sleeve materials:

   a. Steel Pipe Sleeves: For pipes smaller than 6 inches.
   b. Steel Sheet-Metal Sleeves: For pipes 6 inches and larger, penetrating gypsum-board partitions.
   c. Cast-Iron Sleeve Fittings: For floors having membrane waterproofing. Secure flashing between clamping flanges. Install section of cast-iron soil pipe to extend sleeve to 2 inches above finished floor level. Flashing is specified in Division 7 Section "Flashing and Sheet Metal."

      1) Seal space outside of sleeve fittings with nonshrink, nonmetallic grout.

4. Except for below-grade wall penetrations, seal annular space between sleeve and pipe or pipe insulation, using elastomeric joint sealants specified in Division 7 Section "Joint Sealants."

Q. Above Grade, Exterior Wall, Pipe Penetrations: Seal penetrations using sleeves and mechanical sleeve seals. Size sleeve for 1-inch annular clear space between pipe and sleeve for installation of mechanical seals.

1. Install steel pipe for sleeves smaller than 6 inches.
2. Install cast-iron "wall pipes" for sleeves 6 inches and larger.
3. Assemble and install mechanical seals according to manufacturer's printed instructions.

R. Below Grade, Exterior Wall, Pipe Penetrations: Install cast-iron "wall pipes" for sleeves. Seal pipe penetrations using mechanical sleeve seals. Size sleeve for 1-inch annular clear space between pipe and sleeve for installation of mechanical seals.

S. Below Grade, Exterior Wall, Pipe Penetrations: Install ductile-iron wall penetration system sleeves according to manufacturer's printed installation instructions.

T. Fire Barrier Penetrations: Maintain indicated fire rating of walls, partitions, ceilings, and floors at pipe penetrations. Seal pipe penetrations with firestopping sealant material. Firestopping materials are specified in Division 7.

U. Verify final equipment locations for roughing-in.

V. Refer to equipment specifications in other Sections of these Specifications for roughing-in requirements.

W. Piping Joint Construction: Join pipe and fittings as follows and as specifically required in individual piping system specification Sections.

1. Ream ends of pipes and tubes and remove burrs. Bevel plain ends of steel pipe.

2. Remove scale, slag, dirt, and debris from inside and outside of pipe and fittings before assembly.

3. Soldered Joints: Construct joints according to AWS "Soldering Manual," Chapter 22 "The Soldering of Pipe and Tube."

4. Brazed Joints: Construct joints according to AWS "Brazing Manual," Chapter 28 "Pipe and Tube."

5. Threaded Joints: Thread pipe with tapered pipe threads according to ASME B1.20.1. Cut threads full and clean using sharp dies. Ream threaded pipe ends to remove burrs and restore full inside diameter. Join pipe fittings and valves as follows:

   a. Note the internal length of threads in fittings or valve ends, and proximity of internal seat or wall, to determine how far pipe should be threaded into joint.
   b. Apply appropriate tape or thread compound to external pipe threads (except where dry seal threading is specified).
   c. Align threads at point of assembly.
   d. Tighten joint with wrench. Apply wrench to valve end into which pipe is being threaded.
   e. Damaged Threads: Do not use pipe or pipe fittings having threads that are corroded or damaged. Do not use pipe sections that have cracked or open welds.

6. Welded Joints: Construct joints according to AWS D10.12 "Recommended Practices and Procedures for Welding Low Carbon Steel Pipe" using qualified processes and welding operators according to "Quality Assurance" Article.
7. Flanged Joints: Align flange surfaces parallel. Select appropriate gasket material, size, type, and thickness for service application. Install gasket concentrically positioned. Assemble joints by sequencing bolt tightening to make initial contact of flanges and gaskets as flat and parallel as possible. Use suitable lubricants on bolt threads. Tighten bolts gradually and uniformly using torque wrench.

X. Piping Connections: Except as otherwise indicated make piping connections as specified below.

1. Install unions, in piping 2 inches and smaller, adjacent to each valve and at final connection to each piece of equipment having 2-inches or smaller threaded pipe connection.

2. Install flanges, in piping 2-1/2-inches and larger, adjacent to flanged valves and at final connection to each piece of equipment having flanged pipe connection.

3. Dry Piping Systems (Gas, Compressed Air, and Vacuum): Install dielectric unions and flanges to connect piping materials of dissimilar metals.

4. Wet Piping Systems (Water and Steam): Install dielectric coupling and nipple fittings to connect piping materials of dissimilar metals.

3.2 EQUIPMENT INSTALLATION - COMMON REQUIREMENTS

A. Install equipment to provide the maximum possible headroom, where mounting heights are not indicated.

B. Install equipment according to approved submittal data. Portions of the Work are shown only in diagrammatic form. Refer conflicts to the Architect.

C. Install equipment level and plumb, parallel and perpendicular to other building systems and components in exposed interior spaces, except where otherwise indicated.

D. Install mechanical equipment to facilitate servicing, maintenance, and repair or replacement of equipment components. Connect equipment for ease of disconnecting, with minimum of interference with other installations. Extend grease fittings to an accessible location.

E. Install equipment giving right-of-way to piping systems installed at a required slope.

3.3 LABELING AND IDENTIFYING

A. Piping Systems: Install pipe markers on each system. Include arrows showing normal direction of flow and as indicated in other Division 15 sections.

1. Stenciled Markers: Complying with ASME A13.1.

2. Plastic markers, with application systems. Install on pipe insulation segment where required for hot non-insulated pipes.

3. Locate pipe markers as follows wherever piping is exposed in finished spaces, machine rooms, accessible maintenance spaces (shafts, tunnels, plenums) and exterior non-concealed locations.

   a. Near each valve and control device.
   b. Near each branch, excluding short take-offs for fixtures and terminal units. Mark each pipe at branch, where flow pattern is not obvious.
   c. Near locations where pipes pass through walls, floors, ceilings, or enter non-accessible enclosures.
   d. At access doors, manholes, and similar access points that permit view of concealed piping.
   e. Near major equipment items and other points of origination and termination.
   f. Spaced at a maximum of 50 feet intervals along each run. Reduce intervals to 25 feet in congested areas of piping and equipment.
   g. On piping above removable acoustical ceilings, except omit intermediately spaced markers.

B. Equipment: Install engraved plastic laminate sign or equipment marker on or near each major item of mechanical equipment.

1. Lettering Size: Minimum 1/4-inch-high lettering for name of unit where viewing distance is less than 2 feet, 1/2-inch-high for distances up to 6 feet, and proportionately larger lettering for greater distances. Provide secondary lettering 2/3 to 3/4 of size of principal lettering.
2. Text of Signs: Provide text to distinguish between multiple units, inform operator of operational requirements, indicate safety and emergency precautions, and warn of hazards and improper operations, in addition to name of identified unit.

C. Duct Systems: Identify air supply, return, exhaust, intake, and relief ducts with duct markers; or provide stenciled signs and arrows, showing duct system service and direction of flow.

1. Location: In each space where ducts are exposed or concealed by removable ceiling system, locate signs near points where ducts enter into space and at maximum intervals of 50 feet.

D. Adjusting: Relocate identifying devices which become visually blocked by work of this Division or other Divisions.

3.4 PAINTING AND FINISHING

A. Refer to Division 9 Section "Painting" for field painting requirements.

B. Damage and Touch-Up: Repair marred and damaged factory painted finishes with materials and procedures to match original factory finish.

3.5 CONCRETE BASES

A. Construct concrete equipment bases of dimensions indicated, but not less than 4 inches larger in both directions than supported unit. Follow supported equipment manufacturer's setting templates for anchor bolt and tie locations. Use 3000 psi, 28-day compressive strength concrete and reinforcement as specified in Division 3 Section "Cast-In-Place Concrete."

3.6 ERECTION OF METAL SUPPORTS AND ANCHORAGE

A. Cut, fit, and place miscellaneous metal supports accurately in location, alignment, and elevation to support and anchor mechanical materials and equipment.

B. Field Welding: Comply with AWS D1.1 "Structural Welding Code - Steel."

3.7 ERECTION OF WOOD SUPPORTS AND ANCHORAGE

A. Cut, fit, and place wood grounds, nailers, blocking, and anchorage to support and anchor mechanical materials and equipment.

B. Select fastener sizes that will not penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting wood members.

C. Attach to substrates as required to support applied loads.

3.8 CUTTING AND PATCHING

A. Cut, channel, chase, and drill floors, walls, partitions, ceilings, and other surfaces necessary for mechanical installations. Perform cutting and patching as specified in other section.

B. Repair cut surfaces to match adjacent surfaces.

3.9 TEST AND TESTING

A. General: Tests shall be as required by the various Sections under Division 15, as well as by this Section.

B. Tests required by other Sections and the Sections where they are specified include the following:

1. Testing, adjusting and balancing: Section [15260].

2. Tests of Smoke or Fire Detectors: Division 16.

C. Tests may be required in the case of materials and equipment submittals and substitutions:

1. For items submitted which are altered, substituted, or which cannot readily be determined by the City Engineer as exactly conforming to the Specifications, Contractor may be required to submit certified test results to prove that the items in question meet Specification requirements.

2. Tests may also be required on certain items which are as specified, including fan and pump performance. Should such tests be required of specified items and tests prove that items do meet Specification requirements, the City will pay for applicable portions of tests.

D. Piping Tests:

1. Perform engineering tests required to demonstrate that operation of mechanical systems and their parts are in accordance with Specifications covering each item or system, and

furnish materials, instruments and equipment necessary to conduct such tests. Tests shall be made in presence of the City Engineer, the Architect or the Field Inspector, and the representatives of any governmental agency having jurisdiction. Work shall not be concealed or covered until required approvals are obtained.

2. Should Contractor refuse or neglect to perform any test required by Specifications, the City Engineer may perform such tests and Contractor shall pay charges in connection therewith.

3. Pressure gages used in testing shall have one pound graduations; vacuum gages shall have one-inch mercury graduations. Air shall be bled from lines requiring hydrostatic or water tests.

4. Systems shall be pressure tested in accordance with Pipe Test Schedule below. Pipe test shall show no loss in pressure after a minimum duration of 4 hours at test pressures indicated. Where local codes require higher test pressures than specified herein for Fire Sprinkler Systems, local codes shall govern.

5. Flue gas lines shall be tested twice: First with piping exposed, before backfilling trenches or lathing; second with pipe in finished arrangement, ground backfilled (paved where required) and walls finished.

6. Refrigerant piping may be tested using a halide detector or calibrated electronic testing equipment.

7. Piping systems may be tested as a unit or in sections as directed by the City Engineer, but entire system shall successfully meet requirements specified herein, before acceptance by the City Engineer.

8. Repair of damage to pipes and their appurtenances, or to any other structures resulting from or caused by these tests, shall be performed by Contractor.

E. Pipe Testing Schedule:

System Tested	Test Pressure (psig)	Test With:
Vent and roof drain (except pipes running under a slab or under-ground)	Fill with water to top of highest vent, allow to stand two hours, or longer, as directed by Inspector. Minimum head required for any joint shall be 10-feet in building.	Water
Cast-iron soil, waste and interior downspout, con-densate drain from air conditioning equipment	10-feet of water vertically	
Storm water disposal lines	Running water test	Water
Hot water heating	150	Water

system piping		
Domestic water piping (metallic)	200	Water
Fire Sprinkler piping	200	Water
Gas piping (steel threaded or plastic)	60 (both tests)	Air
Gas piping (steel welded)	100 (both tests)	Air
Refrigeration Suction Freon R407C	150	Nitrogen & Freon
Puron R410A	250	
Refrigeration Liquid & Hot Gas Piping Freon R407C	150	Nitrogen & Freon
Puron R410A	300	

F. Operational Tests:

1. Before operating any equipment or systems, a through check shall be made to determine that all systems have been flushed and cleaned as required and that all equipment has been properly installed, aligned, lubricated, and serviced.

   Factory instructions shall be checked to see that installations have been made accordingly and that recommended lubricants have been used in all bearings, gearboxes, crankcases, and similar equipment. Particular care shall be used in lubricating bearings to avoid damage by over-lubrication and blowing out seals. Equipment shall also be checked for any damage that may have occurred during shipment, after delivery, or during installation. In event of any damage, equipment shall be replaced, renewed, or repaired at Contractor's expense.

2. Contractor shall provide, maintain, and pay costs for equipment, instruments, and operating personnel as required for all tests hereinafter specified.

3. Contractor shall pay for electric energy and fuel required for tests.

4. Any final adjustment to equipment or systems shall meet specified performances requirements.

5. Any equipment, system, or work found deficient during any test shall be replaced or corrected. Retest and obtain approval from the City Engineer.

G. Project Completion Tests:

1. Upon completion of Mechanical work, or such a time prior to completion as may be determined by the City Engineer, all mechanical equipment and systems shall be operated and tested for a period of at least 5 consecutive 8-hour days to demonstrate satisfactory over-all operation of building or project as a completed unit. Tests shall

include operation of heating, ventilating, and air conditioning equipment and systems for a period of not less than 2, 8-hour, days at not less than 90% of full, specified heating and cooling capacities.

2. Tests shall commence after preliminary balancing and adjustments to equipment and systems have been completed, and all running equipment has been checked and thoroughly lubricated.

3. Immediately before starting tests all air filter media shall be cleaned or renewed. Roll type filters shall be advanced to provide new clean media. Cleanable type media shall be thoroughly cleaned and shall be re-oiled with new clean oil as recommended by manufacturer if they are of viscous impingement type. Disposable type filters shall be replaced with new filters. Replaceable media shall be replaced with new media.

4. An accurate means of measuring air flow and temperatures shall be used to balance air supply, return, and exhaust systems, so that uniform temperatures occur in every room and design air flow is obtained through registers, diffusers and grilles.

5. Systems shall be adjusted to provide air flows indicated including maximum fresh air and maximum return air. Dampers shall be checked for proper settings and operation. Air and water inlet and leaving temperatures at coils shall be checked. Complete operational data including air flows, room temperatures, fan speeds, motor currents, plenum and duct static pressures shall be tabulated.

6. Welding done on this project may be subject to radiographic inspections at random.

H. Post Contract Tests: If required full load operating conditions cannot be obtained at time of project completion test, due to unfavorable outdoor temperatures or conditions, Contractor shall return to job site when requested by the City Engineer and operate and test equipment and systems at such times of year when proper loading of system can be accomplished. Such tests shall be conducted within a one-year period from completion date. Contractor will be notified at least 10 days prior to start.

3.10 LOCATION

A. Location of piping, apparatus and equipment as indicated on Drawings is approximate only and shall be altered to avoid all obstructions, preserve headroom and keep openings and passageways clear.

B. Placement of equipment in locations and spaces indicated shall be Contractor's responsibility. Any disassembling and reassembling of equipment, or other work necessary, shall be done without extra cost to the City.

3.11 CUTTING, NOTCHING AND BACKING:

A. Conform to State Building Code, Title 24, Part 2, Section 2517(9) 8, 9, for notches and bored holes in wood; Section 2606, for pipes and sleeves embedded in concrete and for cuts in steel, as detailed on Structural Drawings.

B. Where pipes or ducts pass through, or are located within 1" of any construction element, install a resilient pad, 1/2" thick minimum, to prevent contact.

C. Contractor shall make provisions for recesses, chases, accesses, and provide sheet metal spacers, channel and backing as necessary for proper reception and installation of Mechanical work.

3.12 SERVICE INTERRUPTIONS, OFFSITE, GAS AND WATER

A. Arrange work so that there will be NO service interruptions of any existing systems.

B. When service interruptions are mandatory, arrange in advance with the City Engineer as to time and date of such interruptions.

C. Systems, which are interrupted, shall be put back into operation in such manner that they will function as they were originally intended.

3.13 OPERATION AND MAINTENANCE MANUALS AND REPAIR MANUAL

A. General: Submit 2 copies of operation and maintenance manuals in acceptable form and content. If no revisions are required, furnish one additional acceptable copy. If revisions are required, one copy will be returned with instructions for changes; make such changes and return 3 copies of acceptable manuals. Manuals shall be bound in hard-back, three-ring, loose-leaf binders. Deliver manuals to the City Engineer Inspector.

B. Contents of Manual:

1. Title sheet with job name, and names, addresses and telephone numbers of Contractor, Subcontractor and related equipment suppliers.

2. Typewritten manufacturer's operating instructions describing how to start and stop each piece of equipment, how to set temperature control systems for normal operation and normal restarting procedures, and caution and warning notices.

3. Manufacturer's product data and parts and maintenance booklet for each item of equipment furnished under Division 15.

4. Project Record drawings of Electrical and control diagrams.

5. Test and balance reports.

6. Valve directory.

7. Pipe and component identification chart.

C. Submit one complete copy of repair manual.

END OF SECTION

SECTION 22 05 29

HANGERS AND SUPPORTS

NTS:	This specification section requires careful review by the specifier. The specifier is required to modify the section according to the requirements of the project. Brackets indicate items to be checked, completed, edited, selected, or filled in. NTS notations and brackets should be removed in the final printing.

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes pipe and equipment supports, hangers, anchors, guidesand bases sleeves and the sealing of work to adjacent construction.

B. Related Sections:

1. Division 3 Concrete: the execution requirements for placement of inserts and sleeves in concrete forms specified by this division.

2. Section [03300] – Cast-in-Place Concrete: Execution requirements for placement of concrete housekeeping pads specified by this section.

3. Section [07811] – Sprayed Fire Resistive Material

4. Section [07840] - Fire Stopping.

1.2 REFERENCES

A. ASME B31.1 (American Society of Mechanical Engineers) - Power Piping

B. ASME B31.9 (American Society of Mechanical Engineers) - Building Services Piping.

C. ASTM F708 - Design and Installation of Rigid Pipe Hangers.

D. MSS SP58 (Manufacturers Standardization Society of the Valve and Fittings Industry) - Pipe Hangers and Supports - Materials, Design and manufacturer.

E. MSS SP69 (Manufacturers Standardization Society of the Valve and Fittings Industry) - Pipe Hangers and Supports - Selection and Application.

F. MSS SP89 (Manufacturers Standardization Society of the Valve and Fittings Industry) - Pipe Hangers and Supports - Fabrication and Installation Practices.

G. SMACNA – Seismic Restraint Manual.

1.3 SUBMITTALS

A. Comply with pertinent provisions of SUBMITTALS Section [01330] of DIVISION 1 - GENERAL REQUIREMENTS of these Specifications .

B. Shop Drawings: Indicate system layout with location and all pipe supports, hangers, guides and anchors. .

C. Product Data: Submit manufacturers catalog data including load capacity.

D. Design Data: Indicate load carrying capacity of trapeze, multiple pipe, and riser support hangers.

E. Manufacturer's Installation Instructions: Submit special procedures and assembly of components.

F. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

1.4 QUALITY ASSURANCE

A. Perform Work in accordance with applicable authority code for piping support.

B. Maintain one copy of each document on site.

1.5 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years documented experience.

B. Installer: Company specializing in performing Work of this section with minimum three years documented experience approved by manufacturer.

1.6 PRE-INSTALLATION MEETING

A. Division 1 – Project Meetings: Pre-installation meeting.

B. Convene minimum one week prior to commencing Work of this section.

1.7 FIELD MEASUREMENTS

A. Verify field measurements prior to fabrication.

1.8 WARRANTY

A. Section [01611] – Guaranty/Warranty.

B. Provide five year manufacturer warranty for pipe hangers and supports.

PART 2 - PRODUCTS

2.1 PIPE HANGERS AND SUPPORTS

A. Manufacturers:

1. Carpenter & Paterson Inc.

2. Globe Pipe Hanger Products Inc.

3. Superior Valve Co.

4. Substitutions: Section [01630] – Substitutions and “or equal” submittal.

B. Plumbing Piping - DWV:

1. Conform to ASME B31.9.

2. Hangers for Pipe Sizes to 1-1/2 inch: Malleable iron, adjustable swivel, split ring.

3. Hangers for Pipe Sizes 2 inches and Over: Carbon steel, adjustable, clevis.

4. Multiple or Trapeze Hangers: Steel channels with welded spacers and hanger rods.

5. Wall Support for Pipe Sizes to 3 inches: Cast iron hook.

6. Wall Support for Pipe Sizes 4 inches and Over: Welded steel bracket and wrought steel clamp. Bolt clamp securely to pipe, reset clamp end section on building structure.

7. Vertical Support: Steel riser clamp.

8. Floor Support: Cast iron adjustable pipe saddle, lock nut, nipple, floor flange, and concrete pier or steel support.

9. Copper Pipe Support: Copper-plated, carbon-steel adjustable, ring.

C. Plumbing Piping - Water:

1. Conform to ASME B31.9.

2. Hangers for Pipe Sizes to 1-1/2 inches: Malleable iron, adjustable swivel, split ring.

3. Hangers for Cold Pipe Sizes 2 inches and Over: Carbon steel, adjustable, clevis.

4. Multiple or Trapeze Hangers: Steel channels with welded spacers and hanger rods.

5. Wall Support for Pipe Sizes to 3 inches: Cast iron hook.

6. Wall Support for Pipe Sizes 4 inches and Over: Welded steel bracket and wrought steel clamp.

7. Vertical Support: Steel riser clamp. . Bolt clamp securely to pipe, reset clamp end section on building structure.

8. Floor Support for Cold Pipe: Cast iron adjustable pipe saddle, lock nut, nipple, floor flange, and concrete pier or steel support.

9. Copper Pipe Support: Copper-plated, Carbon-steel ring.

D. Hydronic Piping:

1. Conform to ASME B31.9.

2. Hangers for Pipe Sizes to 1-1/2 inch: Malleable iron, adjustable swivel, split ring.

3. Hangers for Cold Pipe Sizes 2 inches and Over: Carbon steel, adjustable, clevis.

4. Hangers for Hot Pipe Sizes 2 to 4 inches: Carbon steel, adjustable, clevis.

5. Multiple or Trapeze Hangers: Steel channels with welded spacers and hanger rods.

6. Wall Support for Pipe Sizes to 3 inches: Cast iron hooks.

7. Wall Support for Pipe Sizes 4 inches and Over: Welded steel bracket and wrought steel clamp.

8. Vertical Support: Steel riser clamp.

9. Floor Support for Cold Pipe: Cast iron adjustable pipe saddle, lock nut, nipple, floor flange, and concrete pier or steel support.

10. Floor Support for Hot Pipe Sizes to 4 Inches (100 mm): Cast iron adjustable pipe saddle, lock nut, nipple, floor flange, and concrete pier or steel support.

11. Copper Pipe Support: Copper-plated, carbon steel ring.

2.2 ACCESSORIES

A. Hanger Rods: Mild steel threaded both ends, threaded on one end, or continuous threaded.

2.3 INSERTS

A. Inserts: Malleable iron case of galvanized steel shell and expander plug for threaded connection with lateral adjustment, top slot for reinforcing rods, lugs for attaching to forms; size inserts to suit threaded hanger rods.

2.4 FLASHING

A. Metal Flashing: 26 gage thick galvanized steel.

B. Metal Counter flashing: 22 gage thick galvanized steel.

C. Lead Flashing:

1. Waterproofing: 5 lb./sq. ft. sheet lead

2. Soundproofing: 1 lb./sq. ft. sheet lead.

D. Flexible Flashing: 47 mil thick sheet butyl; compatible with roofing.

E. Caps: Steel, 22 gage minimum; 16 gage at fire resistant elements.

2.5 EQUIPMENT CURBS

A. Fabrication: Welded 18 gage galvanized steel shell and base, mitered 3 inch cant, variable step to match roof insulation, 1-1/2 inch thick insulation, factory installed.

2.6 SLEEVES

A. Sleeves for Pipes Through Non-fire Rated Floors: 18 gage thick galvanized steel.

B. Sleeves for Pipes Through Non-fire Rated Beams, Walls, Footings, and Potentially Wet Floors: Steel pipe or 18 gage thick galvanized steel.

C. Sleeves for Round Ductwork: Galvanized steel.

D. Sleeves for Rectangular Ductwork: Galvanized steel or wood.

E. Fire-stopping Insulation: Glass fiber type, non-combustible; refer to Section [07840].

F. Sealant: Acrylic; refer to Section [07920] – Joint Sealants.

PART 3 - EXECUTION

3.1 INSERTS

A. Provide inserts for placement in concrete forms.

B. Provide inserts for suspending hangers from reinforced concrete slabs and sides of reinforced concrete beams.

C. Provide hooked rod to concrete reinforcement section for inserts carrying pipe over 4 inches.

D. Where concrete slabs form finished ceiling, locate inserts flush with slab surface.

E. Where inserts are omitted, drill through concrete slab from below and provide through-bolt with recessed square steel plate and nut recessed into and grouted flush with slab.

3.2 PIPE HANGERS AND SUPPORTS

A. Support horizontal piping as scheduled.

B. Install hangers to provide minimum 6 inch space between finished covering and adjacent work.

C. Place hangers within 12 inches of each horizontal elbow.

D. Use hangers with 1-1/2 inch minimum vertical adjustment.

E. Support horizontal cast iron pipe adjacent to each hub, with 5 feet maximum spacing between hangers.

F. Support vertical piping at every floor. Support vertical cast iron pipe at each floor at hub.

G. Where several pipes can be installed in parallel and at same elevation, provide multiple or trapeze hangers.

H. Support riser piping independently of connected horizontal piping.

I. Provide copper plated hangers and supports for copper piping.

J. Design hangers for pipe movement without disengagement of supported pipe.

K. Prime coat exposed steel hangers and supports. Refer to Section [09900] - Painting. Hangers and supports located in crawl spaces, pipe shafts, and suspended ceiling spaces are not considered exposed.

PIPING SUPPORT SCHEDULE - STEEL PIPE

Nominal Pipe Size	Inches	½	¾	1	1-1/2	2	2-1/2	3	3-1/2
Maximum Span Between Single Feet Pipe Supports	Feet	5	6	7	9	10	10	12	12
Minimum Rod Size	Inches	3/8	3/8	3/8	3/8	3/8	½	½	½
Nominal Pipe Size	Inches	4	6	8	10	12	14	16	18
Maximum Span Between Single Pipe Supports	Feet	14	16	16	18	20	17	14	12
Minimum Rod Size	Inches	5/8	¾	7/8	7/8	1	1	1-1/8	1-1/4

TUBING SUPPORT SCHEDULE-COPPER TUBING/PLASTIC PIPES

Nominal Pipe Size 4	Inches	½	¾	1	1-1/4	1-1/2	2	2-1/2	3	3-1/2
Maximum Span Between Single Pipe Supports 14	Feet	5	6	7	8	9	10	11	12	12
Minimum Rod Size 5/8	Inches	3/8	3/8	3/8	3/8	½	½	½	5/8	5/8

3.3 EQUIPMENT BASES AND SUPPORTS

A. Provide housekeeping pads of concrete, minimum 3-1/2 inches thick and extending 6 inches beyond supported equipment. Refer to Section [03300] – Cast-in-Place Concrete.

B. Provide templates, anchor bolts, and accessories for mounting and anchoring equipment.

C. Construct supports of steel members. Brace and fasten with flanges bolted to structure.

D. Provide rigid anchors for pipes after vibration isolation components are installed.

3.4 FLASHING

A. Provide flexible flashing and metal counterflashing where piping and ductwork penetrate weather or waterproofed walls, floors, and roofs.

B. Flash vent and soil pipes projecting 3 inches minimum above finished roof surface with lead worked 1 inch minimum into hub, 8 inches minimum clear on sides with 24 x 24 inches sheet size. For pipes through outside walls, turn flanges back into wall and caulk, metal counter-flash, and seal.

C. Flash floor drains in floors with topping over finished areas with lead, 10 inches clear on sides with minimum 36 x 36 inches sheet size. Fasten flashing to drain clamp device.

D. Seal floor drains watertight to adjacent materials.

E. Provide acoustical lead flashing around ducts and pipes penetrating equipment rooms for sound control.

F. Provide curbs for mechanical roof installations 14 inches minimum high above roofing surface. Flash and counter-flash with sheet metal; seal watertight. Attach Counterflashing mechanical equipment and lap base flashing on roof curbs. Flatten and solder joints.

G. Adjust storm collars tight to pipe with bolts; caulk around top edge. Use storm collars above roof jacks. Screw vertical flange section to face of curb.

3.5 SLEEVES

A. Set sleeves in position in forms. Provide reinforcing around sleeves.

B. Size sleeves large enough to allow for movement due to expansion and contraction. Provide for continuous insulation wrapping.

C. Extend sleeves through floors 1 inch above finished floor level. Caulk sleeves.

D. Where piping or ductwork penetrates floor, ceiling, or wall, close off space between pipe or duct and adjacent work with fire stopping insulation and caulk airtight. Provide close fitting metal collar or escutcheon covers at both sides of penetration.

E. Install chrome plated steel escutcheons at finished surfaces.

END OF SECTION

SECTION 23 08 10

MECHANICAL SYSTEMS COMMISSIONING

NTS: This specification section requires careful review by the specifier. The specifier is required to modify the section according to the requirements of the project. Brackets indicate items to be checked, completed, edited, selected, or filled in. NTS notations and brackets should be removed in the final printing.

PART 1 – GENERAL

1.01 DESCRIPTION

A. The purpose of this section is to specify Division 15 responsibilities in the commissioning process.

B. The systems to be commissioned are listed in Section 01810.

C. Commissioning requires the participation of Division 15 to ensure that all systems are operating in a manner consistent with the Contract Documents. The general commissioning requirements and coordination are detailed in Division 01, Section 01810. Division 15 shall be familiar with all parts of Division 01, Section 01810 and the commissioning plan issued by the CA and shall execute all commissioning responsibilities assigned to them in the Contract Documents.

1.02 RESPONSIBILITIES

A. Mechanical, Controls and TAB Contractors. The commissioning responsibilities applicable to each of the mechanical, controls and TAB contractors of Division 15 are as follows (all references apply to commissioned equipment only):

1. Construction and Acceptance Phases

a. Include and itemize the cost of commissioning in the contract price.
b. In each purchase order or subcontract written, include requirements for submittal data, commissioning documentation, O&M data and training.
c. Attend a commissioning kickoff meeting and other meetings necessary to facilitate the commissioning process.
d. Contractors shall provide the CA with normal cut sheets and shop drawing submittals of commissioned equipment.
e. Provide additional requested documentation, prior to normal O&M manual submittals, to the CA for development of start-up and functional testing procedures.

(1) Typically this will include detailed manufacturer installation and start-up, operating, troubleshooting and maintenance procedures, full details of any owner-contracted tests, fan and pump curves, full factory testing reports, if any, and full warranty information, including all responsibilities of the Owner to keep the warranty in force clearly identified. In addition, the installation, start-up and checkout materials that are actually shipped inside the equipment and the actual field checkout sheet forms to be used by the factory or field technicians shall be submitted to the Commissioning Agent.
(2) The Commissioning Agent may request further documentation

necessary for the commissioning process.

(3) This data request may be made prior to normal submittals.

f. Provide a copy of the O&M manuals and submittals of commissioned equipment, through normal channels, to the CA for review and approval.

g. Contractors shall assist (along with the design engineers) in clarifying the operation and control of commissioned equipment in areas where the specifications, control drawings or equipment documentation is not sufficient for writing detailed testing procedures.

h. Provide limited assistance to the CA in preparing the specific functional performance test procedures as specified in Section 15997. Subs shall review test procedures to ensure feasibility, safety and equipment protection and provide necessary written alarm limits to be used during the tests.

i. Develop a full start-up and initial checkout plan using manufacturer's start-up procedures and the prefunctional checklists from the CA for all commissioned equipment. Submit to CA for review and approval prior to startup. Refer to Section 01810 for further details on start-up plan preparation.

j. During the startup and initial checkout process, execute the mechanical-related portions of the prefunctional checklists for all commissioned equipment.

k. Perform and clearly document all completed startup and system operational checkout procedures, providing a copy to the CA.

l. Address current A/E punch list items before functional testing. Air and water TAB shall be completed with discrepancies and problems remedied before functional testing of the respective air- or water-related systems.

m. Provide skilled technicians to execute starting of equipment and to execute the functional performance tests. Ensure that they are available and present during the agreed upon schedules and for sufficient duration to complete the necessary tests, adjustments and problem solving.

n. Provide skilled technicians to perform functional performance testing under the direction of the CA for specified equipment in Section 15997 and 01810. Assist the CA in interpreting the monitoring data, as necessary.

o. Correct deficiencies (differences between specified and observed performance) as interpreted by the CA, CM and A/E and retest the equipment.

p. Prepare O&M manuals according to the Contract Documents, including clarifying and updating the original sequences of operation to as-built conditions.

q. During construction, maintain as-built red-line drawings for all drawings and final CAD as-builts for contractor-generated coordination drawings. Update after completion of commissioning (excluding deferred testing).

r. Provide training of the Owner's operating staff using expert qualified personnel, as specified.

s. Coordinate with equipment manufacturers to determine specific requirements to maintain the validity of the warranty.

2. Warranty Period

a. Execute seasonal or deferred functional performance testing, witnessed by the CA, according to the specifications.

b. Correct deficiencies and make necessary adjustments to O&M manuals and as-built drawings for applicable issues identified in any seasonal

testing.

B. Mechanical Contractor. The responsibilities of the HVAC mechanical contractor, during construction and acceptance phases in addition to those listed in (A) are:

1. Provide startup for all HVAC equipment, except for the building automation control system, if any.
2. Assist and cooperate with the TAB contractor and CA by:

    a. Putting all HVAC equipment and systems into operation and continuing the operation during each working day of TAB and commissioning, as required.
    b. Including cost of sheaves and belts that may be required by TAB.
    c. Providing test holes in ducts and plenums where directed by TAB to allow air measurements and air balancing. Providing an approved plug.
    d. Providing temperature and pressure taps according to the Construction Documents for TAB and commissioning testing.
    e. Install a P/T plug at each water sensor, which is an input point to the control system.
    f. List and clearly identify on the as-built drawings the locations of all air-flow stations.
    g. Prepare a preliminary schedule for Division 15 pipe and duct system testing, flushing and cleaning, equipment start-up and TAB start and completion for use by the CA. Update the schedule as appropriate.
    h. Notify the GC, CM or CA depending on protocol, when pipe and duct system testing, flushing, cleaning, startup of each piece of equipment and TAB will occur. Be responsible to notify the GC, CM or CA, ahead of time, when commissioning activities not yet performed or not yet scheduled will delay construction. Be proactive in seeing that commissioning processes are executed and that the CA has the scheduling information needed to efficiently execute the commissioning process.

C. Controls Contractor. The commissioning responsibilities of the controls contractor, during construction and acceptance phases in addition to those listed in (A) are:

1. Sequences of Operation Submittals. The Controls Contractor's submittals of control drawings shall include complete detailed sequences of operation for each piece of equipment, regardless of the completeness and clarity of the sequences in the specifications. They shall include:

    a. An overview narrative of the system (1 or 2 paragraphs) generally describing its purpose, components, and function.
    b. All interactions and interlocks with other systems.
    c. Detailed delineation of control between any packaged controls and the temperature control system, listing what points the temperature control system monitors only and what points are control points and are adjustable.
    d. Written sequences of control for packaged controlled equipment. (Equipment manufacturers' stock sequences may be included, but will generally require additional narrative).
    e. Start-up sequences.
    f. Warm-up mode sequences.
    g. Normal operating mode sequences.
    h. Unoccupied mode sequences.

i. Shutdown sequences.
j. Capacity control sequences and equipment staging.
k. Temperature and pressure control: setbacks, setups, resets, etc.
l. Detailed sequences for all control strategies, e.g., economizer control, optimum start/stop, staging, optimization, demand limiting, etc.
m. Effects of power or equipment failure with all standby component functions.
n. Sequences for all alarms and emergency shut downs.
o. Seasonal operational differences and recommendations.
p. Initial and recommended values for all adjustable settings, setpoints and parameters that are typically set or adjusted by operating staff; and any other control settings or fixed values, delays, etc. that will be useful during testing and operating the equipment.
q. Schedules, if known.
r. To facilitate referencing in testing procedures, all sequences shall be written in small statements, each with a number for reference. For a given system, numbers will not repeat for different sequence sections, unless the sections are numbered.

2. Control Drawings Submittal

a. The control drawings shall have a key to all abbreviations.
b. The control drawings shall contain graphic schematic depictions of the systems and each component.
c. The schematics will include the system and component layout of any equipment that the control system monitors, enables or controls, even if the equipment is primarily controlled by packaged or integral controls.
d. Provide a full points list with at least the following included for each point:

(1) Controlled system
(2) Point abbreviation
(3) Point description (DB temp, airflow, etc.)
(4) Display unit
(5) Control point or setpoint (Point that controls equipment and can have its setpoint changed, e.g. OSA, SAT, etc.)
(6) Monitoring point (Point that does not control or contribute to the control of equipment, but is used for operation, maintenance, or performance verification)
(7) Intermediate point (Point whose value is used to make a calculation which then controls equipment, e.g. space temperatures that are averaged to a virtual point to control reset)
(8) Calculated point (“Virtual” point generated from calculations of other point values)

e. The Controls Contractor shall keep the CA informed of all changes to this list during programming and setup.

3. An updated as-built version of the control drawings and sequences of operation shall be included in the final controls O&M manual submittal.
4. Assist and cooperate with the TAB contractor in the following manner:

a. For a given area, have all required prefunctional checklists, calibrations, startup and selected functional tests of the system completed and approved by the CA prior to TAB.
b. Provide a qualified technician to operate the controls to assist the TAB contractor in performing TAB, or provide sufficient training for TAB to

operate the system without assistance.

5. Assist and cooperate with the CA in the following manner:

   a. Using a skilled technician who is familiar with this building, execute the functional testing of the controls system as specified for the controls contractor in Section 15997. Assist in the functional testing of all equipment specified in Section 15997.
   b. Execute all control system trend logs specified in Section 15997.

6. The controls contractor shall prepare a written plan indicating in a step-by-step manner, the procedures that will be followed to test, checkout and adjust the control system prior to functional performance testing, according to the process in Section 01810. At minimum, the plan shall include for each type of equipment controlled by the automatic controls:

   a. System name.
   b. List of devices.
   c. Step-by-step procedures for testing each controller after installation, including:

      (1) Process of verifying proper hardware and wiring installation.
      (2) Process of downloading programs to local controllers and verifying that they are addressed correctly.
      (3) Process of performing operational checks of each controlled component.
      (4) Plan and process for calibrating valve and damper actuators and all sensors.
      (5) A description of the expected field adjustments for transmitters, controllers and control actuators should control responses fall outside of expected values.

   d. A copy of the log and field checkout sheets that will document the process. This log must include a place for initial and final read values during calibration of each point and clearly indicate when a sensor or controller has “passed” and is operating within the contract parameters.
   e. A description of the instrumentation required for testing.
   f. Indicate what tests on what systems should be completed prior to TAB using the control system for TAB work. Coordinate with the CA and TAB contractor for this determination.

7. Provide a signed and dated certification to the CA and CM upon completion of the checkout of each controlled device, equipment and system prior to functional testing for each piece of equipment or system, that all system programming is complete as to all respects of the Contract Documents, except functional testing requirements.
8. Beyond the control points necessary to execute all documented control sequences, provide monitoring, control and virtual points as specified in Division 15.
9. List and clearly identify on the as-built duct and piping drawings the locations of all static and differential pressure sensors (air, water and building pressure).

D. TAB Contractor. The duties of the TAB contractor, in addition to those listed in (A) are:

1. Six weeks prior to starting TAB, submit to the CM the qualifications of the site technician for the project, including the name of the contractors and facility

managers of recent projects the technician on which was lead. The Owner will approve the site technician's qualifications for this project.

2. Submit the outline of the TAB plan and approach for each system and component to the CA, CM and the controls contractor six weeks prior to starting the TAB. This plan will be developed after the TAB has some familiarity with the control system.
3. The submitted plan will include:

    a. Certification that the TAB contractor has reviewed the construction documents and the systems with the design engineers and contractors to sufficiently understand the design intent for each system.
    b. An explanation of the intended use of the temperature control system. The controls contractor will comment on feasibility of the plan.
    c. All field checkout sheets and logs to be used that list each piece of equipment to be tested, adjusted and balanced with the data cells to be gathered for each.
    d. Discussion of what notations and markings will be made on the duct and piping drawings during the process.
    e. Final test report forms to be used.
    f. Detailed step-by-step procedures for TAB work for each system and issue: flow calibration , diffuser proportioning, branch / submain proportioning, total flow calculations, rechecking, diversity issues, expected problems and solutions, etc. Criteria for using air flow straighteners or relocating flow stations and sensors will be discussed. Provide the analogous explanations for the water side, as applicable.
    g. List of all air flow, water flow, sound level, system capacity and efficiency measurements to be performed and a description of specific test procedures, parameters, formulas to be used.
    h. Details of how *total* flow will be determined (Air: via hood readings of all outlets, supply (SA) and return air (RA) pitot traverse, SA or RA flow stations, etc.).
    i. The identification and types of measurement instruments to be used and their most recent calibration date.
    j. Specific procedures that will ensure that both air and water side are operating at the lowest possible pressures and provide methods to verify this.
    k. Confirmation that TAB understands the outside air ventilation criteria under all conditions.
    l. Details of whether and how minimum outside air cfm will be verified and set, and for what level (total building, zone, etc.).
    m. Details of how building static and exhaust fan / relief damper capacity will be checked.
    n. Proposed selection points for sound measurements and sound measurement methods.
    o. Details of methods for making any specified coil or other system plant capacity measurements.
    p. Details of any TAB work to be done in phases (by floor, etc.), or of areas to be built out later.
    q. Details regarding specified deferred or seasonal TAB work.
    r. Details of any specified false loading of systems to complete TAB work.
    s. Details of all exhaust fan balancing and capacity verifications, including any required room pressure differentials.

4. A running log of events and issues shall be kept by the TAB field technicians. Submit hand-written reports of discrepancies, deficient or uncompleted work by others, contract interpretation requests and lists of completed tests to the CA and

CM at least twice a week.

5. Communicate in writing to the controls contractor all setpoint and parameter changes made or problems and discrepancies identified during TAB which affect the control system setup and operation.
6. Provide a draft TAB report within two weeks of completion. A copy will be provided to the CA. The report will contain a full explanation of the methodology, assumptions and the results in a clear format with designations of all uncommon abbreviations and column headings. The report should follow the latest and most rigorous reporting recommendations by AABC.
7. Provide the CA with any requested data, gathered, but not shown on the draft reports.
8. Provide a final TAB report for the CA with details, as in the draft.
9. Conduct functional performance tests and checks on the original TAB as specified for TAB in Section 15997.

1.03 RELATED WORK

A. Refer to Section 01810 Part 1.12 for systems to be commissioned and Section 01810 Part 3.05 and Section 15997 for functional testing requirements.

PART 2 – PRODUCTS

2.01 TEST EQUIPMENT

A. Division 15 shall provide all test equipment necessary to fulfill the testing requirements of this Division.

B. Refer to Section 01810 Part 2.01 for additional Division 15 requirements.

PART 3 – EXECUTION

3.01 SUBMITTALS

A. Division 15 shall provide submittal documentation relative to commissioning to the CA as requested by the CA. Refer to Section 01810, Part 3.03 for additional Division 15 requirements.

3.02 STARTUP

A. The HVAC mechanical and controls contractors shall follow the start-up and initial checkout procedures listed in the Responsibilities list in this section and in Section 01810. Division 15 has start-up responsibility and is required to complete systems and sub-systems so they are fully functional, meeting the design objectives of the Contract Documents. The commissioning procedures and functional testing do not relieve or lessen this responsibility or shift that responsibility partially to the commissioning agent or Owner.

B. Functional testing is intended to begin upon completion of a system. Functional testing may proceed prior to the completion of systems or sub-systems at the discretion of the CA and CM. Beginning system testing before full completion does not relieve the Contractor from fully completing the system, including all prefunctional checklists as soon as possible.

3.03 TAB

A. Refer to the TAB responsibilities in Part 1.02 above.

3.04 FUNCTIONAL PERFORMANCE TESTS

A. Refer to Section 01810 Part 1.12 for a list of systems to be commissioned and to Part 3.05 for a description of the process and to Section 15997 for specific details on the required functional performance tests.

3.05 TESTING DOCUMENTATION, NON-CONFORMANCE AND APPROVALS

A. Refer to Section 01810 Part 3.06 for specific details on non-conformance issues relating to prefunctional checklists and tests.

B. Refer to Section 01810 Part 3.05 for issues relating to functional performance tests.

3.06 OPERATION AND MAINTENANCE (O&M) MANUALS

A. The following O&M manual requirements do not replace O&M manual documentation requirements elsewhere in these specifications.

B. Division 15 shall compile and prepare documentation for all equipment and systems covered in Division 15 and deliver this documentation to the GC for inclusion in the O&M manuals, according to this section and Section 01810, prior to the training of owner personnel.

C. The CA shall receive a copy of the O&M manuals for review.

D. Special Control System O&M Manual Requirements. In addition to documentation that may be specified elsewhere, the controls contractor shall compile and organize at minimum the following data on the control system in labeled 3-ring binders with indexed tabs.

1. Three copies of the controls training manuals in a separate manual from the O&M manuals.
2. Operation and Maintenance Manuals containing:

    a. Specific instructions on how to perform and apply all functions, features, modes, etc. mentioned in the controls training sections of this specification and other features of this system. These instructions shall be step-by-step. Indexes and clear tables of contents shall be included. The detailed technical manual for programming and customizing control loops and algorithms shall be included.
    b. Full as-built set of control drawings (refer to Submittal section above for details).
    c. Full as-built sequence of operations for each piece of equipment.
    d. Full points list. In addition to the updated points list required in the original submittals (Part 1 of this section), a listing of all rooms shall be provided with the following information for each room:

        (1) Floor
        (2) Room number
        (3) Room name
        (4) Air handler unit ID

(5) Reference drawing number
(6) Heating and/or cooling valve tag ID
(7) Minimum cfm
(8) Maximum cfm

e. Full print out of all schedules and set points after testing and acceptance of the system.
f. Full as-built print out of any software program.
g. Electronic copy on disk or CDRom of the entire program for this facility.
h. Marking of all system sensors and thermostats on the as-built floor plan and mechanical drawings with their control system designations.
i. Maintenance instructions, including sensor calibration requirements and methods by sensor type, etc.
j. Control equipment component submittals, parts lists, etc.
k. Warranty requirements.
l. Copies of all checkout tests and calibrations performed by the Contractor (not commissioning tests).

3. The manual shall be organized and subdivided with permanently labeled tabs for each of the following data in the given order:

a. Sequences of operation
b. Control drawings
c. Points lists
d. Controller / module data
e. Thermostats and timers
f. Sensors and DP switches
g. Valves and valve actuators
h. Dampers and damper actuators
i. Program setups (software program printouts)

4. Field checkout sheets and trend logs should be provided to the CA for inclusion in the Commissioning Record Book.

E. Special TAB Documentation Requirements. The TAB will compile and submit the following with other documentation that may be specified elsewhere in the *Specifications.*

1. Final report containing an explanation of the methodology, assumptions, test conditions and the results in a clear format with designations of all uncommon abbreviations and column headings.
2. The TAB shall mark on the drawings where all traverse and other critical measurements were taken and cross reference the location in the TAB report.

F. Review and Approvals. Review of the commissioning related sections of the O&M manuals shall be made by the A/E and by the CA. Refer to Section 01810, Part 3.07 for details.

3.07 TRAINING OF OWNER PERSONNEL

A. The GC shall be responsible for training coordination and scheduling and ultimately to ensure that training is completed. Refer to Section 01810 for additional details.

B. The CA shall be responsible for overseeing and approving the content and adequacy of the training of Owner personnel for commissioned equipment. Refer to Section 01810 for additional details.

C. Mechanical Contractor. The mechanical contractor shall have the following training responsibilities:

1. Provide the CA with a training plan two weeks before the planned training according to the outline described in Section 01810, Part 3.08.
2. Provide designated Owner personnel with comprehensive orientation and training in the understanding of the systems and the operation and maintenance of each piece of HVAC equipment including, but not limited to air conditioning units, air handling units, fans, and controls, etc.
3. Training shall normally start with classroom sessions followed by hands-on training on each piece of equipment, which shall illustrate the various modes of operation, including startup, shutdown, fire/smoke alarm, power failure, etc.
4. During any demonstration, should the system fail to perform in accordance with the requirements of the O&M manual or sequence of operations, the system will be repaired or adjusted as necessary and the demonstration repeated.
5. The appropriate trade or manufacturer's representative shall provide the instructions on each major piece of equipment. This person may be the start-up technician for the piece of equipment, the installing contractor or manufacturer's representative. Practical building operating expertise as well as in-depth knowledge of all modes of operation of the specific piece of equipment are required. More than one party may be required to execute the training.
6. The controls contractor shall attend sessions other than the controls training, as requested, to discuss the interaction of the controls system as it relates to the equipment being discussed.
7. The training sessions shall follow the outline in the Table of Contents of the operation and maintenance manual and illustrate whenever possible the use of the O&M manuals for reference.
8. Training shall include:

    a. Use of the printed installation, operation and maintenance instruction material included in the O&M manuals.
    b. A review of the written O&M instructions emphasizing safe and proper operating requirements, preventative maintenance, special tools needed, and spare parts inventory suggestions. The training shall include start-up, operation in all modes possible, shut-down, seasonal changeover and any emergency procedures.
    c. Discussion of relevant health and safety issues and concerns.
    d. Discussion of warranties and guarantees.
    e. Common troubleshooting problems and solutions.
    f. Explanatory information included in the O&M manuals and the location of all plans and manuals in the facility.
    g. Discussion of any peculiarities of equipment installation or operation.
    h. The format and training agenda in *The HVAC Commissioning Process, ASHRAE Guideline 1-1989R*, 1996 is a recommended reference.
    i. Classroom sessions shall include the use of overhead projections, slides, video/audio-taped material as might be appropriate.

9. Hands-on training shall include start-up, operation in all modes possible, including manual, shut-down and any emergency procedures and preventative maintenance for all pieces of equipment.
10. The mechanical contractor shall fully explain and demonstrate the operation, function and overrides of any local packaged controls, not *controlled* by the central control system.
11. Training shall occur after functional testing is complete, unless approved otherwise by the Project Manager.
12. Duration of Training. The mechanical contractor shall provide training on each

piece of equipment according to the following schedule.

Hours	System
2	Air Handling Units
1	Variable Speed Drives
2	Split System AC or Heat Pumps
1	Specialty Exhaust Fans
2	Controls

D. Controls Contractor. The controls contractor shall have the following training responsibilities:

1. Provide the CA with a training plan four weeks before the planned training according to the outline described in Section 01810, Part 3.08.
2. The controls contractor shall provide designated Owner personnel training on the control system in this facility. The intent is to clearly and completely instruct the Owner on all the capabilities of the control system.
3. Training manuals. The standard operating manual for the system and any special training manuals will be provided for each trainee, with three extra copies left for the O&M manuals. In addition, copies of the system technical manual will be demonstrated during training and three copies submitted with the O&M manuals. Manuals shall include detailed description of the subject matter for each session. The manuals will cover all control sequences and have a definitions section that fully describes all relevant words used in the manuals *and* in all software displays. Manuals will be approved by the CA. Copies of audiovisuals shall be delivered to the Owner.
4. The trainings will be tailored to the needs and skill-level of the trainees.
5. The trainers will be knowledgeable on the system and its use in buildings. For the on-site sessions, the most qualified trainer(s) will be used. The Owner shall approve the instructor prior to scheduling the training.
6. During any demonstration, should the system fail to perform in accordance with the requirements of the O&M manual or sequence of operations, the system will be repaired or adjusted as necessary and the demonstration repeated.
7. The controls contractor shall attend sessions other than the controls training, as requested, to discuss the interaction of the controls system as it relates to the equipment being discussed.
8. There shall be a training session, which shall consist of a total of 8 hours of actual training. Upon completion, each student, using appropriate documentation, should be able to perform elementary operations and describe general hardware architecture and functionality of the systems.

    a. This training shall be held on-site for a period of 8 hours. The portions of actual hands-on training shall take place after the completion of system commissioning. The session shall include instruction on:
        (1) Controls training. Upon completion, each student, using appropriate documentation, should be able to perform elementary operations and describe general hardware architecture and functionality of the system.
        (2) Specific hardware configuration of installed systems in this building and specific instruction for operating the installed system, including HVAC systems, lighting controls and any interface with security and communication systems.
        (3) Security levels, alarms, system start-up, shut-down, power outage and restart routines, changing setpoints and alarms and other typical changed parameters, overrides, freeze protection, manual operation of equipment, optional control strategies that

can be considered, energy savings strategies and set points that if changed will adversely affect energy consumption, energy accounting, procedures for obtaining vendor assistance, etc.

(4) All trending and monitoring features (values, change of state, totalization, etc.), including setting up, executing, downloading, viewing both tabular and graphically and printing trends. Trainees will actually set-up trends in the presence of the trainer.

(5) Every screen shall be completely discussed, allowing time for questions.

(6) Use of keypad or plug-in laptop computer at the zone level, if applicable.

(7) Use of remote access to the system via phone lines or networks.

(8) Graphics generation.

(9) Point database entry and modifications.

(10) Understanding DDC field panel operating programming (when applicable).

E. TAB The TAB contractor shall have the following training responsibilities:

1. TAB shall meet for 4 hours with facility staff after completion of TAB and instruct them on the following:

a. Go over the final TAB report, explaining the layout and meanings of each data type.

b. Discuss any outstanding deficient items in control, ducting or design that may affect the proper delivery of air or water.

c. Identify and discuss any duct runs, diffusers, coils, and fans that are close to or are not meeting their design capacity.

d. Discuss any temporary settings and steps to finalize them for any areas that are not finished.

e. Other salient information that may be useful for facility operations, relative to TAB.

3.08 DEFERRED TESTING

A. Refer to Section 01810, Part 3.09 for requirements of deferred testing.

3.09 WRITTEN WORK PRODUCTS

A. Written work products of Contractors will consist of the start-up and initial checkout plan described in Section 01810 and the filled out start-up, initial checkout and prefunctional checklists.

END OF SECTION

SECTION 23 09 93

TESTING, ADJUSTING AND BALANCING

NTS:	**This specification section requires careful review by the specifier. The specifier is required to modify the section according to the requirements of the project. Brackets indicate items to be checked, completed, edited, selected, or filled in. NTS notations and brackets should be removed in the final printing.**

PART 1 – GENERAL

1.1 SECTION INCLUDES

A. Perform testing, adjusting and balancing of completed heating, ventilating, and air conditioning systems and prepare reports and recommendations.

1.2 DEFINITIONS

A. Definitions are as indicated in applicable AABC, ASHRAE, ANSI publications, and Sections and section **[15130]**.
   1. TAB: Testing, Adjusting and Balancing.
   2. AABC: Associated Air Balance Council
   3. NEBB: National Environmental Balancing Bureau.

1.3 TESTING, ADJUSTING AND BALANCING AGENDA:

A. Definition: Proposed procedures and proposed forms, diagrams and reports for documenting testing, adjusting and balancing work.

B. Preparation: By testing, adjusting and balancing agency for review and approval by the Architect and the City Engineer.

C. Agenda shall include one complete set of AABC or NEBB publications listed in Article 1.03, Paragraph A, applicable publications, or, in case of other testing, adjusting and balancing organizations, comparable publications to establish an approved systematic and uniform set of procedures.

D. Agenda shall also include the following detailed narrative procedures, system diagrams and forms for test results.
   1. Specific standard procedures required and proposed for each system.
   2. Specified test forms for recording each procedure and for recording sound and vibration measurements.
   3. Systems diagrams for each air, and water system. Diagrams may be single line. In addition to information recorded for standard AABC or NEBB procedures, following information is required:
      a. Air handling units: Prepare pressure profile and show design ad actual CFM outside air, return air, supply air). Measure and record each mode (minimum OLA and 100% OA)

where economizer cycle is specified. Record pressure drops of all components (coils, heat recovery devices, filters, sound attenuators, louvers, dampers, fans) and compare with design values. Pressure profile and component pressure drops are performance indicators and are not to be used for flow measurements. Set and record purge airflow for heat recovery wheels.

b. Duct distribution systems: Prepare pressure profiles from air handling unit to extremities of system. As a minimum, show pressure at each floor, main branch, and airflow, measuring device. Make pitot tube traverses of all trunk lines and major branch lines where required for analysis of distribution system. Airflow measuring devices installed in ductwork, if available, may be utilized. Record residual pressures at inlets of volume controlled terminals at ends of system. Show actual pressures at all static pressure control points utilized for constant or variable flow systems.

c. Variable air flow systems: Include in test forms provisions for measuring and reporting CFM (supply, return, exhaust, outside), GPM (primary, secondary) system pressures, motor loads, other pertinent data, at full unthrottled capacity and at design (100%) flows. Record additional flow, pressure, and motor loads for supply and return/exhaust system capacities in 10% increments down to a minimum attainable by the system to verify fan tracking and control. Modulate systems by varying supply temperature of air or other approved means.

d. Water systems: Record system fill pressures and expansion tank (level, pressure, temperature) conditions. Record shut-off heads for all pumps and compare with pump curves to determine if correct pump impellers have been installed.

1.4 SUBMITTALS

A. Submit in accordance with Section **[01330]**: Submittals.

B. Work Certification: Submit name of organization proposed to perform work as herein described, for review within 35 days after Contract Award. Include in submittal the certified qualifications of all persons responsible for supervising and performing actual work.

C. Testing and Balancing Contractor shall submit, for approval, 6 copies of procedures to test and balance all mechanical systems.

D. Upon approval of the testing, adjusting and balancing agency submit agenda for approval.

E. Preliminary Report: Review drawings and specifications, examine system installation and submit a written report indicating deficiencies in system that would preclude proper adjusting, balancing, and testing of system.

F. After completion of tests, submit complete test reports for approval. Where test results differ from specified design conditions, indicating a Contract Deficiency, include explanatory comments in report. Contractor shall submit 8 copies of final Testing and Balancing Reports prior to requesting final inspection of project. Distribution of the reports shall be by the Architect as follows:
2 copies to Contractor
3 copies to Design and Construction Branch
1 copy to Inspector
2 retained by the Architect

1.5 QUALITY ASSURANCE

A. Qualifications of Agency and Personnel: Obtain services of an independent, qualified testing organization acceptable to the Architect to perform testing and balancing work as herein specified. Testing organization shall submit proof that it meets technical standards for

membership in the AABC as published in the AABC; or, organization is a member of the Associated Air Balance Council; or, certified by the National Environmental Balancing Bureau (NEBB).

B. Performance Criteria: Work shall be performed in accordance with approved TAB agenda.

C. Test Equipment Criteria: Basic instrumentation requirements and accuracy/calibration required by AABC (Section Two) or Section II of the NEBB Procedural Standards for Testing, Adjusting and Balancing of Environmental Systems.

1.6 APPLICABLE PUBLICATIONS

A. Following publications form a part of this specification to extent indicated by reference thereto. In text, publications are referred to by the initials of organization.

1. American Society of Heating, Refrigerating and Air Conditioning Engineers, Inc. (ASHRAE): 1980 Systems Volume.

2. Associated Air Balance Council (AABC): National Standards for Field Measurement and Instrumentation Total System Balance, Volume 4, current edition.

3. American Society of Mechanical Engineers (ASME): Section VIII, Pressure Vessels, Division 1, 1977

4. American Society for Testing and Materials (ASTM):
B486 ..... Paste Solder
B88 ..... Seamless Copper Water Tube,
B280 ..... Seamless Copper Tube for Air Conditioning and Refrigeration Field Service
D635 ..... Rate of Burning and/or Extent and Time of Burning of Self-supporting Plastics in a Horizontal Position,
D1693 .... Environmental Stress-Cracking of Ethylene Plastics,

5. National Fire Protection Association (NFPA):
70 ..... National Electric Code
90A ..... Installation of Air Conditioning and Ventilating Systems

6. Scientific Apparatus Makers Association (SAMA): Standard PMC 20, 1-1973. Process Measurement and Control Terminology.

7. Underwriters Laboratories, Inc. (UL).

1.7 PRODUCT HANDLING

A. Protection: Protect installed work and materials of other trades.

B. Replacements: In event of damage, immediately make repairs and replacements at no additional cost to the City.

1.8 COORDINATION

A. Coordinate all activities in accordance with provisions of Basic Mechanical Requirements, Section **[15130]**.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.1 GENERAL

A. At least 14 days before specified occupancy or date of completion of overall contract, Contractor shall put all heating, ventilating, and air conditioning equipment into operation and shall continue operation of same during each work day for not less than five eight-hour periods, until all adjusting, balancing, testing, demonstrations, and instructions on systems have been completed. Final instructions and demonstrations and preparation of reports shall be done during the 2-week period.

B. When an individual building is ready for occupancy, all above equipment relative to that portion of work shall be put into service, tested, and adjusted.

C. Coordinate testing, adjusting and balancing procedures with any phased construction requirements for project so that usable increments of finished work may be accepted for beneficial occupancy. Systems serving partially occupied phases of project may require balancing for each phase prior to final balancing.

D. Conduct final procedures after system has been completed and is in full working order. Put all HVAC systems into full operation and continue operation of the systems during each working day. Accomplish testing, adjusting and balancing procedures in accordance with the agenda approved by the Architect.

3.2 FIELD EXAMINATION

A. Before starting testing, adjusting and balancing, Contractor shall ascertain that following conditions are fulfilled:
   1. Ensure that all water heating and water cooling systems have been flushed, cleaned, filled and high points vented.
   2. Boilers and hot water are filled.
   3. Refrigerant systems are fully charged with specified refrigerant.
   4. Over-voltage and current protection have been provided for motors.
   5. Equipment has been labeled as required.
   6. Curves and descriptive data on each piece of equipment to be tested and adjusted are available as required.
   7. Operations and maintenance manuals have been supplied.
   8. Controls manufacturer and boiler-burner representatives shall be available for consultation and supervision of adjustments during tests.
   9. Air filters clean and installed.
   10. Automatic control systems completed and operating.

3.3 TESTING, ADJUSTING AND BALANCING

A. For each heating, ventilating, or air conditioning system following shall be performed, recorded and submitted in approved forms for review. Readings shall include but not be limited to following:

1. Distribution Systems:
   a. Outside Climatic Conditions: Outside air DB, WB, atmospheric conditions, during final adjusted cfm run.
   b. System Operation Temperatures: Supply, mixed and return air WB and DB temperatures during final adjusted cfm.
   c. Heat Exchangers (furnaces, duct heaters, heating or cooling coils): Face velocity, WB and DB temperatures in and out.
   d. Diffusers or Registers and Grilles: Supply or return air:
   Identification number, location, type, size, manufacturer, number and factor, airflow hood factor, design cfm and fpm, and final adjusted cfm and fpm tabulated; fpm tabulation; not required if airflow hood is used.
   e. Variable Air Volume Diffusers: Items in (1) required, except that cfm minimum and maximum values shall be added to design and final adjusted cfm tabulation.
   f. Variable Air Volume Terminal Unit: Identification number, location, manufacturer, model number, size, minimum static pressure, design cfm minimum and maximum, and actual cfm minimum and maximum.
   g. Space Conditions - Final and balanced condition DB and WB temperatures.
   h. Fans and air handling equipment make, type, and model cfm, static pressure, fan rpm, outlet velocity, brake horsepower, etc.
   i. Motors rpm, voltage, and ampere draw.
   j. Sound levels in decibels at each diffuser, grille or register in occupied areas. Sound levels shall be measured approximately 5'-0" above floor on a line approximately 45 degrees to center of opening, on the "A" and "C" scales of a General Radio Company sound level meter, or similar instrument.
   k. Report shall also include ambient sound levels of rooms in which above openings are located, taken without air-handling equipment operating. A report shall also be made of any noise caused by mechanical vibration, which is at an intensity deemed to be objectionable.

2. Hot Water Heating System:
   a. Heating Coils: Identification number, location, cfm, gpm, coil pressure drop, entering and leaving water temperatures, entering and leaving air DB temperatures.
   b. Pumps: Pressure at the suction and discharge of each pump; gpm flow, manufacturer, make, type, and model.
   c. Boilers: Manufacturer model and serial number, heat output of boilers (see Test and Adjusting procedures); inlet and outlet water temperatures of boiler. Inlet and outlet pressure of boiler; hot water flow in gpm. Gas input to boiler-burner unit during this period; control set points.

3. Air Conditioning, Condensing and Refrigeration Units:
   a. Suction pressure and temperature.
   b. Discharge pressure and temperature.
   c. Amps and volts.
   d. Make, type, and model of unit; capacity rating.
   e. Ambient temperature: WB, DB

4. Air Moving Equipment - Fan Systems: Identification number, location, manufacturer, model or size and serial numbers, cfm requirements, total and/or external static pressure, fan and motor rpm, fan and motor sheave size, belt size and number.

5. Fan Motor: Manufacturer, frame, horsepower, voltage and phase, amperage, service factor, mag-starter heater elements and/or fuse size.

6. All Pumps: Identification number, location, manufacturer, size, impeller, service: chilled or hot water, gpm, feet head, suction and discharge pressure.

7. Pump Motor: Manufacturer, frame, horsepower, rpm, voltage and phase, amperage, service factor, mag-starter heater elements.

3.4 WATER FLOW ADJUSTMENT

A. Test, adjust, and balance the water flow in systems. Provide flow-metering device for use with installed balancing valves as required.

B. Adjust pump flow by adjusting and setting balancing valves, to obtain amperage reading on a clamp-on ammeter, to correspond to amperage indicated on pump's curves for required flow.

3.5 PUMP TESTING

A. Pumps shall be tested by using a clamp-on ammeter to:
1. Verify the pump is moving the specified amount of water (gpm) as shown on the pump capacity;

2. Verify that the motor is not drawing more current than indicated on motor plate rating. When actual flows of primary pumps are found by test to vary more than 5% from specified amount, system shall be re-balanced to regulate flow within this tolerance. When a flow indicating device(s) is in circuit, it shall be used to verify pump flows.

B. When testing is completed, a pump capacity chart with pump number and location indicated thereon, shall be marked indicating operating point of pump on the curve. Chart shall then be sealed in clean plastic and posted on wall near pump or in a location selected by the City Engineer.

3.6 TESTING, ADJUSTING AND BALANCING OF HOT WATER BOILERS AND NON-DOMESTIC TYPE WATER HEATERS

A. After adjusting, balancing and testing of pumps has been completed, the boiler(s) shall be tested for:
1. Specified heat output

2. Proper operation of controls. Boilers shall not be initially operated or tests performed with students or faculty on site.

B. Heat output of hot water boilers shall be adjusted to within 2-1/2% of the AGA output rating indicated on nameplate, under steady stated conditions.

C. Heat output of boilers shall be determined by following formula: Temperature rise x gallons per minute x 500 = BTU/per hour. Temperature rise is difference in inlet and outlet thermometer readings.

D. Temperature controllers and safety devices shall be tested during operating tests, with all other controls and devices, except one under test, being by-passed.

E. Boiler make-up pump capacity shall be tested with boiler water temperature at maximum design temperature by temporarily jumping the 2 temperature controllers, setting make-up pump pressure switch above setting of boiler, pressure relief valve and firing boiler, with relief valve discharging for not less than 5 minutes. Test shall be made with circulating pump de-energized.

Should boiler water temperature exceed 250° F. during this test, the City Engineer will request the Mechanical Engineer to undertake a design investigation.

F. Gas pressure in burner manifold shall be tested with boiler operating at full firing rate.

G. Upon completion of tests, controls and devices shall be returned to their normal operating condition and boiler shall remain in service.

H. If full load tests cannot be run, due to outside weather conditions, Contractor shall conduct such tests within six months, when conditions permit.

3.7 FINAL TABULATION

A. After heating, ventilating, and air conditioning components have been balanced, entire system shall be put into operation and all pressures, temperatures, gpm, cfm, velocities, etc., recorded and checked against design schedules. Design requirements shall be listed on reports and final tabulation shall be within a tolerance of plus or minus 10% of design requirements.

B. Readings at various locations as described herein will be made every hour for 4 hours, during normal working hours. Boilers, forced warm air furnaces, and chillers shall be started up far enough in advance to meet design conditions of day during period of testing.

3.8 VIBRATION TESTING

A. Furnish instruments and perform vibration measurements as specified in Section **[15020]**: Sound Vibration and Seismic Control. Provide measurements for all rotating HVAC equipment half horsepower and larger, including centrifugal/screw compressors, pumps, fans and motors.

B. Record initial and final measurements for each unit of equipment on test forms. Where vibration readings exceed allowable tolerance and efforts to make corrections have proved unsuccessful, forward a separate report to the Architect.

3.9 SOUND TESTING

A. Perform and record sound measurements as specified in paragraph 3.03(A) (1) in this section. Take readings in additional rooms as designated by the Architect.

B. Take measurements with a calibrated sound level meter and octave band analyzer of accuracy required by AABC or NEBB.

C. Sound reference levels, formulae and coefficients shall be according to ASHRAE handbook, 1986 Systems Volume; Chapter: Sound and Vibration Control.

D. Determine compliance with Specifications as follows:
   1. Where sound pressure levels are specified, including noise criteria in Section **[15020]**: Sound, Vibration and Seismic Control.
      a. Reduce background noise as much as possible by shutting off unrelated audible equipment.
      b. Measure octave band sound pressure levels with specified equipment "off".

c. Measure octave band sound pressure levels with specified equipment "on".
d. Use difference in corresponding readings to determine sound pressure due to equipment.

DIFF.:	0	1	2	3	4	5	9-10 or More
FACTOR:	10	7	4	3	2	1	0

Sound pressure level, due to equipment, equals sound pressure level with equipment "on" minus factor.
e. Plot octave bands of sound pressure level due to equipment for typical rooms, on a graph which also shows noise criteria (NC) curves.

2. When sound power levels are specified:
   a. Perform steps Article 3.10, Paragraph D, 1.a. through 1.d.
   b. For indoor equipment: Determine room attenuating effect; i.e., difference between sound power level and sound pressure level. Determine sound power level will be sum of sound pressure level due to equipment, plus room attenuating effect.
   c. For outdoor equipment: Use directivity factor and distance from noise source to determine distance factor, i.e., difference between sound power level and sound pressure level. Measured sound power level will be sum of sound pressure level due to equipment, plus distance factor.

3. Where sound pressure levels are specified in terms of dbA, measure sound levels using the "A" scale of meter. Single value readings will be used instead of octave band analysis.

E. Where measured sound levels exceed specified level, installing Contractor or equipment manufacturer shall take remedial action approved by the Architect and necessary sound tests shall be repeated.

END OF SECTION

SECTION 23 30 00

AIR CONDITIONING AND AIR HANDLING EQUIPMENT

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Furnish and install air conditioning and air handling equipment as indicated on Drawings and as specified. Air conditioning and air handling equipment shall include but not be limited to following:

1. Packaged Variable Air Volume or Constant Volume Air Conditioning Units.

2. Split System Air Conditioning Units, Air Cooled.

3. Spit System Heat Pump Unit, Air Cooled.

4. Steam Humidifiers.

5. Exhaust Fans.

6. Gravity Ventilators.

1.2 SUBMITTALS

A. Submit in accordance with Division 01: Submittals.

1.3 QUALITY ASSURANCE

A. Make submittals in accordance with Section 15310: Basic Mechanical Requirements.

1.4 INSTRUCTIONS

A. Contractor shall provide instructions on equipment operation and maintenance procedure, as required, before or during completion test, to the Owner's maintenance personnel:

B. Instructions shall be entrusted to a qualified and experienced person, who has been adequately trained and is able to demonstrate correct operation and maintenance of equipment and related components.

PART 2 - PRODUCTS

2.1 APPROVED MANUFACTURERS AND ACCEPTABILITY REQUIREMENTS

Manufacturers: The design shown on the drawing is based upon products of the manufacturer scheduled. Alternate equipment manufacturers will be acceptable if equipment meets the scheduled performance and complies with these specifications. If equipment manufactured by manufacturer other than that scheduled is utilized, then the Mechanical Contractor will be responsible for coordinating with the General Contractor and all affected Subcontractors to insure proper provisions for installation of the furnished unit. This coordination will include, but not limited to the following:

A. Structural supports for units.

B. Roof curb transition.

C. Piping size and connection/header locations.

D. Electrical power requirements and wire/conduit and overcurrent protection sizing.

E. All costs incurred to modify the building provisions to accept the furnished units.

2.2 ROOFTOP PACKAGE AIR CONDITIONING UNIT

A. Custom designed units shall be self-contained, packaged, factory assembled and prewired, consisting of cabinet and frame, supply fan, return fan (where applicable), gas furnace (where applicable), controls, air filters, refrigerant cooling coil and compressors, condenser coil and condenser fans.

B. Include accessories as shown or specified herein or on drawings.

C. Units shall have the capacities, electrical power, and EER requirement as indicated on the drawings.

D. Units shall be manufactured by: York, McQuay, Trane, Carrier or equal.

E. GENERAL DESCRIPTION

1. Furnish as shown on plans, Unit performance, EERs and electrical characteristics shall be per the job schedule.

2. Configuration: Fabricate as detailed on prints.

3. The complete unit shall be ETL/UL listed.

4. Each unit shall be specifically designed for outdoor rooftop application and include a weatherproof cabinet. Units shall be of a modular design with factory installed access sections available to provide maximum design flexibility. Unit shall be completely factory assembled and shipped in one piece. Units shall be shipped fully charged with R22.

5. The unit shall undergo a complete factory run test prior to shipment and factory test sheets shall be available upon request. The factory test shall include final balancing of all fan assemblies; a refrigeration circuit run test, a unit control system operations checkout, a unit refrigerant leak test and a final unit inspection.

6. All units shall have decals and tags to indicate caution areas and aid unit service. Unit nameplates shall be fixed to the main control panel door. Electrical wiring diagrams shall be attached to the control panels. Installation, operating and maintenance bulletins and start-up forms shall be supplied with each unit.

7. Performance: All scheduled capacities and face areas are the minimum accepted value. All scheduled amps, KW, and HP are maximum accepted values that allow scheduled capacity to be met.

F. CABINET, CASING, AND FRAME

1. For units greater than 40 tons, unit cabinet shall be designed to operate at total static pressures up to 6.5 inches w.g.

2. Unit shall have heavy gauge solid galvanized steel liners provided throughout, allowing no exposed insulation within the air stream. All cabinet insulation, except floor panels, shall be a nominal 2" thick, 1 ½ lb. density, R6.5, glass fiber. Floor panels to be a minimum 1" thick, 3 lb. density, R4.2, glass fiber.

3. Exterior surfaces shall be constructed of pre-painted galvanized steel for aesthetics and long term durability. Paint finish to include a base primer with a high quality, polyester resin topcoat of a neutral beige color. Finished surface to withstand a minimum 750-hour salt spray test in accordance with ASTM B117 standard for salt spray resistance.

4. Service doors shall be provided on both sides of each section in order to provide user access to all unit components. Service doors shall be constructed of heavy gauge galvanized steel with galvanized steel interior liners. All service doors shall be mounted on multiple, stainless steel hinges and shall be secured by a stainless steel latch system that is operated by a single, flush mounted handle. The latch system shall feature a staggered engagement for ease of operation and a safety catch shall protect the user from injury in case a positive pressure door is opened while the fan is operating. Removable panels, or doors secured by multiple, mechanical fasteners are not acceptable.

5. For unit sizes greater than 40 tons, the unit base frame shall be constructed of 13 gauge pre-painted galvanized steel.

6. The unit base shall overhang the roof curb for positive water runoff and shall have a formed recess that seats on the roof curb gasket to provide a positive, weathertight seal. Lifting brackets shall be provided on the unit base with lifting holes to accept cable or chain hooks.

G. INDOOR AIR FANS

1. All fan assemblies shall be statically and dynamically balanced at the factory, including a final trim balance, prior to shipment. All fan assemblies shall employ solid steel fan shafts. Heavy-duty pillow block type, self-aligning, grease lubricated ball bearings shall be used. Bearings shall be sized to provide an L-50 life at 200,000 hours. The entire fan assembly shall be isolated from the fan bulkhead and rigidly mounted to the unit's floor. Fixed pitch V-belt drives with matching belts shall be provided. V-belt drives shall be selected at the manufacturer's standard service factor.

2. Fan motors shall be heavy-duty 1800 rpm open drip-proof (ODP), premium efficiency. Fan motors to have grease lubricated ball bearings. Motors shall be mounted on an adjustable base that provides for proper alignment and belt tension adjustment.

3. Airfoil supply fans. Forward curved fans are not acceptable.

   Supply fan shall be a double width, double inlet (DWDI) airfoil centrifugal fan. All fans shall be mounted using shafts and hubs with mating keyways. Fans shall be Class II type and fabricated from heavy-gauge aluminum. Fan blades shall be continuously welded to the back plate and end rim.

4. Airfoil return fans.

   A single width, single inlet (SWSI) airfoil centrifugal return air fan shall be provided. The fan shall be Class II construction. The fan wheel shall be Class II construction and fabricated from heavy-gauge aluminum with fan blades continuously welded to the back plate and end rim. The fan shall be mounted using shafts and hubs with mating keyways. (Exhaust or relief fans are not acceptable)

H. INDOOR AIR FAN VARIABLE AIR VOLUME CONTROL

1. Separate electronic variable frequency drives shall be provided for the supply and return air fans. Each drive shall be mounted in the fan section. Drives shall meet UL Standard 95-5V and the variable frequency drive manufacturer shall have specifically approved them for plenum duty application. The completed unit assembly shall be listed by a recognized safety agency, such as ETL. Drives are to be accessible through a hinged door assembly complete with a single handle latch mechanism. Mounting arrangements that expose drives to high temperature, unfiltered ambient air are not acceptable.

2. The drive output shall be controlled by the factory installed main unit control system and drive status and operating speed shall be monitored and displayed at the main unit control panel.

I. ELECTRICAL

1. Unit wiring shall comply with NEC requirements and with all applicable UL standards. All electrical components shall be UL recognized where applicable. All wiring and electrical components provided with unit shall be number and color coded and labeled according to the electrical diagram provided for easy identification. The unit shall be provided with a factory wired weatherproof control panel with deadfront cover. Unit shall have a single point power terminal block for main power connection. A terminal board shall be provided for low voltage control wiring. Branch circuit fusing, 115 volt control circuit transformer and fuse, system switches, high temperature sensor, and a 115 volt receptacle with a separate electrical connection shall also be provided with unit (separate 120V power for service lights to be provided by others). UV lights will be powered from unit provided transformer. Each compressor and condenser fan motor shall be furnished with contactors and inherent thermal overload protection. A separate keylocked control panel shall house all controls for the condensing section. Supply and return fan motors shall have contactors and external overload protection. Knockouts shall be provided in the bottom of the main control panels for field wiring entrance thru the unit's curb. All 115-600 volt internal and external wiring between control boxes and components shall be protected from damage by raceways or conduit.

J. HEATING AND COOLING SECTIONS

1. The cooling coil section shall be installed in a draw through configuration, upstream of the supply air fan. The coil section shall be complete with factory piped cooling coil and sloped drain pan. Hinged access doors on both sides of the section shall provide convenient access to the cooling coil and drain pan for inspection and cleaning.

2. Cooling coil performance schedule is based on mixed air and coil leaving air temperatures, not including fan motor heat. Manufacturer shall add motor heat to the DX coil LAT to calculate unit LAT on draw through models. Scheduled total and sensible capacities are gross capacities, are minimum accepted values, and do not include fan motor heat.

3. Direct expansion (DX) cooling coils shall be fabricated of seamless 1/2" diameter high efficiency copper tubing that is mechanically expanded into high efficiency aluminum plate fins. Coils shall be a multi-row, staggered tube design. All multiple compressor units shall have two independent refrigerant circuits and shall use an interlaced coil circuiting that keeps the full coil face active at all load conditions.

4. All coils shall be factory leak tested with high pressure air under water.

5. A stainless steel, positively sloped drain pan shall be provided with the cooling coil. The drain pan shall extend beyond the leaving side of the coil and underneath the cooling coil connections. The drain pan shall have a minimum slope of 1/8" per foot to provide positive draining. The drain pan shall be connected to a threaded drain connection extending through the unit base. Units with stacked cooling coils shall be provided with a secondary drain pan piped to the primary drain pan.

K. UV LIGHTS

1. Provide factory installed UV lights downstream of cooling coil. Housings shall be constructed of 304 SS. UV lights shall be wired to a door switch (Include switch to any door providing access to UV lights) which will shut-off lights when door is opened. Unit shall be UL certified with UV lights installed. There shall be a minimum of 2 rows of lights per 48” of coil height. Light banks shall span the entire width of coil face. UV lights will be powered from factory supplied control panel.

L. FILTERS

1. Unit shall be provided with a draw-through filter section. The filter section shall be supplied complete with the filter rack as an integral part of the unit. The draw-through filter section shall be provided with cartridge filters.

2. 12" deep 80-85% efficient, UL Std. 900, Class 1, cartridge filters shall be provided. 2” panel, 30% efficient pre-filters shall be included. Cartridge filters shall consist of filter media permanently attached to a metal frame and shall slide into a gasketed, extruded aluminum rack contained within the unit. The filter rack shall have secondary gasketed, hinged end panels to insure proper sealing. Filters shall be accessible from both sides of the filter section.

M. OUTDOOR/RETURN AIR SECTION

1. Unit shall be provided with an outdoor air economizer section. The 0 to 100% outside air economizer section shall include outdoor, return, and exhaust air dampers. Outdoor air shall enter from both sides of the economizer section through horizontal, louvered intake panels complete with rain lip and bird screen. The floor of the outdoor air intakes shall provide for water drainage. The economizer section shall allow return air to enter from the bottom of the unit. The outside and return air dampers shall be sized to handle 100% of the supply air volume. The dampers shall be opposed sets of parallel blades, arranged vertically to converge the return air and outdoor air streams in multiple, circular mixing patterns

2. Dampers shall be provided on outdoor or return dampers. Damper blades shall be fully gasketed and side sealed and arranged horizontally in the hood. Damper leakage shall be less than 0.2% at 1.5 inches static pressure differential. Leakage rate to be tested in accordance with AMCA Standard 500. Damper blades shall be operated from multiple sets of linkages mounted on the leaving face of the dampers.

3. A barometric exhaust damper shall be provided to exhaust air out of the back of the unit. Exhaust louvers and a bird screen shall be provided to prevent infiltration of rain and foreign materials. Exhaust damper blades shall be lined with urethane gasketing on contact edges.

4. Control of the outdoor or return dampers shall be by a factory installed actuator. Damper actuator shall be of the modulating, spring return type. If outdoor air is suitable for “free”

cooling, the outdoor air dampers shall modulate in response to the unit's temperature control system. An adjustable enthalpy control shall be provided to sense the dry-bulb temperature and relative humidity of the outdoor air stream to determine if outdoor air is suitable for "free" cooling.

N. DISCHARGE AND RETURN PLENUM OPTIONS

1. A supply air discharge plenum shall be provided. The plenum section shall have a bottom discharge opening.

O. CONDENSING SECTION

1. Air Cooled Condenser

a. The condensing section shall be open on the sides and bottom to provide access and to allow airflow through the coils. Condenser coils shall be multi-row and fabricated from 3/8" high efficiency rifled copper tubing mechanically bonded to high efficiency aluminum fins. Each condenser coil shall be factory leak tested with high-pressure air under water. Each refrigerant circuit shall include a subcooling circuit to provide 15 degrees of liquid subcooling. Condenser coil guards shall provide protection from incidental contact to coil fins. Coil guards to be constructed of cross wire welded steel with PVC coating.

b. Condenser fans shall be direct drive, propeller type designed for low tip speed, vertical air discharge, and include service guards. Fan blades shall be constructed of steel and riveted to a steel center hub. Condenser fan motors shall be heavy-duty, inherently protected, three-phase, non-reversing type with permanently lubricated ball bearing and integral rain shield.

c. Units shall have at least one condenser fan controlled to maintain positive head pressure. An ambient thermostat shall prevent the refrigeration system from operating below 45º F ambient.

2. Scroll Compressors

a. Each unit shall have multiple, heavy-duty Copeland scroll compressors.

b. Each compressor shall be complete with gauge ports, crankcase heater, sight-glass, anti-slug protection, motor overload protection and a time delay to prevent short cycling and simultaneous starting of compressors following a power failure.

c. Compressors shall be isolated with resilient rubber isolators to decrease noise transmission.

d. Each unit shall have two independent refrigeration circuits. Each circuit shall be complete with a liquid line solenoid valve, low pressure control, filter drier, liquid moisture indicator/sight-glass, thermal expansion valve, liquid line shutoff valve with charging port, discharge line shutoff valve, a manual reset high pressure safety switch, high pressure relief device and pump down switch. The thermal expansion valve shall be capable of modulation from 100% to 25% of its rated capacity. Sight-glasses shall be accessible for viewing without disrupting unit operation. Each circuit shall be dehydrated and factory charged with Refrigerant 22 and oil.

e. Refrigeration capacity control shall be accomplished by staging of the unit's multiple compressors. All compressor capacity control staging shall be controlled by the factory installed main unit control system.

P. CONTROLS

1. Each unit shall be equipped with a microprocessor based control system. The unit control system shall include all required temperature and pressure sensors, input/output boards, main microprocessor and operator interface. The unit control system shall perform all unit control functions including scheduling, temperature controls, alarms, unit diagnostics and safeties. All boards shall be individually replaceable for ease of service. All microprocessors, boards, and sensors shall be factory mounted, wired and tested.

2. The microprocessor shall be a stand-alone DDC controller not dependent on communications with any on-site or remote PC or master control panel. The microprocessor shall maintain existing set points and operate stand alone if the unit loses either direct connect or network communications. The microprocessor memory shall be protected from voltage fluctuations as well as any extended power failures. All factory and user set schedules and control points shall be maintained in nonvolatile memory. No settings shall be lost, even during extended power shutdowns.

3. The main microprocessor shall support an RS-232 direct connection to a product service tool or a modem. A communications port shall be provided for direct communication into the BAS network.

4. All digital inputs and outputs shall be protected against damage from transients or wrong voltages. Each digital input and digital output shall be equipped with an LED for ease of service. All field wiring shall be terminated at a separate, clearly marked terminal strip.

5. The microprocessor memory shall be protected from all voltage fluctuations as well as any extended power failures. The microprocessor shall support an RS-232 direct connect from an IBM PC or 100% true compatible using MicroTech software. The microprocessor shall maintain existing set points and operate stand alone if the rooftop loses either direct connect or network communications.

6. The microprocessor shall have a built-in time schedule. The schedule shall be programmable from the unit keypad interface. The schedule shall be maintained in nonvolatile memory to insure that it is not lost during a power failure. There shall be one start/stop per day and a separate holiday schedule. The controller shall accept up to sixteen holidays each with up to a 5-day duration. Each unit shall also have the ability to accept a time schedule via BAS network communications.

7. If the unit is to be programmed with a night setback or setup function, an optional space sensor shall be provided. Space sensors shall be available to support field selectable features. Sensor options shall include Zone sensor with tenant override switch, or Zone sensor with tenent override switch and heating/cooling set point adjustment.

8. User Interface (UI)

   a. The keypad/display character format shall be 20 characters x 4 lines. The character font shall be a 5 x 8 dot matrix. The display shall be a super twist liquid crystal display (LCD) with black characters on yellow background providing high visibility. The display form shall be in plain English coded formats. Lookup tables are not acceptable.

b. The keypad shall be equipped with 8 individual touch-sensitive membrane key switches. All control settings shall be password protected from changes by unauthorized personnel.

9. The display shall provide the following information:

a. Supply, return, outdoor and space air temperature.

b. Duct and building static pressure- the control contractor is responsible for providing and installing sensing tubes.

c. Supply fan and return fan status and airflow verification.

d. Supply and return VFD speed.

e. Outside air damper position and economizer mode.

f. Cooling and changeover status.

g. Occupied, unoccupied, and dirty filter status.

h. Date and time schedules.

i. Up to 4 current alarms and 8 previous alarms with time and date.

10. The keypad shall provide the following set points as a minimum:

a. Six control modes including off manual, auto, heat/cool, cool only, heat only and fan only.

b. Four occupancy modes including auto, occupied, unoccupied and bypass (tenant override with adjustable duration).

c. Control changeover based on return air temperature, or space temperature.

d. Primary cooling and heating set point temperature based on supply or space temperature.

e. Night setback and setup space temp.

f. Cooling and heating control differential (or dead band).

g. Cooling and heating supply temperature reset options based on one of the following: Return air temperature, outdoor air temperature, space temperature, Airflow, or external (1-5VDC) signal.

h. Reset schedule temperature.

i. High supply, low supply and high return air temperature alarm limits.

j. Ambient compressor and heat lockout temperatures.

k. Auto or manual lead lag method on compressors.

l. Compressor interstage timers duration.

m. Duct static pressure.

n. Return fan tracking (VaneTrol) settings that include minimum/maximum with and without remote exhaust operation.

o. Return fan tracking (VaneTrol) settings that include minimum/maximum vfd speed with and without remote exhaust operation.

p. Minimum outdoor airflow reset based on external reset (1-5 VDC), percent of CFM capacity, and fixed outdoor damper position.

q. Economizer changeover based on enthalpy, dry bulb or network signal.

r. Current time and date.

s. Occupied/unoccupied time schedules with allowances for holiday/ event dates and duration.

t. Three types of service modes including timers normal (all time delays,) timers fast (all time delays 20 seconds,) and normal.

2.3 SPLIT SYSTEM AIR CONDITIONING UNIT, AIR COOLED.

A. Split System Air Conditioning Unit: Cooling only, split type, air cooled, ground mounted with electrical voltages as scheduled.

Units shall be air-cooled direct expansion fan coil. Outdoor section shall be factory assembled having direct-drive condenser fans with horizontal or vertical air discharge, Scroll type compressor, refrigerant coil, fan motor(s), pre-wired control panel and a holding charge of refrigerant R-410A. Indoor fan coil unit shall have horizontal discharge and will include evaporator coil, fan and motor, condensate pan with drain, thermal expansion valve, pre-wired control panel and programmable remote thermostat control.

Unit shall have SEER/COP complying with California Energy Conservation Standards, CCR, Title 24. U.L. listed and rated at ARI Standard 210 / 240.

1. Nominal unit cooling, capacities, electrical characteristics, and operating conditions shall be as indicated on Drawings.

2. Evaporator and condenser coils shall be copper with mechanically bonded, smooth Aluminum plate fins. All tube joints shall be brazed with copper or silver alloy. Coils shall be pressure-tested at factory.

3. Condenser Fan and Motors: Condenser fan shall be direct driven, propeller type arranged for horizontal or vertical discharge. Condenser fan motors shall have inherent protection, and shall be permanently lubricated type, resiliently mounted for quiet operation. Each fan shall have a safety guard.

4. Evaporator fan section shall have a squirrel cage or centrifugal forward-curved blades, double inlet fans mounted on a solid shaft. Fan shall be statically and dynamically balanced and shall run on permanently lubricated bearings.

5. Cabinets shall be made of galvanized steel, bonderized and finished with baked enamel. Cabinet interior shall be insulated with 1" thick neoprene covered fiberglass. Cabinet panels to be hinged for easy removal for service to all operating components.

6. Compressor shall be serviceable hermetic scroll type, warranted unconditionally for 5 years. Compressor shall have access valves. It shall be mounted on rubber isolators so as to reduce sound vibration. It shall be equipped with high and low-pressure protection.

7. Controls: Compressor motor assembly shall be protected with low pressure switches, internal overloads, internal thermostat, internal relief valve, and anti-recycle relay, or time cycle device to prevent rapid cycling of compressor after any "off" cycle.
   Unit shall incorporate an automatic relay for indoor circulating air blower. Control panel shall be pre-wired in unit casing.

8. Low Ambient Operation: Head pressure control shall be provided for operation at outside air temperature below 45°F.

9. Filters: Filters shall be 2" replaceable media type, Farr 30/30, or approved equal, installed in a 2" rack filter section and complete with an access door.

10. An in-line filter-drier shall be included in the refrigerant liquid line.

11. Manufacturer: Carrier, Bryant, or approved equal.

2.4 SPLIT SYSTEM AIR CONDITIONING UNIT, AIR COOLED

A. Cooling only, split type, air cooled, ground mounted with electrical voltages as scheduled.

Indoor units shall be air-cooled direct expansion fan coil. Outdoor heat pump unit shall be factory assembled having direct-drive condenser fans with horizontal or vertical air discharge, Scroll type compressor, refrigerant coil, fan motor(s), pre-wired control panel and a holding charge of refrigerant R-410A. Indoor fan coil unit shall have horizontal discharge and will include evaporator coil, fan and motor, condensate pan with drain, thermal expansion valve, pre-wired control panel and programmable remote thermostat control.

Unit shall have SEER/COP complying with California Energy Conservation Standards, CCR, Title 24. U.L. listed and rated at ARI Standard 210 / 240.

1. Nominal unit cooling, capacities, electrical characteristics, and operating conditions shall be as indicated on Drawings.

2. Evaporator and condenser coils shall be copper with mechanically bonded, smooth Aluminum plate fins. All tube joints shall be brazed with copper or silver alloy. Coils shall be pressure-tested at factory.

3. Condenser Fan and Motors: Condenser fan shall be direct driven, propeller type arranged for horizontal or vertical discharge. Condenser fan motors shall have inherent protection, and shall be permanently lubricated type, resiliently mounted for quiet operation. Each fan shall have a safety guard.

4. Evaporator fan section shall have a squirrel cage or centrifugal forward-curved blades, double inlet fans mounted on a solid shaft. Fan shall be statically and dynamically balanced and shall run on permanently lubricated bearings.

5. Cabinets shall be made of galvanized steel, bonderized and finished with baked enamel. Cabinet interior shall be insulated with 1" thick neoprene covered fiberglass. Cabinet panels to be hinged for easy removal for service to all operating components.

6. Compressor shall be serviceable hermetic scroll type, warranted unconditionally for 5 years. Compressor shall have access valves. It shall be mounted on rubber isolators so as to reduce sound vibration. It shall be equipped with high and low-pressure protection.

7. Controls: Compressor motor assembly shall be protected with low pressure switches, internal overloads, internal thermostat, internal relief valve, and anti-recycle relay, or time cycle device to prevent rapid cycling of compressor after any "off" cycle. Unit shall incorporate an automatic relay for indoor circulating air blower. Control panel shall be pre-wired in unit casing.

8. Low Ambient Operation: Head pressure control shall be provided for operation at outside air temperature below 45°F.

9. Filters: Filters shall be 2" replaceable media type, Farr 30/30, or approved equal, installed in a 2" rack filter section and complete with an access door.

10. An in-line filter-drier shall be included in the refrigerant liquid line.

11. Manufacturer: Carrier, Bryant, or approved equal.

2.6 INLINE EXHAUST FANS

A. Fan shall be duct mounted, belt driven centrifugal square inline. Fan shall be manufactured at an ISO 9001 certified facility. Fan shall be listed by Underwriters Laboratories (UL 705) and UL listed for Canada (cUL 705). Fan shall bear the AMCA certified ratings seal for sound and air performance.

B. The fan shall be of bolted construction utilizing corrosion resistant fasteners. Housing shall be minimum 18 gauge galvanized steel with integral duct collars. Bolted access doors shall be provided on three sides, sealed with closed cell neoprene gasketing. Pivoting motor plate shall utilize threaded L-bolt design for positive belt tensioning. Housing shall be pre-drilled to accommodate universal mounting feet for vertical or horizontal installation. Unit shall bear an engraved aluminum nameplate. Nameplate shall indicate design CFM, static pressure, and maximum fan RPM. Unit shall be shipped in ISTA certified transit tested packaging.

C. Wheel shall be centrifugal backward inclined, constructed of 100% aluminum, including a precision machined cast aluminum hub. Wheel inlet shall overlap an aerodynamic aluminum inlet cone to provide maximum performance and efficiency. Wheel shall be balanced in accordance with AMCA Standard 204-96, Balance Quality and Vibration Levels for Fans.

D. Motor shall be heavy duty type with permanently lubricated sealed ball bearings and furnished at the specified voltage, phase and enclosure.

E. Bearings shall be designed and individually tested specifically for use in air handling applications. Construction shall be heavy duty regreasable ball type in a pillow block cast iron housing selected for a minimumL50 life in excess of 200,000 hours at maximum cataloged operating speed.

F. Belts shall be oil and heat resistant, non-static type. Drives shall be precision machined cast iron type, keyed and securely attached to the wheel and motor shafts. Drives shall be sized for 150% of the installed motor horsepower. The variable pitch motor drive must be factory set to the specified fan RPM.

Manufacturer: Greenheck, Cook, Penn or approved equal.

2.7 UTILITY VENT SET

A. Fan shall be a single width, single inlet, backward inclined flat blade, belt driven centrifugal vent set. Fan shall be manufactured at an ISO 9001 certified facility. Fan shall be listed by Underwriters Laboratories (UL/cUL 705) for US and Canada. For restaurant applications, fan shall be listed by Underwriters Laboratories (UL/cUL 762) for US and Canada. Fan shall bear the AMCA certified ratings seal for air performance.

B. The fan shall be of bolted and welded construction utilizing corrosion resistant fasteners. The scroll wrapper shall be a minimum 14 gauge steel and the scroll side panels shall be a minimum 12 gauge steel. The entire fan housing shall have continuously welded seams for leakproof operation. A performance cut-off shall be furnished to prevent the recirculation of air in the fan housing. The fan housing shall be field rotatable to any one of eight discharge positions and shall have a minimum 1-1/2 inch outlet discharge flange. Bearing support shall be minimum 10 gauge welded steel. Side access inspection ports shall be provided with quick release latches for access to the motor compartment without removing the weather cover. Lifting lugs shall be provided for ease of installation. Unit shall bear an engraved aluminum nameplate. Nameplate shall indicate design CFM, static pressure, and maximum fan RPM. Unit shall be shipped in ISTA certified transit tested packaging.

C. Steel fan components shall be electrostatically applied, baked polyester powder coating. Each component shall be subject to a five stage environmentally friendly wash system, followed by a minimum 2 mil thick baked powder finish. Paint must exceed 1,000 hour salt spray under ASTM B117 test method.

D. Wheel shall be steel centrifugal backward inclined, non-overloading flat blade type. Blades shall be continuously welded to the backplate and deep spun inlet shroud. Wheel hub shall be keyed and securely attached to the fan shaft. Wheel inlet shall overlap an aerodynamic aluminum inlet cone to provide maximum performance and efficiency. Wheel shall be balanced in accordance with AMCA Standard 204-96, Balance Quality and Vibration Levels for Fans.

E. Motor shall be heavy duty type with permanently lubricated sealed ball bearings and furnished at the specified voltage, phase and enclosure.

F. Bearings shall be designed and tested specifically for use in air handling applications. Construction shall be heavy duty regreasable ball or roller type in a cast iron pillow block housing selected for a minimum L50 life in excess of 200,000 hours at maximum cataloged operating speed.

G. Blower shaft shall be AISI C-1045 hot rolled and accurately turned, ground and polished. Shafting shall be sized for a critical speed of at least 125% of maximum RPM.

H. Belts shall be oil and heat resistant, non-static type. Drives shall be precision machined cast iron type, keyed and securely attached to the wheel and motor shafts. Drives shall be sized for 150% of the installed motor horsepower. The variable pitch motor drive must be factory set to the specified fan RPM.

I. Manufacturer: Greenheck, Cook, Penn or approved equal.

2.8 GRAVITY VENTILATORS

A. Unit shall be a hooded aluminum, roof mounted gravity intake ventilator. Fan shall be manufactured at an ISO 9001 certified facility.

B. The unit shall be of bolted and welded construction utilizing corrosion resistant fasteners. The aluminum hood shall be constructed of minimum 14 gauge marine alloy aluminum, bolted to a minimum 8 gauge aluminum support structure. The aluminum base shall have continuously welded curb cap corners for maximum leak protection. Birdscreen constructed of 1/2" mesh shall

be mounted across the intake opening. Unit shall bear an engraved aluminum nameplate. Nameplate shall indicate design CFM and static pressure. Unit shall be shipped in ISTA certified transit tested packaging.

C. Manufacturer: Greenheck, Cook, Penn or approved equal.

PART 3 - EXECUTION

3.1 GENERAL

A. Examine areas under which work of this Section will be performed. Correct conditions detrimental to proper and timely completion of work. Do not proceed until unsatisfactory conditions have been corrected.

3.2 EQUIPMENT FOUNDATIONS

A. Equipment foundations, where indicated, shall be of sufficient size and weight, and of proper design to preclude shifting of equipment under operating conditions, or under any abnormal conditions that could be imposed upon equipment.

B. Foundations shall meet requirements of equipment manufacturer and, when required by the Architect, Contractor shall obtain from equipment manufacturer, approval of foundation design and construction for equipment involved. Equipment vibration shall be maintained within design limits, and shall be dampened and isolated. Isolators shall be bolted to a steel member so as to be readily removable.

3.3 EQUIPMENT DESIGN AND INSTALLATION

A. Uniformity: Unless otherwise specified, equipment of same type or classification shall be product of same manufacturer.

B. Application: Only use equipment recommended by manufacturer, and approved by the Owner or the Architect.

C. Equipment Installation: Equipment installation shall be strictly in accordance with these Specifications, and installation instructions of manufacturers. Equipment mounted on concrete foundations shall be grouted before piping is installed. All piping shall be installed in such a manner as not to place a strain on any of the equipment. Flanged joints shall be adequately extended before installation.

All piping shall be graded, anchored, guided and supported, without low pockets.

1. Erect equipment in a neat and workmanlike manner, properly aligned, leveled and adjusted for satisfactory operation.

2. Install so that connecting and disconnecting of piping and accessories can be readily accomplished, and so that all parts are readily accessible for inspection, service and repair. Space shall be provided to readily remove filters, coils, compressors and fan wheels. All access doors shall be hinged with cam lock door handles.

3.4 ROOF-TOP EQUIPMENT MOUNTING

A. All Units: Install unit on a prefabricated isolation curb with seismic restraints secured directly to roof. Follow manufacturer's recommended installation manuals. Submit shop drawings for approval of the Architect.

3.5 NOISE AND VIBRATION

A. Operation of Equipment: Mechanical equipment and piping systems shall operate with noise and vibration to design level or less.

B. Corrective Measures: If such objectionable noise and vibration should be produced, make necessary changes to produce satisfactory results.

3.6 FIELD TESTS AND INSPECTION

A. General: Perform all field inspections, field tests, and trial operations as specified in Section 15010. Provide all labor, equipment and incidentals required for testing. The Owner Inspector will witness all field tests and trial operations as specified in Section 15010.

B. Equipment and Material: Equipment and material certified as having been successfully tested by manufacturer, in accordance with referenced Specifications and standards, will not require re-testing before installation. Equipment and materials not tested at the place of manufacture will be tested before or after installation, as applicable or necessary, to determine compliance with reference Specifications and standards.

C. Start-Up and Operational Test: System shall be started up and initially operated with all components operating. During this test, various strainers or filters shall be periodically cleaned until no further accumulation of foreign material occurs. Exercise care so that minimum loss of water occurs when strainers are cleaned. Adjust safety and automatic control instruments as necessary to place them in proper operation and sequence. See also Section 15010.

D. Single-zone and VAV systems shall be provided with factory start-up.

E. Extent of Field Tests: After installation and before acceptance, work of this Section shall be subjected to all necessary field tests, including those specified here and in Section 15010.

F. Operation and Maintenance Data: Provide required operation and maintenance data as specified in Section 15010.

3.7 REFRIGERANT PIPING

A. Unless otherwise indicated, main liquid and suction lines from condensing unit to evaporator coil shall be of sizes specified by manufacturer.

B. All refrigeration piping shall be refrigeration grade copper tubing, type "L" hard drawn. In instances where refrigeration lines should be inaccessible and must be snaked through conduit or a trench, that portion of tubing required to complete connections through conduit or trench may be soft drawn. Extreme care shall be taken to keep entire system clean and dry during installation. Pipe to be sealed until installed.

C. All refrigeration lines, both hard and soft drawn, shall be straight and free from kinks, restrictions or traps and horizontal runs shall be sloped towards compressor 1" to 10' wherever possible.

D. All joints shall be made with Silfos 15, Silvaloy 15 or equal, high melting-point solder.

E. Any flare nuts required on suction lines shall be of the short forged or "frost-proof" type. All other fittings shall be standard sweat-soldered type. All ells and return bends shall be long radius type. Install leak lock material.

F. Refrigeration Piping: All joints shall be silver brazed and leak tested. Field fabricated lines shall be thoroughly flushed and cleaned before connection. Bleed nitrogen through lines during silver brazing, and cap and seal lines when not completed and connected to equipment.

G. Sleeve all penetrations of floors, walls and ceiling to allow for free motion of piping. Use #24 gage galvanized iron pipe and chrome plated escutcheon plates. Pack annular space between pipe and sleeve with incombustible material, fiberglass or approved equal, and seal each end with mastic to make waterproof.

H. Install insulated couplings at points of connection between all dissimilar metals for cathodic protection. Insulate copper tubing from ferrous materials and hangers with 2" thickness of 3" wide strip, 10 mil. polyvinyl tape wrapped around pipe.

I. Support all piping so that it is firmly held in place by iron hangers and supports, per manufacturer's recommendations. Provide saddles to protect pipe insulation.

J. Make connections of copper and brass pipe and tubing with 95-5 tinantimony, ASTM B32, Grade A solder.

K. Insulate all refrigerant suction lines.

L. On split systems insulate both suction and liquid lines. See Section 15250 for insulation material.

END OF SECTION

SECTION 23 34 00

FANS

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:

1. Utility set fans.

2. Centrifugal roof ventilators.

3. Axial roof ventilators.

4. Upblast propeller roof exhaust fans.

5. Centrifugal wall ventilators.

6. Ceiling-mounting ventilators.

7. In-line centrifugal fans.

8. Propeller fans.

1.3 PERFORMANCE REQUIREMENTS

A. Project Altitude: Base air ratings on [actual site elevations] [sea-level conditions].

B. Operating Limits: Classify according to AMCA 99.

1.4 SUBMITTALS

A. Product Data: Include rated capacities, furnished specialties, and accessories for each type of product indicated and include the following:

1. Certified fan performance curves with system operating conditions indicated.

2. Certified fan sound-power ratings.

3. Motor ratings and electrical characteristics, plus motor and electrical accessories.

4. Material gages and finishes, including color charts.

5. Dampers, including housings, linkages, and operators.

B. Shop Drawings: Detail equipment assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.

1. Wiring Diagrams: Power, signal, and control wiring. Differentiate between manufacturer-installed and field-installed wiring.

2. Design Calculations: Calculate requirements for selecting vibration isolators and seismic restraints and for designing vibration isolation bases.

3. Vibration Isolation Base Details: Detail fabrication, including anchorages and attachments to structure and to supported equipment. Include auxiliary motor slides and rails, and base weights.

C. Coordination Drawings: Show roof penetration requirements and reflected ceiling plans drawn to scale and coordinating roof penetrations and units mounted above ceiling. Show the following:

1. Roof framing and support members relative to duct penetrations.

2. Ceiling suspension assembly members.

3. Size and location of initial access modules for acoustical tile.

4. Ceiling-mounted items including light fixtures, diffusers, grilles, speakers, sprinklers, access panels, and special moldings.

A. Maintenance Data: For power ventilators to include in maintenance manuals specified in Division 1.

1.5 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

B. AMCA Compliance: Products shall comply with performance requirements and shall be licensed to use the AMCA-Certified Ratings Seal.

C. NEMA Compliance: Motors and electrical accessories shall comply with NEMA standards.

D. UL Standard: Power ventilators shall comply with UL 705.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver fans as factory-assembled unit, to the extent allowable by shipping limitations, with protective crating and covering.

B. Disassemble and reassemble units, as required for moving to final location, according to manufacturer's written instructions.

C. Lift and support units with manufacturer's designated lifting or supporting points.

1.7 COORDINATION

A. Coordinate size and location of structural-steel support members.

B. Coordinate size and location of concrete bases. Cast anchor-bolt inserts into bases. Concrete, reinforcement, and formwork requirements are specified in Division 3 Section "Cast-in-Place Concrete."

C. Coordinate installation of roof curbs, equipment supports, and roof penetrations. These items are specified in Division 7.

1.8 EXTRA MATERIALS

A. Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

B. Belts: [One] <Insert number> set[s] for each belt-driven unit.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Utility Set Fans:

    a. Aerovent; a Twin City Fan Company.
    b. Cook, Loren Company.
    c. New York Blower Company (The).
    d. Penn Ventilation Companies, Inc.
    e. <Insert manufacturer's name.>

2. Centrifugal Roof Ventilators:

    a. Acme Engineering & Mfg. Corp.
    b. Cook, Loren Company.
    c. Greenheck Fan Corp.
    d. JennFan; Div. of Breidert Air Products, Inc.
    e. Penn Ventilation Companies, Inc.
    f. <Insert manufacturer's name.>

3. Axial Roof Ventilators:

    a. Acme Engineering & Mfg. Corp.
    b. Cook, Loren Company.
    c. Greenheck Fan Corp.
    d. JennFan; Div. of Breidert Air Products, Inc.
    e. Penn Ventilation Companies, Inc.
    f. <Insert manufacturer's name.>

4. Upblast Propeller Roof Exhaust Fans:

    a. Acme Engineering & Mfg. Corp.
    b. Cook, Loren Company.
    c. Greenheck Fan Corp.
    d. JennFan; Div. of Breidert Air Products, Inc.
    e. Penn Ventilation Companies, Inc.
    f. <Insert manufacturer's name.>

5. Centrifugal Wall Ventilators:

    a. Acme Engineering & Mfg. Corp.

b. Cook, Loren Company.
c. Greenheck Fan Corp.
d. JennFan; Div. of Breidert Air Products, Inc.
e. Penn Ventilation Companies, Inc.
f. <Insert manufacturer's name.>

6. Ceiling-Mounting Ventilators:

a. Breidert Air Products, Inc.
b. Broan Mfg. Co., Inc.
c. Cook, Loren Company.
d. Greenheck Fan Corp.
e. JennFan; Div. of Breidert Air Products, Inc.
f. NuTone Inc.
g. Penn Ventilation Companies, Inc.
h. <Insert manufacturer's name.>

7. In-Line Centrifugal Fans:

a. Acme Engineering & Mfg. Corp.
b. Cook, Loren Company.
c. Greenheck Fan Corp.
d. JennFan; Div. of Breidert Air Products, Inc.
e. Penn Ventilation Companies, Inc.
f. <Insert manufacturer's name.>

8. Propeller Fans:

a. Acme Engineering & Mfg. Corp.
b. Cook, Loren Company.
c. Greenheck Fan Corp.
d. JennFan; Div. of Breidert Air Products, Inc.
e. Penn Ventilation Companies, Inc.
f. <Insert manufacturer's name.>

2.2 UTILITY SET FANS

A. Description: Belt-driven centrifugal fans consisting of housing, wheel, fan shaft, bearings, motor and disconnect switch, drive assembly, and accessories.

B. Housing: Fabricated of [galvanized] steel with side sheets fastened with a deep lock seam or welded to scroll sheets.

1. Housing Discharge Arrangement: Adjustable to eight standard positions.

C. Fan Wheels: Single-width, single inlet; welded to cast-iron or cast-steel hub and spun-steel inlet cone, with hub keyed to shaft.

1. Blade Materials: [Steel] [Aluminum].

2. Blade Type: [Backward inclined] [Forward curved].

3. Spark-Resistant Construction: AMCA 99.

D. Fan Shaft: Turned, ground, and polished steel; keyed to wheel hub.

E. Shaft Bearings: Prelubricated and sealed, self-aligning, pillow-block-type ball bearings with ABMA 9, L_{50} of 200,000 hours.

F. Belt Drives: Factory mounted, with final alignment and belt adjustment made after installation.

1. Service Factor Based on Fan Motor: [1.5] [1.4] [1.3] [1.2].

2. Motor Pulleys: Adjustable pitch for use with motors through 5 hp; fixed pitch for use with motors larger than 5 hp. Select pulley so pitch adjustment is at the middle of adjustment range at fan design conditions.

3. Belts: Oil resistant, nonsparking, and nonstatic; matched sets for multiple belt drives.

4. Belt Guards: Fabricate of steel for motors mounted on outside of fan cabinet.

G. Accessories:

1. Backdraft Dampers: Gravity actuated with counterweight and interlocking aluminum blades and felt edges in steel frame installed on fan discharge.

2. Access Doors: Gasketed doors with latch-type handles.

3. Scroll Dampers: Single-blade damper installed at fan scroll top with adjustable linkage.

4. Inlet Screens: Removable wire mesh.

5. Drain Connections: NPS 3/4 threaded coupling drain connection installed at lowest point of housing.

6. Weather Hoods: Weather resistant with stamped vents over motor and drive compartment.

H. Coatings: [Thermoplastic vinyl] [Epoxy] [Zinc] [Synthetic resin] [Phenolic] [Color-match enamel] [Polytetrafluoroethylene] [Vinyl ester] [Hot-dip galvanized] [Powder-baked enamel]; <Insert manufacturer and trade name>.

2.3 CENTRIFUGAL ROOF VENTILATORS

A. Description: Belt-driven or direct-driven centrifugal fans consisting of housing, wheel, fan shaft, bearings, motor and disconnect switch, drive assembly, curb base, and accessories.

B. Housing: Removable, [spun-aluminum, dome top and outlet baffle] [extruded-aluminum, rectangular top] [galvanized steel, mushroom-domed top]; square, one-piece, aluminum base with venturi inlet cone.

1. Upblast Units: Provide spun-aluminum discharge baffle to direct discharge air upward, with rain and snow drains [and grease collector].

C. Fan Wheels: Aluminum hub and wheel with backward-inclined blades.

D. Belt-Driven Drive Assembly: Resiliently mounted to housing, with the following features:

1. Fan Shaft: Turned, ground, and polished steel; keyed to wheel hub.

2. Shaft Bearings: Permanently lubricated, permanently sealed, and self-aligning ball bearings.

3. Pulleys: Cast-iron, adjustable-pitch motor pulley.

4. Fan and motor isolated from exhaust airstream.

E. Accessories:

1. Variable-Speed Controller: Solid-state control to reduce speed from 100 percent to less than 50 percent.

2. Disconnect Switch: Nonfusible type, with thermal-overload protection mounted inside fan housing, factory wired through an internal aluminum conduit.

3. Bird Screens: Removable, 1/2-inch mesh, aluminum or brass wire.

4. Dampers: Counterbalanced, parallel-blade, backdraft dampers mounted in curb base; factory set to close when fan stops.

5. Motorized Dampers: Parallel-blade dampers mounted in curb base with electric actuator; wired to close when fan stops.

F. Roof Curbs: Galvanized steel; mitered and welded corners; 1-1/2-inch- thick, rigid, fiberglass insulation adhered to inside walls; and 1-1/2-inch wood nailer. Size as required to suit roof opening and fan base.

1. Configuration: [Self-flashing without a cant strip, with mounting flange] [Built-in cant and mounting flange] [Built-in raised cant and mounting flange].

2. Overall Height: [8 inches] [9-1/2 inches] [12 inches] [16 inches] [18 inches].

3. Sound Curb: Curb with sound-absorbing insulation matrix.

4. Pitch Mounting: Manufacture curb for roof slope.

5. Metal Liner: Galvanized steel.

6. Burglar Bars: [1/2-inch-] [5/8-inch-] [3/4-inch-] thick steel bars welded in place to form 6-inch squares.

7. Hinged Subbase: Galvanized steel hinged arrangement permitting service and maintenance.

8. Mounting Pedestal: Galvanized steel with removable access panel.

9. Vented Curb: Unlined with louvered vents in vertical sides.

2.4 AXIAL ROOF VENTILATORS

A. Description: Belt-driven or direct-driven axial fans consisting of housing, wheel, fan shaft, bearings, motor and disconnect switch, drive assembly, curb base, and accessories.

B. Housing: Heavy-gage, removable, spun-aluminum, dome top and outlet baffle; square, one-piece, hinged, aluminum base.

C. Fan Wheel: [Aluminum hub and blades] [Steel hub and blades].

D. Belt-Driven Drive Assembly: Resiliently mounted to housing, with the following features:

1. Fan Shaft: Turned, ground, and polished steel; keyed to wheel hub.

2. Shaft Bearings: Permanently lubricated, permanently sealed, and self-aligning ball bearings.

3. Pulleys: Cast-iron, adjustable-pitch motor pulley.

E. Accessories:

1. Disconnect Switch: Nonfusible type, with thermal-overload protection mounted inside fan housing, factory wired through an internal aluminum conduit.

2. Bird Screens: Removable, 1/2-inch mesh, aluminum or brass wire.

3. Dampers: Counterbalanced, parallel-blade, backdraft dampers mounted in curb base; factory set to close when fan stops.

4. Motorized Dampers: Parallel-blade dampers mounted in curb base with electric actuator; wired to close when fan stops.

F. Roof Curbs: Galvanized steel; mitered and welded corners; 1-1/2-inch- thick, rigid, fiberglass insulation adhered to inside walls; and 1-1/2-inch wood nailer. Size as required to suit roof opening and fan base.

1. Configuration: [Self-flashing without a cant strip, with mounting flange] [Built-in cant and mounting flange] [Built-in raised cant and mounting flange].

2. Overall Height: [8 inches] [9-1/2 inches] [12 inches] [16 inches] [18 inches].

3. Sound Curb: Curb with sound-absorbing insulation matrix.

4. Pitch Mounting: Manufacture curb for roof slope.

5. Metal Liner: Galvanized steel.

6. Burglar Bars: [1/2-inch-] [5/8-inch-] [3/4-inch-] thick steel bars welded in place to form 6-inch squares.

7. Hinged Subbase: Galvanized steel hinged arrangement permitting service and maintenance.

8. Mounting Pedestal: Galvanized steel with removable access panel.

2.5 UPBLAST PROPELLER ROOF EXHAUST FANS

A. Description: Belt-driven or direct-driven propeller fans consisting of housing, wheel, butterfly-type discharge damper, fan shaft, bearings, motor and disconnect switch, drive assembly, curb base, and accessories. Wind Band, Fan Housing, and Base: Reinforced and braced [galvanized steel] [aluminum], containing [galvanized steel] [aluminum] butterfly dampers and rain trough, motor and drive assembly, and fan wheel.

1. Damper Rods: Steel with [bronze] [nylon] bearings.

B. Fan Wheel: Replaceable, [cast-aluminum] [extruded-aluminum], airfoil blades fastened to cast-

aluminum hub; factory set pitch angle of blades.

C. Belt-Driven Drive Assembly: Resiliently mounted to housing; weatherproof housing of same material as fan housing with the following features:

1. Fan Shaft: Turned, ground, and polished steel; keyed to wheel hub.

2. Shaft Bearings: Prelubricated and sealed, self-aligning, pillow-block-type ball bearings.

3. Pulleys: Cast-iron, adjustable-pitch motor pulley.

4. Motor Mount: On outside of fan cabinet, adjustable base for belt tensioning.

D. Roof Curbs: Galvanized steel; mitered and welded corners; 1-1/2-inch- thick, rigid, fiberglass insulation adhered to inside walls; and 1-1/2-inch wood nailer. Size as required to suit roof opening and fan base.

1. Configuration: [Self-flashing without a cant strip, with mounting flange] [Built-in cant and mounting flange] [Built-in raised cant and mounting flange].

2. Overall Height: [8 inches] [9-1/2 inches] [12 inches] [16 inches] [18 inches].

3. Sound Curb: Curb with sound-absorbing insulation matrix.

4. Pitch Mounting: Manufacture curb for roof slope.

5. Metal Liner: Galvanized steel.

6. Burglar Bars: [1/2-inch-] [5/8-inch-] [3/4-inch-] thick steel bars welded in place to form 6-inch squares.

7. Hinged Sub-base: Galvanized steel hinged arrangement permitting service and maintenance.

8. Mounting Pedestal: Galvanized steel with removable access panel.

2.6 CENTRIFUGAL WALL VENTILATORS

A. Description: Belt-driven or direct-driven centrifugal fans consisting of housing, wheel, fan shaft, bearings, motor and disconnect switch, drive assembly, and accessories.

B. Housing: Heavy-gage, removable, spun-aluminum, dome top and outlet baffle; venturi inlet cone.

C. Fan Wheel: Aluminum hub and wheel with backward-inclined blades.

D. Belt-Driven Drive Assembly: Resiliently mounted to housing, with the following features:

1. Fan Shaft: Turned, ground, and polished steel; keyed to wheel hub.

2. Shaft Bearings: Permanently lubricated, permanently sealed and self-aligning ball bearings.

3. Pulleys: Cast-iron, adjustable-pitch motor pulley.

4. Fan and motor isolated from exhaust airstream.

E. Accessories:

1. Variable-Speed Controller: Solid-state control to reduce speed from 100 percent to less than 50 percent.

2. Disconnect Switch: Nonfusible type, with thermal-overload protection mounted inside fan housing, factory wired through internal aluminum conduit.

3. Bird Screens: Removable, 1/2-inch mesh, aluminum or brass wire.

4. Wall Grille: Ring type for flush mounting.

5. Dampers: Counterbalanced, parallel-blade, backdraft dampers mounted in wall sleeve; factory set to close when fan stops.

6. Motorized Dampers: Parallel-blade dampers mounted in curb base with electric actuator; wired to close when fan stops.

2.7 CEILING-MOUNTING VENTILATORS

A. Description: Centrifugal fans designed for installing in ceiling or wall or for concealed in-line applications.

B. Housing: Steel, lined with acoustical insulation.

C. Fan Wheel: Centrifugal wheels directly mounted on motor shaft. Fan shrouds, motor, and fan wheel shall be removable for service.

D. Grille: [Plastic] [Stainless-steel], louvered grille with flange on intake and thumbscrew attachment to fan housing.

E. Electrical Requirements: Junction box for electrical connection on housing and receptacle for motor plug-in.

F. Accessories:

1. Variable-Speed Controller: Solid-state control to reduce speed from 100 percent to less than 50 percent.

2. Manual Starter Switch: Single-pole rocker switch assembly with cover and pilot light.

3. Time-Delay Switch: Assembly with single-pole rocker switch, timer, and cover plate.

4. Motion Sensor: Motion detector with adjustable shutoff timer.

5. Ceiling Radiation Damper: Fire-rated assembly with ceramic blanket, stainless-steel springs, and fusible link.

6. Filter: Washable aluminum to fit between fan and grille.

7. Isolation: Rubber-in-shear vibration isolators.

8. Manufacturer's standard roof jack or wall cap, and transition fittings.

2.8 IN-LINE CENTRIFUGAL FANS

A. Description: In-line, belt-driven centrifugal fans consisting of housing, wheel, outlet guide vanes, fan shaft, bearings, motor and disconnect switch, drive assembly, mounting brackets, and accessories.

B. Housing: Split, spun aluminum with aluminum straightening vanes, inlet and outlet flanges, and support bracket adaptable to floor, side wall, or ceiling mounting.

C. Direct-Driven Units: Motor encased in housing outside of airstream, factory wired to disconnect switch located on outside of fan housing.

D. Belt-Driven Units: Motor mounted on adjustable base, with adjustable sheaves, enclosure around belts within fan housing, and lubricating tubes from fan bearings extended to outside of fan housing.

E. Fan Wheels: Aluminum, airfoil blades welded to aluminum hub.

F. Accessories:

1. Volume-Control Damper: Manually operated with quadrant lock, located in fan outlet.

2. Companion Flanges: For inlet and outlet duct connections.

3. Fan Guards: 1/2- by 1-inch mesh of galvanized steel in removable frame. Provide guard for inlet or outlet for units not connected to ductwork.

4. Motor and Drive Cover (Belt Guard): Epoxy-coated steel.

2.9 PROPELLER FANS

A. Description: Belt-driven or direct-driven propeller fans consisting of fan blades, hub, housing, orifice ring, motor, drive assembly, and accessories.

B. Housing: Galvanized steel sheet with flanged edges and integral orifice ring with baked-enamel finish coat applied after assembly.

C. Steel Fan Wheels: Formed-steel blades riveted to heavy-gage steel spider bolted to cast-iron hub.

D. Fan Wheel: Replaceable, [cast-aluminum] [extruded-aluminum], airfoil blades fastened to cast-aluminum hub; factory set pitch angle of blades.

E. Belt-Driven Drive Assembly: Resiliently mounted to housing, statically and dynamically balanced and selected for continuous operation at maximum rated fan speed and motor horsepower, with final alignment and belt adjustment made after installation.

1. Service Factor Based on Fan Motor: 1.4.

2. Fan Shaft: Turned, ground, and polished steel; keyed to wheel hub.

3. Shaft Bearings: Permanently lubricated, permanently sealed, and self-aligning ball bearings.

a. Ball-Bearing Rating Life: ABMA 9, L_{10} of 100,000 hours.

4. Pulleys: Cast iron with split, tapered bushing; dynamically balanced at factory.

5. Motor Pulleys: Adjustable pitch for use with motors through 5 hp; fixed pitch for use with motors larger than 5 hp. Select pulley so pitch adjustment is at the middle of adjustment range at fan design conditions.

6. Belts: Oil resistant, nonsparking, and nonstatic; matched sets for multiple belt drives.

7. Belt Guards: Fabricate of steel for motors mounted on outside of fan cabinet.

F. Accessories:

1. Gravity Shutters: Aluminum blades in aluminum frame; interlocked blades with nylon bearings.

2. Motor-Side Back Guard: Galvanized steel, complying with OSHA specifications, removable for maintenance.

3. Wall Sleeve: Galvanized steel to match fan and accessory size.

4. Weathershield Hood: Galvanized steel to match fan and accessory size.

5. Weathershield Front Guard: Galvanized steel with expanded metal screen.

6. Variable-Speed Controller: Solid-state control to reduce speed from 100 percent to less than 50 percent.

7. Disconnect Switch: Nonfusible type, with thermal-overload protection mounted inside fan housing, factory wired through an internal aluminum conduit.

2.10 MOTORS

A. Comply with requirements in Division 15 Section "Motors."

B. Enclosure Type: Guarded drip proof.

2.11 SOURCE QUALITY CONTROL

A. Sound-Power Level Ratings: Comply with AMCA 301, "Methods for Calculating Fan Sound Ratings from Laboratory Test Data." Factory test fans according to AMCA 300, "Reverberant Room Method for Sound Testing of Fans." Label fans with the AMCA-Certified Ratings Seal.

B. Fan Performance Ratings: Establish flow rate, pressure, power, air density, speed of rotation, and efficiency by factory tests and ratings according to AMCA 210, "Laboratory Methods of Testing Fans for Rating."

PART 3 – EXECUTION

3.1 INSTALLATION

A. Install power ventilators level and plumb.

B. Support units using [spring isolators] [restrained spring isolators] <Insert other device> having a static deflection of [1 inch] <Insert other deflection>. Vibration- and seismic-control devices are specified in Division 15 Section "Mechanical Vibration Controls and Seismic Restraints."

1. Secure vibration and seismic controls to concrete bases using anchor bolts cast in concrete base.

C. Install floor-mounting units on concrete bases. Concrete, reinforcement, and formwork requirements are specified in Division 3 Section "Cast-in-Place Concrete."

D. Install floor-mounting units on concrete bases designed to withstand, without damage to equipment, the seismic force required by code. Concrete, reinforcement, and formwork requirements are specified in Division 3 Section "Cast-in-Place Concrete."

E. Secure roof-mounting fans to roof curbs with cadmium-plated hardware. Refer to Division 7 Section "Roof Accessories" for installation of roof curbs.

F. Ceiling Units: Suspend units from structure; use steel wire or metal straps.

G. Support suspended units from structure using threaded steel rods and [spring hangers] <Insert other vibration isolators>. Vibration-control devices are specified in Division 15 Section "Mechanical Vibration Controls and Seismic Restraints."

1. In seismic zones, restrain support units.

H. Install units with clearances for service and maintenance.

I. Label units according to requirements specified in Division 15 Section "Mechanical Identification."

3.2 CONNECTIONS

A. Duct installation and connection requirements are specified in other Division 15 Sections. Drawings indicate general arrangement of ducts and duct accessories. Make final duct connections with flexible connectors. Flexible connectors are specified in Division 15 Section "Duct Accessories."

B. Install ducts adjacent to power ventilators to allow service and maintenance.

C. Ground equipment.

D. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

3.3 FIELD QUALITY CONTROL

A. Equipment Startup Checks:

1. Verify that shipping, blocking, and bracing are removed.

2. Verify that unit is secure on mountings and supporting devices and connections to ducts and electrical components are complete. Verify that proper thermal-overload protection is installed in motors, starters, and disconnect switches.

3. Verify that cleaning and adjusting are complete.

4. Disconnect fan drive from motor, verify proper motor rotation direction, and verify fan wheel free rotation and smooth bearing operation. Reconnect fan drive system, align and adjust belts, and install belt guards.

5. Verify lubrication for bearings and other moving parts.

6. Verify that manual and automatic volume control and fire and smoke dampers in connected ductwork systems are in fully open position.

7. Disable automatic temperature-control operators.

B. Starting Procedures:

1. Energize motor and adjust fan to indicated rpm.

2. Measure and record motor voltage and amperage.

C. Operational Test: After electrical circuitry has been energized, start units to confirm proper motor rotation and unit operation. Remove malfunctioning units, replace with new units, and retest.

D. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

E. Shut unit down and reconnect automatic temperature-control operators.

F. Refer to Division 15 Section "Testing, Adjusting, and Balancing" for testing, adjusting, and balancing procedures.

G. Replace fan and motor pulleys as required to achieve design airflow.

H. Repair or replace malfunctioning units. Retest as specified above after repairs or replacements are made.

3.4 ADJUSTING

A. Adjust damper linkages for proper damper operation.

B. Adjust belt tension.

C. Lubricate bearings.

3.5 CLEANING

A. On completion of installation, internally clean fans according to manufacturer's written instructions. Remove foreign material and construction debris. Vacuum fan wheel and cabinet.

B. After completing system installation, including outlet fitting and devices, inspect exposed finish. Remove burrs, dirt, and construction debris and repair damaged finishes.

3.6 COMMISSIONING

A. Verify that power ventilators are installed and connected according to the Contract Documents.

B. Adjust flows and controls to deliver specified performance.

C. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

3.7 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain power ventilators.

1. Train Owner's maintenance personnel on procedures and schedules for starting and stopping, troubleshooting, servicing, and maintaining equipment and schedules.

2. Review data in maintenance manuals. Refer to Division 1.

3. Schedule training with Owner, through Architect, with at least seven days' advance notice.

END OF SECTION

SECTION 26 05 00

GENERAL ELECTRICAL REQUIREMENTS

PART 1 – GENERAL

1.1 DESCRIPTION:

A. Electrical subcontractor shall attend the Commissioning pre-construction meeting and other required meetings to facilitate coordination and execution of the commissioning scope.

B. Provide pre-functional checklists and complete functional testing under the supervision of the commissioning authority, including preparation of data in form templates. Provide qualifying calibrated instrumentation needed for the prescribed testing procedures.

C. Provide the services of specialized technicians for testing and validation. Technicians may be supplied by the equipment suppliers or from qualified independent testing services.

D. Systems that shall be commissioned are:

1. Lighting system and controls

2. Fire Life and Safety system using Chief's 4 testing procedures

E. Detailed descriptions of electrical commissioning requirements are provided in City of Los Angeles Specification 01810 – Fundamental Commissioning Requirements.

F. Comply with all provisions of the General Conditions, Supplementary Conditions and General Requirements as applicable to work of all Sections of Division 26 concerning definitions, guarantees, submittals, as-builts, clean-up, etc.

G. Examine all Technical Sections for work required to be included in work in Sections of Division 26 - Electrical Work.

H. All work of this Division shall be coordinated with work of other trades.

1.2 SCOPE

A. Required: Provide all labor, materials, equipment, tools and appliances required to furnish and install all electrical work shown on the Contract Drawing and herein specified in the Sections of Division 16 complete and operable but not limited to the following:

1. All construction power and lighting and power for testing equipment and systems through final acceptance of test.

2. Complete lighting and power system(s) including branch circuits, fixtures, outlets, lamps, switches, controllers, and auxiliary equipment.

3. Complete distribution system(s) including switchboards, panelboards, transformers, feeders, and auxiliary equipment.

4. Complete system of exterior (vandal resistant) lighting.

5. Complete Grounding System.

6. Complete Music and Paging System(s)

7. Complete Intercom System(s)

   a. Telephone system, including service raceways, cabinets, backboards, grounding, and ac power provisions.

   b. Television antenna and coaxial cable distribution system.

8. Distribution for emergency power system including but not limited to a central battery inverter, lighting panelboard and branded circuit wiring.

9. Conduit System including backboards, pullboxes, wiring devices, grounding, etc. for the following as applicable:

   a. Telephone System

   b. Television antenna and coaxial cable distribution.

10. Control wiring and devices for equipment specified in Sections of Division 16 and other Technical Sections, except where specifically indicated or noted otherwise on the Contract Drawings or in the Specifications.

11. Complete and Operable Fire Alarm System.

    Connection and testing of electrical equipment and controls specified in Division 16 and other technical sections, except where specifically indicated or noted elsewhere on the Contract Drawing or in the Specifications.

12. Applicable excavating, trenching and backfilling.

1.3 WORK NOT INCLUDED

A. Furnishing all electrical or partially electrically devices related uniquely to mechanical equipment and only as specified in the Mechanical Division.

B. Furnishing and installing of all motors.

1.4 LEGAL REQUIREMENTS AND STANDARDS

A. Required: Comply with the latest, as applicable and effective, during the progress of Contracted Work.

1. Latest Los Angeles City Electrical, Fire and Building Codes and U.B.C. Supplement.

2. California State Administrative Code, Title 24, State Building Standard.

3. (CAL/OSHA) California State Occupational Safety and Health Act.

4. California State Fire Marshal Standards.

5. Los Angeles City Department of Water and Power.

6. U.L. - Underwriters Laboratories Inc.

7. NEC - National Electric Code.

8. ASTM - American Society of Testing and Materials.

9. Current publications of the National Fire Protection Association.

10. National and American Standards Association.

B. General Compliance as Applicable

1. Drawings and specification requirements shall govern where they exceed Code requirements.

2. Where requirements between governing Codes and Regulations vary, the more restrictive provision shall apply.

3. Nothing contained in Contract Documents shall be construed as authority or permission to disregard or violate legal requirements.

1.5 GENERAL REQUIREMENTS

A. Permits and Inspections:

1. Apply and pay for all required electrical work (construction and installation) prescribed by legally constituted public authorities.

2. Arrange and pay for all required inspections or examinations and shall deliver "certifications" of such inspections to the City Engineer prior to acceptance of the electrical work. Obtain approved plans from the Los Angeles City Department of Building and Safety.

B. Site Inspections:

1. Carefully examine the job-site and existing facilities and compare the Contract Drawings for work coordination.

2. By act of submitting bid, it will be deemed the Contractor has made required inspections and has accepted such job-site conditions and has made allowances thereof in the preparation of "Bid" figures.

C. Verification of Dimensions: All dimensions (scaled, figured or noted) are approximate, given for estimating purposes. Before proceeding with work Contractor shall carefully check and verify all dimensions, sizes, etc. and shall assume full responsibility for proper fitting in and attachment of all materials and equipment to other equipment and to the structure.

D. Examination of the Contract Drawings:

1. Carefully study Contract Drawings and Specifications to verify if any work as laid out or indicated is contrary to or in conflict with applicable Codes and Standards. Report to the City Engineer such data prior to submittal of Bid(s).

2. The City Engineer will then instruct the Contractor on how to proceed.

3. By the act of submitting a "Bid" or "Proposal" Contractor is deemed to have made such study and has accepted all job-site conditions.

E. Substitutions:

1. Items, articles or products named on the Contract Drawings and in the Specifications are intended to establish a standard of quality and required functional performance.

2. If the Contractor desires to propose a substitution or alternate, submit a complete list with detailed specifications and manufacturer's data which differ from those specified within thirty-five (35) days after award of Contract for approval or rejection by the City Engineer.

3. If such submittals are not approved, use specified materials and equipment throughout the Electrical Work.

F. Interpretations:

1. Make all requests for interpretations of the Contract Drawings and/or Specifications to the Contractor through the City Engineer.

2. Manufacturer's or Supplier's requests for interpretations will be referred to the Contractor.

G. Submittals: Conform to applicable provisions of Section 01330 of the General Requirements and as hereinafter specified.

1. Prepare, review and coordinate schedule of submittals, determining necessary lead time for preparation, submitting, checking, and ordering and delivering materials and equipment to the job-site for timely arrival and conformance with the overall Construction schedule.

2. All submittals will be checked for general compliance with Specifications only. Contractor will be responsible for deviations from the Drawings or Specifications and for errors or omissions of any sort in the Submittals.

3. Shop drawings shall be submitted in completed groups of materials (i.e., all lighting fixtures or all switchgear, etc.). The Contractor shall add and sign the following paragraph on all equipment and materials submitted for review.

a. "It is hereby certified that the (equipment) (material) shown and marked in this submittal is that proposed to be incorporated into the project; is in compliance with the Contract Drawings and Specifications and can be installed in the allocated spaces".

b. Failure to add the above written statement for compliance will result in return of submittals to be reviewed.

4. All required submittals on electrical items and equipment shall include complete catalog information such as construction ratings, insulation systems, including manufacturer's certification that items or equipment meet or exceed U.L. and Trade Standards, and the Specifications.

5. Equipment Floor Plans: Submit after approval of material and/or equipment is secured. Prepare for each electrical equipment room drawn to 1/2" = 1'0" scale. Layout drawing shall be to exact scale.

*6. Materials list of items and equipment proposed to be provided for the work of this Division 16 and shall include the following as applicable:

   a. Service and distribution switchgear.

   b. Motor control centers.

   c. Central battery inverter.

   d. Lighting panelboards.

   e. Dry type transformers.

   f. Conduits.

   g. Conductors.

   h. Electrical equipment layout at 1/2" = 1'-0" scale indicating exact dimensions of equipment, clearances, housekeeping pads.

   i. Disconnect switches, pull boxes and fuses.

   j. Lighting fixtures.

   k. Fire alarm and detection system.

   l. Control devices, standard and special receptacles, switches and finish device plates.

   m. Cabinets for signal and telephone systems, special terminals and cabinets.

   n. Vibration isolators, including lateral and vertical seismic restraints.

   o. All fabricated equipment.

   p. Clock and program system.

   q. Time clocks, contactors, control switches, etc. including wiring diagrams and sequence of operation.

   r. Grounding Systems.

   s. Cable Trays.

H. Special Submissions:

1. Test Reports for the Following:

a. Ground fault devices.
b. Megger Readings: Ground system, motors, feeders and switchgear.
c. Voltage Readings: Distribution, service and motors.
d. Fire alarm system.

2. Maintenance service and operating manuals for all equipment.

3. Items as outlined in other Sections.

I. "No Exceptions Taken": Be responsible for equipment ordered and/or installed prior to receipt of shop drawings returned from the City Engineer bearing the Electrical Engineer's stamp of "No Exceptions Taken". Corrections or modifications to equipment as noted on shop drawings shall be performed or equipment removed from the job site at request of City Engineer without additional compensation.

J. Disapprovals: Any article or equipment supplied by the Contractor disapproved by the City Engineer as not conforming to the Specifications or not of proper quality or grade or suitability shall be deleted and suitable article or equipment be provided in lieu thereof in conformance with the Specifications at no added cost to the City.

K. Terminology: Generally speaking throughout this Division 16 of the Specifications when the words "or equal" or other words of similar intent and meaning are used implying judgment or decision is to be exercised, it is understood that it is the judgment, discretion, or decision of the City Engineer to which reference is made.

Note: Specifier should name at least two manufacturers plus the words "or equal".

L. Modification of Contract Drawings: In each case where proposed substitute material or equipment will require changes to the design of the Project as indicated on the drawings, for proper installation or operation, appropriate proposed revision drawings prepared and signed by a licensed Engineer shall be furnished by the Contractor for approval by the City Engineer. Make such drawings sufficiently complete for the proper installation and operation of the proposed substitute materials or equipment, and for construction by all of the involved trades of the proposed revisions. The cost of the drawings and the proposed revised construction shall be borne by the Contractor.

M. Record Drawings: Provide in strict accordance with applicable provisions of Section 30 in the GENERAL CONDITIONS of these Specifications concerning accurate locations of raceways, cable runs, outlets and equipment. See also applicable provisions of Section 01783-RECORD (as-built) Drawings of the GENERAL REQUIREMENTS of these Specifications.

N. Operation and Maintenance Manuals: Prior to final acceptance of Contracted Work by the City, furnish 4 bound copies of operation and maintenance manuals for all electrical equipment, as required in this Section. The contents shall include description of equipment, names of manufacturers, parts lists, model numbers, maintenance schedules, location of nearest facility for replacement

parts or service, wiring and connection diagrams, internal schematic drawings, and other electrical/mechanical data necessary for operation and maintenance.

1.7 QUALITY ASSURANCE

A. General:

1. All equipment and accessories to be the product of a manufacturer regularly engaged in its manufacture.

2. Supply all equipment and accessories new, free from defects and listed by Underwriters' Laboratories, Inc. or bearing its label. Special or custom equipment must bear the label of laboratory recognized by the City of Los Angeles Department of Building and Safety.

3. Supply all equipment and accessories in compliance with the applicable standards listed in Article 1. 5 of this Section and with all applicable National, State and Local codes.

4. All items of a given type shall be the product of the same manufacturer.

B. Labor: Use adequate numbers of skilled workers who are thoroughly trained and experienced in the necessary crafts and completely familiar with specifications, requirements and methods needed for proper performance of the work of Electrical Division 16.

C. Superintendence: Provide an experienced Superintendent to be in charge of erection and/or installation of electrical work together with journeymen helpers to properly unload, erect, connect, adjust, operate and test the work involved to provide a neat, workmanlike and operable installation.

1.8 LOCATION

A. The location of apparatus and equipment indicated on the Contract Drawings are approximate only and shall be changed to meet the Architectural and Structural conditions as required.

B. Any change in work which has not been installed shall be made by the Contractor without additional compensation, except changes which are caused by Architectural changes which increase or decrease the size of apparatus or materials specified or indicated on the drawings. The Contractor shall submit a detailed breakdown cost estimate of, or credit for, such changes and shall proceed only upon the written authority of the Engineer.

C. All apparatus and equipment shall be furnished and installed in a manner and in locations avoiding all obstructions, preserving head room, and keeping openings and passageways clear. Changes shall be made in locations of equipment and materials which may be necessary in order to accomplish this.

D. The drawings are essentially diagrammatic to the extent that many offsets, bends, special fittings, and exact locations are not indicated. The Contractor shall carefully study the Contract Drawings and premises in order to determine the best methods, exact location, routes, and building obstructions, etc., and shall install all apparatus and equipment in the available location.

1.9 CUTTING AND PATCHING

A. Conform to provisions of Section 01 73 29 of the General Requirements.

B. The Contractor shall do all drilling, cutting and patching of the general construction work existing or new, rough finish and trim, which may be required for the installation of electrical equipment. All patching shall be of the same materials, workmanship and finish as the original work, and shall accurately match all surrounding work.

C. All cutting and patching shall be as approved by the Engineer or his authorized representative.

1.10 PROTECTION OF WORK

A. The Contractor shall protect all work, material and equipment from damage from any cause whatsoever, and shall provide adequate and proper storage facilities during the progress of the Work. Contractor shall provide for the safety and good condition of all work until final acceptance of the work by the City, and replace all damaged or defective work, materials and equipment before requesting final acceptance.

B. The Contractor shall be held responsible for the protection and correction of the work of all trades from smears, splashes, stain or damages that might occur in the progress of the work.

1.11 WORK COORDINATION

A. The Contractor shall so order electrical work that progress will harmonize with that of other trades so that all work may proceed as expeditiously as possible.

B. So far as possible, the work has been indicated on the Contract Drawings in such positions as to suit and accommodate the work of the other trades, but the work as indicated is largely diagrammatic, and the correct finish position of all equipment and materials cannot always be indicated. Therefore, the Contractor is hereby made directly responsible for the correct placing of electrical work and the proper location and connection of electrical work in relation to the work of other trades.

1.12 JOB SAFETY

A. The Contractor shall be solely and completely responsible for the condition of the premises on which the work is performed and for the safety of all persons and property on the site during performance of the Contract. These requirements shall not be limited to normal working hours, but shall apply continuously.

B. Contractor shall conform to all governing safety regulations.

PART 2 - PRODUCTS

2.1 MATERIALS

A. All materials, items and equipment furnished under this Contract shall be new, recently manufactured and available locally.

B. All materials shall comply with applicable legal requirements and standards hereinbefore specified in this specification.

C. The label of listing by UL shall appear on all materials and equipment for which standards have been established by that agency.

D. Where local or other authorities having jurisdiction have established label or approval requirements, furnish all materials and equipment with either the required labels affixed or the necessary written approval.

E. Examine the Drawings and Specifications and determine the work to be performed by the electrical and other trades. Provide the type and quantity of electrical materials and equipment necessary to complete this work and all systems in proper operation, tested and ready for use.

F. Provide and install all incidental items not indicated on the Drawings nor mentioned in the Specifications that belong to the work described or are required for complete systems.

2.2 MATERIALS LISTING

A, Required: See Subsection 1. 6 G 6 of this specification.

PART 3 - EXECUTION

3.1 UTILITY SERVICES (AS APPLICABLE)

A. Every effort has been made to determine as accurately as possible the requirements of the electrical and telephone services. However, before submitting bid, the Contractor shall verify the locations shown on the plans and shall include sufficient funds for material, labor and utility fees for installation of an approved utility service.

B. Before any work is performed on these facilities, verify all electrical, civil, architectural and structural, dimensional and other requirements related to these facilities with the serving utility companies.

C. Should any major changes to the work indicated be necessary to complete the power and telephone systems, notify the City Engineer at once and cease all work affected until approval for required modifications has been obtained from the City Engineer.

3.2 WORK RESPONSIBILITIES

A. The drawings indicate diagrammatically the desired locations or arrangement of conduit runs, outlets, equipment, etc., and are to be followed as closely as possible. Proper judgment must be exercised in executing the work so as to secure the best possible installation in the available space and to overcome local difficulties due to space limitations or interference with structural conditions. The Contractor is responsible for the correct placement and coordination of electrical work in relation to the work of other trades. Advise appropriate trade as to locations of access panels.

B. Locations shown on architectural plans and elevations shall take precedence over electrical plan locations, but where a major conflict is evident; notify the City Engineer for instructions.

C. In the event changes in the indicated locations or arrangement are necessary due to developed conditions in the building construction or rearrangement of furnishings or equipment, such changes shall be made without extra cost, providing the change is ordered before the conduit runs, etc., and work directly connected to same are installed and no extra materials are required.

D. Where equipment is furnished by others, verify dimensions and the correct location of this equipment before proceeding with the roughing in of connections.

E. Lighting fixtures and equipment disconnects in mechanical spaces and elevator machine rooms and pits are shown in their approximate locations only. Do no install outlets, switches, equipment disconnects or fixtures until mechanical piping and ductwork are installed; then lights shall be installed in locations best suited for equipment arrangement or as directed by the City Engineer. Verify exact locations of elevator equipment disconnects, switches, receptacles and fixtures in elevator machine room and pits with the elevator equipment installer before rough in.

F. All scaled and figured dimensions are approximate of typical equipment of the class indicated. Before proceeding with any work, carefully check and verify all dimensions, sizes, etc., with the drawings to see that the equipment will fit into the spaces provided without violation of applicable codes.

G. Should any changes to the work indicated on the Drawings or described in the Specifications be necessary in order to comply with the above requirements, notify the City Engineer immediately and cease work for all parts of the Contract Work which are affected until approval for any required modifications to the construction has been obtained from the City Engineer.

H. Be responsible for any cooperative work which must be altered due to lack of proper supervision or failure to make proper provisions in time. Such changes shall be under the direction of the City Engineer and shall be made to their satisfaction.

I. Perform all work with competent and skilled personnel. Conform to provisions of Subsection 1.07B of this specification.

J. All work, including aesthetic as well as electrical and mechanical aspects of the work, shall be of the highest quality consistent with the best practices of the trade.

K. Replace or repair, without additional compensation, any work which, in the opinion of the City Engineer does not comply with these requirements.

3.3 GENERAL INSTALLATION (AS APPLICABLE)

A. Unless otherwise specified elsewhere in the Specifications, do all excavating necessary for the proper installation of the electrical work in accordance with the "Section 31 23 13 – Excavation and Fill.

B. Locations of Openings: Obtain approval for all chases, shafts and openings required for the installation of the electrical work. Cutting or drilling in any structural member is prohibited without written approval of the City Engineer. Furnish access panels as required.

C. Finish Around Sleeves: Rough edges shall be finished smooth. Space between conduit and sleeves where conduit passes through exterior walls shall be sealed to permit movement of conduit but prevent entrance of water. Space between conduit and sleeves where conduit passes through fire rated interior walls and slabs shall be sealed with approved materials to provide a fire barrier conforming to the requirements of the governing authorities having jurisdiction, use Dow Corning 3-6548 RTV silicone foam or equal by General Electric if so approved by the applicable and/or authorities having jurisdiction of the job site.

D. Wherever conduit extends through roof, furnish and install flashings in accordance with City Engineer's directions.

E. Be responsible for all cutting and patching which may be required for the proper installation of the electrical work. Work shall be performed by the trade originally installing same and paid for under this Section of the work.

F. Protect all work, materials and equipment from damage from any cause whatever and provide adequate and proper storage facilities during the progress of the work. Storage outdoors shall be weather protected and shall include space heaters to prevent condensation. Provide for the safety and good condition of all work until final acceptance of the work by the City Engineer and replace all damaged or defective work, materials and equipment before requesting final acceptance at no added cost to the City.

G. Conduit and Equipment to be installed: Clean thoroughly to remove plaster, spattered paint, cement and dirt on both exterior and interior.

H. Conduit and Equipment to be painted: Clean all conduits exposed to view in completed structure by removing plaster and dirt. Remove grease, oil and similar material from conduit and equipment by wiping with clean rags and suitable solvents in preparation for paint.

I. All Items with Factory Finish: Remove cement, plaster, grease and oil, and leave all surfaces, including cracks and corners, clean and polished. Touch up any scratched or bare spots to match finish. Factory finish may be approved as prime coat by the Engineer (see "Painting" Section).

J. Site Cleaning: Remove from site all packing cartons, scrap materials and other rubbish relating to electrical installation.

K. Electrical equipment and materials exposed to public and in finished areas shall be finish-painted after installation to coordinate with surrounding walls. Surfaces shall be thoroughly cleaned for receiving painting. Paint color coordination shall be as directed by the City Engineer. Paint shall be identical to that on adjacent surfaces to insure proper matching of quality and color with surrounding areas.

3.4 EXCAVATION, CUTTING AND PATCHING

A. All excavating, trenching and backfilling required for the work of this Division shall conform to the applicable requirements of the Section 31 23 13 – Excavation and Fill in the Project Specifications. All excavating and backfilling connected with electrical work, repaving all cuts and providing and maintaining all protective measures for the electrical work excavation required by the governing authorities having jurisdiction shall be performed as a part of the work of this Division.

B. At a time in advance of the work, verify all openings indicated on the Drawings. Should the work of this division require it, furnish new instruction as to requirements for these openings, subject to the Engineer's approval. All cutting, patching and reinforcement of the building (subject to the City Engineer's approval) shall be performed under the Section of the Specifications under which the work was originally performed, but the coat shall be an obligation of the Contractor.

3.5 TESTS

A. Conduct resistance to ground tests by qualified personnel to measure resistance to ground at all grounding electrodes. Make tests before slabs of affected areas are poured in order that corrective measures, if requested, may be taken. Submit to the City Engineer a report showing the results of these measurements. If the resistances exceed values specified elsewhere, perform all corrective measures as directed by the City Engineer at no additional cost to City.

B. Prior to energizing any motors, measure the service voltage for phase balance and report immediately to the City Engineer if unbalance exceeds 1% from means.

C. Measure the three-phase voltage at no load and at maximum load conditions and submit to the City Engineer a report showing the results of these measurements.

D. Upon completion of the work and adjustment of all equipment, conduct an operating test for approval at such time as the Engineer directs. Conduct the test in the presence of an authorized representative of the State. Demonstrate all systems and equipment to operate in accordance with all requirements of the Contract documents and to be free from all electrical and mechanical defects. Provide all systems free from short circuits and grounds and show an insulation resistance between phase conductors and ground not less than the requirements of the governing electric code. Test all circuits for proper neutral connections.

E. Complete all tests prior to final inspection of project, including corrective work based on the results of the tests.

F. Perform special tests on systems and equipment as specified herein in other sections of this division, using personnel qualified to perform such tests.

G. Measure voltage on secondary side of all transformers with full load connected and adjust taps to provide rated secondary voltage.

H. Submit to the City Engineer a report showing test voltage of L-N on the secondary's of all transformers.

3.6 PROTECTION

A. Besides the provisions of Subsection 1.10 of this Section comply with the following:

1. Protect all finish parts of the materials and equipment against damage during the progress of the work and until final completion and acceptance. Cover all materials and equipment in storage and during construction in such a manner that no finished surfaces will be damaged or marred. Keep all moving parts clean, dry and lubricated.

3.7 PRELIMINARY OPERATIONS

A. Required: Should the City require that any portion of the systems or equipment be operated prior to the final scheduled dates for completion and acceptance of the work, the Contractor shall consent. Such operation shall be under the direct supervision of, and at the expense of the Contractor, and shall not be construed as an acceptance of any of the work by the City.

3.8 CLEANING UP

A. Upon completion of the work and at various times during the progress of the work, remove from the building all surplus materials, rubbish and debris resulting from the work of this division and leave the involved portions of the job-site in a neat, clean and acceptable conditions.

B. Thoroughly clean all switchgear, apparatus, exposed conduit, metal work and accessories for the work of this Division of cement, plaster and other deleterious materials; remove all grease and oil spots with cleaning solvent; carefully wipe all surfaces and scrape all cracks and corners clean.

C. Thoroughly polish all chromium and all plated work. Remove all dirt and stains from lighting fixtures.

D. Leave the entire installation in a neat, clean and usable condition.

3.9 COMPLETION

A. The work will not be reviewed for final acceptance until operating and maintenance data, manufacturer's literature, panel directories and nameplates specified herein have been approved and properly posted or installed and final cleaning of equipment and premises has been completed.

B. When the installation is complete and all adjustments have been made, operate the systems for a period of one week, during which time demonstrate to the City Engineer that the systems are completed and operating in conformance with the Specifications.

3.10 GUARANTEE

A. Conform to applicable provisions of the GENERAL CONDITIONS of these Specifications.

B. Required: Except as may be specified under other sections in the Specifications, guarantee all equipment furnished under the specifications for a period of one year from date of acceptance against defective workmanship and material, and improper installation. Upon notification of failure, correct deficiency immediately and without cost to the City.

C. Standard warranty of manufacturer shall apply for replacement of parts after expiration of the above period. Manufacturer shall furnish replacement parts to the City or his service agency as directed. Furnish to the City Engineer printed manufacturer's warranties complete with material included and expiration dates, upon completion of project.

3.11 OPERATING AND MAINTENANCE DATA

A. Required: Submit to the City Engineer, complete and at one time, prior to acceptance of the installation, 10 copies of manufacturer's instructions for operation and maintenance of electrical equipment, including replacement parts lists. Each set to be bound in an indexed loose leaf ring binder with permanent cover and permanent identification on back.

3.12 RECORD DRAWINGS

A. Required: Conform to the provisions of Subsection 1. 6 M of this Section and as noted hereinafter as applicable.

B. Provide and maintain in good order at the field office a complete set of electrical contract prints. All changes to the contract shall be clearly recorded on this set of prints and initialed by the Contractor on a weekly basis. At the end of the project transfer all changes, using same symbols, to one set of Mylar transparencies. Obtain Mylar transparencies from the Engineer at Contractor's cost.

C. Accurately indicate and dimension all underground conduit runs and conduit stub-outs and all pullboxes from building walls on all Record Drawings.

D. Upon completion of the work and as a prerequisite to issuance of certificate for final payment, deliver one complete set of final prints of the mylars and the Mylar originals themselves.

E. Initial and identify name and telephone number of installing Contractor on all sheets as being a correct and accurate record of the installation. This also includes, but is not limited to, fire alarm and control systems.

3.13 INSPECTION AND ACCEPTANCE PROCEDURES

The City Engineer will submit observation reports periodically during the construction phase detailing Contract deficiencies. The Contractor is responsible for making all corrections immediately to avoid delaying other trades. Final acceptances of the project will not be made until all items have been corrected.

3.14 FINAL ACCEPTANCE OF ELECTRICAL SYSTEMS

A. Prior to Final Acceptance of operating electrical systems Contractor shall do the following, as applicable:

1. Provide materials of the type and quality specified and as necessary for proper operation, tested and ready for use.

2. Deliver to the City Engineer the "as-built" transparency and set of prints as "Record Drawings".

3. Furnish the required operating and maintenance data/manuals.

4. Clean-up of the project pertaining to this Division of the work, as hereinbefore noted in Subsection 3. 8 of this Division.

5. After installation has been completed and adjustments made, operate the system for a period of one week, during which time, demonstrate to

the City Engineer that all systems are complete and operating in conformance with Contract documents.

6. Conduct all tests required and as specified in Sections of this Division and submit test reports and corrective actions taken.

7. Submission of all warranties and guarantees.

B. Final Acceptance of Electrical Work Shall Be Contingent On The Following:

1. Contractor replacing defective materials and workmanship.

2. Upon completion of work and adjustments made, Contractor shall conduct an operating test for each system for approval at such time as City Engineer directs. Conduct test in presence of authorized representative of the City Engineer demonstrate that systems and equipment do operate in accordance with requirements of the Contract documents and are free from electrical and mechanical defects.

3. Contractor shall provide the necessary training programs and instructions to the City's representative.

4. Submit copies of manufacturer's instructions and maintenance of electrical equipment including replacement parts lists. Each set shall include one set of shop drawings of equipment installed.

3.15 SUBMITTALS FOR CHANGE ORDERS

A. General: When changes are made during the construction phase, deletions and additions shall be presented in a manner that will indicate the cost of each item of material and corresponding labor. Overhead and profit makeup shall be then added in accordance with the requirements of the GENERAL CONDITIONS.

1. Unit costs shall apply in event of changes, additions and deletions to the contract, as follows:

2. Submit with Bid Costs a unit cost, covering one hour of labor, including all applicable supervision, nonproductive labor, burdens, benefits, insurance, taxes, direct and indirect job expenses including drawings, engineering, temporary power, warehouse, tools, equipment, clean-up, bonds, overhead and profit, charged for labor. Unit cost of labor shall be applicable for duration through completion of the project.

3. Material unit costs shall be based on the latest edition of "Electrical Trade Book", published by Trade Service Publications, Inc. Unit cost shall be taken from extreme right-hand column.

4. Labor unit quantities, for specific items required, shall be those listed in the third column from the National Electrical Contractors' Association, Inc., "NECA Manual of Labor Units".

END OF SECTION

SECTION 26 05 33

CONDUITS

PART 1 - GENERAL

1.1 THE REQUIREMENT

A. The CONTRACTOR shall furnish all tools, equipment, materials, and supplies and shall perform all labor required to complete the work as indicated on the Drawings and specified herein.

1.2 RELATED WORK SPECIFIED ELSEWHERE

A. The following Divisions and Sections applies to the WORK of this Section. Other Sections of the Specifications, not referenced below, shall also apply to the extent required for proper performance of this WORK.

1. Division 32 Site Work.
2. Division 03 Concrete.
3. Division 09 Finishes.
4. Division 11 Equipment.
5 Division 22 Plumbing.
6. DIVISION 26 ELECTRICAL

B. Materials and equipment furnished and installed under Divisions 11 and 22 with raceway and electrical conductors furnished, installed, and connected under Division 26, Electrical.

1.3 REFERENCE CODES AND STANDARDS

A. All work specified herein shall conform to or exceed the applicable requirements of the referenced portions of the following publications to the extent that the provisions thereof are not in conflict with other provisions of these specifications.

B. Comply with the current provisions of the following Codes and Standards.

1. Codes and Standards:

LAEC	City of Los Angeles Electrical Code, latest adopted edition.

2. Commercial Standards:

ANSI C80.1	Electrical Rigid Steel Conduit (ERSC).
ANSI/NEMA FB 1	Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit
ANSI/UL 467	Grounding and Bonding Equipment, Safety Standard For.
NEMA TC 2	Electrical Polyvinyl Chloride (PVC) Conduit
NEMA TC 3	Polyvinyl Chloride (PVC) Fittings

NEMA VE-1	Metal Cable Tray Systems.
UL 6	Electrical Rigid Metal Conduit - Steel

C. All equipment furnished by the CONTRACTOR shall be listed by and shall bear the label of Underwriters' Laboratories, Incorporated (UL), or of an independent testing laboratory acceptable to the Building and Safety Department of the City of Los Angeles.

D. The construction and installation of all electrical equipment and materials shall comply with all provisions of the CAL OSHA Safety orders Title 8 CCR, as applicable, State Building Standards, and applicable local codes and regulations.

1.4 CONTRACTOR SUBMITTALS

A. Submittals shall be made in accordance with the requirements of Section 16020 Municipal Facilities General Electrical Requirements.

B. The following submittals and specific information shall be provided.

1. Catalog cuts, bulletins, or brochures shall be submitted for mass produced non-custom material.

2. The CONTRACTOR shall furnish copies of the manufacturer’s certified test reports for the material being supplied to establish compliance with NEMA RN-1.

1.5 QUALITY ASSURANCE

A. Quality Assurance shall be in accordance with Section 16010 Municipal Facilities General Electrical Requirements.

PART 2 - PRODUCTS

2.1 RIGID GALVANIZED STEEL CONDUIT

A. Use rigid steel conduit, including bushings, couplings, elbows, nipples, and other fittings, galvanized by hot-dipping, and meeting the requirements of ANSI C80.1, ANSI/NEMA FB 1, UL, and the LAEC. Do not use setscrew type couplings, bushings, bends, nipples, and other fittings, unless approved by the ENGINEER or the INSPECTOR. Factory bends are not permitted unless approved by the ENGINEER or the INSPECTOR. Conduit bending radius shall not be less than the minimum cable bending radius of the cable to be installed. See NEC Section 300.34 for conductor bending radius.

2.2 PVC SCHEDULE 40 CONDUIT

A. Use rigid PVC Schedule 40 conduit, UL listed for concrete-encased, underground direct burial, concealed and direct sunlight exposed use, and UL listed and marked for use with conductors having 90 degrees C insulation. Use conduits, couplings, bushings, elbows, nipples, and other fittings meeting the requirements of NEMA TC 2 and TC 3, UL, NEC, and ASTM specified tests for the intended use. Use only conduit with a factory formed bell on one end. Conduit that requires the use of couplings for straight runs will not be acceptable.

2.3 PVC SCHEDULE 80 CONDUIT

A. Use rigid PVC conduit, Schedule 80, extra heavy wall, UL listed for concrete-encased, underground direct burial, and UL listed and marked for use with conductors having 90 degrees C insulation. Use conduit, couplings, bushings, elbows, nipples, and other fittings meeting the requirements of NEMA TC 2 and TC 3, UL, and LAEC. CONTRACTOR shall account for conduit wall thickness in determining appropriate conduit size. Schedule 80 conduit shall be used as indicated on the drawings. In general, this conduit is used in concrete encased or direct burial locations exposed to vehicular traffic.

2.4 PVC COATED RIGID GALVANIZED STEEL CONDUIT

A. Use PVC coated rigid steel conduit, galvanized inside and out. Prior to coating, the galvanized conduits and fittings shall be UL listed. The galvanized conduit shall have an exterior PVC coating of 40 mils nominal (+10 mils / -5 mils) bonded to the metal. The interior shall be coated with a urethane coating no more than 7 mils thick. Use PVC coated fittings with the same interior and exterior coating requirements. PVC coated fittings and sleeves shall be completely watertight to prevent moisture from penetrating the interior of the conduits and fittings. The PVC coating shall be resistant to ultra-violet rays when installed outdoors. The conduit and fittings shall meet all the requirements of NEMA RN-1.

2.5 FLEXIBLE METAL CONDUIT, LIQUID-TIGHT

A. Use UL listed liquid-tight flexible metal conduit consisting of galvanized steel flexible conduit covered with an extruded PVC jacket and terminated with nylon bushings or bushings with steel or malleable iron body and insulated throat and sealing O-ring. Provide external grounding connector and appropriately sized grounding conductor to assure ground continuity.

2.6 RACEWAY FITTINGS

A. Fittings for Rigid Steel.

1. Use insulated throat bushings of metal with integral plastic bushings rated for 105 degrees C.

2. For insulated throat bushings for rigid steel conduit, use Thomas & Betts Nylon Insulated Metallic Bushings, or O.Z. Gedney Type B, or equal.

3. Use Myers Scru-Tite, or equal hubs for rigid steel conduit.

4. Use conduit bodies for rigid steel conduit of metal and sized as required by the NEC. Use Appleton Form 35 threaded Unilets; Crouse-Hinds Mark 9 or Form 7 threaded condulets; Killark Series O Electrolets; or equal, for normal conduit bodies for rigid steel conduit. Where conduit bodies for rigid steel conduit are required to be approved for hazardous (classified) locations, use conduit bodies manufactured by Appleton, Crouse-Hinds, Killark, or equal.

5. Use only couplings for rigid steel conduit supplied by the conduit manufacturer.

6. Use Appleton Type EYF, EYM, or ESU; Crouse-Hinds Type EYS or EZS; Killark Type EY or EYS; or equal, 40% fill sealing fittings for rigid steel conduit. Where condensate may collect on top of a seal, provide a drain by using Appleton Type SF Crouse-Hinds Type EYD or EZD, or equal Drain Seal.

7. Use Appleton Type ECDB, Crouse-Hinds ECD, or equal drain fittings for rigid steel conduit.

8. Fittings for Liquid-Tight Flexible Metal Conduit: Use insulated throat connectors for liquid-tight flexible metal conduit of metal with an integral plastic bushing rated for 105 degrees C, and of the long design type extending outside of the box or other device at least 2-inches. Use Thomas & Betts Super-Tite Nylon Insulated Connectors or equal.

9. Fittings in Hazardous Areas: In hazardous areas, use only fittings approved for the atmosphere involved.

10. Use cable sealing fittings forming a watertight nonslip connection to pass cords and cables into conduit. Size cable sealing fitting for the conductor OD. For conductors with OD's of 1/2-inch or less, provide a neoprene bushing where the conductor enters the connector. Use Crouse-Hinds CGBS, Appleton CG Series, or equal, cable 40% fill sealing fittings.

11. Coating thickness of PVC coated fittings shall be the same as that for PVC coated conduits.

2.7 PRECAST MAINTENANCE HOLES AND HANDHOLES

A. Install maintenance holes and handholes precast with 28-day, 3,000 psi minimum compressive strength concrete and designed for AASHTO H-20 loading. Minimum dimensions for maintenance holes and handholes are shown on the Drawings. Increase these as required by use of extension sections to accommodate the several raceway entrances at their required elevations.

B. Provide raceway entrances on all 4 sides. For raceways installed under this Contract, knockout panels or precast individual raceway openings may be used. On sides where no raceways are installed under this Contract, provide knockout panels for future raceway installation.

C. Utilize heavy-duty type frames and covers made of cast iron, as per CITY of Los Angeles standards, suitable for H-20 loading, and having machined bearing surfaces. Provide indented type covers, solid top design, with two drop handles each. On the upper side of each cover, cast or burned by welder, in integral letters not less than 2-inches high appropriate titles, ELECTRIC HV (for above 600 volts), ELECTRIC LV (for 600 volts and below), or TELEPHONE. Field stamp covers with manhole or handhole numbers indicated on the Drawings.

D. Provide heavy weight cable racks with adjustable arms and acceptable insulators for all cables in each maintenance hole. Set adjustable inserts in the concrete walls for the attachment of racks. Do not use bolts or studs embedded in concrete for attaching racks. Set racks and inserts on not greater than 3-foot centers around the entire inside perimeter of the maintenance hole, arranged so that all spare conduit ends are clear for future cable installation. Provide racks with a sufficient number of arms and insulators to accommodate cables for each conduit entering or leaving the maintenance hole, including spares.

E. Provide a pulling iron embedded in the concrete wall opposite each raceway entrance and one in the floor vertically below the center of the manhole or handhole cover. Utilize 3/4-inch round stock securely fastened to the overall steel reinforcement before concrete is poured.

F. Utilize maintenance hole and handhole hardware of steel, hot-dip galvanized after fabrication.

G. Acceptable Manufacturers:

1. Brooks Products;
2. Jensen Precast;
3. Oldcastle Precast;
4. Or equal.

H. All prefabricated maintenance holes shall be shop inspected before delivery to the site.

2.8 RACEWAY TAGS

A. Provide permanent, stainless steel markers with raceway designations, minimum 1/4-inch high lettering, pressure stamped, embossed, or engraved onto the tag. Tags relying on adhesives or taped-on markers are not acceptable. Attach tags to raceways with stainless steel wire.

2.9 WARNING TAPE

A. Provide heavy-gauge, [yellow] [red] plastic tape of [3] [6] -inch minimum width for use in trenches containing electric circuits. Utilize tape made of material resistant to corrosive soil. Use tape with printed warning that an electric circuit is located below the tape.

B. Acceptable Manufacturers:

1. Brady;
2. Marking Services Inc.;
3. Seton;
4. Or equal.

PART 3 - EXECUTION

3.1 GENERAL

A. Provide raceway systems meeting or exceeding the requirements of the NEC.

3.2 PROTECTION DURING CONSTRUCTION

A. In addition to the provisions of the GENERAL REQUIREMENTS, and Section 16020 "Municipal Facilities General Electrical Requirements," prior to installation, store all products specified in this section in a dry location. Following installation, protect products from the effects of moisture, corrosion, and physical damage during construction. Keep openings in conduit and tubing capped with manufactured seals during construction.

3.3 MINIMUM RACEWAY SIZE

A. Use no circular raceway less than 3/4-inch.

3.4 REQUIRED RACEWAY TYPE FOR LOCATION AND INSTALLATION METHOD

A. Exterior, Exposed:

1. PVC coated rigid galvanized steel conduit.

B. Interior, Exposed:

1. Rigid galvanized steel conduit.
2. EMT for above-ceiling application.

C. Interior, Concealed (Not Embedded in Concrete):

1. Rigid galvanized steel conduit.
2. PVC Schedule 40 conduit.

D. Embedded in Concrete Walls or Floors:

1. PVC Schedule 40 conduit.

E. Underground, Direct Earth Burial:

1. PVC Schedule 40 conduit.
2. PVC Schedule 80 conduit. (For vehicular traffic areas)

F. Concrete Encased Raceways:

1. Rigid galvanized steel conduit.
2. PVC Schedule 40 conduit.

G. Under Concrete Floor Slabs:

1. PVC Schedule 40 conduit.

H. Final Connection to Certain Equipment:

1. Make final connection to motors, wall or ceiling mounted fans and unit heaters, dry type transformers, valves, local instrumentation, and other equipment where flexible connection is required to minimize vibration or where required to facilitate removal or adjustment of equipment, with 36-inch maximum length liquid-tight, PVC-jacketed, flexible steel conduit.

2. The flexible conduit shall be long enough to allow the item to which it is connected to be withdrawn or moved off its base. Use liquid-tight flexible metal conduit in outside areas, process areas exposed to moisture, and areas required to be oil free and dust-tight.

I. Special Locations:

1. Use PVC coated rigid galvanized steel conduit:

   a. Where conduit changes from underground and/or concrete embedded to exposed.

   b. Under equipment mounting pads.

   c. In exterior light pole foundations.

J. Communication and Instrumentation Conduits:

1. Communication and instrumentation conduits shall be PVC coated rigid galvanized steel.

3.5 GENERAL INSTALLATION REQUIREMENTS FOR RACEWAYS

A. Location, Routing, and Grouping:

1. Conceal or expose raceways as indicated. Group raceways in same area together. Locate raceways at least 12-inches away from parallel runs of heated piping for other utility systems.

2. Run exposed raceways parallel or perpendicular to walls, structural members, or intersections of vertical planes to provide a neat appearance. Follow surface contours as much as possible.

3. Avoid obstruction of passageways. Run concealed raceways with a minimum of bends in the shortest practical distance considering the building construction and other systems.

4. In block walls, do not run raceways in the same horizontal course with reinforcing steel.

5. In outdoor, underground, or wet locations, use watertight couplings and connections in raceways. Install and equip boxes and fittings so as to prevent water from entering the raceway.

6. Paint all threads of galvanized conduits with UL approved zinc-rich paint or liquid galvanizing compound before assembling. Touch up after assembly to cover nicks or scars.

7. Do not notch or penetrate structural members for passage of raceways except with prior approval of the ENGINEER or the INSPECTOR.

8. Do not run raceways in equipment base foundations.

9. Locate above ground raceways concealed in poured concrete so that the minimum concrete covering is not less than 1-1/2-inches.

10. Except at raceway crossings, separate raceways in slabs not less than six times the raceway outside diameter.

11. Raceways installed under slab floors shall lie completely under the slab with no part of the horizontal run of the raceway embedded within the slab.

12. Install concealed, embedded, and buried raceways so that they emerge at right angles to the surface. Provide support during pouring of concrete to ensure that raceways remain in position.

13. Allow a minimum headroom of 7 feet for conduit passing over walkways.

14. Communication and instrumentation conduits crossing power circuits shall be separated from such circuits by the minimum distance stipulated by the IEEE standards.

B. Support:

1. Support raceways at intervals not exceeding LAEC requirements unless otherwise indicated. Support multiple raceways adjacent to each other by ceiling trapeze. Support individual raceways by wall brackets, strap hangers, or ceiling trapeze, fastened by toggle bolts on hollow masonry units, expansion shields on concrete or brick, and machine screws or welded thread studs on steelwork.

2. Threaded studs driven in by a powder charge shall not be accepted.

3. Support all raceways from building structural members only.

4. Do not use nails anywhere or wooden plugs inserted in concrete or masonry as a base for raceway or box fastenings. Do not weld raceways or pipe straps to steel structures. Do not use wire in lieu of straps or hangers.

C. Bends:

1. Make changes in direction of runs with symmetrical bends. Make bends and offsets of the longest practical radius. Do not heat metal raceways to facilitate bending.

2. Make bends in parallel or banked runs of raceways from the same center or centerline so that bends are parallel and of neat appearance. Make field bends in parallel runs.

3. For PVC conduits, use factory made elbows for all bends 30 degrees or larger. Use rigid steel elbows on all 90-degree bends in PVC conduits. Use acceptable heating methods for forming smaller bends.

4. Make no bends in flexible conduit that exceed 90 degrees or allowable bending radius of the cable to be installed or that significantly restricts the conduits flexibility.

D. Bushing and Insulating Sleeves:

1. Where metallic conduit enters metal equipment enclosures through conduit openings, install a bonding bushing on the end of each conduit. Install a bonding jumper from the bushing to any equipment ground bus or ground pad.

2. If neither exists, connect the jumper to a threaded bolt connection to the metallic enclosure.

3. Use manufacturer's standard insulating sleeves in all metallic conduits or insulated bushings terminating at an enclosure.

E. Expansion Joints: Provide suitable expansion fittings for raceways crossing expansion joints in structures or concrete slabs, or provide other suitable means to compensate for expansion and contraction. Provide for the high rate of thermal expansion and contraction of PVC conduit by providing PVC expansion joints as recommended by the manufacturer and as required.

F. PVC Conduit: Solvent weld PVC conduit joints with solvent recommended by the conduit manufacturer. Follow manufacturer's solvent welding instructions and provide watertight joints. Use acceptable PVC terminal adapters when joining PVC conduit to metallic fittings. Use acceptable PVC female adapters when joining PVC conduit to rigid metal conduit.

G. PVC Coated Rigid Steel Conduit: Install in strict accordance with the manufacturer's instructions. Touch up any damage to the coating with conduit manufacturer acceptable patching compound. PVC boot shall cover all threads. Where belled conduits are used, bevel the unbelled end of the joint before joining. Leave no metallic threads uncovered.

H. Penetrations:

1. Seal the interior of all raceways entering structures at the first box or outlet with oakum or suitable plastic expandable compound to prevent the entrance into the structure of gases, liquids, or rodents.

2. Dry pack with nonshrink grout around raceways that penetrate concrete walls, floors, or ceilings aboveground, or use one of the methods specified for underground penetrations.

3. Where an underground conduit enters a structure through a concrete roof or a membrane waterproofed wall or floor, provide an acceptable, malleable iron, watertight, entrance sealing device. Provide a device having a gland type sealing assembly at each end with pressure bushings which may be tightened at any time when there is no raceway concrete encasement specified or indicated,. When there is raceway concrete encasement specified or indicated, provide such a device with a gland type sealing assembly on the accessible side. Securely anchor all such devices into the masonry construction with one or more integral flanges. Secure membrane waterproofing to such devices in a permanently watertight manner.

4. Where an underground raceway without concrete encasement enters a structure through a nonwaterproofed wall or floor, install a sleeve made of Schedule 40 galvanized pipe.

   Fill the space between the conduit and sleeve with a suitable plastic expandable compound, or oakum and lead joint, on each side of the wall or floor in such a manner as to prevent entrance of moisture. A watertight entrance sealing device as specified may be used in lieu of the sleeve.

5. Where raceways penetrate fire-rated walls, floors, or ceilings, fire stop openings around electrical penetrations to maintain the fire-resistance rating.

6. Raceways passing through roofs shall be flashed.

7. Provide conduit seals where required by Article 500 of the LAEC.

3.6 INSTALLATION REQUIREMENTS FOR UNDERGROUND DIRECT BURIAL CONCRETE-ENCASED RACEWAYS

A. General:

1. Coordinate installation of underground raceways with other outside and building construction work. Maintain existing outside utilities in operation unless otherwise authorized by the ENGINEER.

2. Remove entirely and properly reinstall all raceway installations not in compliance with these requirements.

3. Do not use union type fittings underground.

4. Provide a minimum cover per NEC Table 300.5 for all underground raceways unless otherwise indicated. Warning tape as specified in Part 2 shall be placed no less than 12 inches above conduit and duct bank.

5. Where a concrete-encased duct bank is installed over an extensive area of disturbed earth such as that within the periphery of a building, provide a separate concrete base under the duct bank to ensure stability of raceways during installation. Allow this base to set before the duct bank is installed.

6. Do not backfill underground direct burial and concrete-encased raceways until they have been inspected by the ENGINEER and the INSPECTOR.

7. Warning Tapes: Bury warning tapes approximately 8]-inches below grade and above all underground conduit runs or duct banks. Align parallel to and within 12-inches of the centerline of runs.

B. Separation and Support:

1. Separate parallel runs of two or more raceways in a single trench with preformed, nonmetallic spacers designed for the purpose. Install spacers at intervals not greater than that specified in the LAEC for support of the type raceways used, and in no case greater than 10-feet.

2. Support raceways installed in fill areas to prevent accidental bending until backfilling is complete. Tie raceways to supports, and raceways and supports to the ground, so that raceways will not be displaced when concrete encasement or earth backfill is placed.

C. Arrangement and Routing:

1. Arrange multiple conduit runs substantially in accordance with any details shown on the Drawings. Locate underground conduits where indicated on the Drawings.

2. Make minor changes in location or cross-section as necessary to avoid obstructions or conflicts. Where raceway runs cannot be installed substantially as shown because of conditions not discoverable prior to digging of trenches, refer the condition to the ENGINEER for instructions before further work is done.

3. Where other utility piping systems are encountered or being installed along a raceway route, maintain a 12-inch minimum vertical separation between raceways and other systems at crossings. Maintain a 12-inch minimum separation between raceways and other systems in parallel runs. Do not place raceways over valves or couplings in other piping systems. Refer conflicts with these requirements to the ENGINEER for instructions before further work is done.

4. Provide insulated grounding bushings on all metallic raceways entering manholes. Provide bell-ends flush with manhole walls on all nonmetallic raceways entering manholes.

5. In multiple conduit runs, stagger raceway coupling locations so that couplings in adjacent raceways are not in the same transverse line.

6. Provide markers at grade to indicate the direction of underground conduits provided under this Contract. Provide markers consisting of double-ended arrows, straight for straight runs and bent at locations where runs change

direction. Provide markers at all bends and at intervals not exceeding 100-feet in straight runs. Use markers made of sheet bronze not less than 1/4-inch thick embedded in and secured to the top of concrete posts. Use markers not less than 10-inches long and 3/4-inch wide and marked ELECTRIC CABLES in letters 1/4-inch high incised into the bronze to a depth of 3/32-inch.

7. All conduits shall enter maintenance holes and structures at right angles.

D. Provide expandable grommets for concrete encased raceway passing through wall to the earth.

E. Raceway Coating: At couplings and joints, coat metallic underground direct-burial conduits with Bitumastic No. 50 or equal, or wrap with Scotchrap No. 51, or equal plastic tape with 1/2-inch overlap.

1. Direct Earth Burial Conduit Zone Backfill Installation:

2. Backfill material for the conduit zone of direct burial conduit trenches may be selected from the excavated material if it is free from roots, foreign material, and oversized particles. Use material with 3/4-inch maximum particle size and suitable gradation for satisfactory compaction. Remove material if necessary to meet these requirements.

3. Imported 3/4-inch minus gravel or sand may be used in lieu of material from the excavation.

4. After conduits have been properly installed, backfill the trench with specified material placed around the conduits and carefully tamped around and over them with hand tampers. Final, tamped conduit cover shall be 4-inches minimum.

F. Concrete Encasement:

1. Where indicated, encase conduits in a red concrete envelope sized as indicated and located at the elevation shown. Use 2,500 psi concrete as specified in Section 03300 CAST-IN-PLACE CONCRETE.

2. Maintain a grade of at least 4-inches per 100-feet, either from one maintenance hole or pull box to the next, or from a high point between them, depending on the surface contour.

3. Hold conduits for concrete-encased raceways securely in place by acceptable window type spacer supports. Where, in the opinion of the ENGINEER, ground conditions are such as to require concrete forms, install forms constructed of materials and in a manner acceptable to the ENGINEER. No variations greater than 1/2-inch in 50-feet will be permitted from a straight line.

4. Envelopes may be poured directly against the sides of trenches if the cut is clean, even, and free of loose material. Remove loose material from trenches before and during pouring of concrete to ensure sound envelopes. Carefully spade concrete during pouring to eliminate all voids under and between raceways and honeycombing of the exterior surface.

5. Do not use power-driven tampers unless they are specifically designed for the application, in order to ensure that the watertight integrity of the raceways is maintained.

6. Generally, pour an entire concrete envelope in one continuous pour. Where more than one pour is necessary, terminate each pour in a sloped plane, and insert 3/4-inch reinforcing rod dowels extending into the concrete 18-inches minimum on each side of the joint. Obtain Engineers' approval for the number and location of dowels.

7. Provide reinforcement shown where envelopes connect to manholes or building structures to prevent shearing of joints.

3.7 MAINTENANCE HOLES AND HANDHOLES

A. Install maintenance holes and handholes where shown on the Drawings. Provide excavation, shoring, bracing, backfilling, grading, etc., in accordance with requirements specified elsewhere in these Contract Documents.

B. Do not install maintenance holes or handholes until final conduit grading, including field changes necessitated by underground interferences, has been determined. Set frames to final grades as required.

C. Make installation so that raceways enter maintenance holes or handholes at nearly right angles and as near as possible to one end of a wall, unless otherwise indicated.

D. Install one ground rod in each maintenance hole and handhole. Connect all noncurrent-carrying metal parts in the maintenance holes and any metallic raceway grounding bushings to this ground rod with No. 6 AWG (minimum) copper conductor.

E. CONTRACTOR shall clean and remove all debris from maintenance holes and handholes whether new or existing.

3.8 WIREWAYS

A. Mount wireways securely in accordance with the LAEC and manufacturer's instructions. Locate removable cover or hinged cover on accessible vertical face of wireway unless otherwise indicated.

3.9 PREPARATION FOR PULLING IN CONDUCTORS

A. Do not install crushed or deformed raceways. Avoid traps in raceways where possible. Take care to prevent the lodging of plaster, concrete, dirt, or trash in raceways, boxes, fittings, and equipment during the course of construction. Make raceways entirely free of obstructions or replace them. Ream all raceways, remove burrs, and clean raceway interior before introducing conductors or pull wires.

B. Immediately after installation, plug or cap all raceway ends with watertight and dust-tight seals until the time for pulling in conductors.

C. For concrete-encased raceways, after the concrete envelope has set, pull a mandrel of a diameter approximately 1/4-inch less than the raceway inside diameter, through each raceway. Then pull a bristle brush through each raceway to remove debris.

3.10 EMPTY RACEWAYS

A. Certain raceways will have no conductors pulled in as part of this Contract. Identify with tags at each end and at any intermediate pull point the origin and destination of each such empty raceway. Where a raceway has been identified with a name (number) in the Raceway Schedule, use that name on the tag in lieu of origin and destination. Provide a

removable permanent cap over each end of each empty raceway. Mandrel and provide a nylon pull cord in each empty raceway.

3.11 PAINTING

A. Paint raceway systems in accordance with and as specified in Section 09800 "Protective Coating."

END OF SECTION

SECTION 26 06 20

BASIC MATERIALS AND METHODS

PART 1 - GENERAL

1.1 THE REQUIREMENT

A. The CONTRACTOR shall furnish all tools, equipment, materials, and supplies and shall perform all labor required to complete the work as indicated on the Drawings and specified herein.

B. This section covers the work necessary to furnish and install, complete, the materials specified hereinafter.

1.2 RELATED WORK SPECIFIED ELSEWHERE

A. Work Specified Under Other Divisions:

All concrete work required for encasement, installation, or construction of the work specified in the various Sections of Division 16 is included as a part of the work hereunder, and shall be 2500-psi concrete conforming to the applicable requirements of City of Los Angeles Specification 03300, "Cast-in-Place Concrete"; provided, that the following exceptions and supplementary requirements shall apply:

1. Consolidation of encasement concrete around duct banks shall be by hand puddling, and/or no mechanical vibration.

2. A workability admixture shall be used in encasement concrete, which shall be a hydroxylated carboxylic acid type in liquid form. Admixtures containing calcium chloride shall not be used.

3. Concrete for encasement of conduit or duct banks shall contain an integral red-oxide coloring pigment in the proportion of 8 pounds per cubic yard of concrete.

B. Materials and equipment furnished and installed under other Divisions with raceway and electrical conductors furnished, installed and connected under Division 26, Electrical.

1.3 REFERENCE SPECIFICATIONS, CODES AND STANDARDS

A. All work specified herein shall conform to or exceed the applicable requirements of the referenced portions of the following publications to the extent that the provisions thereof are not in conflict with other provisions of these specifications.

1. Codes and Standards:

LAEC City of Los Angeles Electrical Code, latest adopted edition.

2. Government Standards:

FS W-C-596E/GEN(1)	Connector, Plug, Receptacle and Cable Outlet, Electrical Power.
FS W-S-896E/GEN(1)	Switches, Toggle (Toggle and Lode), Flush Mounted (ac).

FS WW-C-581E	Conduit, Metal, Rigid, And Intermediate; And Coupling, Elbow, and Nipple, Electrical Conduit: Steel, Zinc Coated.

3. Commercial Standards:

ANSI B16.5	Pipe Flanges and Flanged Fittings, Steel, Nickel Alloy, and Other Special Alloys.
ANSI C80.1	Rigid Steel Conduit, Zinc Coated, specification for.
ANSI Z55.1	Gray Finishes for Industrial Apparatus and Equipment.
ANSI/UL 467	Grounding and Bonding Equipment, Safety Standard For.
NEMA WD-1-1.10	General Requirements for Wiring Devices.
NEMA AB-1	Molded Case Circuit Breakers.
NEMA KS-1	Enclosed Switches.
\ICEA S-61-402	Thermoplastic - Insulated Wire and Cable for the Transmission and Distribution of Electrical Energy.
ICEA S-19	Rubber - Insulated Wire and Cable for the Transmission and Distribution of Electrical Energy.
UL 943	Ground Fault Circuit Interrupters.

B. All equipment furnished by the CONTRACTOR shall be listed by and shall bear the label of Underwriters' Laboratories, Incorporated, (UL) or of an independent testing laboratory acceptable to the CITY's Department of Building and Safety.

C. The construction and installation of all electrical equipment and materials shall comply with all applicable provisions of the Cal/ OSHA Safety Orders (Title 8, CCR), State Building Standards, and applicable local codes and regulations.

PART 2 - PRODUCTS

2.1 SERVICE ENTRANCE

A. Provide labor and furnish equipment as required by the electric utility which will provide service to the facility. All such materials and work shall meet the requirements of the utility company.

B. Provide temporary service for construction tools and testing apparatus during construction.

2.2 HAZARDOUS AREAS

A. Provide devices, materials, and equipment for installation in hazardous areas that are specifically approved for installation in hazardous areas of the Class, Division, and Group indicated, and are of construction that will ensure safe performance under conditions of proper use and maintenance. Provide devices, materials, and equipment meeting the requirements of the NEC, applicable state and local codes, and the authority enforcing these codes.

2.3 OUTLET AND DEVICE BOXES

A. General: Provide boxes not less than 2-inches deep, unless shallower boxes are required by structural conditions and are specifically accepted by the ENGINEER. Do not use box extensions to provide wiring space required by the NEC. For hollow masonry construction, provide boxes of sufficient depth so that conduit knockouts or hubs are in the masonry void space.

B. Sheet Steel (SS) Boxes: Provide zinc- or cadmium-plated boxes of the one-piece drawn type. Install 4-inch minimum octagonal boxes for ceiling outlets, except where smaller boxes are required for the particular fixture being installed. Use concrete type boxes in poured concrete slabs. Provide 2-inch by 4-inch minimum boxes for switches and receptacles. Provide plaster rings where required.

C. Cast Steel (CS) Boxes: Provide boxes of cast ferrous metal with gasketed, watertight, cast ferrous metal covers and stainless steel screws. Provide boxes with threaded conduit hubs and cast mounting lugs where lugs are required.

D. Nonmetallic (NM) Boxes: Provide fiberglass boxes with gasketed, watertight covers and stainless steel screws. Provide boxes with conduit hubs and any required mounting lugs.

E. Provide a box suitable for the conditions encountered at each outlet in the wiring or raceway system and sized in accordance with the LAEC. Use the listed types unless otherwise indicated or accepted.

2.4 JUNCTION AND PULL BOXES

A. Utilize NEMA 4X 316 stainless steel or fiberglass UV-rated watertight enclosures for outdoor or wet and corrosive locations and where subscript WP is indicated at the box location on the Drawings.

B. Where outlet boxes are used as junction or pull boxes, use materials as specified under article 2.3, OUTLET AND DEVICE BOXES.

C. Where larger sheet steel boxes are required, utilize boxes of code-gauge, galvanized steel with full-access screw covers mounted with corrosion-resistant machine screws.

2.5 TERMINAL JUNCTION BOXES (TJB)

A. Provide hinged-cover terminal junction boxes of the required type and size where indicated. Utilize NEMA 12 enclosures for indoor dry locations. Utilize NEMA 4X watertight enclosures, as described under article 2.4, JUNCTION AND PULL BOXES, for outdoor or wet locations and where subscript WP is indicated at the box location on the Drawings. Provide terminal blocks with a separate connection point for each conductor entering or leaving the box.

2.6 TELEPHONE TERMINAL CABINETS

A. Provide telephone terminal cabinets of the type and size indicated for incoming telephone service. Provide hinged doors code-gauge galvanized steel box containing a 3/4-inch plywood backboard. Utilize cabinet conforming to the requirements of the telephone company.

2.7 WIRING DEVICES

A. Switches:

1. General Use Switches: Provide specification grade, totally-enclosed, ac type, quiet tumbler switches meeting NEMA WD 1 performance standards and Federal Specification W-S-896E, and capable of control of 100 percent tungsten filament and fluorescent lamp loads. Switches shall have screw terminals.

2. Weatherproof Switches: Use switches mounted in a cast metal box with gasketed, weatherproof device plate.

B. Receptacles:

1. Single and Duplex: Provide specification grade receptacles meeting NEMA WD 1 performance standards and Federal Specification W-C-596, and having a contact arrangement such that contact is made on two sides of each inserted blade without detent.

2. Weatherproof Receptacles: Receptacles shall be specified above mounted in a cast metal box with gasketed, weatherproof device plate as specified below.

3. Ground Fault Interrupter (GFI) Receptacles: Provide duplex specification grade GFI receptacles tripping at 5 milliamps.

2.8 NONFUSED SWITCHES, INDIVIDUAL, 600 VOLTS AND LESS

A. Mount individual switches in NEMA 1, general purpose enclosure unless otherwise indicated.

2.9 FUSES, 600 VOLTS AND LESS

A. Provide a complete set of current-limiting fuses wherever fuses are indicated. Supply a set of six spare fuses of each type and each current rating installed. Utilize fuses that fit mountings specified with switches and which provide features rejecting Class H fuses.

2.10 LOW VOLTAGE SURGE PROTECTIVE EQUIPMENT

A. Provide secondary surge protective equipment consisting of a surge capacitor and surge arrestor combination located where indicated on the Drawings. Utilize components for all surge protective equipment covered by this Specification, designed and tested in accordance with NEMA LA-1 and ANSI/IEEE C62.1.

2.11 ENCLOSURE PAINT AND FINISH

A. All metallic enclosures shall be finished with a prime coat of rust inhibitor and painted as per ANSI No. 61 or as per the ENGINEER’s instructions.

PART 3 - EXECUTION

3.1 OUTLET AND DEVICE BOXES

A. Installation:

1. Mount boxes at the following heights unless otherwise required by the Americans with Disabilities Act (heights are to the centerline of the box):

Wall switches	48-inches above floor

Wall telephone outlets	6-inches above counter tops; 12-inches above floor
Wall mounted telephone	52-inches above floor outlets for public pay telephone, 52-inches above floor for standard wall telephone
Office, Lab Receptacles:	Flush device plate bottom or side with top of the splash-back on use areas, halls, etc. or 6-inches above countertops without splash-back; 12-inches above floor unless otherwise indicated.

a. Where above heights do not suit the building construction or finish, locate boxes where directed by the ENGINEER.

b. Locations indicated are approximate. Study the Drawings in relation to spaces and equipment surrounding each outlet. When necessary, with the approval of the ENGINEER, relocate outlets to avoid interference with mechanical equipment or structural features. Locate all light switches on lock side of doors. Locate all light fixture outlets in a symmetrical pattern according to the room layout unless otherwise indicated.

c. Mount all boxes plumb and level. Use flush mounted boxes with concealed conduits. Make edges of boxes flush with finished surface. Provide proper type extension rings or plaster covers for this purpose. For flush mounted boxes, make holes in the surrounding surface no larger than required to receive the box.

d. Install boxes in a secure, substantial manner supported independently of conduit by attachment to the building structure or a structural member. Fasten boxes with bolts and expansion shields on concrete or brick, toggle bolts on hollow masonry units, and machine screws or welded, threaded studs on steelwork. Threaded studs driven in by a powder charge and provided with lock washers and nuts are acceptable in lieu of expansion shields. Boxes embedded in concrete or masonry need not be additionally supported. Utilize galvanized mounting hardware in industrial areas.

d. Provide flush or recessed lighting fixtures with separate junction boxes when required by the fixture terminal temperature. Where boxes support fixtures, provide proper means of attachment with adequate strength.

e. Open no more knockouts in sheet steel boxes than are actually required. Seal any used openings in any type box.

3.2 JUNCTION AND PULL BOXES

A. Where indicated on the Drawings, and where necessary to terminate, tap-off, or redirect multiple conduit runs, provide and install appropriately designed junction boxes. Furnish and install pull boxes where necessary in the raceway system to facilitate conductor installation. Provide pull boxes to limit conduit runs to less than 150-feet and to contain no more than the equivalent of three right-angle bends unless accepted by the ENGINEER.

1. Installation:

a. Make all boxes accessible. Do not install boxes in finished areas unless accepted by the ENGINEER. Mount all boxes plumb and level. Use flush mounted boxes with concealed conduits. Make edges of boxes flush with the final surface.

b. Mount boxes in a secure, substantial manner, supported independently of conduit by attachment to the building structure or a structural member. Fasten boxes with bolts and expansion shields on concrete or brick, toggle bolts on hollow masonry units, and machine screws or welded threaded studs on steelwork. Threaded studs driven in by a powder charge and provided with lock washers and nuts are acceptable in lieu of expansion shields. Boxes embedded in concrete or masonry need not be additionally supported. Utilize galvanized mounting hardware in industrial areas.

c. Install boxes for conduits under grade flush with finished grade in locations outside of paved areas, roadways, or walkways.

d. If adjacent structure is available, the box may be mounted on the structure surface just above finished grade in accessible but unobtrusive location. If it is found desirable to locate boxes in paved areas, roadways, or walkways, obtain ENGINEER's written approval and utilize boxes and covers suitable for the weights to which they may be subjected.

3.3 TERMINAL JUNCTION BOXES (TJB)

A. Install in accordance with all the requirements detailed under article 3.2, JUNCTION AND PULL BOXES above. Label each block and terminal with a permanently attached, non-destructible tag.

3.5 WIRING DEVICES

A Multioutlet Surface Raceway System: Locate multioutlet surface raceway systems where shown and install in accordance with the manufacturer's instructions.

B. Telephone Outlets: Mount outlets at the heights indicated under article 3.1, OUTLET AND DEVICE BOXES. Mount outlets in the vertical position unless otherwise indicated.

C. Device Plates:

1. Installation: Securely fasten device plates to switch or receptacle boxes or the wiring device contained therein. Install device plates used with flush mounted boxes with all four edges in continuous contact with the finished wall surfaces without the use of mats or similar materials. Plaster fillings will not be acceptable. Install device plates vertically or horizontally with an alignment tolerance of 1/16-inch. Do not use sectional type device plates.

3.6 LIGHTING AND DISTRIBUTION PANELBOARDS

A. Mount panelboards securely where indicated, plumb, in-line, and square with walls. Unless otherwise indicated, mount panelboard with top of its cabinet approximately 6-feet above the floor. Provide a typewritten circuit directory under a metal-framed transparent plastic cover inside each panelboard. Provide an engraved, laminated plastic nameplate on the outside of the panelboard showing the panelboard designation, voltage, and phases.

3.7 DRY TYPE TRANSFORMERS (600-VOLTS AND LESS PRIMARY)

A. Mount transformers approximately where indicated. Load any vibration isolators external to the unit properly and provide complete isolation with no direct transformer unit metal in contact with the mounting surface. Connect electrical circuits to transformers by means of

moisture proof, flexible conduit in a manner that prevents transformer vibrations from being transmitted to the building or other equipment.

B. Ground neutrals and enclosures of all transformers and all moisture proof flexible conduit in accordance with applicable codes and as otherwise may be indicated. Connect voltage taps on all transformers to give as close as possible to rated output voltage under normal plant load conditions.

3.8 DRY TYPE, SHIELDED, ISOLATION TRANSFORMERS (600-VOLTS AND LESS PRIMARY)

A. Follow instructions for DRY TYPE TRANSFORMERS (600-VOLTS AND LESS PRIMARY) above. In addition, ground isolation shields to the unit enclosure with a conductor of the same material, and at least as big, as the shield ground lead provided with the unit.

END OF SECTION

SECTION 26 08 00

ELECTRICAL SYSTEMS COMMISSIONING

PART 1 - GENERAL

1.1 DESCRIPTION

A. The purpose of this section is to specify Division 16 responsibilities in the commissioning process which are being directed by the CA. Other electrical systems testing are required under the direction of the CM.

B. The list of commissioned equipment and systems is found in Section 01810, Part 1.12.

C. Commissioning requires the participation of Division 16 to ensure that all systems are operating in a manner consistent with the Contract Documents. The general commissioning requirements and coordination are detailed in Division 01. Division 16 shall be familiar with all parts of Division 01 and the commissioning plan issued by the CA and shall execute all commissioning responsibilities assigned to them in the Contract Documents.

1.2 RESPONSIBILITIES

A. Electrical Contractors. The commissioning responsibilities applicable to the electrical contractor are as follows (all references apply to commissioned equipment only):

1. Construction and Acceptance Phases

a. Include the cost of commissioning in the contract price, if not yet let.

b. In each purchase order or subcontract written, include requirements for submittal data, O&M data and training.

c. Attend a commissioning kickoff meeting and other necessary meetings scheduled by the CA to facilitate the construction process.

d. Contractors shall provide normal cut sheets and shop drawing submittals to the CA of commissioned equipment.

e. Provide additional requested documentation, prior to normal O&M manual submittals, to the CA for development of start-up and functional testing procedures.

1) Typically this will include detailed manufacturer installation and start-up, operating, troubleshooting and maintenance procedures, full details of any owner-contracted tests, fan and pump curves, full factory testing reports, if any, and full warranty information, including all responsibilities of the Owner to keep the warranty in force clearly identified. In addition, the installation and checkout materials that are actually shipped inside the equipment and the actual field checkout sheet forms to be used by the factory or field technicians shall be submitted to the Commissioning Agent.

2) The Commissioning Agent may request further documentation necessary for the commissioning process.

3) This data request may be made prior to normal submittals.

f. Provide a copy of the O&M manuals submittals of commissioned equipment, through normal channels, to the CA for review and approval.

g. Contractors shall assist (along with the design engineers) in clarifying the operation and control of commissioned equipment in areas where the specifications, control drawings or equipment documentation is not sufficient for writing detailed testing procedures

h. Provide assistance to the CA in preparation of the specific functional performance test procedures specified in Section 16570. Subs shall review test procedures to ensure feasibility, safety and equipment protection and provide necessary written alarm limits to be used during the tests.

i. Develop a full start-up and initial checkout plan using manufacturer's start-up procedures and the prefunctional checklists from the CA. Submit manufacturer's detailed start-up procedures and the full start-up plan and procedures and other requested equipment documentation to CA for review.

j. During the startup and initial checkout process, execute and document the electrical-related portions of the prefucntional checklists provided by the CA for all commissioned equipment.

k. Perform and clearly document all completed startup and system operational checkout procedures, providing a copy to the CA.

l. Address current A/E punch list items before functional testing.

m. Provide skilled technicians to execute starting of equipment and to execute the functional performance tests. Ensure that they are available and present during the agreed upon schedules and for sufficient duration to complete the necessary tests, adjustments and problem-solving.

n. Perform functional performance testing under the direction of the CA for specified equipment in Section 16570 and 01810. Assist the CA in interpreting the monitoring data, as necessary.

o. Correct deficiencies (differences between specified and observed performance) as interpreted by the CA, CM and A/E and retest the equipment.

p. Prepare O&M manuals according to the Contract Documents, including clarifying and updating the original sequences of operation to as-built conditions.

q. During construction, maintain as-built red-line drawings for all drawings and final CAD as-builts for contractor-generated coordination drawings. Update after completion of commissioning (excluding deferred testing). Prepare red-line as-built drawings for all drawings and final as-builts for contractor-generated coordination drawings.

r. Provide training of the Owner's operating personnel as specified.

s. Coordinate with equipment manufacturers to determine specific requirements to maintain the validity of the warranty.

2. Warranty Period

a. Execute seasonal or deferred functional performance testing, witnessed by the CA, according to the specifications.

b. Correct deficiencies and make necessary adjustments to O&M manuals and as-built drawings for applicable issues identified in any seasonal testing.

B. Electrical Designer/Engineer

1. Refer to Section 01810 for the responsibilities of the Electrical Designer/Engineer.

1.3 RELATED WORK

A. Refer to Section 16570 for functional testing requirements.

PART 2 - PRODUCTS

2.1 TEST EQUIPMENT

A. Division 16 shall provide all test equipment necessary to fulfill the testing requirements of this Division (i.e. light meters).

PART 3 - EXECUTION

3.1 SUBMITTALS

A. Division 16 shall provide submittal documentation relative to commissioning to the CA as requested by the CA. Refer to Section 01810 Part 3.3 for additional Division 16 requirements.

3.2 STARTUP

A. The electrical contractors shall follow the start-up and initial checkout procedures listed in the Responsibilities list in this section and in 01810 Part 3.4. Division 16 has start-up responsibility and is required to complete systems and sub-systems so they are fully functional, meeting the design objectives of the Contract Documents. The commissioning procedures and functional testing do not relieve or lessen this responsibility or shift that responsibility partially to the commissioning agent or Owner.

B. Functional testing is intended to begin upon completion of a system. Functional testing may proceed prior to the completion of systems, or sub-systems at the discretion of the CA and CM. Beginning system testing before full completion does not relieve the Contractor from fully completing the system, including all prefunctional checklists as soon as possible.

3.3 FUNCTIONAL PERFORMANCE TESTS

A. Refer to Section 16570 for specific details on the required functional performance tests.

3.4 TESTING DOCUMENTATION, NON-CONFORMANCE AND APPROVALS

A. Refer to Section 01810 Part 3.6 for specific details on non-conformance issues relating to prefunctional checklists and tests.

B. Refer to Section 01810 Part 3.5 for issues relating to functional performance tests.

3.5 OPERATIONS AND MAINTENANCE (O&M) MANUALS

A. Division 16 shall compile and prepare documentation for all equipment and systems covered in Division 16 and deliver to the GC for inclusion in the O&M manuals, according to Section 01810.

B. The C shall receive a copy of the O&M manuals for review.

3.6 TRAINING OF OWNER PERSONNEL

A. The GC shall be responsible for training coordination and scheduling and ultimately to ensure that training is completed. Refer to Section 01810 for additional details.

B. The CA shall be responsible for overseeing and approving the content and adequacy of the training of Owner personnel for commissioned equipment. Refer to Section 01810 for additional details.

C. Electrical Contractor. The electrical contractor shall have the following training responsibilities:

1. Provide the CA with a training plan two weeks before the planned training according to the outline described in Section 01810, Part 3.8.

2. Provide designated Owner personnel with comprehensive training in the understanding of the systems and the operation and maintenance of each major piece of commissioned electrical equipment or system.

3. Training shall start with classroom sessions, if necessary, followed by hands on training on each piece of equipment, which shall illustrate the various modes of operation, including startup, shutdown, fire/smoke alarm, power failure, etc.

4. During any demonstration, should the system fail to perform in accordance with the requirements of the O&M manual or sequence of operations, the system will be repaired or adjusted as necessary and the demonstration repeated.

5. The appropriate trade or manufacturer's representative shall provide the instructions on each major piece of equipment. This person may be the start-up technician for the piece of equipment, the installing contractor or manufacturer’s representative. Practical building operating expertise as well as in-depth knowledge of all modes of operation of the specific piece of equipment is required. More than one party may be required to execute the training.

6. The training sessions shall follow the outline in the Table of Contents of the operation and maintenance manual and illustrate whenever possible the use of the O&M manuals for reference.

7. Training shall include:

a. Use the printed installation, operation and maintenance instruction material included in the O&M manuals.

b. Include a review of the written O&M instructions emphasizing safe and proper operating requirements, preventative maintenance, special tools needed and spare parts inventory suggestions. The training shall include start-up, operation in all modes possible, shut-down, seasonal changeover and any emergency procedures.

c. Discuss relevant health and safety issues and concerns.

d. Discuss warranties and guarantees.

e. Cover common troubleshooting problems and solutions.

f. Explain information included in the O&M manuals and the location of all plans and manuals in the facility.

g. Discuss any peculiarities of equipment installation or operation.

h. The format and training agenda in Guidelines for Commissioning HVAC Systems, ASHRAE, 1989R, 1996 is a recommended reference.

i. Classroom sessions shall include the use of overhead projections, slides, video and audio taped material as might be appropriate.

8. Hands-on training shall include start-up, operation in all modes possible, including manual, shut-down and any emergency procedures and maintenance of all pieces of equipment.

9. The electrical contractor shall fully explain and demonstrate the operation, function and overrides of any local packaged controls, not controlled by the central control system.

a. Training shall occur after functional testing is complete, unless approved otherwise by the Project Manager.

b. Duration of Training. The electrical contractor shall provide training on each piece of equipment according to the following schedule.

Hours	System
4	Lighting controls, controllers, and schedules
2	Occupancy sensors and photo sensors

3.7 DEFERRED TESTING

A. Refer to Section 01810, Part 3.9 for requirements of deferred testing.

3.8 WRITTEN WORK PRODUCTS

A. Written work products of Contractors will consist of the startup and initial checkout plan described in Section 01810 and the filled out startup, initial checkout and pre-functional checklists.

END OF SECTION

SECTION 26 09 10

ELECTRICAL TESTING REQUIREMENTS

PART 1 - GENERAL

1.1 INCLUDED SYSTEMS AND EQUIPMENT

A. The following is a list of the equipment and system test requirements included in this section:

1. Lighting sweep controls (weekday, weekend, and holiday schedules).

2. Occupancy sensors.

3. Photo sensors (indoor and outdoor).

4. Lighting controllers (indoor and outdoor).

1.2 DESCRIPTION

A. This section specifies the functional testing requirements for Division 16 systems and equipment. From these requirements, the Commissioning Authority (CA) shall develop step-by-step procedures to be executed by the Subs. The general functional testing process, requirements and testing methods definitions are described in Section 01810. The test requirements for each piece of equipment or system contain the following:

1. The contractors responsible to execute the tests, under the direction of the CA.

2. A list of the integral components being tested.

3. Prefunctional checklists associated with the components.

4. Functions and modes to be tested.

5. Required conditions of the test for each mode.

6. Special procedures.

7. Required methods of testing.

8. Required monitoring.

9. Acceptance criteria.

10. Sampling strategies allowed.

1.3 PREREQUISITES

A. The following applicable generic prerequisite checklist items are required to be listed on each written functional test form and be completed prior to functional testing.

1. All related equipment has been started up and calibrated and start-up reports and prefunctional checklists submitted and approved ready for functional testing. Sample prefunctional checklists can be found in Section 01813. These are samples and for reference only. Final prefunctional checklists will be provided as part of the Construction Phase Commissioning Plan.

2. All A/E punchlist items for this equipment corrected.

3. These functional test procedures reviewed and approved by installing contractor.

4. Safeties and operating ranges reviewed by the CA.

5. Test requirements and sequences of operation attached.

6. Schedules and set points attached.

7. Record of all values for pre-test set points changed to accommodate testing has been made and a check box provided to verify return to original values (control parameters, limits, delays, lockouts, schedules, etc.).

PART 2 - PRODUCTS – (NOT USED)

PART 3 - EXECUTION

3.1 LIGHTING SWEEP CONTROLS

A. Parties Responsible to Execute Functional Test

1. Lighting Controls contractor: operate the controls

2. Electrical contractor: assist in testing sequences

3. CA: to witness, direct and document testing.

B. Prerequisites

1. The applicable prerequisite checklist items listed in the beginning of Section 16570 shall be listed on each functional test form and checked off prior to functional testing.

C. Functions / Modes Required To Be Tested and Test Methods

1. The following testing requirements are an addition to and do not replace any testing requirements elsewhere in this Division.

Function / Mode	Test Method Manual (demonstration), Monitoring, Either or Both
MISCELLANEOUS FUNCTIONS	
1. All specified functions and features are set up, debugged and fully operable.	Verbal discussion of features
2. Power failure and battery backup and power-up restart functions.	Demonstration
3. Security and access codes.	Demonstration
4. Verify override duration setting.	Demonstration
5. Scheduling features fully functional and setup, including weekdays, weekends, and holidays.	Observation in terminal screens or printouts
SWEEP FUNCTIONS	
1. 50% of the zones with a minimum of 2 zones per controller or relay must be verified by turning on at least 25% of the lights in the zone and witnessing an actual sweep.	Either

Function / Mode	Test Method Manual (demonstration), Monitoring, Either or Both
OVERRIDE FUNCTIONS	
1. Manual occupant overrides: 25% of the local override switches, with a minimum of 4 switches must be verified by turning the override switches ON after a sweep and seeing the lights turn back on. 100% of the remainder of the switches should be sight verified to be in place.	Either

D. Acceptance Criteria (referenced by function or mode ID)

1. For the conditions, sequences and modes tested, the sweep controls, integral components and related equipment respond to changing conditions and parameters appropriately as expected, as specified and according to acceptable operating practice.

E. Sampling Strategy for Identical Units

1. Sample the units per the above table. If 10% of the units in the first sample fail the functional performance tests, test another 10% of the group (the 2nd sample). If 10% of the units in the 2nd sample fail, test all remaining units in the whole group, fully at the contractor's expense.

3.2 OCCUPANCY SENSORS

A. Parties Responsible to Execute Functional Test

1. Electrical contractor: assist in testing sequences

2. CA: to witness, direct and document testing.

B. Prerequisites

1. All occupancy sensor calibration and set points shall be verified prior to functional testing.

2. The applicable prerequisite checklist items listed in the beginning of Section 16570 shall be listed on each functional test form and checked off prior to functional testing.

C. Functions / Modes Required To Be Tested and Test Methods

1. The following testing requirements are an addition to and do not replace any testing requirements elsewhere in this Division.

Function / Mode	Test Method Manual (demonstration), Monitoring, Either or Both
MISCELLANEOUS FUNCTIONS	
1. All specified functions and features are set up, calibrated, debugged and fully operable.	Verbal discussion of features
2. Occupant over-ride functions and duration setting.	Demonstration

Function / Mode	Test Method Manual (demonstration), Monitoring, Either or Both
OCCUPANCY SENSOR FUNCTIONS	
1. Test the sequence of operation for all features and modes.	Manual
2. Verify that the controls and sensors are not easily overridden or disabled by occupants.	Visual inspection
3. Verify that the occupancy sensor is in an adequate location and is not being affected by obstructions.	Visual inspection

D. Acceptance Criteria (referenced by function or mode ID)

1. For the conditions, sequences and modes tested, the dimming controls, integral components and related equipment respond to changing conditions and parameters appropriately as expected, as specified and according to acceptable operating practice.

E. Sampling Strategy for Identical Units

1. Each occupancy sensor and its controlled zone must be tested (no sampling).

3.3 PHOTO SENSORS

A. Parties Responsible to Execute Functional Test

1. Electrical contractor: assist in testing sequences

2. CA: to witness, direct and document testing.

B. Prerequisites

1. All photo sensor calibration and set points shall be verified prior to functional testing.

2. The applicable prerequisite checklist items listed in the beginning of Section 16570 shall be listed on each functional test form and checked off prior to functional testing.

C. Functions / Modes Required To Be Tested and Test Methods

1. The following testing requirements are an addition to and do not replace any testing requirements elsewhere in this Division.

Function / Mode	Test Method Manual (demonstration), Monitoring, Either or Both
MISCELLANEOUS FUNCTIONS	
1. All specified functions and features are set up, calibrated, debugged and fully operable (indoor and outdoor sensors).	Verbal discussion of features
PHOTO SENSOR FUNCTIONS	
1. Test the sequence of operation for all features and modes (weekday, weekend, and holiday schedules) and interlocks with time clocks, if any.	Manual

Function / Mode	Test Method Manual (demonstration), Monitoring, Either or Both
2. Verify that the controls and sensors are not easily overridden or disabled by occupants.	Visual inspection
3. Verify that the photo sensor is in an adequate location and is not being affected by obstructions.	Visual inspection
DIMMING FUNCTIONS	
1. Verify that dimming does not cause lower than specified light levels in adjacent “non-dimmed” spaces.	

D. Acceptance Criteria (referenced by function or mode ID)

1. For the conditions, sequences and modes tested, the dimming controls, integral components and related equipment respond to changing conditions and parameters appropriately as expected, as specified and according to acceptable operating practice.

E. Sampling Strategy for Identical Units

1. Each photo sensor and its controlled zone must be tested (no sampling).

END OF SECTION

SECTION 26 11 23

ELECTRIC MOTORS

PART 1 - GENERAL

1.1 THE REQUIREMENT

A. General: The CONTRACTOR shall furnish and install electric motors, accessories, and appurtenances as specified herein and in conformance with the individual specifications of driven equipment, to provide a complete and operable installation, all in accordance with the requirements of the Contract Documents.

1.2 RELATED WORK SPECIFIED ELSEWHERE

A. The work of the following Sections and Divisions applies to the work of this Section. Other Sections of the Specifications, not referenced below, shall also apply to the extent required for proper performance of this work.

1. Section 11 11 10 Pre-Engineered Car Wash System.

2. Division [26] as applicable, Electrical.

3. Division 14 24 00 as applicable, Passenger Hydraulic Elevators.

1.3 REFERENCE SPECIFICATIONS, CODES, AND STANDARDS

A. All work specified herein shall conform to or exceed the applicable requirements of the referenced portions of the following publications to the extent that the provisions thereof are not in conflict with other provisions of these specifications.

1. LAEC: City of Los Angeles Electrical Code, latest adopted edition.

2. Commercial Standards

NEMA MG 1	Motors and Generators
NEMA MG 2	Safety Standard for Construction and Guide for Selection, Installation and Use of Electric Motors and Generators
NEMA MG 10	Energy Management Guide for Selection and Use of Polyphase Motors
I EEE 43	Recommended Practice for Testing Insulation Resistance of Rotating Machinery
IEEE 85	Standard Test Procedure for Airborne Sound Measurement on Rotating Electric Machinery
I EEE 112	Standard Test Procedure for Polyphase Induction Motors and Generators.
I EEE 113	Guide on Test Procedures for DC Machines
I EEE 115	Test Procedure for Synchronous Machines

1.4 CONTRACTOR SUBMITTALS

A. Submittals shall be made in accordance with the General Requirements.

B. Complete motor data shall be submitted with the driven machinery shop drawings. Motor data shall include:

1. Machine name and specification number of driven machine.

2. Motor manufacturer.

3. Motor type or model and dimension drawing.

4. Nominal horsepower.

5. NEMA design.

6. Frame size.

7. Enclosure.

8. Winding insulation class and treatment.

9. Rated ambient temperature.

10. Service factor.

11. Voltage, phase, and frequency rating.

12. Full load current at rated horsepower for application voltage.

13. Starting code letter, or locked rotor kVA, or current.

14. Special winding configuration such as part-winding, star-delta. Include winding diagram.

15. Rated full load speed.

16. Power Factor at full load.

17. Noise certification and data sheets.

18. Replica of motor nameplate.

19. Bearing types and catalog numbers.

C. The following submittals and specific information shall be provided.

1. General Description:

a. Motor dimensional drawings. Net motor weight shall be noted on the dimensional drawings. Shipping weight shall also be noted if motors are to be shipped separately from the driven equipment.

b. List of special characteristics and features being provided.

2. Motor Characteristics:

a. Guaranteed minimum efficiency at rated load at rated voltage.

b. Expected efficiency at 1/2, 3/4, and full load at rated voltage.

c. Motor no-load current at rated voltage.

d. Full load current at rated voltage.

e. Full load current at 110 percent voltage.

f. Starting current at rated voltage.

g. Full load speed.

h. Certified copy of test report for identical motor tested in accordance with NEMA MG 1-12.53a and IEEE Standard 112, Test Method B, showing full load efficiency not less than specified value. Motors not as specified will be rejected.

3. Motor Tests and Test Reports:

a. Certified copies of test reports on actual motors being provided.

b. Short commercial tests, including running light current at rated voltage, high potential, and locked rotor current.

1.5 QUALITY ASSURANCE

A. Quality assurance shall be in accordance with all applicable requirements of General Requirements.

B. Adjustable frequency driven motors shall be tested as an assembly with the drive and the driven equipment prior to delivery to the site.

1.6 SERVICES OF MANUFACTURER'S REPRESENTATIVE

A. Where motors are part of packaged equipment such as an Elevator or Air-Conditioning Unit, a qualified manufacturer's representative shall supervise the unpacking, installation and field testing.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Materials and equipment shall be standard products of established manufacturers who have produced continuously the type of equipment specified. All equipment and material shall be new and of high quality insuring long life and reliable operation.

2.2 SERVICE CONDITIONS

A. Motors shall be designed and manufactured for continuous severe duty service.

2.3 RATING AND APPLICATION

A. Unless indicated otherwise in specifications or on motor data sheets, motor enclosures shall be of the following type(s) approved for its intended purpose:

1. Motors installed indoors and outdoors shall be totally enclosed fan cooled (TEFC) with a service factor of 1.15.

B. Motors shall be rated in accordance with the following, unless otherwise specified.

1. Motors below 1/2 hp shall be rated 115 volts, single phase, 60 Hertz and shall be of the capacitor-start, induction-run type.

2. Motors 1/2 hp through 200 hp inclusive shall be rated 460 volts, three phase, 60 Hertz.

C. Motor mechanical design shall be in accordance with this Specification and the detailed requirements indicated on the individual motor data sheet.

D. The design and construction of all motors shall be coordinated with the driven equipment requirements.

E. Motors shall be designed for full-voltage starting and rated for continuous operation as shown on the Contract Drawings.

F. Motors shall operate successfully under running conditions at rated load at plus or minus 10 percent of rated voltage or plus or minus 5 percent of rated frequency or a combination of the two.

G. In sizing motors, the horsepower rating of the motor, as stamped on the nameplate, shall not be exceeded during any operating conditions of the driven equipment.

H. Starting current at full voltage shall not exceed 650 percent of the motor full load current for all integral horsepower alternating current motors.

I. All motors shall have a safe stall (locked rotor) time equal to or greater than the maximum accelerating time under the worst voltage conditions specified.

J. Motor fans shall be suitable for rotation in either direction. They shall be nonsparking, corrosion resistant material, accurately balanced before assembly on the motor.

K. All motors shall be NEMA Design "B" unless otherwise specified on the motor data sheet, or required by the application.

L. Totally enclosed motors shall be "Severe Duty Chemical Service" type including shaft seals, internal surfaces coated with corrosion resistant paint or epoxy varnish, external surfaces coated with alkyd paint or epoxy enamel.

M. All motors shall be "high-efficiency" design, capable of operating at a higher normal efficiency than the standard industry design.

1. Motors built in NEMA Frames 143T through 445T shall have the guaranteed efficiency stamped on the nameplate. The basis for motor efficiency evaluation shall be IEEE test procedure 112, Method B, using accuracy improvement by segregated loss determination including stray load loss measurements.

2.4 TERMINAL BOXES

A. Terminal boxes of the split type shall be furnished for each motor unless the base or housing of the motor is of a design which incorporates provisions for incoming cables.

B. Terminal boxes for medium-voltage motors shall have sufficient interior space to permit stress cones to be formed on the incoming cables and to permit the cable shields to be properly terminated and grounded. In addition, boxes shall be sized to contain surge protection equipment.

C. Separate terminal boxes shall be furnished for each accessory device, such as space heaters, temperature detectors, and other items.

D. All boxes shall be heavy duty class, weather tight and thoroughly coated internally and externally with corrosion-resistant paint.

2.5 INSULATION

A. The insulation system shall be Class F with temperature rise (based on maximum ambient temperature of 40 degrees C) of 80 degrees C measured by the resistance method.

B. Motors constructed in NEMA Frame 364 and larger, except totally enclosed motor, shall be vacuum pressure impregnated with 100 percent solids epoxy resins. The completed insulation shall have a minimum resistance of 10 mega-ohms after 168 hours of testing in a humidity chamber maintained at 100 percent relative humidity and 40 degrees C ambient. In addition, motors with form wound coils shall also meet NEMA MG1-20.48 Qualification Test.

C. Totally enclosed motors shall be dipped and baked in epoxy resin. The completed insulation shall have a minimum resistance of 1.5 mega-ohms after testing as in 2.5B above.

2.6 BEARINGS AND LUBRICATION - HORIZONTAL MOTORS

A. All horizontal motors rated 200 hp and below shall have anti-friction bearings, selected to provide an L10 life of 100,000 hours for direct connected motors and 17,500 hours for belt or chain drive motors when belted or chain driven in accordance with the information contained on the data sheets. Further, bearings shall be re-greaseable while running via installed grease fittings.

B. The requirement for bearing temperature protection will be specified on the individual motor data sheets. When specified, protection shall be resistance type bearing temperature detectors 120 ohms at 0 degrees C tip sensitive with leads brought out to the head of the device where suitable connection can be made. The detector holder and head assembly shall be suitable for the area classification in which the motors will be installed. The detectors shall sense the temperature at the outer shell of sleeve type bearings.

C. Motors shall be greased type and lubricated with Chevron SRI grease NLGI-2 or equal.

2.7 BEARINGS AND LUBRICATION - VERTICAL MOTORS

A. Vertical motors shall be solid shaft or hollow shaft and bearings shall be anti-friction type grease.

B. Motors for "Process" or "In-Line" service shall be "In-Line, Solid Shaft" type construction with a clamped and locked bearing arrangement. Mounting and shaft extension dimensions and tolerances shall be in accordance with NEMA MG1-18.620 or 18.625. The bearings shall be rated for a L10 minimum life of 2 years or 17,500 hours at the maximum expected up or down thrust the driven equipment may impose during startup or operation at any capacity including shutoff.

2.8 SPACE HEATERS

A. Space heaters shall be supplied to maintain the interior of the motor enclosure above the dew point on all motors 30 hp and larger installed outdoors and on all motors 50 hp and larger installed indoors.

B. Heaters shall be unaffected by the accumulation of moisture and shall have terminals adequately protected against moisture under severe weather conditions. Heaters shall be mounted on noncombustible material and shall operate without thermal damage to the

motor or themselves. Heaters shall be rated 120 volts single phase. They shall have a maximum sheath temperature of 200 degrees C.

C. Leads for the heaters shall be brought out into a terminal box separate from the main power leads terminal box or in a separate cabinet, if required.

D. Where motors are provided with space heaters, warning nameplate shall be red background with white letters and shall read: "CAUTION - CONTAINS AN EXTERNAL VOLTAGE SOURCE."

2.9 WINDINGS AND WINDING PROTECTION

A. Stator windings shall be copper.

B. Leads shall be brought out to a terminal box separate from the main power leads terminal box.

2.10 GROUNDING

A. Each motor shall have a threaded hole in the motor frame with either a bronze bolt and lock washer or a bronze post-type connector for connection to an external ground conductor. The hole shall be for a 1/2 inch bolt or post-type connector except for motors of 100 hp or less where the size of the bolt or post-type connector may be 3/8 inch. The hole in the motor frame shall be threaded to a depth not less than 1 1/2 times the diameter of the hole to ensure a firm connection. If necessary, a metal pad shall be bonded to the motor frame to provide this depth for the threaded hole. The grounding means shall be located on the same side of the motor as the main lead terminal box.

2.11 BALANCE AND VIBRATION

A. Motors shall be dynamically balanced. Method of measuring dynamic balance shall be when measured in accordance with NEMA MG1-12.06 or MG1-20.52 and with the maximum amplitude values as shown in NEMA MG1-12.05.

B. Motors shall have a maximum peak-to peak amplitude of vibration in accordance with MG1-20.52 when measured in accordance with MG1-12.06 B or MG1-20.53.

2.12 NOISE

A. Maximum sound pressure levels 3 feet from any motor shall not exceed 85dbA.

B. All motors shall be "quiet line" type and shall be so indicated on the submittals, Quiet Line type motors shall be capable of operating at a lower noise level than the standard industry design.

C. Measurement procedures shall in general be guided by the provisions of IEEE Publication No. 85.

2.13 NAMEPLATES

A. Each motor shall have a corrosive-resistant nameplate containing information in accordance with NEMA MG1, and the service factor and efficiency shall be included.

PART 3 - EXECUTION

3.1 INSTALLATION

A. CONTRACTOR shall make provision to protect motors from moisture by connecting power to space heaters. The space heaters shall be connected while in storage and/or before commissioning.

END OF SECTION

SECTION 26 20 00

CONDUCTORS

PART 1 - GENERAL

1.1 THE REQUIREMENT

A. The CONTRACTOR shall furnish all tools, equipment, material, and supplies and shall perform all labor required to complete the work as indicated on the Drawings and specified herein.

1.2 RELATED WORK SPECIFIED ELSEWHERE

A. The following Sections or Divisions applies to the WORK of this Section. Other Sections of the Specifications, not referenced below, shall also apply to the extent required for proper performance of this WORK.

1. Division 11 Euipment.
2. Division 17 Instrumentation and Control.

B. Materials and equipment furnished and installed under other divisions with raceway and electrical conductors furnished, installed, and connected under Division 16, Electrical.

1.3 REFERENCE CODES AND STANDARDS

A. All work specified herein shall conform to or exceed the applicable requirements of the referenced portions of the following publications to the extent that the provisions thereof are not in conflict with other provisions of these specifications.

B. Comply with the current provisions of the following Codes and Standards.

1. Codes and Standards:

LAEC	City of Los Angeles Electrical Code, latest adopted edition.

2. Commercial Standards:

ANSI/UL 467	Grounding and Bonding Equipment, Safety Standard For.
ICEA S-95-658/WC70	Power Cables Rated 2000 Volts or Less.
ICEA S-96-659/WC71	Nonshielded Cables Rated 2,001-5,000 V.
ICEA S-93-639/WC74	5-46 kV Shielded Power Cable.
ANSI/UL 62	Flexible Cord and Fixture Wire.
ANSI/UL 510	Insulating Tape.
ANSI/UL 1277	Electric Power and Control Tray Cables with Optional Optical Fiber Members.
ASTM B8	Standard Specifications from Concentric Lay Standard Copper Conductors, Hard, Medium-Hard or Soft.

IEEE 48	Standard Test Procedures and Requirements for High Voltage Alternating Current Cable Terminations.
NEMA WC-57	Control, Thermocouple Extension, and Instrumentation Cable.

C All Conductors furnished by the CONTRACTOR shall be listed by and shall bear the label of Underwriters' Laboratories, Incorporated, (UL).

D The construction and installation of all electrical equipment and materials shall comply with all provisions of the CAL OSHA Safety Orders Title 8 CCR, as applicable, State Building Standards, and applicable local codes and regulations.

1.4 CONTRACTOR SUBMITTALS

A. Submittals shall be made in accordance with the Section 16010 Wastewater Facilities General Electrical Requirements.

B. CONTRACTOR shall submit the following items.

1. Catalog cut sheets and other brochures depicting conductor characteristics.

2. Manufacturer’s certified test records and factory test procedures.

3. Manufacturer’s recommended splicing, testing, and installation procedures and practices.

4. Certified test reports of HI-POT and Megger test results for medium and high voltage cables.

1.5 QUALITY ASSURANCE

A Conductor Identification System:

1. Provide complete power, control and signal conductor identification system so that after installation, circuits can be easily traced from origin to final destination.

2. Identify power, control and signal conductors at each termination and in all accessible locations such as maintenance holes, handholes, panels, switchboards, pull boxes, terminal boxes, etc. For identification, use type of tags specified herein.

3. Tag conductors using a three-segment conductor numbering scheme which defines the origin of the conductor, the function of the conductor, and the destination of the conductor.

   Example: MCCA-P-MCCB where MCCA is the origin, P is the function identification (P = power, C = control, S = signal, etc.), and MCCB is the destination.

4. For conductors with one point of origin and two or more destinations, expand the function identification number, e.g., PA, PB, etc.

5. Make the origin and destination identification the specific names for the equipment used in the Contract Documents. Make the instrumentation and control identification names exactly as designated, i.e., FT-S-121.

B. Conductor Color Coding:

1. Color coding of multiconductor control and instrumentation cable is specified in the individual cable type specification.

2. For power conductors, provide all single conductors and individual conductors of multiconductor power cables with integral insulation pigmentation of the designated colors, except conductors larger than No. 6 AWG may be provided with color coding by applying a heat shrink tube of the appropriate color.

3. Phase A, B, C implies the direction of positive phase rotation.

4. Use the following colors:

System	Conductor	Color
All Systems	Equipment Grounding	Green
240/120 Volts	Grounded Neutral	White
1-Phase, 3-Wire	One Hot Leg	Black
	Other Hot Leg	Red
208Y/120 Volts	Grounded Neutral	White
3-Phase, 4-Wire	Phase A	Black
	Phase B	Red
	Phase C	Blue
240/120 Volts	Grounded Neutral	White
3-Phase, 4-Wire	Phase A	Black
Delta, Center Tap "High"	(wild) Leg	Orange
Ground on 1-Phase	Phase C	Blue
480Y/277 Volts	Grounded Neutral	White
3-Phase, 4-Wire	Tracer	
	Phase A	Brown
	Phase B	Orange
	Phase C	Yellow
4,160 Volt	Grounded Neutral	White
4,800 Volt	Phase A	Yellow
13,800 Volt	Phase B	Red
34,500 Volt	Phase C	Blue

C. For all high voltage cable and all 600 volt cable sized AWG #2 and larger, CONTRACTOR shall furnish cable manufactured no more than one year prior to installation. Provide documentation from the supplier.

PART 2 - PRODUCTS

2.1 GENERAL

A. The use of a manufacturer's name and model or catalog number is for the purpose of establishing the standard of quality and general configuration desired only. Products of other manufacturers will be considered in accordance with the GENERAL REQUIREMENTS.

2.2 CONDUCTORS

A. Conductors 600 Volts and Below:

1. Unless otherwise indicated, provide stranded conductors, except provide solid conductors where No. 10 AWG and No. 12 AWG are designated for branch circuit power wiring in lighting and receptacle circuits.

2. Provide conductors with Type THW or Type THHN/THWN, except for sizes No. 6 and larger, provide conductors with XHHW, XHHW-2 insulation.

3. Use only copper conductors.

4. For all direct burial and aerial conductors and cables, provide conductors with UL labeling "TYPE USE" and RHW insulation with heavy-duty, black, neoprene sheath meeting the physical requirements and minimum thickness requirements of ICEA S-95-658 NEMA WC70.

5. Where flexible cords and cables are specified, provide Type SO, 600-volt, with the number and size of copper conductors indicated.

6. Conductors for applications of 600 volts and below shall be rated for 600 volts unless otherwise specified.

7. The name of the manufacturer, insulation type, voltage rating and wire size shall be clearly and permanently imprinted throughout the length of each conductor. All conductors and cables supplied shall bear the UL label.

B. Conductors Above 600 Volts:

1. 5 kV Conductors

a. Unless indicated otherwise, provide minimum 19 strandsoft annealed uncoated copper conductors with crosslinked polyethylene (XLPE) insulation, extruded semiconducting strand and insulation shields, and a polyvinyl chloride jacket.

b. Provide shielded single conductors with 100 percent insulation level, that meet applicable portions of ICEA S-93-639/NEMA WC74, Ionization Level Requirements. Provide conductors UL listed 1072 Type MV-90.

c. Cable marking shall include manufacturer’s name, insulating material, Conductor size, voltage class and UL mark.

C. Multi-Conductor Cable:

1. Provide cable that is UL listed Type TC and conforms to the requirements of UL 1277 and NEC Article 336, or UL listed Power Limited Circuit Cable that conforms to the requirements of Article 725 of the LAEC. Provide cables permanently and legibly marked with the manufacturer's name, the maximum working voltage for which the cable was designed, the type of cable, and labeled UL (or submit evidence of UL listing).

2. Provide cables as specified under the type number in this section (Type 1, Type 2, etc.). Conduits shown on the Drawings and in the Circuit/Raceway

Schedule have been sized to accommodate the outside diameter for each type. For this reason, use cable diameters equal to or less than the diameters specified.

a. Type 1 (600-Volt Multi-Conductor Control Cable, Type TC):

(1) General: Multi-conductor control circuit interconnection cable with ground. Suitable for installation in open air, in cable trays, conduit, or other approved raceways. Maximum cable temperature rating 90 degrees C dry locations, 75 degrees C wet locations. Passes vertical tray flame test.

(2) Individual Conductors: No. 14 AWG, strand copper.

(3) Insulation and Jackets: Provide conductors having 15-mil PVC insulation with 4-mil nylon jacket, and UL listed as Type THHN/THWN. Color code the conductor group in accordance with ICEA S-95-658/WC70. Include one full size green equipment grounding conductor. Bind conductor group with a spiral wrap of barrier tape. Provide cable with overall outer PVC jacket which is flame-retardant, sunlight- and oil-resistant, and has a nominal thickness as shown in the table below.

(4) Use only2,3, 4, 5, 7, 9, 12,19, 25, 30,and 37 -conductor cables. The green grounding conductor is included in the number of conductors shown in the table below.

No. of Conductors	Max. Outside Diameter (inches)	Jacket Thickness (mils)
5	0.45	45
7	0.48	45
12	0.65	60
19	0.76	60
25	0.93	60
37	1.04	80

(5) Acceptable Manufacturers:

1. Belden;
2. General Cable;
3. Southwire;
4. Or equal.

b. Type 2 (600-Volt Multi-Conductor Power Cable, Type TC):

(1) General: 3 or 4-conductor, with ground and overall jacket. Suitable for installation in open air, in cable trays, conduit, or other approved raceways. Maximum cable temperature rating 90 degrees C dry locations, 75 degrees C wet locations.

(2) Individual Conductors: Class B stranded, coated, or uncoated copper.

(3) Insulation and Jacket: Provide conductors insulated with chemically cross-linked polyethylene or ethylene-propylene, UL rated VW-1. Provide sunlight- and oil-resistant PVC outer jacket with nominal thickness as shown in the following table. Provide phase conductors color-coded black, red, and blue. [Provide neutral conductor color-coded white with black tracer.]

Conductor Size	No. of Conductors	Ground Wire Size	Max. OD (inches)	Thickness (mils)
12	3	-	0.45	45
	4	-	0.49	45
10	3	-	0.50	45
	4	-	0.58	60
8	3	10	0.66	60
	4	10	0.72	60
6	3	8	0.74	60
	4	8	0.81	60
4	3	8	0.88	60
	4	8	0.97	80
2	3	6	1.01	80
	4	6	1.11	80
1	3	6	1.14	80
	4	6	1.25	80
1/0	3	6	1.22	80
	4	6	1.35	80
2/0	3	6	1.32	80
	4	6	1.46	80
3/0	3	4	1.42	80
	4	4	1.58	80
4/0	3	4	1.56	80
	4	4	1.78	110

(4) Acceptable Manufacturers:

1. General Cable;
2. Okonite;
3. Southwire;
4. Or equal.

c. Type 3 (600-Volt No. 16 AWG Twisted, Shielded Pair Instrumentation Cable, Type TC) (UL 62 & 1277):

(1) General: Single pair instrumentation cable designed for noise rejection for process control, computer, or data log applications. Suitable for installation in cable trays, conduit, or other approved raceways. Maximum cable temperature rating shall be 90 degrees C dry locations, 75 degrees C wet locations.

(2) Individual Conductors: Bare soft annealed copper, Class B, 7-strand concentric per ASTM B 8; 20 AWG, 7-strand tinned copper drain wire.

(3) Insulation and Jacket: Each conductor 15-mil nominal PVC and 4-mil nylon insulation. Pair conductors pigmented black and red. Jacket flame-retardant and sunlight- and oil-resistant PVC with 45 mils nominal thickness. Shield 1.35-mil aluminum/mylar overlapped to provide 100 percent coverage.

(4) Dimension: 0.31 inch nominal OD.

(5) Acceptable Manufacturers:

1. Belden;
2. General Cable;
3. Okonite;
4. Or equal.

d. Type 4 (600-Volt No. 16 Twisted, Shielded Triad Instrumentation Cable, Type TC) (UL 62 & 1277):

(1) General: Single triad instrumentation cable designed for noise rejection for process control, computer, or data log applications. Suitable for installation in cable tray, conduit, or other approved raceways. Maximum cable temperature rating shall be 90 degrees C dry locations, 75 degrees C wet locations.

(2) Conductors: Bare soft annealed copper, Class B, 7-strand concentric per ASTM B 8; 20 AWG, 7-strand, tinned copper drain wire.

(3) Insulation and Jacket: Each conductor, 15-mil nominal PVC and 4-mil nylon insulation. Triad conductors pigmented black, red, and blue. Jacket flame-retardant and sunlight- and oil-resistant PVC with 45 mils nominal thickness. Shield 1.35-mil aluminum/mylar, overlapped to provide 100 percent coverage.

(4) Dimension: 0.32 inch nominal OD.

(5) Acceptable Manufacturers:

1. Belden;
2. General Cable;
3. Okonite;
4. Or equal.

e. Type 5 (600-Volt No. 18 AWG, Multi-twisted Shielded Pairs with a Common Overall Shield Instrumentation Cable, Type TC)(UL 62 & 1277):

(1) General: Twisted, shielded pairs of instrument cables, grouped in a single cable, designed for use as instrumentation, process control, and computer cable. Suitable for installation in cable tray, conduit, or other approved raceways. Maximum cable temperature rating shall be 90 degrees C dry locations, 75 degrees C wet locations.

(2) Conductors: Bare soft annealed copper, Class B, 7-strand, concentric per ASTM B 8. Tinned copper drain wires. Pair drain wire size AWG 20, group drain wire size AWG 18.

(3) Insulation and Jacket: Each conductor 15-mil PVC and 4-mil nylon insulation. Pair conductors pigmented black and red with red conductor numerically printed for group identification. Outer jacket flame-retardant and sunlight- and oil-resistant PVC with nominal thickness as shown in table. Individual pair shield 1.35-mil aluminum/mylar. Group shield 2.35-mil aluminum/mylar, overlapped for 100 percent coverage.

(4) Dimensions as noted in table below:

Number of Pairs	Maximum Outside Dimension (inches)	Nominal Jacket Thickness (mils)
4	0.50	45
8	0.68	60
12	0.82	60
16	0.95	80
20	1.05	80
24	1.16	80
36	1.33	80
50	1.56	80

(5) Acceptable Manufacturers:

1. Belden;
2. General Cable;
3. Okonite;
4. Or equal.

D. Conductor and Cable Tags:

1. Tags relying on adhesives or taped-on markers are not acceptable.

2. Provide conductor tags for conductors No. 12 AWG and below with legible permanent sleeve of yellow or white PVC with machine printed black marking.

3. Provide tags for cables, and for conductors No. 10 AWG and larger, consisting of permanent nylon marker plates with legible designations hot stamped on the plate. Attach these marker plates to conductors and cables with nylon tie cord.

E. Equipment Grounding Conductors:

1. Provide soft-drawn copper conductors, not smaller than AWG12 and as indicated or as required by NEC, for equipment grounding.

2. Provide conductors with green insulation of the same type as all other circuit wires.

F. Direct Buried Grounding Conductors:

2.3 MANUFACTURED WIRING SYSTEMS

A. Provide a flexible, coordinated means of distributing lighting branch circuit and control wiring.

B. Provide a system rated at 20 amperes load-carrying capacity per phase with final assemblies consisting of a maximum of three, phase conductors. Provide a system manufactured of Type MC cable with 90 degrees C insulation and stranded copper conductors.

C. Provide three, single-phase, five-wire circuit cable configuration with standard color wire coding as per Article 1.5 B. of this Section.

D. Provide a system having a latch/strike locking mechanism with voltage clearly marked on latch. Provide a system UL listed for use in air handling plenums, listed to connect or disconnect under load, and manufactured in accordance with Article No. 604 of the NEC.

PART 3 - EXECUTION

3.1 GENERAL

A. Do not exceed cable manufacturer's recommendations for maximum pulling tensions and minimum bending radii. Where pulling compound is used, use only UL listed compound compatible with the cable outer jacket and with the raceway involved. contractor shall perform and submit pulling calculation per manufacturers' recommendation to ascertain that there is no overstrain to the cable. The calculation shall be submitted to the ENGINEER for approval."

B. Tighten all screws and terminal bolts using torque type wrenches and/or drivers to tighten to the inch-pound requirements of the NEC and UL.

C. Single conductors and cables in maintenance holes, handholes, vaults, cable trays, and other indicated locations shall be wrapped together by arc and fireproofing tapes, and shall be bundled throughout their exposed length with nylon, self-locking, releasable, cable ties placed at intervals not exceeding 18 inches on centers.

D. Wires and cables in each voltage classification shall be installed in separate raceways and shall be completely isolated at the cable and wire terminations.

E. No vehicles shall be used to pull conductors. Only cable pulling machines shall be used.

F. A means of monitoring cable tension shall be provided at all pulls. (I.e. dynamometer)

3.2 CONDUCTOR 600 VOLTS AND BELOW

A. Provide conductor sizes indicated on Drawings.

B. Wire nuts may be used on solid conductors of 120-volt and 277-volt lighting and 120-volt receptacle circuits only. Place no more than one conductor in any single-barrel pressure connection. Use crimp connectors with tools by same manufacturer and/or UL listed for connectors of all stranded conductors.

C. Soldered mechanical joints insulated with tape will not be acceptable.

D. Vinyl plastic insulating tape for wire and cable splices and terminations shall be flame retardant, 7-mil thick minimum, rated for 90 degrees C minimum meeting the requirements of UL 510.

E. Provide terminals and connectors acceptable for the type of material used.

F. Arrange wiring in cabinets, panels, and motor control centers neatly cut to proper length, remove surplus wire, and bridle and secure in an acceptable manner. Identify all circuits entering motor control centers or other control cabinets in accordance with the conductor identification system specified herein.

G. Terminate control and instrumentation wiring with methods consistent with terminals provided, and in accordance with terminal manufacturer's instructions. Where terminals provided will accept such lugs, terminate all control and instrumentation wiring (except solid thermocouple leads) with insulated, locking-fork compression lugs, Thomas & Betts Sta-Kon, or equal.

H. For terminals designed to accept only bare wire compression terminations, use only stranded wire, and terminate only one wire per terminal. Tighten all terminal screws with torque screwdriver to recommended torque values.

I. Attach compression lugs with a tool specifically designed for that purpose which provides a complete, controlled crimp where the tool will not release until the crimp is complete. Use of plier type crimpers is not acceptable.

J. Cap spare conductors and conductors not terminated with UL listed end caps.

K. Where conductors pass through holes or over edges in sheet metal, remove all burrs, chamfer all edges, and install bushings and protective strips of insulating material to protect the conductors.

L. For conductors that will be connected by others, provide at least 6 feet spare conductor in freestanding panels and at least 2 feet spare in other assemblies. Provide appropriate length of spare conductor in any particular assembly where it is obvious that greater spare conductor length will be needed to reach the termination point.

3.3 CONDUCTORS ABOVE 600 VOLTS

A. Splices will not be permitted unless specifically indicated or approved by the ENGINEER.

B. Make all joints and terminations with high voltage splice and termination kits specified herein and in accordance with splice or termination manufacturer's instructions. Once started, install splices or terminations as a continuous operation.

C. Identify all circuits in accordance with the conductor identification system specified at load centers, maintenance holes, splices, terminations, etc.

D. Provide terminals or connectors acceptable for the type of conductor material used.

E. Give 2 working days notice to the ENGINEER and the INSPECTOR prior to the making of joints or terminations.

F. Cable splices shall be made by qualified cable splicers in accordance with the recommendations of the manufacturer. CONTRACTOR shall furnish documentation detailing the qualifications of each cable splicer to be working on the job.

3.4 CABLES

A. Do not splice without permission of the ENGINEER or the INSPECTOR. Locate splices, when permitted, only in readily accessible cabinets or junction boxes using locknut terminal strips. Splices will not be permitted unless deemed necessary by approved pulling tension calculations.

B. Where connections of cables installed under this section are to be made under Division Instrumentation and Controls, leave pigtails of adequate length for neat bundled type connections.

C. Instrumentation, computer, and control cables run under infinite access floors in control rooms may be installed under the floor without protection. Run individual wires, pairs, or triads in flex conduit under the floor or grouped into bundles at least 3/4 inch in diameter.

D. Maintaining the integrity of shielding of instrumentation cables is essential to the operation of the control systems. Take special care in cable installation to ensure that grounds do not occur because of damage to the jacket over the shield.

E. Cables entering maintenance holes, handholes or vaults shall be sealed at the entrance and exit using an expanding fireproof foam product approved for the purpose.

3.5 CONDUCTOR ARC AND FIREPROOFING TAPES

A. Use arc and fireproofing tapes on all 600-volt single conductors and cables except those rated Type TC at splices in all maintenance holes, handholes, vaults, cable trays, and other indicated locations.

B. Use arc and fireproofing tapes on all 5 kVat splices in all maintenance holes , handholes, vaults, cable trays, and other indicated locations.

C. Wrap together as a single cable all conductors entering from each conduit.

D. Follow tape manufacturer's installation instructions. Secure the arc and fireproofing tape at frequent intervals with bands of the specified glass cloth electrical tape. Make each band of at least two wraps of tape directly over each other.

E. Wrap together as far as possible, conductors carrying phases A, B, and C of the same feeder. Do not wrap together conductors carrying only two of the three phases.

F. The cables shall be placed as closely as possible to their final positions.

G. The cables shall be cleaned of all oil, grease, and cable pulling compounds using suitable solvents and cleaners non-injurious to cable and then wiped completely dry.

H. Any projecting surfaces such as fittings, ground connectors or bonding connections shall be covered with an insulating compound to present a smooth continuous surface for taping.

I. Fireproofing tapes shall be submitted as shop drawings for approval. Tapes shall be 3-inch width half-lapped and extend a minimum of 6-inches into the raceway. Use ¾” glass tape at three foot intervals to hold tape in place.

3.6 UNDERGROUND DIRECT BURIAL CABLE

A. Comply with requirements for Installation of Underground Direct Burial Raceways in Section 16110, "Raceway", including warning tapes above the cables.

3.7 FIELD TESTS

A. Field test shall be performed on conductors in accordance with Section 16020 Municipal Facilities Electrical Testing Requirements.

END OF SECTION

SECTION 26 22 00

TRANSFORMERS

PART 1- GENERAL

1.1 SCOPE

A. Required: Provide and install dry type transformers work as indicated on the Contract Drawings and Schedules and herein specified.

B. Comply with the General Conditions, General Requirements and the requirements of Division 16 concerning definitions, guarantees, submittals, as-builts, clean-up, etc. as applicable to work of this Section.

1.2 RELATED WORK

A. Related Sections: The following sections contain requirements that relate to this section:

1. Section 16190 "Electrical Identification"

2. Section 16030 "Wastewater Facilities Electrical Testing Requirements" for testing requirements.

3. Section 16560 "Municipal Facilities Electrical Commissioning Requirements" for commissioning requirements.

4. Section 16570 "Municipal Facilities Electrical Testing Requirements" for testing requirements.

1.3 QUALITY ASSURANCE

A. Manufacturers: Firms regularly engaged in manufacture of power/distribution transformers of types and ratings required, whose products have been in satisfactory use in similar service for not less than 5 years.

B. Installer's Qualifications: Firm with at least 5 years of successful installation experience on projects utilizing electrical power and distribution transformers similar to those required for this project.

C. NEC Compliance: Comply with NEC as applicable to installation and construction of electrical power/distribution transformers.

D. ANSI Compliance: Comply with applicable requirements of ANSI Standards C57-Series pertaining to power/distribution transformers.

E. NEMA Compliance: Comply with requirements of NEMA Std Pub/No.'s ST 20; "Dry-Type Transformers for General Applications", TR 1.

F. UL Compliance: Comply with applicable requirements of ANSI/UL 506; "Safety Standard for Specialty Transformers". Provide power/distribution transformers and components which are UL-listed and labeled.

G. NESC Compliance: Comply with applicable requirements of National Electrical Safety Code (ANSI Std C2) pertaining to indoor installation of transformers.

H. Testing Agency Qualifications: In addition to requirements specified in Section 01453, "Quality Control," an independent testing agency shall meet OSHA criteria for accreditation of testing laboratories, Title 29, Part 1907; or shall be a full-member company of the InterNational Electrical Testing Association.

1. Testing Agency's Field Supervisor: Person currently certified by the InterNational Electrical Testing Association or the National Institute for Certification in Engineering Technologies, to supervise on-site testing specified in Part 3.

I. Listing and Labeling: Provide transformers specified in this Section that are listed and labeled.

1. The Terms "Listed" and "Labeled": As defined in NFPA 70, Article 100.

2. Listing and Labeling Agency Qualifications: A "Nationally Recognized Testing Laboratory" as defined in OSHA Regulation 1910.7.

1.4 SUBMITTALS

A. Conform to applicable provisions of Section 01330 and as herein specified.

B. Product Data: Submit manufacturer's technical product data including rated KVA, frequency, primary and secondary voltages, percent taps, polarity, impedance and certification of transformer performance efficiency at indicated loads, percentage regulation at 100% and 80% power factor, no-load and full-load losses in watts, % impedance at 75 deg. C, hot-spot and average temperature rise above 40 deg. C ambient temperature, sound level in decibels, and standard published data.

C. Shop Drawings: Submit manufacturer's drawings indicating dimensions, and weight loadings for transformer installations, showing layouts, mountings and supports, spatial relationship to panelboards and associated equipment, include transformer connections to electrical equipment.

D. Wiring Diagrams: Submit wiring protection and control diagrams for power distribution transformers. Clearly differentiate between portions of wiring that are manufacturer-installed and portions to be field-installed.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products which may be incorporated in the work included, but are not limited to the following:

1. Eaton;
2. Schneider Electric;
3. Siemens;
4. Or equal.

2.2 DISTRIBUTION TRANSFORMERS

A. General: Except as otherwise indicated, provide manufacturer's standard materials and components as indicated by published product information, designed and constructed as recommended by manufacturer, and as required for completed installation.

B. 15 KVA and Above: Shall have drip-proof ventilated enclosures and copper coils of continuous wound construction impregnated with non-hygroscopic thermosetting varnish. Cores shall be constructed of high grade non-aging silicon steel, with high magnetic permeability and low hysteresis losses. Flux densities shall be well below the saturation point. Vibration-absorbing mounts shall be provided between the core/coil and the mounting base. Provide four 2-1/2 percent full capacity primary taps, two above and two below, the rated nominal voltage. Terminals shall be accessible from the front. Insulation materials shall be in accordance with NEMA ST20 standards for a 220 degrees C. U.L. recognized insulation system. Full load temperature rise shall not exceed 80 degrees C. in a 40 degrees C. ambient.

C. Less than 15 KVA: Wall mounted type, copper coils; full load temperature rise shall not exceed 115 degrees C. in a 40 degrees C. ambient.

D. Finishes: Coat interior and exterior surfaces of transformer, including bolted joints, with manufacturer's standard color baked-on enamel.

2.3 CONTROL AND SIGNAL TRANSFORMERS

A. Units comply with NEMA ST 1 and are listed and labeled as complying with UL 506.

B. Ratings: Continuous duty. If rating is not indicated, provide capacity exceeding peak load by 50 percent minimum.

C. Description: Self-cooled, 2 windings.

PART 3 - EXECUTION

3.1 INSPECTION

A. Installer must examine areas and conditions under which power/distribution transformers and ancillary equipment are to be installed, and notify Contractor in writing of conditions detrimental to proper completion of the work. Do not proceed with the work until satisfactory conditions have been corrected in a manner acceptable to Installer.

B. Coordinate transformer installation work with electrical raceway and wire/cable work, as necessary for proper interface.

C. Tighten electrical connectors and terminals, including screws and bolts, in accordance with equipment manufacturer's published torque tightening values for equipment connectors. Where manufacturer's torquing requirements are not indicated, tighten connectors and terminals to comply with tightening torques specified in UL Std 486A and B.

3.2 GROUNDING

Provide equipment grounding connections for power/distribution transformers as indicated. Tighten connections to comply with tightening torques specified in UL Std 486A to assure permanent and effective grounding.

3.3 CLEANING

A. On completion of installation, inspect components. Remove paint splatters and other spots, dirt, and debris. Repair scratches and mars on finish to match original finish. Clean components internally using methods and materials recommended by the manufacturer.

3.4 INSTALLATION

A. Comply with safety requirements of IEEE C2, National Electrical Safety Code.

B. Arrange equipment to provide adequate spacing for access and for circulation of cooling air.

C. Identify transformers and install warning signs according to Section 16190, "Electrical Identification."

D. Tighten electrical connectors and terminals according to manufacturer's published torque- tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

3.5 TESTING

A. Prior to energizing of transformers, check all accessible connections for compliance with manufacturer's torque tightening Specifications.

B. Prior to energizing, check circuitry for electrical continuity, and for short-circuits.

C. Upon completion of installation of transformers, energize primary circuitry at rated voltage and frequency from normal power source, and test transformers, including, but not limited to, audible sound levels, to demonstrate capability and compliance with requirements. Where possible, correct malfunctioning units at site, then retest to demonstrate compliance; otherwise, remove and replace with new units or components, and proceed with retesting.

END OF SECTION

SECTION 26 24 00

SWITCHES, DISCONNECTS AND SAFETY

PART 1 - GENERAL

1.1 SCOPE

A. Work Included: Not limited to the following:

1. Fabricate, provide and install disconnect and safety type switches where indicated on the Contract Drawing and hereinafter specified.

2. Comply with General Conditions, the General Requirements and the requirements of Division 16 concerning definitions, guarantees, submittals, as-builts, clean-up, etc. as applicable to the work of this Section.

3. Examine all other Sections for work related to those Sections which are required to be included as work under this Section.

1.2 QUALITY ASSURANCE

A. Conform to applicable provisions of Subsection 1.7 of Section 16020 –Municipal Facilities General Electrical Requirements.

B. Conform to applicable Codes and NEMA, ANSI, UL and IEEE Standards, Federal Specification W-S-865,

1.3 SUBMITTALS

Conform to applicable provisions of Section 01330 of Division 1 - General Requirements and Subsection 1.6 G of Section 16020.

PART 2 - PRODUCTS

2.1 GENERAL

A. APPROVED MANUFACTURERS:

1. Appleton;
2. Eaton;
3. Schneider Electric;
4. Or equal.

B. Disconnect Switches: Provide with devices enabling the switch to be locked in the open or closed positions.

C. Manual Motor Switches: Tumbler type rated 3HP, 208 Volts three phase or single phase with or without overload heaters as required to protect equipment served.

D. Externally Operable Safety Switches: To have quick-make, quick-break mechanism, capable of switching 10 times switch rating, with cover interlock to prevent opening with switch in ON position and defeat mechanism for maintenance.

E. Switches: Shall be Heavy Duty (HD) type unless otherwise indicated. Provide NEMA 1 enclosures for interior locations, NEMA 3R enclosures for exterior or wet locations, NEMA 4X 316 SS for corrosive locations and NEMA 7 for hazardous locations. Provide with number of poles, ampacity, voltage and HP rating, fusible or nonfusible as indicated.

F. Fusible Switches: Equip them with rejection clips for UL Class R fuses. Switches having a dual rating when used with dual element fuses shall have a rating so indicated.

G. 600 Amperes or Less Fuses: UL Class RKI with a minimum interrupting rating of 200,000 Amperes, Bussmann "Low-Peak Type" or equal.

PART 3 - EXECUTION

3.1 GENERAL INSTALLATION

A. Locations: Install switches, disconnects and safety where indicated on the Contract Drawings.

B. Fastenings: Securely fasten switches to structural members or unistrut support as directed by the manufacturer.

C. Manual Motor Starters: Install flush mounted for switching motors 3HP and smaller in finished areas. Install surface mounted in equipment rooms and non-finished areas. Where installed above inaccessible ceilings provide access panels.

END OF SECTION

SECTION 26 24 10

SERVICE AND DISTRIBUTION SWITCHBOARD

PART 1 - GENERAL

1.1 SCOPE

A. Work Included: Not limited to the following:

1. Fabricate, provide and install service and distribution switchboards as indicated on the Contract Drawings and hereinafter specified.

2. Comply with the General Conditions, the General Requirements and the requirements of Section 16020 of this Division 16, concerning definitions, guarantees, submittals, as-builts, clean-up, etc. as applicable to the Work of this Section.

3. Examine all other Sections for work related to those Sections which are required to be included as Work under this Section.

1.2 RELATED WORK

A. Related Sections: The following sections contain requirements that relate to this section:

1. Section 16560 " Municipal Facilities Electrical Commissioning Requirements " for commissioning requirements.

2. Section 16570 " Municipal Facilities Electrical Testing Requirements" for testing requirements.

1.3 QUALITY ASSURANCE

A. Conform to applicable provisions of Sub-Section 1.7 of Section 16020.

B. Conform to applicable Codes and NEMA, ANSI and IEEE Standards.

1.4 SUBMITTALS

A. Conform to applicable provisions of Section 01330 of Division 1 - General Requirements and of Sub-Section 1.6G of Section 16020.

B. Shop Drawings shall show and contain the following information:

1. Plans showing top and bottom of switchboards.

2. Front, rear and side elevations of switchboards.

3. Schematic Wiring Diagrams showing the following:

a. One-line diagram with each circuit numbered.

b. Schedule showing circuit number, description and rating of protective device(s).

c. Complete short circuit availability of bus.

4. 1/2" - 1'-0" scale drawings of electrical rooms or areas overall dimensions for equipment layout including space available for conduits and protective devices.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Each switchboard shall be U.L. listed deadfront, deadrear, completely self-supporting, with the required number of vertical sections bolted together to form one floorstanding switchboard. Construction shall be NEMA Class II with line and load and main bus connections accessible from the front. Provide switchboards of 1000 amperes or greater rating with line and load insulated bus bars. Overcurrent protective devices shall be grouped in convertible type construction. Vertical sections shall have full height bussing and where space for future devices is indicated on the Drawings all the necessary mounting hardware shall be furnished. Switchboards shall include all protective devices and other equipment indicated on the Contract Drawings with the necessary interconnections, instrumentation, and control wiring. Bus shall be copper with plated joints, or tin plated aluminum. Bus bars shall be mounted on supports of high impact-resistant, non-tracking insulating material, and braced to withstand the maximum available fault current as indicated on the Contract Drawings. Other ratings shall be as indicated on the Contract Drawings. Series-connected or "integrated equipment" short circuit ratings shall not be applied in lieu of, or to comply with, short circuit and interrupting capacity ratings indicated on the Drawings, unless specifically approved by the City Engineer. Switchboards shall be as manufactured by Eaton, Square D. Co., Power Style Class 2700 (Schneider), or equal.

B. Service and distribution sections shall contain circuit breakers, fusible switches, and combination motor starters, with shunt trips, motor operators, ground fault protection, and other accessories, as indicated on the Drawings, as well as provisions for utility metering in accordance with the serving electric utility requirements. Each disconnecting means shall be provided with a means for individual padlocking. Switches shall be heavy-duty, quick-make and quick-break, and horsepower rated through 500 HP. Switches rated over 600 amperes shall be bolted pressure contact type. Ratings of disconnecting means and overcurrent protective devices shall be as indicated on the Drawings. Combination motor controllers shall comply with applicable requirements of Section 16200 for Motor Control Centers.

C. Finish: Interior finish shall be a gray lacquer or enamel; exterior finish shall be a gray baked-on enamel or lacquer. Apply all finish coatings over a rust-inhibiting metal primer.

D. Identification: Each switchboard shall have an engraved laminated plastic nameplate identifying the switchboard as designated and located on the Contract Drawings, and indicating voltage, phase, and number of system conductors. For example, "Switchboard MS 277/480V. 3Ø 4W. Lettering shall be white on black finish and 1/4-inch high minimum. Nameplates shall be affixed by a minimum of two escutcheon pins or screws. Each device on the switchboard shall be provided with an engraved plastic nameplate as specified in Section 16190.

PART 3 - EXECUTION

3.1 GENERAL INSTALLATION

A. Switchboard(s) shall be securely bolted to the flooring or structure. Final attachment means shall be in compliance with the seismic requirements of governing authority.

Shop Drawings indicating the bolt down requirements shall be provided by the manufacturer along with all necessary calculations and shall be submitted with the Shop Drawings of the switchboard equipment. Refer to other Sections of the Specifications related to seismic requirements.

B. Switchboard(s) shall be installed on a level floor, with shims provided where necessary to attain both horizontal and vertical "plumb" conditions.

C. Switchboard(s) equipment shall be protected during construction in such a manner to prevent plaster, paint, dust, etc. from defacing the finish of equipment. Prior to final acceptance of the equipment, the interior of the equipment shall be cleaned of all foreign materials and debris. Any blemishes or defects on the exterior of the equipment shall be repaired by painting the equipment with paint supplied by the manufacturer of the equipment to match the factory finishes.

D. No operating handles in any switchboard shall be located above 6-foot 6-inches above finish floor. Code clearances on all sides of the switchboard equipment shall be maintained.

E. Switchboards shall be mechanically grounded to the grounding system.

F. Furnish ammeters, voltmeters, current and potential transformers, test blocks, control switches, fuses and circuit breakers, and other devices as indicated on the Drawings. Meters shall be switchboard type semi-flush mounted, with phase selector switches. The height of all devices shall comply with Code and utility company requirements with the switchboard installed on a 2-inch high concrete pad.

G. For solidly grounded "wye" services of more than 150 volts to ground, but not exceeding 600 volts phase to phase, provide ground fault protection of equipment for each service disconnecting means for services rated 1000 amperes or more, without a single main disconnecting means. Provide ground fault protection of equipment for other systems as indicated on the Drawings.

H. Ground fault sensors shall be zero sequence type unless indicated otherwise on the Drawings. Trip settings shall be as indicated on the Drawings or as directed by the City Engineer.

I. Protection: Keep switchboards covered during construction operations. Clean interior and exterior after all connections are completed. Factory connections shall be checked and re-torqued tight as required. Damage shall be field or factory repaired to a condition acceptable to the City Engineer at no added cost to the City.

J. Operational Test of the ground fault protection system using the primary current injection method shall be performed by qualified personnel with suitable testing/recording equipment in the presence of the City Engineer. Provide the City Engineer with a "Certified Test Report" including test parameters.

3.2 COMMISSIONING OF SWITCHGEAR AND SWITCHBOARD ASSEMBLIES

A. General:

1. Inspect for physical damage.

2. Compare equipment nameplate information with latest single line diagram and report discrepancies.

3. Inspect for proper alignment, anchorage and grounding.

4. Check tightness of accessible bolted bus joints by calibrated torque wrench method. Refer to manufacturer's instruction for proper foot pound levels.

5. Spot check breaker settings against Short Circuit Study.

6. Key interlock systems shall be physically tested to insure proper function.

   a. Closure attempt shall be made on locked open devices. Opening attempt shall be made on locked closed devices.

   b. Key exchange shall be made with devices operated in off-normal positions.

7. All doors, panels and sections shall be inspected for paint, dents, and scratches.

END OF SECTION

SECTION 26 24 16

PANELBOARDS

PART 1 - GENERAL

1.1 SCOPE

A. Required: Provide and install complete equipment including circuit breakers and panelboards as indicated on the Contract Drawings and herein specified.

B. Comply with the General Conditions, General Requirements and the requirements of Section 16020 of this Division 16 concerning definitions, guarantees, submittals, as-builts, clean-up, etc. as applicable to work of this Section.

1.2 RELATED WORK

A. Related Sections: The following sections contain requirements that relate to this section:

1. Section 16560 " Municipal Facilities Electrical Commissioning Requirements " for commissioning requirements.

2. Section 16570 " Municipal Facilities Electrical Testing Requirements" for testing requirements.

1.3 QUALITY ASSURANCE

A. Comply with applicable provisions of Subsection 1.2 of Section 16020.

B. Conform to the applicable provisions of Subsection 1.6 of Section 16020 related to legal requirements and standards including NEMA, ANSI and IEEE Standards, NFPA 70, and Federal Specifications.

1. 4 SUBMITTALS

A. Submit under the provisions of Section 01330.

B. Product Data: For each type of panelboard, overcurrent protective device, accessory, and component indicated. Include dimensions and manufacturers' technical data on features, performance, electrical characteristics, ratings, and finishes.

C. Maintenance Data: For panelboards and components to include in maintenance manuals specified in Division 1. In addition to requirements specified in Section 01770, "Closeout Procedures," include the following:

1. Manufacturer's written instructions for testing and adjusting overcurrent protective devices.

2. Time-current curves, including selectable ranges for each type of overcurrent protective device.

PART 2 - PRODUCTS

2.1 GENERAL REQUIREMENTS

A. Cabinets to House Panelboards: Cabinets shall be formed of galvanized metal, chemically cleaned, and all breaks in galvanizing shall be painted with metallic aluminum paint.

Minimum size: 20 inches wide by 5-3/4 inches deep. Trims and doors shall be chemically cleaned. Provide ANSI synthetic alkalyd factory enamel finish on the exterior and interior of panels. Provide for circuit directory behind door with glass or heavy plastic protection. Cabinets shall be flush or surface mounted type as indicated with screw cover, hinged doors with flush lock keyed to operate from one key. Cabinets greater than three feet shall have three trim bolts on each side.

B. Identification: Each panelboard shall have an exterior engraved laminated plastic nameplate identifying the panelboard as designated on the Drawings and indicating voltage, phases, and number of system conductors. For example:

"Panel A 277/480V. 3ph, 4W". Lettering shall be white on black finish and 3/16 inch high minimum. Nameplates shall be affixed with a minimum of two escutcheon pins or screws. Each circuit breaker shall have a permanent metal or plastic number to identify each circuit. A circuit schedule card and holder shall be mounted on the inside of the door and covered with plastic.

C. Protective Devices:

1. Protective devices, main, branch or sub-feed shall be thermal-magnetic-molded-case circuit breakers, bolt-on type ampacities as scheduled on Drawings. Provide single handle, common trip for two and three-pole units. Handle ties are not acceptable.

2. Circuit Breakers, 250A and Larger: Adjustable magnetic trip setting.

3. Electronic Circuit Breakers, 400A and Larger: RMS sensing; field-replaceable rating plug; with the following field-adjustable settings:

   a. Instantaneous trip.

   b. Long- and short-time pickup levels.

   c. Long- and short-time time adjustments.

   d. Ground-fault pickup level, time delay, and I2t response. Where indicated on the drawings.

4. GFCI Circuit Breakers: Single- and two-pole configurations with 5-mA trip sensitivity, where indicated on the lighting and appliance panelboards.

5. Molded-case circuit breakers shall be suitable for application; Rype SWD for switching fluorescent lighting loads; Type HACR for heating, air-conditioning, and refrigerating equipment.

D. Electrical Equipment Adjacent to Panelboards: Where scheduled provide a separate cabinet with screw cover and hinged door with flush lock keyed alike with panelboard. A single cabinet may be used when a compartment (with appropriate barriers) under separate lockable door and cover is provided.

E. Finish: As specified for service switchboards in Section 16270 service and distribution switchboards.

2.2 DISTRIBUTION PANELBOARDS

A. Each distribution panelboard shall be a deadfront, deadrear, U.L. listed, circuit breaker type with copper buses and comply with Federal Specification W-P-115a. Construction shall be NEMA Class I. Electrical ratings shall be as indicated on the Drawings.

Series-connected or "integrated equipment" short circuit ratings shall not be applied in lieu of, or to comply with, short circuit and interrupting capacity ratings indicated on the Drawings unless specifically approved by the City Engineer. Provide fronts with flush cylinder tumbler locks, trim clamps, and concealed hinges.

Double doors or doors over 48 inches high shall have 3 point latching. Provide 2 keys for each panelboard. Furnish panelboards with main lugs or main circuit breakers and all other circuit breakers as indicated on the drawings. Each circuit breaker shall be provided with a means for individual padlocking. Distribution panelboards shall be Square D. Co. I-line type or equal.

2.3 LIGHTING AND APPLIANCE PANELBOARDS

A. Each lighting and appliance panelboard shall be a U.L. listed circuit breaker type with copper buses and meet Federal Spec. W-P115a. Electrical ratings shall be as indicated on the Drawings. Series connected or "integrated equipment" ratings shall not be applied in lieu of or to comply with short circuit and interrupting ratings indicated on the Drawings, unless specifically approved by the City Engineer. Provide fronts with flush cylinder tumbler locks, trim clamps, and concealed hinges. Provide two keys for each panelboard. Furnish panelboards with main lugs or main circuit breakers and all circuit breakers as indicated on the Drawings.

B. Each circuit breaker shall be provided with a means for individual padlocking. Lighting and appliance panelboards shall be Square D. Co. Type NQO for 120/240 or 208/120 volt systems, and Type NEHB for 480/277 volt systems.

2.4 FABRICATION AND FEATURES

A. Hinged Front Cover: Entire front trim hinged to box and with standard door within hinged trim cover.

B. Directory Card: With transparent protective cover, mounted inside metal frame, inside panelboard door.

C. Bus: Hard-drawn copper, 98 percent conductivity or Tin-plated aluminum.

D. Main and Neutral Lugs: Mechanical type suitable for use with conductor material.

E. Equipment Ground Bus: Adequate for feeder and branch-circuit equipment ground conductors; bonded to box.

F. Future Devices: Mounting brackets, bus connections, and necessary appurtenances required for future installation of devices.

G. Isolated Equipment Ground Bus: Adequate for branch-circuit equipment ground conductors; insulated from box, where indicated on the Drawings.

H. Extra-Capacity Neutral Bus: Neutral bus rated 200 percent of phase bus and UL listed as suitable for nonlinear loads, where indicated on the Drawings.

I. Skirt for Surface-Mounted Panelboards: Same gage and finish as panelboard front with flanges for attachment to panelboard, wall, and ceiling or floor. Provide back, sides and removable front.

J. Feed-through Lugs: Mechanical type suitable for use with conductor material. Locate at opposite end of bus from incoming lugs or main device, where indicated on the Drawings.

PART 3 - EXECUTION

3.1 GENERAL INSTALLATION OF PANELBOARDS

A. Install equipment square, level and secure to the building structure by bolting.

B. Align top of adjacent panelboards unless specifically noted otherwise. Install panelboards over 29 inches high to mount highest protective device handle a maximum of 6'-6" or 5'-6" for panelboards up to 29 inches high, except where adjacent to taller panelboards.

C. Flush enclosures shall be installed with the front edge flush with combustible finish surfaces and not more than 1/4 inch behind noncombustible finish surfaces, and shall be secured to framing or blocking except where embedded in masonry or concrete.

D. Provide weather-proof gaskets on trims and doors of panelboards located in mechanical areas.

3.2 OTHER APPLICABLE REQUIREMENTS

A. Provide a typewritten circuit directory for each branch circuit. Obtain City facility room numbers and use in final directory.

B. Provide a schematic diagram and sequence of operation for control devices installed under separate door adjacent to panelboards.

C. Install nameplates in accordance with provisions noted in Section 16190 – Electrical Identification.

D. Equip each circuit breaker for electrical discharge lamps with a locking device unless circuit will be switched at panelboard. Equip each circuit breaker for night-light circuits, fire alarm, security and control circuits with a locking device.

E. Provide filler plates for all unused spaces.

F. Stub five 3/4-inch empty conduits from each flush mounted panelboard into accessible ceiling space and cap for future use. Stub four 1-inch empty conduits into raised floor space or below slab not on grade

G. Wiring in Panelboard Gutters: Arrange conductors into groups and bundle and wrap with wire ties after completing load balancing.

3.3 COMMISSIONING

A. Spot check breaker settings against Short Circuit Study

B. Spot check phase balance after system is under load. Ensure proper, thorough and accurate identification of load. Trip breakers and validate load identified. Test GFI breakers.

C. Receptacle Polarity Test: Spot check receptacles installed or reconnected under this contract with a receptacle circuit tester. Tester shall test for open ground, reverse polarity, open hot, open neutral, hot and ground reversed, hot or neutral and hot open.

D. Check circuit labeling by de-energizing circuits while circuit tester is in the receptacle. Labeling shall be checked on the load/receptacle and at the breaker

3.4 CLEANING

A. On completion of installation, inspect interior and exterior of panelboards. Remove paint splatters and other spots. Vacuum dirt and debris; do not use compressed air to assist in cleaning. Repair exposed surfaces to match original finish.

END OF SECTION

SECTION 26 27 16

CABINETS AND RACKS

PART 1 - GENERAL

1.1 GENERAL CONDITIONS:

A. See the Conditions of the Contract (General, Supplementary and Special Conditions) and the General Requirements (Division 1).

1.2 WORK INCLUDED:

A. This section covers all equipment cabinets, enclosures and racks as shown on the drawings or as required to house the specified devices and equipment. The work under this section consists of furnishing materials and equipment, performing labor and services necessary for the installation of the cabinets and racks required for a complete system.

1.3 RELATED WORK SPECIFIED ELSEWHERE:

A. Refer to all other Division 16 specification sections and drawings, and to the specifications and drawings under the General Construction Contract to ascertain the extent of work included.

1.4 REFERENCED SPECIFICATIONS, MATERIALS AND/OR CODES:

A. City of Los Angeles Electrical Code, latest adopted edition

B. Electronic Industries Alliance (EIA) Standards. EIA/ECA-310-E

1.5 COOPERATION WITH OTHER TRADES:

A. The Contractor shall coordinate the work of the section with that of other sections as required to ensure that the entire work of this Project will be carried out in an orderly, complete and coordinated fashion.

1.6 SUBMITTALS:

A. General: Submittals shall be made in accordance with the General Provisions (Section 16000) of these specifications.

B. Provide thermal calculations for cabinets. Include sizing calculations for air conditioner or forced ventilation fans. Account for solar gain for outside cabinets.

PART 2 - PRODUCTS

2.1 MATERIALS:

A. Cabinets - Wall Mounted:

1. All equipment cabinets installed indoors shall be NEMA [1] [12] enclosures.

2. All equipment cabinets installed outside or exposed to weather shall be NEMA [3R] [4X] enclosures.

3. Cabinets shall be constructed of 14 gauge rolled steel.

4. Cabinet doors shall be furnished with key lockable doors with all cabinets under Division 16 keyed alike.

5. All cabinets shall be furnished with removable steel back panels for mounting equipment.

6. Cabinets shall be furnished with appropriate size and quantity of knock-outs for conduit entry.

7. Cabinets shall be grounded as specified in Section 16290.

8. Cabinets shall be provided with adequate vents.

9. All cabinets shall be furnished with black on white laminated plastic name plates identifying each cabinet as noted on the drawings. Lettering shall be minimum 3/16” high.

10. Cabinet finish shall be ANSI 61 gray inside and out.

11. Cabinets shall be sized in strict accordance with the EIA/ECA-310-E.

12. Cabinet back panels shall be furnished with a ground buss bar.

13. Door size shall be selected to allow a minimum door swing of 90 degrees within the dimensional constraints of the equipment room.

14. Cabinets shall be equipped with index card holders and cards mounted behind heavy plastic on inside of cabinet doors.

15. Affix nameplates to cabinet doors with a minimum of two stainless steel escutcheon pins or screws.

B. Vertical Cabinet - Floor Mounted:

1. All vertical cabinets shall be free-standing floor mounted type having features and/or characteristics as follows:

a. Panel Width - 19"

b. Panel Height - 78-3/4"

c. Overall Height - 87" Nominal

d. Overall Depth - 25" Nominal

e. Rear Door - Vented, except as otherwise specified.

f. Front door with vents at top and bottom, except as otherwise specified.

g. Plain top panel

h. Frame- 14 ga. Cold rolled sheet steel

i. Side panels - 18 ga.

j. Styled frames with trim

k. 19" EIA adjustable mounting rails for front and rear equipment mounting

l. Locks - all cabinets to be keyed alike

m. Units shall be pre-assembled type

n. Color - to be selected by Architect

2. Cabinets grouped side-by-side shall have side panels on each section.

3. Furnish and install blank 19" panels of color to match cabinet for all unused vertical mounting units on front mounting rails. Maximum height of each filler panel shall be 10.5".

C. Power Strips:

1. Furnish and install plug-in or hardwired outlet strips as required to support the installed equipment.

2. Power strips shall have a metallic case.

3. Plug-in power strips shall be equipped with a locking plug and shall only be used with a compatible locking-type receptacle.

D. Pedestals:

1. Pedestals shall be weather-tight, seam welded, constructed of 14 gauge galvanized steel. Where indicated on the drawings construction shall be stainless steel.

2. Pedestals shall be furnished with gasketed panel for access to equipment contained within. Panel shall be secured with security screws.

3. Pedestal shall be painted to withstand environmental conditions and the final color shall be as specified by the Architect.

4. Pedestal shall be pre-drilled for mounting of intercom stations, loop detectors, and other equipment as specified herein.

5. Pedestal dimensions shall be as shown on the drawings.

PART 3 - EXECUTION

3.1 EXECUTION:

A. Cabinets:

1. Provide cabinets as necessary for proper installation of the equipment specified and in compliance with all codes and regulations.

2. Secure all cabinets in place with anchors and lag bolts to ensure compliance with seismic requirements.

3. Unused openings in cabinets shall be closed to afford protection equivalent to that of the wall of the cabinet.

B. Ventilation:

1. Furnish and install ventilation fans, vents, and filters for all cabinets where forced air cooling is required to maintain interior cabinet temperature at or below 95°F.

2. For cabinets with forced ventilation, doors and side panels shall be solid with no louvers.

3. Division 17 Subcontractor shall select vented vs. forced air cabinets based on the environment's conditions of the equipment room and equipment to be installed in each cabinet.

C. Pedestals:

1. Provide pedestals at all locations shown on the drawings.

2. Secure pedestals to concrete base with anchors to ensure compliance with seismic requirements. Anchors shall be located such that they are only accessible from inside the enclosure.

3. Coordinate installation of required conduit such that all conduit is stubbed up inside pedestal.

4. Cabinets shall be large enough and equipment spaced in cabinets to provide adequate spacing for airflow and maintenance.

5. Locate all heat producing equipment, such as power supplies and amplifiers, at top of equipment cabinets.

3.2 COMPLETION:

A. General:

1. Upon completion of the work, remove excess debris, materials, equipment, apparatus, tools and the like and leave the premises clean, neat and orderly.

2. All cables shall be dressed neatly in each cabinet and rack. Excess cable shall be trimmed and disposed of. Any unused cables shall be identified with stainless steel tags showing the origination and marked as “spare”.

END OF SECTION

SECTION 26 27 26

WIRING DEVICES

PART 1 - GENERAL

1.1 SCOPE

A. Required: Provide and install wiring devices as indicated on the Contract Drawing and herein specified.

B. Comply with the General Conditions, General Requirements and Section 16020 of this Division 16 concerning definitions, guarantees, submittals, as-builts, clean-up, etc. as applicable to work of this Section.

1.2 SUBMITTALS

A. Submit under the provision of Section 01330.

B. Product Data: For each product specified.

C Maintenance Data: For materials and products to include in maintenance manuals specified in Division 1.

PART 2 - PRODUCTS

2.1 GENERAL

A. All wiring devices shall be specification grade, UL listed and labeled, conform to NEMA standards and meet the requirements of Federal specifications.

2.2 BOXES

A. Types:

1. Provide galvanized steel knockout type outlet boxes with suitable plaster rings of similar material, for interior concealed wiring in dry, non-hazardous (classified) locations.

2. Provide cast metal boxes for floor outlets, and where installed in walls direct contact with the earth. Floor outlet boxes shall be Walker box 880 series or equal.

3. Provide weatherproof cast metal outlet boxes for surface wiring, or in wet or damp locations, or where indicated on the Drawings, unless otherwise directed by the City Engineer. Boxes shall be Crouse-Hinds FS, FD, GRF, GS, or VXF series.

4. Provide sheet steel type with screw cover for pull and junction boxes over 100 cubic inches, in dry non-hazardous (classified) locations.

B. Sizes: In accordance with Code for the number and size of conductors, but not less than indicated on the drawings nor less than 4 inch square trade size, except for cast metal type, or multigang masonry type embedded in concrete or masonry walls.

C. Accessories:

1. Plaster rings, fixture studs, covers, plates, dividers, etc., as required.

2. Weatherproof covers, plates, and other accessories in wet or damp locations.

2.3 SWITCHES

A. All switches shall be specification grade and meet Federal Spec. W-S-896E.

B. Provide screw type; push-in type connections not acceptable.

C. Switches shall be self-grounding, color coded, silent or quiet type, and rated 120-277 Volts AC, 20 ampere rating, totally enclosed, where installed in AC systems Bakelite or composition base with "T" rating for AC loads, standard toggle handle, side wired only and binding screw terminals with screwdriver slot.

D. Where pilot lights are specified for switches, they shall be the neon type 1/25 W. mounted under the same plate as the switch. Lighted toggles are not acceptable.

E. Momentary contact switches shall be three position toggle, 20 Ampere rating at 120 Volts AC.

F. Single pole switches shall be equal to Bryant 1121-I; two pole switches Bryant 1122-I; three way switches Bryant 1123-I; four way switches Bryant 1124-I.

G. Approved Manufacturers:

1. Hubbell/Bryant;
2. General Electric;
3. Or equal.

2.4 PLATES AND COVERS

A. Required: For all switches, receptacles, junction boxes, telephone and other outlets.

B. Finishes of Plates and Devices:

Location	Plate	Device
General interior finished areas	White	White
Interior finished areas over wood panels	Black	Black
On exterior with spring loaded cover	Corrosion resistant	Brown
In equipment rooms or other generally unfinished areas	Galvanized	Brown
Janitor and utility rooms	Stainless steel	Gray
Toilet rooms	Stainless steel	Ivory

C. Provide the Following: Unless otherwise directed by the City Engineer, provide telephone, TV, and communication outlet plates with a bushed hole.

D. Provide engraved or etched plates for all lock switches, pilot switches, switches from which the equipment or circuit controlled cannot be readily seen, three or more switches under a common plate and for switches as indicated.

E. Stainless steel plates, type 302 non-magnetic with beveled edges, 0.040" thick with satin finish. Leviton 84000-40 series or approved equal.

F. Galvanized steel plates shall be square or rectangular and hot dipped galvanized or sherardized beveled edges and 0.040" thick.

G. Provide weatherproof receptacles with spring-loaded, corrosion resistant covers with gasket for mounting on outdoor type or flush wall boxes. Leviton 6196-V or approved equal.

H. Provide plates equipped with close fitting openings for the exact device to be used. Provide plates for telephone outlets equipped with bushed openings. Synthetic plates shall be smooth finish as manufactured by Pass & Seymour, Sierra, Leviton, or approved equal.

I. Provide brass covers for floor receptacles with duplex flap opening flush with floor See also Section 16115, sub-section 2.2, paragraph E..

J. Provide brass covers for data and communications floor outlets with 2-1/8 x 1 inch combination threaded opening.

K. Engraved plates and covers for equipment and controls, motors, for switches out of sight of the equipment controlled, for receptacles rated other than 125 volts, and for ganged switches (except no more than two switches controlling lights in the same room). Engraving shall provide positive identification acceptable to the City Engineer.

2.5 RECEPTACLES

A. Types:

1. All receptacles shall be specification grade and meet Federal Spec. WC 596 E.

2. Provide screw terminal type receptacles. Push-in type connections are not acceptable.

3. Straight blade 125 volt, 15 and 20 ampere duplex type shall be equal to Bryant 5262-I or 5263-I; single type shall be Bryant 5661-I or 5461-I.

4. Straight blade 250 volt, 15 and 20 ampere duplex type shall be equal to Bryant 5662-I or 5462-I; single type shall be Bryant 5661-I or 5461-I.

5. Combination duplex receptacles, straight blade 125/250 volt, 15 and 20 amperes, shall be equal to Bryant 5292-I or 5492-I.

6. Clock hanger receptacles shall be Bryant 2828-GS or equal.

7. Special outlets of other types shall be as indicated on the Contract Drawings.

2.6 OCCUPANCY SENSORS:

A. Wall-mounted, passive infrared sensors, as specified on the contract drawings or approved equal.

B. Ceiling mounted combination, passive infrared and ultra sonic, as approved on the contract drawings or approved equal.

2.7 CONTROLS

A. Required: For all equipment furnished in this and other divisions, as required by Code, and as indicated on the Contract Drawings and in the specifications. All devices shall be listed by U.L. or another approved testing laboratory.

B. Types:

1. Circuit Breakers: Thermal-magnetic with interrupting and trip ratings as indicated on the drawings. Equip each breaker with a device for individual padlocking. Circuit breakers shall meet Federal Specifications W-C-375B.

2. Enclosed Safety Switches: Shall be externally operable, heavy duty "tease-proof", fusible and nonfusible with number of poles and ratings as indicated on the Contract Drawings. Provide suitable rejection type fuse holders for Class R fuses. Switches shall meet Federal Spec. W-S-865C. Switches shall be as manufactured by Square D Co. or equal.

3. Fuses: All fuses shall meet U.L. Standard 198. Provide a label within each fuse enclosure indicating fuse replacement type and ratings. Provide one complete set of each type and rating of fuses and limiters, as spares. Fuses shall be one of the following types:

a. Current-limiting Class L; Bussman KRP-C or KTU.

b. Current-limiting Class J; Bussman JKS or JHC.

c. Dual element Class RK-1; Bussman KTS-R or KTN-R.

d. Dual element Class RK-5; Bussman FRS-R or FRN-R.

e. Low Peak dual element Class RK-5; Bussman LPS-R or LPN-R.

f. For secondary protection of control transformers rated 500 V.A. and 50 volts, or less; Bussman FNQ fuses with HPS-D or HPL-B fuse holder or equal.

g. Fuses for direct-current circuits shall be identified for the use.

h. Other required fuses, if not specified, shall be standard nonrenewable type; Bussman FRN or FRS for circuits where available fault current is 10,000 amperes or less.

4. Terminal connection blocks shall be provided in switch and circuit breaker enclosures in which grounded (neutral) conductors are installed.

5. Magnetic Motor Starters: Shall be across-the-line start type with overload and low voltage protection; Square D. Co. Class 8536. Combination starters shall be fusible or nonfusible disconnect switch type; Square D. Co. Class 8538, or motor

circuit protector type (instantaneous trip only); Square D. Co. Class 8539. Reversing starters shall be Square D. Co. Class 8736 or 8739 or equal. Ratings shall be as indicated on the Drawings. Equip each circuit breaker with a device for individual padlocking.

6. Manual Motor Starters: Pushbutton type with overloads; Square D. Co. Class 2510 Type M. Toggle type with overloads; Square D. Co. Class 2510 Type F. Toggle type without overloads; Square D. Co. Class 2510 Type K or equal. Each device shall have provision for padlocking.

7. General Purpose Contactors: Shall be ASCO 1000 Series or equal with number of poles and ratings as indicated on the drawings. Provide suitable hinged door enclosures.

8. Lighting Contactors: Electrically operated, mechanically held, with coil clearing contacts; ASCO Remote Control (RC) Switches or equal with number of poles and ratings as indicated on the Drawings. Provide suitable hinged door enclosures.

9. Pushbutton and Other Control Devices: Shall be Square D.Co. Class 9001 Type K or equal, in suitable enclosures with legend plates.

10. Pilot Lights: Shall be Square D. Co. Class 9001 Type K, transformer type or equal. Shall have push-to-test feature where installed in switchboards or motor control centers.

11. Control Relays: Shall be Square D. Co. Class 8501 Types D, H, or L. or equal. Install relays in suitable enclosures.

12. Time Switches: Provide types with minimum 10-hour spring driven automatic rewind reserve power. For control of mechanical systems or equipment provide 7 day dial type with features permitting daily control or omission; Paragon 7000 Series. For control of mechanically-held lighting contactors provide astronomic type with day omitting device and momentary contact single pole double-throw switching; Paragon 47216-OSZ or equal. Number of poles and voltages for time switches shall be as indicated on the Drawings.

13. Emergency Control Switches: Shall be ASCO equal to #124 Series break-glass devices for mechanical or data processing rooms or similar applications.

14. Three-Position Selector Switches: Shall be equal to Bryant 4922-I for maintained contact type; Bryant 4921-I for momentary contact type.

15. Manual Timers: Spring-wound timers shall be equal to M.R. Rhoades Inc. "Mark-Time" 125 V. 20 A.

16. Identification: Identify all control and disconnecting devices by engraved laminated plastic nameplates designating the equipment controlled, except where device plates are engraved.

    a. Motors and other equipment shall be suitably and durably identified to correspond to the control or disconnecting device. Nameplate lettering shall be white on black finish and 1/8 inch high minimum.

    b. Marking shall be as indicated on the drawings or as approved by the City Engineer. Nameplates shall be affixed with a minimum of two escutcheon pins or screws.

PART 3 - EXECUTION

3.1 GENERAL

A. Each class of device shall be furnished by one manufacturer for the total project. Mixing of devices by different suppliers will not be permitted.

3.2 BOX INSTALLATION

A. Install boxes where indicated on the Contract Drawings and coordinate locations with structural and architectural features for proper installation. Boxes shall be accessible.

B. Install boxes for wall mounted local switches at 4 feet to center above floor or standing surface unless otherwise directed by the City Engineer. The maximum height in handicapped areas shall be 48 inches.

C. Install boxes for wall mounted receptacles, signal and communication outlets at 15 inches to center above floor or standing surface except where located above counter tops, or used for clock outlets, or as otherwise indicated on the Drawings or directed by the City Engineer.

3.3 RECEPTACLE AND SNAP SWITCH INSTALLATION

A. General:

1. Install receptacles and switches square, level, secure, and connected to a single set of circuit conductors at each outlet. Plaster ears of receptacles and switches installed in flush boxes shall be seated against the finish surface.

2. Install closely adjacent snap switches in a single multi-gang type box, unless otherwise directed by the City Engineer.

3. Install permanent barriers between switches where the voltage between switches exceed 300 volts.

4. Connect all devices by wrapping conductor around binding screw terminals.

5. Provide GFCI type receptacles in toilet, kitchen counters and for all outdoor locations where required by code.

3.4 OUTLET PLATES AND COVER INSTALLATIONS

A. General:

1. Install square, level and secure. Plates installed at flush outlets shall be seated against the finish.

2. Properly identify plates and covers as required and noted in Subsections 2. 5 D and K of this Section as applicable.

3. Provide jumbo size plates for outlets installed in masonry walls.

4. Properly align and plumb all devices and plates. Fit plates flat against walls and tights against surfaces of devices without strain on the plate.

5. Code sized (#12 minimum) bonding jumper shall connect grounded outlet box to receptacle grounding terminal on all flush mounted units.

END OF SECTION

SECTION 26 27 29

ELECTRIC VEHICLE CHARGING STATIONS

PART 1 - GENERAL

1.1 SCOPE

A. Furnish and install electric vehicle (EV) charging stations and appurtenances as indicated on the Contract Drawings and specified hereinafter.

B. Comply with the General Conditions, General Requirements and the requirements of Division 26 concerning definitions, guarantees, submittals, as-builts, etc. as applicable to work of this Section.

1.2 RELATED WORK

A. Related Sections: The following sections contain requirements that relate to this section:

1. Division 1 General Requirements.

1.3 SUBMITTALS

A. Conform to applicable provisions of the General Requirements and of this specification Section.

B. Conform to the following as applicable:

1. Complete catalog data including input and output voltages, currents, ratings, configurations, accessories and finishes.

2. Submit data for safety features, including over-current disconnect, surge protection, ground fault protection, and compliance with safety standards.

3. Submit communications interface with existing LAPD EV charging systems.

4. Submit noise data.

1. 4 QUALITY ASSURANCE

A. Work of this Section shall comply with applicable legal requirements and standards specified and the following:

1.	UL2594	Standard for Electric Vehicle Supply Equipment
2.	UL2231	Safety for Personnel Protection Systems for Electric Vehicle (EV) Supply Circuits
3.	NEC Article 625	Electric Vehicle Charging Systems.

B. Demonstrations: EV charger demonstrations shall occur within 2 weeks prior to project acceptance.

1.5 WARRANTY AND MAINTENANCE

A. General Warranty: Special warranty specified in this Article shall not deprive Owner of other rights Owner may have under other provision of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.

B. Special Warranties: Written warranty, executed by manufacturer agreeing to replace or repair defects or failures in materials or workmanship within specified warranty period.

1. Defects in materials, equipment or workmanship occurring in the warranty period shall be repaired or replaced at the Contractors/ Manufacturer's expense.

PART 2 - PRODUCTS

2.1 ELECTRIC VEHICLE PEDESTAL CHARGING STATIONS

A. Equipment:

1. EV Level 2 charger, standard single or dual mount, 30A, pedestal charging station in NEMA 3R rated cabinet, designed for outdoor use.

2. EV fast charger 64A, pedestal charging station in NEMA 3R rated cabinet, designed for outdoor use.

B. Charging station to provide following:

1. Output cable: Single output cable extending to 18 feet, with cable organizer integral with pedestal. Standard EV connector complying with SAEJ1772.

2. Pedestal Electrical supply: 208 VAC, 40A, 60 Hz (Level 2 charger), and 480 VAC, 64A, 60 Hz (fast charger).

3. Charging power output: 208 to 240VDC, 30A (Level 2 charger), and 50 to 500 VDC, 0 to 120A (fast charger).

4. Ground fault protection: Internal with auto re-closure.

5. Auto restart after ground fault or mains loss.

6. Authentication using RFID card, and networkable with existing Police Station.

7. Simple user interface: Front panel indicators or display showing power status, charge indicator, system fault indicator, general fault indicator.

8. Ambient operating temperature range: -20 degF to 120 degF

C. Manufacturers: Efacec Model QC45 (fast charger), EVSA Model 3703 (Level 2 charger), or equal.

PART 3 - EXECUTION

3. 1 INSTALLATION

A. General:

1. Install EV charging equipment in a manner recommended by manufacturer and accepted by the City Engineer.

2. Furnish and install all additional supports, and other structural reinforcements to properly and safely mount equipment, all acceptable to the City Engineer.

END OF SECTION

SECTION 26 27 80

ELECTRICAL IDENTIFICATION

PART 1 - GENERAL

1.1 SCOPE

A. Required: Furnish and install nameplates and warning sign where indicated on the Contract Drawings or herein specified.

B. Comply with the General Conditions, General Requirements and Division 16 concerning definitions, guarantees, submittals, as-builts, clean-up, etc. as applicable to work of this Section.

C. Work includes but is not necessarily limited to the following:

1. Nameplates and warning signs permanently installed on all electrical equipment and devices including, but not limited to, the following items:

a. Transformers, switchboards, motor control centers, panelboards, variable frequency drives, pullboxes, cabinets and motors.

b. Enclosures for all separately enclosed devices including, but not limited to, disconnect switches, circuit breakers, contactors, time switches control stations and relays, fire alarm panels and lighting control panel.

c. Wall switches not within sight of outlet controlled.

d. Special systems such as, but not limited to, telephone, fire alarm, warning and signal systems. Identification shall be at each equipment rack, terminal cabinet, control panel, annunciator and pullbox.

e. Devices mounted within and part of equipment including circuit breakers, switches, control devices, control transformers, relays, indication devices and instruments.

PART 2 - PRODUCTS

2.1 NAMEPLATE DESIGNATIONS SHALL CLEARLY STATE

A. Manufacturer's nameplate including equipment design rating of current, voltage, KVA, HP, bus bracing rating or as applicable.

B. Equipment nameplates designating system usage and purpose, system nominal voltage, equipment rating in KVA, amperes, HP and RPM as applicable. Designation data per drawings shall be supplied with Shop Drawings approval.

C. Panelboard nameplates showing panel designation, voltage, phase and source.

2.2 MANUFACTURERS DEVICE NAMEPLATES

Device usage, purpose, or circuit number; manufacturer and electrical characteristic ratings including the following:

A. Circuit Breakers: Voltage, continuous current, maximum interrupting current and trip current.

B. Switches: Voltage, continuous current, horsepower or maximum current switching. If fused, include nameplate stating "Fuses must be replaced with current limiting type of identical characteristics".

C. Contactors: Voltage, continuous current, horsepower or interrupting current, and whether "mechanically held" or "electrically held".

D. Motors: Rated voltage, full load amperes, frequency, phases, speed, horsepower, code letter rating, time rating, type of winding, class and temperature.

E. Controllers: Voltage, current, horsepower and trip setting of motor running overcurrent protection.

F. Motor Control Centers: Horizontal and vertical bus ratings.

2.3 MATERIALS

A. For Nameplates: Three layer laminated plastic or Micarta with engraved black letters over white background.

B. For Emergency Equipment: Use engraved white letters over red background.

C. For Warning Signs: Minimum 18 gauge steel with red lettering on white porcelain enamel finish.

PART 3 - EXECUTION

3.1 MOUNTING

Nameplates shall be mounted by self-tapping, threaded stainless steel screws and bolts, or by rivets. Adhesive types are not acceptable.

3.2 MINIMUM LETTER HEIGHTS ON NAMEPLATES (AS APPLICABLE)

A. Panelboards, Switchboards and Motor Control Centers and Special Systems Enclosures: 1/4 inch identifies equipment designation; 3/16 inch identifies voltage rating and source.

B. Individual Circuit Breakers, Switches, and Motor Starters in Panelboards, Switchboards, and Motor Control Centers: 1/4 inch identifies circuit and load served, including location.

C. Individual Circuit Breakers, Enclosed Switches, and Motor Starters: 1/4 inch identify load served.

D. Transformers: 1/4 inch identifies equipment designation; 3/16 inch identifies primary and secondary voltages, primary source and secondary load. Include location of primary source or secondary load if remote from transformer.

3.3 WARNING SIGNS

A. Warning signs shall be permanently mounted with stainless steel screws or nickel-plated brass bolts.

B. Warning signs to read "DANGER - HIGH VOLTAGE", with letters 1-1/2 inch high, 1/4 inch stroke minimum.

C. Provide warning sign on all doors or immediately next to door for equipment rooms or closets containing equipment energized above 150 volts to ground.

END OF SECTION

SECTION 26 29 13

MOTOR CONTROL CENTERS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

B. Related Sections: The following sections contain requirements that relate to this section:

1. Section 16560 " Municipal Facilities Electrical Commissioning Requirements " for commissioning requirements.

2. Section 16570 " Municipal Facilities Electrical Testing Requirements" for testing requirements.

1.2 SUMMARY

A. This Section includes motor-control centers for use on AC circuits rated 600 V and less.

B. Related Sections include the following:

1. Section 16190, "Electrical Identification" for labeling materials.
2. Section 16210, “Switches, Disconnect and Safety”.

1.3 SUBMITTALS

A. Submit under the provisions of Section 01330.

B. Product Data: For products specified in this Section. Include dimensions, ratings, short-circuit rating, and data on features and components.

C. Shop Drawings: For each motor-control center specified in this Section. Include dimensioned plans, elevations, and component lists. Show ratings, including short-time and short-circuit ratings, and horizontal and vertical bus ampacities.

1. Schedule of features, characteristics, ratings, and factory settings of individual motor-control center units.

2. Wiring Diagrams: Interconnecting wiring diagrams pertinent to class and type specified for motor-control center. Schematic diagram of each type of controller unit indicated.

D. Field Test Reports: Indicate and interpret test results for compliance with performance requirements.

E. Maintenance Data: For products to include in the maintenance manuals specified in Division 1. Include operating instructions required per 3.4.B.

F. Load-Current and Overload-Relay Heater List: Compile after motors have been installed and arrange to demonstrate that selection of heaters suits actual motor nameplate full-load currents.

G. Qualification Data for Field Testing Agency: Certificates, signed by Contractor, certifying that agency complies with requirements specified in "Quality Assurance" Article below.

1.4 QUALITY ASSURANCE

A. Manufacturer Qualifications: Maintain, within 100 miles of Project site, a service center capable of providing training, parts, and emergency maintenance and repairs.

B. Field Testing Agency Qualifications: An independent testing agency with experience and capability to satisfactorily conduct testing indicated without delaying the Work. Evaluation criteria shall be according to ASTM E 699.

C. Source Limitations: Obtain similar motor-control devices through one source from a single manufacturer.

D. Comply with NFPA 70 NEMA, IEEE, UL & ANSI Standards.

E. Listing and Labeling: Provide motor-control centers and components specified in this Section that are listed and labeled.

1. The Terms "Listed" and "Labeled": As defined in the National Electrical Code, Article 100.

2. Listing and Labeling Agency Qualifications: A "Nationally Recognized Testing Laboratory" as defined in OSHA Regulation 1910.7.

F. Product Selection for Restricted Space: Drawings indicate maximum dimensions for motor-control centers, including clearances between motor-control centers and adjacent surfaces and items, and are based on types and models indicated. Other manufacturers' motor-control centers with equal performance characteristics and complying with indicated maximum dimensions may be considered. Refer to Section 01330, “Shop Drawings/Submittals."

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver in shipping splits of lengths that can be moved past obstructions in delivery path as indicated.

B. Store so condensation will not occur on or in motor-control centers. Provide temporary heaters as required to prevent condensation.

C. Handle motor-control centers according to NEMA ICS 2.3, "Instructions for the Handling, Installation, Operation, and Maintenance of Motor Control Centers." Use factory-installed lifting provisions.

1.6 COORDINATION

A. Coordinate features of controllers and accessory devices with pilot devices and control circuits to which they connect.

B. Coordinate features, accessories, and functions of each motor controller with the ratings and characteristics of the supply circuit, the motor, the required control sequence, and the duty cycle of the motor and load.

1.6 EXTRA MATERIALS

A. Furnish extra materials described below that match products installed, are packaged with protective covering for storage, and are identified with labels describing contents.

1. Spare Indicating Lights: Furnish 6 of each type required.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Eaton;
2. Tesco Controls;
3. Or equal.

2.2 MOTOR-CONTROL CENTERS

A. Wiring: NEMA ICS 3, Class I, Type B.

B. Enclosures: Free-standing structure as indicated. U.L.listed, NEMA 250, Type 2, unless otherwise indicated to meet environmental conditions at installed location.

1. Outdoor Locations: NEMA 250, Type 3R.

2. Compartments: Modular; individual doors have concealed hinges and quick-captive screw fasteners. Interlocks on combination controller units require disconnect means in off position before door can be opened or closed, except by consciously operating a permissive release device.

3. Interchangeability: Compartments are constructed to remove units without opening adjacent doors, disconnecting adjacent compartments, or disturbing the operation of other units in control center. Units requiring the same size compartment are interchangeable, and compartments are constructed to permit ready rearrangement of units, such as replacing 3 single units with one unit requiring 3 spaces, without cutting or welding.

4. Wiring Spaces: Each vertical section of structure with horizontal and vertical wiring has spaces for wiring to each unit compartment in each section, with supports holding wiring in place.

5. Controls: As specified elsewhere herein and as indicated on the Drawings. Each magnetic starter shall be provided with a hand-off-auto selector switch and a red "on" pilot light. Control power shall be 120 volts from integral transformer(s) unless indicated otherwise on the Drawings. Control transformer insulation shall be Class H. Provide suitable primary and secondary over current protection, and ground the secondary of control transformers. The secondary grounded conductor shall be identified with continuous white insulation.

Where external control circuits are used a disconnecting means shall be provided in the control center and identified with a red laminated plastic nameplate marked "120 volt external control". Provide each motor control unit with a wiring diagram and overload heater chart affixed to the inside of the unit door or cover.

Overload heaters shall be installed only after verification of actual motor FLA ratings.

C. Short-Circuit Current Rating for Each Section: Minimum 42,000 amps symmetrical RMS or as specified on the drawings.

2.3 BUSES

A. Material: Plated copper.

B. Ampacity Ratings: As indicated for horizontal and vertical main buses.

C. Equipment Ground Bus: Noninsulated, horizontal copper bus 2 by 1/4 inch, minimum.

D. Horizontal Bus Arrangement: Main phase, and ground buses extended with same capacity the entire length of motor-control center, with provision for future extension at both ends by bolt holes and captive bus splice sections or approved equivalent.

E. Short-Circuit Withstand Rating: Minimum 42,000 amps symmetrical rms Or as specified on the drawings.

2.4 FUNCTIONAL FEATURES

A. Description: Modular arrangement of motor controllers, control devices, overcurrent protective devices, transformers, panelboards, instruments, indicating panels, blank panels, and other items mounted in compartments of motor-control center as indicated.

B. Motor-Controller Units: Combination controller units of types and with features, ratings, and circuit assignments indicated.

1. Units with full-voltage, across-the-line, magnetic controllers up to and including Size 3 are installed on drawout mountings with connectors that automatically line up and connect with vertical-section buses while being racked into their normal, energized positions.

2. Units have short-circuit current ratings equal to or greater than short-circuit current rating of motor-control center section.

3. Units in motor-control centers with Type B wiring shall be equipped with pull-apart terminal strips or drawout terminal boards for external control connections.

C. Overcurrent Protective Devices: Types of devices with features, ratings, and circuit assignments indicated. Individual feeder-tap units through 225-A rating shall be installed on drawout mountings with connectors that automatically line up and connect with vertical-section buses while being racked into their normal, energized positions.

D. Spaces and Blank Units: Compartments fully bused and equipped with guide rails or equivalent, ready for insertion of drawout units. Provide bus barrier and compartment door.

E. Spare Units: Type, sizes, and ratings as indicated, and installed in compartments indicated "spare."

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine surfaces to receive motor control centers for compliance with installation tolerances and other conditions affecting performance of motor control centers installation. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 APPLICATIONS

A. Select features of each motor controller to coordinate with ratings and characteristics of supply circuit and motor; required control sequence; duty cycle of motor, drive, and load; and configuration of pilot device and control circuit affecting controller functions.

B. Select horsepower rating of controllers to suit motor controlled.

C. Push-Button Stations: In covers of magnetic controllers for manually started motors where indicated, start contact connected in parallel with sealing auxiliary contact for low-voltage protection.

D. Hand-Off-Automatic Selector Switches: In covers of manual and magnetic controllers of motors started and stopped by automatic controls or interlocks with other equipment.

3.3 INSTALLATION

A. Install motor-control centers according to NEMA ICS 2.3 and manufacturer's written instructions.

B. Anchor each motor-control center assembly to steel-channel sills arranged and sized according to manufacturer's written instructions. Attach by tack welding or bolting. Level and grout sills flush with motor-control center mounting surface.

C. Install motor-control centers on concrete housekeeping bases conforming to Section 03300, "Cast-in-Place Concrete."

D. Fuses: Install fuses in each fusible switch as indicated, oriented for label readability.

3.4 IDENTIFICATION

A. Identify field-installed wiring and components and provide warning signs according to Section 16190, "Electrical Identification."

B. Operating Instructions: Frame printed operating instructions for motor-control centers, including control sequences, and emergency procedures. Fabricate frame of finished wood or metal and cover instructions with clear acrylic plastic. Mount on front of motor-control centers.

3.5 CONTROL WIRING INSTALLATION

A. Install wiring between motor-control devices according to Section 16180, “Wiring Devices."

B. Bundle, train, and support wiring in enclosures.

C. Connect hand-off-automatic switch and other automatic control devices according to an indicated wiring diagram or one that is manufacturer approved, where available.

1. Connect selector switches to bypass only the manual and automatic control devices that have no safety functions when switch is in the hand position.

2. Connect selector switches with motor-control circuit in both hand and automatic positions for safety-type control devices such as low- and high-pressure cutouts, high-temperature cutouts, and motor-overload protectors.

3.6 CONNECTIONS

A. Tighten motor-control center bus joint, electrical connector, and terminal bolts according to manufacturer's published torque-tightening values. Where manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

3.7 FIELD QUALITY CONTROL

A. Testing Agency: Provide services of a qualified independent testing agency to perform specified testing.

B. Testing: After installing motor-control center and after electrical circuitry has been energized, demonstrate product capability and compliance with requirements.

1. Procedures: Perform each visual and mechanical inspection and electrical test stated in NETA ATS, Sections 7.5, 7.6, and 7.16. Certify compliance with test parameters.

2. Remove and replace malfunctioning units with new units, and retest.

3.8 COMMISSIONING

A. Spot check breaker settings against Short Circuit Study. Short Circuit Study to be performed by the contractor.

B. Test the operation of the starters in Hand and Off Automatic control will generally be tested with the functional testing of the device.

C. Spot check insulation resistance on the MCC bus and control circuits.

D. Spot check voltage levels and resistance to ground

3.9 CLEANING

A. Inspect interior and exterior of motor-control centers. Remove paint splatters and other spots, dirt, and debris. Touch up scratches and mars of finish to match original finish. Clean devices internally, using methods and materials recommended by manufacturer.

3.10 DEMONSTRATION

A. Training:

1. Conduct a minimum of 4 hours of training in operation and maintenance as specified in Division 1 Section 01770, "Project Closeout." Include training relating to equipment operation and maintenance procedures.

2. Schedule training with at least 7 days' advance notice. Deliver maintenance manuals to Owner before training commences.

END OF SECTION

SECTION 26 29 15

LOW VOLTAGE MOTOR CONTROL

PART 1 - GENERAL

1.1 THE REQUIREMENT

A. The CONTRACTOR shall furnish and install all group-mounted and unit motor control as required for each motor furnished for installation all in accordance with the requirements of the Contract Documents.

B. When motors furnished differ from the indicated, the CONTRACTOR shall, at no additional cost to the CITY, make the necessary adjustments to wiring, conduit, disconnect devices, motor starters, branch circuit protection, and other affected material or equipment to accommodate the motors actually installed.

C. Make like items of equipment provided hereunder the end products of one manufacturer in order to achieve standardization for appearance, operation, maintenance, spare parts, and manufacturer's service.

1.2 RELATED WORK SPECIFIED ELSEWHERE

A. The work of the following Divisions or Sections applies to the work of this Section. Other Sections of the Specifications, not referenced below, shall also apply to the extent required for proper performance of this work.

1. Section 16020 Municipal Facilities General Electrical Requirements.
2. Section 16100 Basic Materials and Methods.
3. Section 16490 Electric Motors

1.3 REFERENCE SPECIFICATIONS, CODES, AND STANDARDS

A. All work specified herein shall conform to or exceed the applicable requirements of the referenced portions of the following publications to the extent that the provisions thereof are not in conflict with other provisions of these specifications.

1. Codes and Standards:

LAEC	City of Los Angeles Electrical Code, latest adopted edition
California Code of Regulations	Title 8, Industrial Relations, Subchapter 5, Electrical Safety Orders.

2. Commercial Standards:

UL 845	Standards for Safety Electric Motor Control Centers.	
NEMA	ICS-1	General Standard for Industrial Control and Systems
NEMS	ICS-2	Industrial Control Devices, Controllers and Assemblies

1.4 CONTRACTOR SUBMITTALS

A. Shop drawing submittals shall comply with the "Contractor Submittals" paragraph of Section 16012, "Municipal Facilities General Electrical Requirements".

B. The following submittals and specific information shall be provided.

1. One-line diagrams,
2. Elementary diagrams,
3. Connection diagrams,
4. Interconnection diagrams,
5. Protective device time-current characteristics on conventional-sized transparencies,
6. Operational description,
7. Installation instructions,
8. Maintenance instructions,
9. Spare parts list,
10. Test reports, including procedures, test conditions, results and graphs.

1.5 QUALITY ASSURANCE

A. Quality assurance shall be in accordance with Section 16010 Wastewater Facilities General Electrical Requirements.

B. Electrical and Mechanical Testing: All components shall be factory tested in accordance with the applicable NEMA ICS requirements.

C. Field Testing: Field tests shall be performed in accordance with Section 16030 Wastewater Facilities Electrical Testing Requirements.

PART 2 - PRODUCTS

2.1 MOTOR CONTROL, GENERAL

A. Provide each motor with a suitable controller and devices that will function as specified for the respective motors and meeting NEMA ICS 2, the NEC, and UL.

B. Provide each motor controller with thermal overload protection in all ungrounded phases. Use protection consisting of thermal overload relays meeting NEMA ICS 2 which are sensitive to motor current and mounted within the motor controller, or a combination of thermal protectors embedded within the motor windings and controller-mounted overload relays, as indicated. Use overload protection devices of the inverse-time current characteristic type.

C. Provide controller-mounted overload relays of the manual-reset type with externally operated reset button when used without motor thermal protectors; when used in conjunction with thermal protectors, provide the automatic reset type. Select and install overload relay heaters after the actual nameplate full-load current rating of the motor has been determined.

D. If power factor correction capacitors are connected on the load side of the overload relays, incorporate the resulting reduction in line current in the selection of overload relay heaters.

E. Install and connect any required thermal protector monitoring relay provided by motor manufacturer in motor-control circuit and provide manual reset function

2.2 MANUALLY OPERATED STARTERS, FRACTIONAL HORSEPOWER

A. Provide starters meeting NEMA ICS 2 with the enclosures shown, rated 1 hp at single-phase, ac voltages of 115 and 230 volts, and with thermal overload protection, and toggle or pushbutton operation. Provide for locking in the OFF position.

2.3 MANUALLY OPERATED STARTERS, INTEGRAL HORSEPOWER

A. Provide starters meeting NEMA ICS 2 of the horsepower rating, voltage, number of phases, and enclosure shown and with thermal overload protection, and pushbutton or toggle switch operation. Provide for locking in the OFF position. Provide running overcurrent protection.

2.4 FULL VOLTAGE MAGNETIC STARTERS

A. Provide starters meeting NEMA ICS 2, Class A, with the rating and enclosure shown. Starters shall be full voltage, non-reversing horsepower rated, providing combined protection against running and stalled overloads. Thermal overload relays on all phases shall be temperature compensated bimetallic type with manual reset and inherent single phasing prevention.

2.5 REDUCED VOLTAGE STARTERS

A. Provide starters meeting NEMA ICS 2, Class A, with the rating and enclosure shown. Starters shall be single-step magnetic type, having closed circuit transition and an adjustable time interval between application of starting and running conditions to the motors. Provide autotransformers suitable for medium-duty service as specified in NEMA ICS 2, and with overtemperature protection. Provide taps giving approximately 50 percent, 65 percent, and 80 percent of line voltage at output terminals.

2.6 CONTROL POWER TRANSFORMERS

A. Supply individual control power transformers unless noted otherwise. The transformers shall have sufficient capacity to serve the connected load and limit voltage regulation to 10 percent during contact or pickup. Fuse one side of the secondary winding and ground the other side. Provide primary, current limiting fuses where fuses shown on Drawings, or where required by applicable codes and standards.

2.7 MOTOR CONTROL CENTERS

A. Provide motor control centers and components meeting the requirements of the latest revised NEMA and UL standards and the following requirements, unless otherwise indicated:

RATING

Voltage	As indicated on the Drawings
Short Circuit Rating	[22,000] [42,000] amps rms symmetrical [as shown]
NEMA Class	Class [1,] [2,] [3,] Type [A] [B] [C] [with all remote control and signal circuits wired to a separate terminal board compartment in each motor control center lineup;] [all additions and revisions shall be included in the final as-built record drawings]

ENCLOSURE

Type	NEMA [Type 1] [Type 1 gasketed] [Type 12][as shown]
Vertical Section	90-inches high, 20-inches wide [as shown]
Dimensions	20-inches deep, Or depth as shown
Finish	Exterior: manufacturer's standard gray over a primer and rust inhibitor or as per architectural standard; Interior: white lacquer or enamel
Construction	Sheet steel reinforced with channel or angle irons, section constructed so they may be butted flush, end-to-end against a similar section without bolts, nuts, or cover plates causing interference; removable top cover plates and bottom cover plates
Section Mounting	Removable formed steel channel sills and removable lifting angles
Horizontal Wiring Compartments	Full width, top and bottom, accessible from front
Vertical Wiring	Full height, isolated from unit Compartment starters with a separate door, accessible from front
Unit Compartment	Individual compartments separated by steel barriers for each starter, feeder, or other unit capable of being wired from front without unit removal
Compartment Doors	Separate hinged doors for each starter, feeder, or other unit
Door Interlocking	Individual Starter and feeder doors mechanically interlocked so doors cannot be opened with unit energized; defeater mechanism to allow intentional access at any time; provisions for padlocking external disconnect handles in the OFF position
Cable Entrance	Main circuits enter from [top;] [bottom;] control and feeder circuits enter from [top] [and] [bottom]
Busway Entrance	Pull box with flanged connection for incoming busway, bus connection to motor control center main power bus and cable connection to ground bus [and neutral bus;] match dimensions of incoming busway; [Belleville washers on all bus connection bolts]

BUS

Horizontal Power Bus	3-phase [tin-plated,] [fully-insulated,] [copper] bus entire width of control center rated [600A,] [1200A,] [as indicated,] constructed to allow future extension of additional sections; pressure type solderless lugs for each incoming line cable; Belleville washers on all bus connection bolts.
Vertical Power Bus	3-phase [tin-plated,] [copper bus full height of section rated 300 amps minimum;] "sandwich" type bus insulation that provides dead front construction with starter units removed except for bus stab openings; Belleville washers on all bus connection bolts
Neutral Bus	None [50 percent neutral] [100 percent neutral] [tin-plated;] [Copper;] Belleville washers on all bus connection bolts
Ground Bus	Copper, [tin-plated,] 400A minimum capacity; Belleville washers on all bus connection bolts
Bus Bracing	[22,000] [42,000] amps rms symmetrical.

MOTOR STARTER UNITS

General	Individual components and control devices including pushbuttons, selector switches, indicating lights, control relays, time delay relays, and elapsed time meters as specified in Section [16100], "Basic Materials and Methods".
Construction	Drawout combination type with stab connections, except where size and weight of equipment make this impracticable; readily interchangeable with starters of similar size; provide pull-apart unit control wiring terminal boards [on all draw-out units] [on all units]
Starters	NEMA standard rating, NEMA Size 1; minimum meeting requirements specified under article 2.1, MOTOR CONTROL, GENERAL;
Disconnecting Device	[As indicated;] disconnecting device lockable in OPEN position
Circuit Breakers	Molded case motor circuit protectors with manufacturer's recommended trip setting for maximum motor protection, tripping indicated by operating handle position; interrupting capacity required for connection to system with short circuit capacity indicated; shunt trip for ground fault protection; copies of circuit breaker time-current characteristics
Fused Switches	Heavy-duty (HD), motor rated, load-break, quick-make, quick-break type meeting requirements of UL and NEMA KS 1; current- limiting fuses as specified with rejection clips

Load Detector Relays	Manual reset with adjustable differential; Relays Cutler-Hammer Type D60LA, or equal
Motor Overload	Temperature compensated, three-pole, Protection bimetallic thermal overload relay; manual-reset overload relays when used independently of other overload protection; automatic-reset when used with integral motor thermal protector
Motor Thermal	Manual-reset interposing Protection Interface relay for connection to motor-mounted thermal protector system
Ground Fault	Same as under FEEDER UNITS Protection AND MAIN PROTECTIVE DEVICE, except instantaneous operation device
Capacitor Connection	Special terminals to allow easy connection of power factor correction capacitors on the source side of starter overload relays on all starters where capacitor connection is shown

CONTROL UNITS

Disconnecting Device	Disconnecting device capable of de-energizing all circuits in the unit. Provide a warning sign giving location of disconnecting device if not located in the unit.
Control Devices	As indicated on the Drawings and as specified in Section [16100], "Basic Materials and Methods".
	Permanent sleeve type markers to be applied to all wires.
Wire Markers Control Wiring	Minimum wire size 14 AWG copper

FEEDER UNITS AND MAIN PROTECTIVE DEVICE

Construction	Same as under MOTOR STARTER UNITS [UL service entrance label on main protective device]
Circuit Breakers	Unless otherwise indicated, molded case with thermal-magnetic trip and interrupting capacity required for connection to system with short circuit capacity indicated; tripping indicated by operating handle position; suitable for use with 75 degrees C wire at full NEC 75 degrees C ampacity; [shunt trip [for ground fault protection] [and] [phase monitoring relay];] [for main [and feeder] protective devices, use molded case circuit breakers with ambient insensitive solid state trips and having the current sensors and solid state logic circuits integral in the circuit breaker frame; use solid state current control providing adjustable ampere setting, adjustable long-time delay, adjustable short-time trip and delay band, fixed instantaneous trip set at 15 times the current sensor rating and adjustable ground fault trip and

	delay band; make settings behind a sealable tamper-proof transparent cover; locate a trip button on the front cover of the circuit breakers to permit mechanical simulation overcurrent tripping for test purposes and to trip the breaker quickly in an emergency situation;] [copies of circuit breaker time-current characteristics]
Fused Switches	Heavy-duty (HD) motor rated, load-break, quick-make, quick-break type meeting requirements of UL and NEMA KS 1; suitable for use with 75 degrees C wire at full NEC 75 degrees C ampacity; current-limiting fuses as specified [with rejection clips]
Ground Fault	Suitable for 480-volt, 3-phase, [three-wire,] [Protection four-wire,] solidly grounded wye system; consisting of ground sensors encircling all phase conductors and neutral conductor where used and connected to ground relays with adjustable pickup settings and time-current characteristics indicated; circuit breaker shunt trip and relay operating from a fused 120-volt ac control source within the control center; ground fault system ITE Ground Shield, General Electric Ground Break, or equal; copies of relay time-current characteristics
Key Interlocking	[Manufacturer's standard] [Kirk] [ ] key interlocking where indicated
Phase Monitoring	3-phase monitoring relay to protect Motor against low Relay voltage, voltage unbalance, and phase reversal; Furnas Class 47, [ ], or equal
INSTRUMENTS	
Voltmeter	Scale indicated, [switchboard class with 250-degree scale, GE AB-40, or equal,] [panel type, nominal 4-1/2-inch model] with [ON/OFF single-phase] [3-phase OFF, four-position] [phase-to-phase, phase-to-ground, OFF, seven-position] selector switch
Ammeter	Scale indicated, [switchboard class with 250-degree scale, GE AB-40, or equal,] [panel type, nominal 4-1/2-inch model] with [ON/OFF single-phase] [3-phase OFF, four-position] selector switch, C.T.'s with ratio indicated
Ground Detection Lights	Heavy-duty oiltight type with operation explanation nameplate
NAMEPLATES	Engraved with inscription as shown on the single-line diagram, laminated plastic nameplates for each motor control center and each unit, blank nameplates on spaces for future units

Nameplates that are white and engraved to a black core; attach nameplates with stainless steel panhead screws

SPACE HEATERS — Thermostatically controlled space heater in the bottom of each vertical section for operation from an external 120V power source

DIAGRAMS — Schematic (elementary) and outline diagrams, equipment schedules, wireless unit connection diagrams, [interconnection diagrams]

2.8 ACCEPTABLE MANUFACTURERS

A. [Manufacturer A];

B. [Manufacturer B];

C. [Manufacturer C];

D. Or equal.

PART 3 - EXECUTION

3.1 GENERAL

A. Perform work in a workmanlike manner with craftsmen skilled in the particular trade. Provide work presenting a neat and finished appearance.

3.2 INSTALLATION

A. Install equipment in strict accordance with submittal drawings and manufacturer's recommendations. Install motor control centers in accordance with NEMA ICS 2.3 as a minimum. Secure motor control centers using approved means as per latest standards and regulations. Grout mounting channels provided with motor control into the floor or mounting pads.

B. Provide a qualified, factory-trained representative to supervise installation, final adjustment, and initial energization of this equipment. Make this representative available for as long as his services are required, but in any case for a period of [ ] days minimum. At the end of installation and adjustment, provide certification signed by this representative that the equipment has been properly installed and tested, and is ready for energization.

C. Retighten to NEMA standards all current-carrying bolted connections and all support framing and panels.

D. Field adjust the trip settings of all motor starter magnetic trip only circuit breakers. Adjust as per manufacturer’s recommendations. Determine motor rated current from motor nameplate following installation. In the selection of overload relay heaters, allow for motor current reduction where power factor correction capacitors are installed on the load side of the overload heaters. Prepare a typed tabulation of motor name, motor

horsepower, nameplate full load current, measured load current, heater catalog number, protective device, trip setting, and include copy in the Technical Manual. Attach to the tabulation a copy of the starter manufacturer's overload heater selection tables, including only the tables for the particular starters provided.

E. After the equipment is installed, touch up any scratches, marks, etc., incurred during shipment or installation of equipment. If required by the ENGINEER because of undue amount of scratches, repaint the entire assembly.

3.3 FIELD TESTS

A. Field tests shall be in accordance with Section 16030 Wastewater Facilities Electrical Testing Requirements.

END OF SECTION

SECTION 26 33 54 16380

UNINTERRUPTIBLE POWER SYSTEM

PART 1 - GENERAL

1.1 SCOPE

A. Required: Furnish and install the single or three phase uninterruptible power system (U.P.S.) and all accessories indicated on the Contract Drawings and herein specified.

B. Comply with the GENERAL CONDITIONS, GENERAL REQUIREMENTS and the requirements of Section 16020 of this DIVISION 16 concerning definitions, guarantees, submittals, as-builts, clean-up, etc. as applicable to work of this Section.

1.2 RELATED WORK

A. Related Sections: The following sections contain requirements that relate to this section:

1. Section 16560 " Municipal Facilities Electrical Commissioning Requirements " for commissioning requirements.

2. Section 16570 " Municipal Facilities Electrical Testing Requirements" for testing requirements.

1.3 LEGAL REQUIREMENTS AND STANDARDS

A. Comply with applicable Codes and Standards noted in Subsection 1.5 of Section 16020 and the following additional commercial standards:

1.	ANSI/IEEE 241	Electric Power Systems in Commercial Buildings, Recommended Practice for.
2.	ANSI/NEMA 250	Enclosures for Electrical Equipment.
3.	EIA	Electronic Industries Association Standards.
4.	IEEE-587	Standards for Surge Suppression.
5.	NEC	National Electrical Code; Article 700 Emergency Systems.
6.	NEMA PB2	Panelboard.
7.	UL 1012	Underwriter's Laboratory Listing.
8.	UL 1778	UL Standard for Safety – Uninterruptible Power Supply Equipment.
9.	IEEE 944	Recommended Practice for the Application and Testing of Uninterruptible Power Supply for power generating stations.
10.	NEMA PE1	Uninterruptible Power Systems.

11.	California Code of Regulations Commercial Standard:	Title 8, Industrial Relations Subchapter 5, Electrical Safety Orders.

1.4 SUBMITTALS

A. General: Conform to applicable provisions of Subsection 1. 6G in Section 16020 - GENERAL ELECTRICAL REQUIREMENTS.

B. Shop Drawings and Catalogue Data: Required to provide sufficient information to indicate scope and quality of the UPS System installation as follows:

1. Block diagram showing system relationships of major components and quantities and interconnecting cable requirements.

2. Control console and panel arrangements, equipment outlet devices, and special mounting details.

3. Wiring diagrams showing terminal identification for field-installed wiring.

4. One-line diagram showing input, output, DC, and bypass circuit breakers and their sizes

5. Operating and services manuals, furnish [6] copies for the system. The manuals shall be bound in flexible binders and all data contained therein shall be printed or typewritten. Each manual shall include all instruction necessary for proper operation and receiving of the system, and shall include a complete block diagram of the system, a complete circuit diagnosis of the system, and a wiring designation schedule for each amplifier as well as other major components, and a replacement parts list.

6. Outline, plan, and elevation drawings, showing dimensions. Mechanical details shall include anchor bolt size and location requirements and net operating and shipping weights for the equipment.

C. The CONTRACTOR shall obtain and submit to the Engineer the test reports for all equipment and material subject to factory testing.

D. The CONTRACTOR shall obtain from the manufacturer all pass codes necessary to perform diagnostic testing and troubleshooting of the system. These pass codes shall be submitted to the ENGINEER and included in the operations and maintenance manuals.

E. Test Reports: Contractor to provide to the City a bound report of all inspections and tests required in Section 3.

1.5 QUALITY ASSURANCE

A. General: Conform to applicable provisions noted in Subsection 1.7 of Section 16020 - GENERAL ELECTRICAL REQUIREMENTS.

B. Uninterruptible power system components shall be manufactured by firms that are regularly engaged in the production of UPS system including auxiliary equipment similar to that required for this project and that have been in satisfactory service for at least 10 years.

C. Operation of the uninterruptible power system shall be demonstrated to the City Engineer to prove that under normal conditions UPS will provide power to the designated load without interruptions of functions and loss of stored information.

D. The UPS system, when specified as a three-phase unit, shall be a three-phase system in one unit. Use of three single-phase units to comprise a three-phase system is not acceptable.

E. Fabrication and assembly: Unless otherwise specified, the UPS shall be shop assembled in a single enclosure and shall utilize interchangeable plug-in printed circuit boards and power conversion components wherever possible. Shop assembly shall be performed by the UPS manufacturer; systems fabricated or assembled in whole or in part by parties other than the UPS manufacturer will not be acceptable.

F. Printed circuit boards: All printed circuit board components shall be sprayed on both sides with corrosion inhabitant compound, Konform C416, or equal.

G. During the warranty period, the CONTRACTOR shall respond to trouble calls with a competent repair person at the project site within 24 hours; the CONTRACTOR shall also maintain a full inventory of replacement parts so that all routine repairs can be completed within 24 hours. The manufacturer shall have a local representative to provide technical services.

1.6 WARRANTY

A. General Warranty: Special project warranty specified in this Article shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by the Contractor under requirements of the Contract Documents.

B. Special Project Warranty:

1. All materials and equipment furnished and installed here under shall be new and free from all defects.

2. The Contractor shall guarantee the uninterruptible power system (UPS) including equipment and labor for a period of two (2) years from the date of final acceptance.

3. Should any trouble develop within two (2) years from date of final acceptance of the work, due to faulty material and/or workmanship, the trouble shall be corrected by the Contractor without expense to the City.

1.7 MAINTENANCE

A. Required: The Contractor shall respond to trouble calls with a competent repair person at the project site within 24 hours; Contractor shall also maintain a full inventory of replacement parts so that all routine repairs can be completed within 24 hours.

PART 2 - PRODUCTS

2.1 THE SYSTEM

A. General Description: This Specification describes a continuous duty, single-phase on-line, solid-state uninterruptible power system (UPS). The UPS shall operate in

conjunction with the plant electrical system to provide power conditioning, back-up, and distribution for electronic equipment loads.

B. The UPS shall consist of the following major equipment:

1. Inverter/charger.

2. [Electro-mechanical] [Static] bypass switch.

3. Enclosed, sealed, maintenance-free battery. Battery cabinets for longer protection times.

4. Input, battery, and output breakers.

5. Microprocessor controlled logic and control panel.

6. Six-pole output distribution panelboard.

7. System Metering.

8. Control Panel Display.

2.2 MODES OF OPERATION

A. Modes of This On-Line Fully Automatic System:

1. Normal: The critical load is continuously controlled by the inverter/charger. It derives power as needed from the commercial ac source and supplies filtered and regulated ac power to the critical load. In addition, simultaneous float-charging of the battery occurs.

2. Emergency: Upon failure of the commercial ac power, the critical load continues to be supplied by the inverter, which without any switching obtains its power from the storage battery. There is no interruption to the critical load upon failure or restoration of the commercial ac source.

3. Recharge: Upon restoration of the commercial ac source, the inverter/charger recharges the battery. This is an automatic function and causes no interruption to the critical load.

4. Bypass Mode: If the UPS must be taken out of service for overload, load fault, or internal failures, the bypass switch automatically transfers the load to the commercial ac power. Return from bypass mode to normal mode of operation is automatic, except for overload trip which requires manual reset. Transfer to bypass mode can also be initiated manually by operating a key controlled ON/OFF switch on the control panel.

5. Maintenance Mode: If the UPS must be taken out of service for maintenance or repair, the external manual bypass switch must be operated to transfer the load to the alternate source. This transfer shall occur without interruption.

6. Downgrade: If the batteries alone are taken out of service, they shall be disconnected from the by circuit breakers. The UPS shall continue to function and meet all of the performance criteria specified herein, except for the reserve time capability.

2.3 UPS PERFORMANCE CHARACTERISTICS

A. Power Ratings: [1.5] [3.0] and [5.0] kVA for load power factor range of [0.8] [0.85] lagging to [0.9] [0.95] leading.

B. Input:

1. Nominal Input Voltage and Frequency: 60 Hz models: [120 vac], [208 vac], [240 vac] or [120/240 vac], [3-phase, 4 wire] [single-phase]

2. Operating Input Voltage Range: +13 percent to -20 percent of nominal without battery discharge.

3. Input Power Factor: 0.9 minimum at full load and nominal input voltage.

4. Input Current THD: 10 percent typical at full load (linear or non-linear).

5. Input Surge Suppression: Per IEEE-587 Standards.

C. Output:

1. Nominal Output Voltage: Same as input voltage.

2. Output Voltage Regulation: Within +2 percent from nominal output voltage for all operating conditions.

3. Manual Output Voltage Adjustment: Within +5 percent from nominal.

4. Transient Voltage Response: Within ±8 percent from nominal peak voltage for a 100 percent load step.

5. Transient Voltage Recovery: 100 msec to within ±2 percent of nominal.

6. Frequency Regulation: ±0.1 Hz.

7. Output Voltage Harmonic Distortion: 3 percent THD for 100 percent linear load, [5] [10] percent THD for 100 percent non-linear loads at nominal input voltage.

8. Output fully isolated from input and battery.

9. Common mode noise attenuation (without static switch): 55 dB up to 500 kHz.

D. [Electro-Mechanical] [Static] Bypass: [An electro-mechanical] [A static] bypass switch includes transfer control logic which automatically transfers the load to bypass upon the following conditions:

1. Output overvoltage or undervoltage.

2. Overload condition of a duration longer than 10 minutes.

3. Overtemperature.

4. Inverter failure.

Return to UPS mode of operation upon restoration of normal operating conditions shall be automatic except for overload or inverter failure which shall require a manual restart. Electro-mechanical transfers are break before make.

E. Microprocessor Controlled Logic: Fully automatic operation of the UPS shall be provided through the use of microprocessor controlled logic. All operating and protection parameters shall be firmware controlled, to eliminate the need for manual adjustments to compensate for component tolerances. The logic includes system and battery test capability to facilitate maintenance and troubleshooting. Start-up, transfers, and battery recharge shall be all automatic functions.

F. Control Panel: The UPS shall be equipped with a control panel that provides the following metering, monitoring, and control functions:

ac input voltage	(LINE VOLT)
ac input current	(LINE AMP)
ac input frequency	(LINE HZ)
dc battery voltage	(BATT VOLT)
dc battery current	(BATT AMP)
ac inverter voltage	(LOAD VOLT)
ac inverter current	(LOAD AMP)
ac inverter frequency	(LOAD HZ)

The metering display shall automatically blank after five minutes.

1. Alarm Monitoring: The following alarm indicators shall be provided on the control panel display:

   a. System Normal (Green): Line is supplying power to the UPS. The UPS is controlling the load voltage, and charging the battery.

   b. Alarm (Red): This indicator flashes whenever an alarm condition exists.

   c. Battery undervoltage (Yellow): The battery voltage has fallen below 128 v dc. Alarm condition ceases when the battery voltage reaches 132 v dc.

   d. Battery discharge (Yellow): The battery is supplying power to the load.

   e. Output Overload (Red): The output current exceeds the maximum rating of the system. If the output current exceeds 105 percent of system rating for 10 minutes, the system will respond by transferring to bypass.

   f. Sync Loss (Red): The utility line frequency has exceeded safe operating tolerances (±1 Hz or ±3 Hz, switch selectable) and/or the UPS is not synchronized within 5 degrees phase angle of the desired operating point.

   g. AC Input Failure (Red): The line voltage is not within normal operating range for the equipment (+13 percent to -20 percent of nominal). The load is being powered by the battery, if not in bypass mode of operation.

   h. Over Temp (Red): The internal temperature of the UPS cabinet is above 65 degrees C. UPS will transfer to bypass.

   i. Shutdown Imminent (Red): Inverter shutdown is imminent (triggered by the battery discharging below 110 v dc or output overload over eight

minutes). The load will be dropped when the battery falls below 95 v dc or the overload exceeds 105 percent for 10 minutes unless the bypass reacts.

j. On Bypass (Red): The load is receiving power which is bypassing the power protection circuitry of the UPS.

k. Inverter not ready (Red): The inverter is not ready to support the critical load.

2. Controls: The following control functions shall be provided on the control panel:

ON/OFF: Key operated switch which activates and deactivates UPS operation.

Alarm Off: Pushbutton which silences the audible alarm. The alarm will sound again at the reoccurrence of an alarm condition.

Test: Pushbutton which initiates a system test routine by simulating a utility power outage. The critical load will be supplied by the battery. When the pushbutton is released, the control circuitry resynchronizes the inverter to the input line and resumes battery charging.

3. Other controls located behind the front door shall include:

Audible Alarm Volume Control: Loud, soft and off.

Manual Restart: Pushbutton used to restart UPS after an overload or inverter failure trip.

G. Alarm Contact: A dry type summary alarm contact shall be provided for remote indication of alarm conditions.

H. Built-In Distribution: A 6-pole distribution panelboard shall be provided on the output of the system.

I. Environmental Conditions:

1. Efficiency at full, unity power factor load and nominal input voltage: [90 percent for a 5.0 kVA model]; [90 percent for a 3.0 kVA model], [85 percent for a 1.5 kVA model].

2. Elevation: 5,000 feet (1,500 m) without derating.

3. Acoustical Noise: 50 dB at one meter. (Measured at +25 degrees C.)

4. EMI Suppression: Electromagnetic effects are minimized to ensure that computer systems or other similar electronic systems are neither adversely affecting to, nor are adversely affected by, the UPS. The UPS is certified to meet the requirements of Class A, Subpart J of Part 15 of the FCC Rules and Regulations.

5. Electrostatic Discharge (Commonly Encountered in Carpeted Offices) Immunity: Withstands up to ±25 kV with no disturbance or adverse effect to the load.

6. Ambient Temperature: 40 degrees C.

J. Battery Pack: The battery consists of battery tray(s) either fully enclosed within the UPS cabinet or enclosed in metal cabinet(s) which match the UPS module in appearance. Individual battery trays are modular and individually fused.

1. Battery Type: a sealed, maintenance-free, high-rate, [lead-acid cells], [nickel-cadmium][vented] [valve-regulated] high-rate type battery shall be used as a stored energy source for the UPS. The battery shall be sized to support the inverter at rated load or the kilowatt load specified for the protection time specified [20 min.] [30 min.] [60 min.] [2 hr.] The battery shall consist of one or more banks of cells as required, and be a common source for each inverter.

2. Expected Life: 5 years or 200 full discharge cycles at full load.

3. Minimum Final Discharge Voltage: 1.66 volts per cell.

4. Nominal Float Voltage: 2.25 volts per cell.

5. Battery Circuit Breaker: A molded case breaker is provided for battery short circuit protection and as a means of manual disconnection for battery maintenance.

2.4 FUNCTIONAL DESCRIPTION

A. Inverter/Charger: The inverter/charger shall employ Pulse Width Modulation (PWM) technology utilizing transistor power blocks as switching elements. The inverter shall be capable of providing the specified quality output power while operating from the ac utility or dc source within the specified operating range. In addition, the inverter shall simultaneously float charge the battery.

B. Electrical Protection:

1. Input protection shall be provided by a thermal-magnetic molded case circuit breaker and transient suppression circuitry.

2. Battery protection shall be provided by individual fusing of each battery tray and a thermal-magnetic molded case circuit breaker.

3. Output protection shall be provided by thermal-magnetic circuit breaker(s), fuses in the inverter circuit, and current limit circuitry.

2.5 ENCLOSURES

A. The UPS shall be housed in a free standing, double dead front (safety shields behind front door) enclosure equipped with casters and leveling feet. Enclosures shall be designed for office or computer room applications. If system consists of more than one cabinet, the cabinets shall be shipped with joining hardware to be bolted together at time of installation.

B. Ventilation: Electronics cabinets shall be designed for natural conversion cooling aided by a thermostatically controlled fan. Air inlets shall be in the lower front and rear; air outlets shall be in the upper rear. Battery cabinets shall be convection cooled.

C. Cable Entry: Units equipped with input cord and plug and output receptacles shall not require any installation. Hard wired systems shall provide for conduit entry through knockouts located in the rear of the unit. Connection between UPS and battery cabinets shall be provided and shall consist of cables and power plugs.

D. Front Access: Major subassemblies shall be modular and shall be replaceable from the front of the unit.

2.6 WARRANTY:

A. The system warranty shall be no less than 12 months after initial startup, and must include all costs including repair, parts, labor, travel and living expenses for the manufacturer's service personnel, within the United States. The manufacturer shall guarantee, in writing, the stated system efficiency.

2.7 DOCUMENTATION AND TRAINING.

A. The UPS shall be supplied with sufficient documentation, including a concise operation and maintenance manual, also including proprietary troubleshooting information, to allow training personnel to troubleshoot and service the UPS. The UPS vendor shall make available a maintenance training school for customer personnel.

B. Operating and Maintenance Manual: The CONTRACTOR shall furnish 6 copies of the operating and maintenance manuals. The manuals shall possess sufficient detail and clarity to enable the owner's technicians to understand and operate the system equipment, and to identify replaceable parts.

PART 3 - EXECUTION

3.1 GENERAL

A. The uninterruptible power system shall be installed as shown, shall conform with Section [16010], Wastewater Facilities General Electrical Requirements and in accordance with the equipment manufacturer's installation instructions.

B. Detailed Requirements:

1. The Contractor shall receive, store, and assemble all sections of the UPS to form complete units. The Contractor shall make all internal wiring interconnections as required for complete assembly of each UPS. Where wiring connectors are not supplied by the manufacturer, the Contractor shall furnish the connectors required to complete internal wiring terminations.

2. The Contractor shall take all necessary precautions to eliminate moisture and foreign material from the equipment at all times during storage and installation. Special care shall be taken to prevent corrosion of and damage to the UPS.

3. Each UPS shall be set level and plumb on its floor channels furnished, installed, and grouted in by the Contractor as shown. The Contractor shall furnish all shims necessary to accomplish these requirements.

3.2 INSTALLATION

A. The UPS system shall be set in place, wired and connected in accordance with the approved shop drawings and manufacturer's instructions.

B. Equipment shall be adequately anchored and braced per details on structural contract drawings to withstand the seismic forces at the location where installed.

3.3 ACCEPTANCE INSPECTION AND TESTS

A. Installation, adjustment and testing of the equipment shall be supervised by a manufacturer's representative.

B. All tests shall be witnessed by the ENGINEER [and Commissioning Agent].

C. Field Tests: As a minimum, the startup and field test procedures shall include the following:

1. Compare equipment nameplate data with specifications and approved shop drawings.

2. Ensure that shipping members have been removed.

3. Inspect physical, electrical, and mechanical condition.

4. Clean the UPS.

5. Attach a phase rotation meter to the UPS input, output and bypass buses, and observe proper phase sequences.

6. Torque test bus and battery connections at shipping splits.

7. Check each electrical bus for proper phasing and identification.

8. Check and test selector switches and meters for proper operation.

9. Check doors for proper alignment and operation.

10. Check and test each protective device for proper mechanical and electrical operation.

11. Verify protective device overcurrent trip settings against approved coordination study.

12. Verify the correct operation of all sensing devices, alarms, and indicating devices.

13. Perform manufacturer’s onsite field test procedures.

14. Demonstrate to the ENGINEER that the interlocks have been tested and agree with the interlocking scheme.

D. Load Test: The installed system shall be load tested for a continuous 24 hour period by means of resistive load banks, provided by equipment manufacturer. The system shall be continuously tested at 1/2 load for 8 hours, 3/4 load for 8 hours and full load for 8 hours. Instrument readings shall be recorded every half hour for the following:

1. Input voltage and current (all three phases, for each module).

2. Input and output frequency.

3. Battery voltage for each module.

4. Output voltage and current (all three phases, for each module).

5. Output kilowatts for each module.

6. Output voltage and current (all three phases).

8. Output kilowatts.

E. Full Load Burn In Test :

1. The installed system shall undergo an additional full load burn-in period of 24 continuous hours. If a failure occurs during the burn-in period, the tests shall be repeated. Instrument readings shall be recorded every half hour as above. During the burn-in period, the following tests shall be performed:

a. With the UPS carrying maximum continuous design load and supplied from the normal source, switch [100 percent load] [50 percent load] on and off a minimum of five times within the burn-in period.

b. With the UPS carrying maximum continuous design load and supplied from the emergency source, repeat the switching operations described. Also, verify that the UPS module rectifier charger unit(s) go into the second-step current limit mode.

c. With the UPS carrying maximum continuous design load and operating on battery power, repeat the switching operations described above.

d. Continue operation on battery power for 1 minute, and then restore normal power.

F. Battery Discharge Test:

1. With the battery fully charged, the system shall undergo a complete battery discharge test to full depletion and a recharge to nominal conditions. Instrument readings shall be recorded every minute during discharge for the following:

a. Battery voltage and current for each module.

b. Output voltage and current (all three phases) for each module.

c. Output kilowatts for each module.

d. Output voltage and current (all three phases - system output).

e. Output kilowatts (system output).

f. Output frequency.

3.4 POSTING FRAMED DATA AND INSTRUCTIONS

Wiring and control diagram instructions and data shall be framed and posted under acrylic glass in a location adjacent to the UPS system as directed by the ENGINEER. Condensed operating instructions, prepared in typed form, shall be framed as specified above and posted beside the diagrams. The framed instructions shall be posted before acceptance testing of the system.

3.5 FOLLOW-UP VERIFICATION

Upon completion of acceptance checks, settings, and tests, the Contractor shall show by demonstration in service that the central uninterruptible power supply is in good operating condition and properly performing the intended function.

3.6 TRAINING OF CITY PERSONNEL

A field training course shall be provided by a certified factory-trained technician for designated City personnel. Training shall be provided for a total period of [4] [8] [16] hours of normal working time and shall start after the system is functionally complete but prior to final acceptance test. Field training shall cover the items contained in the operating and maintenance manuals.

END OF SECTION

SECTION 26 41 30

GROUNDING SYSTEMS

PART 1 - GENERAL

1.1 SCOPE

A. Required: Provide and ground electrical systems completely and effectively as required by Code and herein specified.

B. Comply with the General Conditions, General Requirements and the requirements of Section 16020 of this Division 16 concerning definitions, guarantees, submittals, as-builts, clean-up, etc. as applicable to work of this Section.

1.2 SUBMITTALS

A. General: Submit each item in this article according to the conditions of the Contract and Division 1 Specifications 01330.

B. Product Data for grounding rods, connectors and connection materials, and grounding fittings.

C. Field tests and observation reports certified by the testing organization and indicating and interpreting the test reports for compliance with performance requirements.

1.3 RELATED WORK

A. Related Sections: The following sections contain requirements that relate to this section:

1. Section 16560 " Municipal Facilities Electrical Commissioning Requirements " for commissioning requirements.

2. Section 16570 " Municipal Facilities Electrical Testing Requirements" for testing requirements.

1.4 QUALITY ASSURANCE:

A. Testing Agency Qualifications: A “National Recognized Teating Laboratory” (NRTL) as defined in OSHA Regulation 1910.7.

B. Comply with NFPA 70.

C. Comply with UL 467.

D. Listing and Labeling: Provide products specified in this Section that are listed and labeled.

1. The Terms “Listed” and “Labeled”: As defined in the National Electrical Code Article 100.

2. Listing and Labeling Agency Qualifications: A “Nationally Recognized Testing Laboratory” (NRTL) as defined in OSHA Regulation 1910.7.

1.5 REFERENCE STANDARDS:

A. NFPA 70: National Electrical Code – Article 250.

B. Federal Information Processing Standard Publication #94 “Guideline on Electrical Power for ADP Installations”.

C. IEE Std. 142-1982 “Grounding of Industrial and Commercial Power System (GREEN Book).

D. IEE Std. 1100-1992 “Powering and Grounding Sensitive Electronic Equipment” (Emerald Book).

1.6 SYSTEM DESCRIPTION

A. Ground the electrical service system neutral at service entrance equipment to metallic water service and to concrete encased grounding electrodes.

B. Ground each separately-derived system neutral to nearest effectively grounded metallic water pipe.

C. Provide telephone and data system grounding conductor at main terminals of respective system bonded to service entrance grounding electrode.

D. Bond together system neutrals, service equipment enclosures, exposed non-current carrying metal parts of electrical equipment, metal raceway systems, grounding conductor in raceways and cables, receptacle ground connectors, metallic plumbing systems and concrete encased electrode.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Grounding and Bonding Conductors: Soft-drawn stranded copper.

B. Buried or Concealed Joints: Exothermic welded, inspected and approved the Los Angeles City Building Department before concealment.

C. System grounding conductors shall be a minimum of #3 AWG unless otherwise indicated, and shall be continuous without joints or splices.

D. Bolted Connections: Everdur hardware, bolts, and lock washers or equal.

E. Welded Connections: Either Erico Cadweld Process or Continental Industries Thermoweld Process or equal.

F. Compression Connections: Thomas & Betts Series 5300 fittings or equal. Use manufacturer's specific instructions and tools for each connection.

G. Ground Rods: Copperweld Steel Company or equal. Provide 3/4 inch copperclad steel driven ground rods, 10 feet long, UL listed, in each manhole and where indicated on Contract Drawings.

PART 3 - EXECUTION

3.1 GENERAL INSTALLATION

A. Grounding and Bonding: Provide in accordance with all requirements of NEC and other applicable codes, Contract Drawings and the following descriptions. Comply with the codes as a minimum requirement with specifications where they are more stringent. Ground each electrical service to cold water systems and provide supplemental grounding as follows:

1. Structural Steel Electrode: Bond the structural steel frame of the building or structure to the point of ground at service equipment with a continuous bonding conductor equal in size to the grounding electrode conductor, but not smaller than No. 4 AWG or

2. Concrete-Encased Electrode: Provide three minimum No. 4 horizontal reinforcing bars in and near the bottom of the building or structure footing, each with a minimum continuous (no splices) length of 20 feet. Install a continuous bonding conductor equal in size to the grounding electrode conductors, but not smaller than No. 4 A.W.G., bonded to each reinforcing bar by means of corrosion-resistant clamps or welding, to the point of ground at service equipment. The bonding conductor shall be installed in schedule 40 rigid PVC conduit from a point within the footing continuous to the service equipment. A single size 3/0 bare copper conductor with a minimum continuous length of 20 feet may be used in lieu of the three No. 4 reinforcing bars.

B. Separate Buildings or Structures: When two or more buildings or structures are supplied from a common source or service, the grounding system in each building or structure shall have a grounding electrode connected to the metal enclosure of the building or structure disconnecting means and to the AC system grounded circuit conductor on the supply of the building or structure disconnecting means.

C. Separately Derived Systems: Shall be bonded and grounded in accordance with Code.

D. Customer-Station Transformer: Shall be bonded and grounded in accordance with the requirements of the serving electric utility.

E. Nonmetallic Raceways: A Code-sized green, or green with yellow stripe insulated conductor shall be installed with the circuit conductors, for equipment grounding. Ground conductor shall be installed in raceways with branch circuit wiring where indicated on the Contract Drawings.

F. Communication, Sound, and Signal Systems: Metal raceways and enclosures shall be grounded as directed by the City Engineer.

G. The interior metallic cold water pipe system shall be bonded to the main grounding electrode by a conductor sized in accordance with Code, but not smaller than No. 8 A.W.G.

H. Telephone service main backboard or cabinet shall be grounded in accordance with requirements of the telephone serving facility.

I. All grounding and bonding conductors shall be installed with sufficient slack to avoid breaking due to settlement and movement of conductors at attached points.

J. Flexible Conduit: Where equipment grounding or bonding conductors are required they shall be installed inside the conduit except bonding conductors may be installed exterior of the conduit if not over 3 feet maximum length, not smaller than No. 8 A.W.G., and if secured to the conduit at 6 inch. Flexible conduit not to be used as a ground path. Include code size green conductors in all flexible conduit.

K. Transformers and other isolated neutrals shall be grounded from the neutral bushing or connector to grounding electrodes, building steel or metallic code water pipe system.

L. All conduit stub-ups shall be grounded and where multiple stub-ups are made within an equipment enclosure such as a switchboard, they shall be equipped with grounding bushings and bonded together to the enclosure, and the enclosure ground bus with code sized copper conductors.

M. Metallic conduits, wireways, metal enclosures of busways, electrical equipment housing and all non-current carrying metallic parts shall be grounded. The metallic conduit system shall be used for equipment and enclosure grounding but not as a system ground conductor.

3.2 MEASUREMENT OF RESISTANCE TO GROUND

A. All Systems: Measure by the "direct" method or the "Fall of Potential" method. The "direct" method, or two terminal test, includes a Megger Earth Tester with terminals connected to the electrode under test and to an all metallic water pipe system. The following limitations apply to this method:

1. The water pipe system must be extensive enough to have a negligible resistance.

2. The water pipe system must be metallic throughout, without any insulating couplings or flanges.

3. The earth electrode under test must be far enough away from the water pipe system to be outside its sphere of influence. Rule of thumb: Distance from the earth-electrode system to the water pipe system should be about 10 times the radius of the electrode or grid to obtain a measurement within an accuracy of p 10%.

4. Submit test report of the main building grounding electrode's resistance to ground to the City Engineer.

B. Test each receptacle or branch circuit breaker having ground-fault circuit protection to assure that the ground-fault circuit interrupter will not operate when subjected to a ground-fault current of less than 4 milliamperes and will operate when subjected to a ground-fault current exceeding 6 milliamperes. Perform testing using an instrument specifically designed and manufactured for testing ground-fault circuit interrupters. "TEST" button operation will not be acceptable as a substitute for this test. Replace receptacles that do not shutoff power with 5/1000 of an ampere within 1/40th of a second and retest. Submit test report signed by Test Engineer who performed this test.

END OF SECTION

SECTION 26 46 00

SHORT CIRCUIT AND COORDINATION REPORT

PART 1 - GENERAL

1.1 THE REQUIREMENT

A. The CONTRACTOR shall prepare a power system analysis of short circuit calculations, a protective device coordination study and a harmonic analysis in accordance with the requirements of these Specifications and as shown.

B. The studies shall include all portions of the electrical distribution system for normal and standby power sources down to and including the (208 V) distribution system.

C. The work to be provided by the CONTRACTOR shall include protection studies for motors supplied with solid state overload and overcurrent protection devices.

D. The work to be provided by the CONTRACTOR shall include an evaluation of harmonic distortion and the furnishing and installation of filters and any other equipment as may be required for harmonic suppression.

1.2 RELATED WORK SPECIFIED ELSEWHERE

A. The Work of the following Sections applies to the work of this Section. Other Sections of the Specifications, not referenced below, shall also apply to the extent required for proper performance of this work.

1. Section 16020 Municipal Facilities General Electrical Requirements
2. Section 16270 Service and Distribution Switchboard
3. Section [16340] Low Voltage Motor Control

1.3 REFERENCE SPECIFICATIONS, CODES AND STANDARDS

A. Comply with the current provisions of the following codes and standards.

1. Codes:

LAEC	City of Los Angeles Electrical Code, latest adopted edition,

2. Commercial Standards:

ANSI/IEEE 141	Recommended Practice for Electrical Power Distribution for Industrial Plants
ANSI/IEEE 242	Recommended Practice for Protection and Coordination of Industrial and Commercial Power Systems.
ANSI C 37.010	Standard Application Guide for AC High-Voltage Circuit Breakers
ANSI C 37.5	Calculations of Fault Currents for Application of Power Circuit Breakers
ANSI C-37.13	Low-Voltage AC Power Circuit Breaker (600-Volt Insulation Class)

IEEE 519 Recommended Practices and Requirements for Harmonic Control in Electrical Power Systems

1.4 CONTRACTOR SUBMITTALS

A. Submittals shall be made in accordance with Section 16020 Municipal Facilities General Electrical Requirements and as specified herein.

B. The power system analysis shall be submitted to the ENGINEER prior to receiving final approval of the distribution equipment shop drawings and/or release of equipment for manufacture; approval from the ENGINEER may be obtained for a preliminary submittal of sufficient detail to ensure that device selection will be adequate. Preliminary submittal shall indicate the computer program for use in performing the work of this Section.

C. Studies for harmonic current, voltage and line notching test results shall be forwarded to the ENGINEER prior to acceptance testing of the project and subsequent to the installation of all harmonic generating and harmonic-sensitive equipment.

D. Submittals for solid state motor protective devices shall be forwarded to the engineer prior to loading the motor.

E. Final settings of Protective device shall be approved by the ENGINEER prior to project acceptance and shall be based on the results of the power system analysis.

F. The CONTRACTOR shall indicate in the submittal, changes to the protection scheme or equipment selection that will result in improved system reliability and safety.

1.5 QUALITY ASSURANCE

A. Organization's Qualifications:

1. Short circuit studies, protective device evaluation studies, and protective device coordination studies shall be performed by the medium voltage switchgear manufacturer or by an electrical testing service regularly engaged in the short circuit and protective device coordination studies for a period of at least 15 years. The study shall utilize proven computer programs for power system analysis. The studies shall be signed by the professional electrical engineer, registered in the State of California, responsible for the studies.

PART 2 - PRODUCTS

2.1 GENERAL

A. The organization of the study shall include a single-line and an impedance diagram of the power system. This diagram shall identify all components considered in the study and the ratings of all power devices (this includes, but is not limited to: transformers, circuit breakers, relays, fuses, busses, and cables). The resistance and reactances of all cables shall be identified in the impedance diagram. The study shall contain, from the service utility company, all written data regarding maximum available short circuit current, voltage, and X/R ratio of the utilities' power system.

2.2 SHORT CIRCUIT STUDY

A. The short circuit study shall be performed with the aid of a digital computer program and shall be in accordance with ANSI C 37.5, IEEE Standard 242, and IEEE Standard 141.

2.3 PROTECTIVE DEVICE EVALUATION STUDY

A. A protective device evaluation study shall be performed to determine the adequacy of circuit breakers, molded case switches, automatic transfer switches, and fuses. Any problem areas or inadequacies in the equipment due to prospective short-circuit currents shall be promptly brought to the ENGINEER's attention.

2.4 PROTECTIVE DEVICE COORDINATION STUDY

A. A protective device coordination study shall be performed to provide the necessary calculations required to select or check the selection of power fuse ratings, protective relay characteristics and settings, ratios and characteristics of associated current transformers, and low-voltage breaker trip characteristics and settings. The results of the study shall govern the final selection of the protective devices.

2.5 TIME/CURRENT COORDINATION CURVES

A. As a minimum, the time/current coordination curves for the power distribution system shall include the following on 5-cycle log-log graph paper:

1. Time/current curves for each protective relay or fuse showing graphically that the settings will provide protection and selectivity within industry standards. Each curve shall be identified, and tap and time dial settings shall be specified.

2. Time/current curves for each device shall be positioned to provide the maximum selectivity to minimize system disturbances during fault clearing.

3. Time/current curves and points for cable and equipment damage.

4. Circuit interrupting device operating and interrupting times.

5. Indicate maximum fault values on the graph.

6. Sketch of bus and breaker arrangement.

7. Magnetizing inrush points of transformers.

8. All restrictions of the ANSI and LAEC shall be adhered to and proper coordination intervals and separation of characteristics curves shall be maintained.

9. Thermal limits of motors 250 hp and above.

2.6 HARMONIC MEASUREMENT

A. The CONTRACTOR shall prepare a report of the distribution system, at all voltage levels, which shall indicate the harmonic currents anticipated at each voltage level. This report shall indicate sources of harmonic currents, voltages, and line notching of all equipment. The report shall state the tolerance of sensitive equipment to harmonics.

B. CONTRACTOR shall measure harmonics present in the output of harmonic-generating equipment and at the input terminals of sensitive equipment. Install filters to prevent equipment malfunction, due to harmonics. Harmonic measurements shall be performed and documented after the filter installations.

C. All equipment which is required to conform to IEEE 519 shall be measured to determine output harmonic content. The CONTRACTOR shall take the corrective action necessary to attain compliance with IEEE 519, Table. Measurements and documentation shall be performed to demonstrate compliance with the standards.

2.7 MOTOR PROTECTION

A. Overload protection as phase overcurrent for medium voltage motors is specified in other Sections of these Specifications to be solid-state protective modules. The CONTRACTOR shall adjust these modules with respect to actual installed motor torque, current and thermal characteristics so that the best possible motor protection will result. Protective settings shall be submitted, and approved, before respective motors are run under load.

PART 3 - EXECUTION

3.1 PROTECTIVE DEVICE TESTING, CALIBRATION AND ADJUSTMENT

A. The CONTRACTOR shall provide the services of a qualified field engineer and necessary tools and equipment to test, calibrate, and adjust the protective relays and circuit breaker trip devices as recommended in the power system analysis. The qualifications of the field engineer shall be subject to review and approval by the ENGINEER.

3.2 STUDY REPORTS

A. The results of the power system analysis shall be submitted summarized in a final report. The report shall include, but not limited to the following:

1. Single-line diagram
2. Impedance diagram
3. Tabulation of all protective devices, which shall be identified on the single-line diagram
4. Time/current coordination curves
5. Computerized fault current calculations
6. Specific recommendations, if any
7. Test instrumentation, condition and connections, as applicable, for each study
8. Harmonic measurement results
9. Harmonic distortion correction proposals.

END OF SECTION

SECTION 26 50 00

LIGHTING

PART 1 - GENERAL

1.1 SCOPE

A. Furnish and install lighting fixtures, lamps and ballasts as indicated on the Contract Drawings and specified hereinafter.

B. Comply with the General Conditions, General Requirements and the requirements of Division 26 concerning definitions, guarantees, submittals, as-builts, etc. as applicable to work of this Section.

1.2 RELATED WORK

A. Related Sections: The following sections contain requirements that relate to this section:

1. Division 1 General Requirements.

1.3 SUBMITTALS

A. Conform to applicable provisions of the General Requirements and of this specification Section.

B. Conform to the following as applicable:

1. Complete luminaire photometric catalog data including lamp wattage, input watts, voltage, sound rating, power factor and type of ballast, as well as levels of total harmonic distortion, candlepower distribution curves in 2 or more planes, lumen output charts, average-maximum brightness data, dimming controls, wiring diagram, dimensions and luminaire finish. For exterior luminaires also provide cut-off characteristics, pole fastening details, and wind load data.

2. For lamps provide catalog data, voltage, color, life estimate in hours, base type, and dimming capabilities.

3. Ambient light (photocell) and motion detection data indicating switching capacity, means of adjusting the lighting pickup level and enclosure. Motion detection coverage. Control options combining ambient light, diming and motion over-ride.

4. For pole-mounted fixtures provide complete data on the pole material, finish, internal junction box, ballasts/drivers, anchoring and fixture attachment and support method. Pole and luminaire combination to be designed to withstand a 100-mph wind load without damage.

5. Provide a computer-generated photo metric study for the site to demonstrate that the proposed new lighting design meets lighting level requirements detailed in drawings and specifications.

6. Pole Foundations: Submit pole foundation design for all pole types and associated soil types. Designed to be stamped by a Structural Engineer registered in the State of California. Pole and base designs must be approved by City of Los Angeles Department of Building Safety.

7. Substitutions for specified fixtures, etc. shall be based upon quality of specified fixture construction, light distribution, appearance, wind loading, and maintenance

1. 4 QUALITY ASSURANCE

A. Work of this Section shall comply with applicable legal requirements and standards specified and the following:

1. ANSI C82.1 Specifications for Fluorescent Lamp Ballasts

2. ANSI C84.4 Specifications for High-Intensity-Discharge Lamp Ballasts (Multiple Supply Type).

3. ASHRAE/IES 90.1 High Efficiency Electrical Lighting Systems.

4. Standards of the Certified Ballast Manufacturer's Association.

5. NFPA 70

C. Conform to California's 2013 Title 24 Energy Efficiency Standards.

D. Demonstrations:

1. Lighting system operation shall be demonstrated during both hours of daylight and darkness to indicate that fixtures are properly focused, photocell and motion detection operation is correct, and that fixture switching functions as intended. Through demonstration, the CONTRACTOR shall also verify that panel schedules properly indicate the lighting outlets connected to each circuit.

2. Lighting demonstration shall occur within 2 weeks prior to project acceptance.

1.5 CLEANING PROCEDURES

A. Clean fixture lenses, diffusers and reflectors just prior to time specified for required demonstrations.

B. Clean damaged finish of fixture trim, including poles and support brackets, prior to required refinishing.

C. Before installation of louvers, diffusers or lenses clean reflector surfaces and lamps of all lighting fixtures of accumulated dust, dirt, grease, plaster, paint, etc.

1.6 WARRANTY AND MAINTENANCE

A. General Warranty: Special warranty specified in this Article shall not deprive Owner of other rights Owner may have under other provision of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.

B. Special Warranties: Written warranty, executed by manufacturer agreeing to replace or repair defects or failures in materials or workmanship within specified warranty period.

1. Defects in materials, equipment or workmanship occurring in the warranty period shall be repaired or replaced at the Contractors/ Manufacturer's expense.

2. Special Warranty Period for Parking Area Lights: Manufacturers' standard warranty, but not less than two years from date of Substantial Completion.

C. Maintenance Agreement

1. Lighting system Manufacturer shall offer a 5 year maintenance agreement covering the entire parking structure lighting and control system. The maintenance agreement to guarantee light levels, lamp replacement, monitoring and communications, spill-light control and structural integrity.

a. Maintain lighting levels within + 10% of the maintained horizontal average illuminance level for the sports lighting.

b. Replace lamps if one or more lamps are extinguished.

c. Repairs to be completed within seventy-two (72) hours of notification by Owner unless agreed otherwise by Owner.

1.7 EXTRA MATERIALS

A. Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Lamps: 5 for every 50 of each type and rating installed. Furnish at least one of each type.

2. Plastic Diffusers and Lenses: 1 for every 100 of each type and rating installed. Furnish at least one of each type.

3. Ballasts/ Drivers: 1 for every 100 of each type and rating installed. Furnish at least one of each type.

4. Globes and Guards: 1 for every 20 of each type and rating installed. Furnish at least one of each type.

PART 2 - PRODUCTS

2.1 LIGHTING SYSTEMS GENERAL REQUIREMENTS

A. Conform to ASHRAE/IES 90.1-1989 Standards for High Efficiency Electrical Lighting Systems.

B. Lighting fixtures shall have all parts and fittings necessary for complete and proper installation.

C. Where both catalog numbers and narrative descriptions are indicated, the narrative description requirements shall take precedence and prevail.

D. All fixtures of one type shall be one manufacturer and of identical finish and appearance.

E. Fixture types shall be as indicated on the Contract Drawings. However, if the fixture type is not shown, the bid shall be based on installing fixtures specified in similar areas.

F. Fixtures in exterior locations, wash-down areas, wet or moist locations shall bear a UL label for installation in wet or moist areas or locations.

G. All exposed metal parts of exterior lighting fixtures shall be stainless steel or anodized aluminum with specified finish over. Screws and fastening shall be stainless steel.

H. Complete units and all electrical components for LED and special fixtures shall bear the Underwriters' Laboratories, Inc., IBEW and Electrical Testing Laboratory labels.

2.2 LIGHTING PERFORMANCE

A. Illumination requirement and control. See notes on drawings.:

B. City Ordinance exterior lighting requirements: All site and building mounted lighting shall be designed such that it produces a maximum initial luminance value no greater than 0.20 horizontal and vertical foot candles at the site boundary, and no greater than 0.01 horizontal foot candles 15 feet beyond the site. No more than 5.0 percent of the total initial designed lumens shall be emitted at an angle of 90 degrees or higher from nadir (straight down).

2.3 LED FIXTURES

A. General:

1. Fixtures to be an assembly consisting of LED light source array, housing, and electronic power supply, in accordance with UL 1598, UL 8750. Supply voltage as noted on the drawings.

2. Outside fixtures to be completely sealed against moisture and listed under UL 1598, for luminaires in wet locations.

3. The fixture lens shall be clear convex tempered glass.

4. Minimum service life of luminaire of 70,000 hours.

5. Power supply shall be rated for a life expectancy equal or greater than the luminaire, be designed for dimming and incorporate surge protection device (SPD) to protect against electrical transients. Each luminaire shall be independently fused.

6. Electronic module shall have operating temperature -40 degF to 165 degF, or better with built in thermal overload.

7. Power factor of unit to be 0.9 or higher and induce total harmonic distortion (current and voltage) of 20% or less in the AC supply line.

8. Control: Outside fixtures to include motion detection and automatic dimming when area is not occupied. Dimming bi-level 50%, or user adjustable dimming level.

9. Cut-off Requirements: Exterior lights shall have full cut-off light distribution.

10. Warranty: 5 year minimum manufacturer’s warranty.

B. Outdoor Lighting, pole mount

1. Architectural style post-top, LED luminaire with die-cast aluminum housing designed for exterior area or pathway lighting. Impact resistant tempered glass lens.

2. Finish: Metal parts of luminaire, pole and adapters, finished with corrosion resistant durable, dark bronze, powder coat finish.

3. Pole: ___ft height x ___ inch diameter steel round pole, as specified on contract drawings.

4. Control: Motion detector to automatically switch lamp from a pre-set dimmed output to full brightness, for a pre-set minimum time.

5. Approved Manufacturers: as specified on contract drawings.

C. Skate Facility indoor lighting

1. Ceiling mounted LED luminaires with rugged housing, and integral motion detectors where specified, designed for intended lighting applications.

2. Finish: Metal parts of luminaire, finished with corrosion resistant durable, powder coat finish.

3. Approved manufacturer:

a. Cree Lighting (see drawings for model numbers).
b. Or equal.

2.4 LIGHTING CONTROLS

A. General: Provide an automatic, lighting control system manufactured by the lighting manufacturer.

B. Control system to be enclosed in a dedicated NEMA 1 cabinet containing all lighting contactors, switches, terminals and a microprocessor based controller. The system to provide the following functionality:

1. A web based remote scheduling system allowing authorized users to control and monitor lighting by lighting zone. Control parameter options to include time of day, sun rise/ sunset times, and photocell input (for outdoor lighting only). Output control to include lighting On/ Off and dimming. Schedules to be stored by controller. Schedules able to be set up for a minimum of seven days in advance.

2. Astronomical time clock, with automatic daylight savings compensation, and calculation of sunrise/ sunset times (for outdoor lighting only).

3. Off-On-Auto switches to allow for maintenance and manual operations of lights

4. Key over-ride, High-Medium-Low-Auto switches for light pre-set level dimming control.

5. Minimum of twenty zones and twenty lighting contactors (30A/ 60A) per cabinet.

6. Provide push-button input for outdoor roller skating and indoor ice skating lighting control. Operating momentary push-button mounted on pole to initiate a timed

lighting ‘On” period. Provide strobe light output to warn users when timed period is nearing end. Provide signage on poles to explain light operation to court users.

C. Photocells:

1. Provide automatic ON/OFF switching photo control device, completely self-contained in the die-cast aluminum housing, not affected by moisture, vibration, or temperature changes; ON at dusk and OFF at dawn; time delay feature to prevent false switching; and field adjustable to control operating levels. Provide a by-bass switch to override photocell. Photocell to be compatible with lighting control panel.

2. Approved Manufacturers:

a. Hubbell
b. General Electric
c. Levitron
d. Or equal.

2.5 FOUNDATIONS

A. Install required number and type of reinforced concrete pole bases as indicated on the Contract Drawings.

B. Contractor to prepare pole and foundation drawings for each type of pole, pole loading, and soil type, and submit to the Engineer for approval. Drawings to be stamped by a certified structural Engineer, Register in California. Drawings to show design criteria, soil type, assumptions, code standards, size of foundation, depth of embedment, reinforcing, and backfill material.

C. Pole foundations shall be approved by City of Los Angeles Department of Building Safety (DBS).

PART 3 - EXECUTION

3.1 INSTALLATION OF LIGHTING FIXTURES (LUMINARIES)

A. General:

1. Install fixtures in a manner recommended by the fixture manufacturer and accepted by the City Engineer.

2. Furnish and install all additional supports, and other structural reinforcements to the concrete pole bases required to properly and safely mount luminaires, all acceptable to the City Engineer.

3. Be responsible for handling the luminaires, installing plumb and level, and keeping luminaires clean.

4. Where pole foundation penetrates the below ground liner in the bio-swale, seal liner to pole as indicated on the drawings.

5. After construction of total project is completed, remove all labels and other markings, wash dirty luminaires inside and out with a nonabrasive mild soap or cleaner. Clean luminaire plastic lenses with antistatic cleaners only. Touch up

all painted surfaces of luminaires with high-grade exterior enamel, and poles with paint supplied by manufacturer.

B. Finished Areas:

1. Locate luminaires where shown on the Site Plan.

2. Install all luminaires straight and true.

3. Exterior fixtures requiring exposed exterior boxes shall be mounted on approved cast boxes equipped with suitable gaskets.

4. All adjustable lighting fixtures shall be aimed (during non-daylight hours) and set to the satisfaction of, and in the presence of, the City Engineer.

3.2 INSTALLATION OF LAMPS

A. After installation clean all lamps.

3.3 MISCELLANEOUS

A. Provide all metal shims, spacers and/or mounting bolts necessary,

B. Louvers, diffusers or lenses shall not be installed in lighting fixtures until such time as all glazing has been completed and all construction work involving plastering, grinding, sanding, painting, etc., and final clean-up sweeping and dusting have been completed by the Contractor as noted in Subsection 1. 4 of this Section.

C. Reflector surfaces and lamps in all lighting fixtures shall be thoroughly cleaned of accumulated dust, dirt, plaster, paint, etc., before the installation of the louvers, diffusers or lenses.

D. After completion of this portion of the work, it shall be the responsibility of the Contractor to clean and/or repair any damage to the finished building caused by this work, to the complete satisfaction of the Architect at no added cost to the City.

3.4 INSTALLATION OF CONTROLS

A. Install in strict accordance with manufacturer's recommendations.

3.5 LIGHTING CONTROL

A. Photocell: Install photo control as shown on Drawings.

B. Lighting Control Panel: Install as shown on the drawings and in strict compliance with manufacturer’s recommendation

C. Lighting control panel Configuration: Provide initial configuration of control panel and web interface. Configure to ENGINEERS direction. Document configuration.

D. Contractor to notify lighting Control Panel Manufacturer at least 7 days before activation of the lighting system to allow him to run diagnostics and confirm system programming. Contractor shall assist with any needed corrections Manufacturer identifies.

3.6 FIELD QUALITY CONTROL

A. Inspect each installed fixture for damage. Replace damaged fixtures and components.

B. Advance Notice: Give dates and times for field tests.

C. Provide instruments to make and record test results.

D. Tests: As follows:

1. Verify normal operation of each fixture after installation.

2. Verify motion detection and dimming control.

3. Verify actuation and termination on photocell, timer, or other control function, as applicable, and in coordination with required testing per Section 16570.

4. Perform lighting illumination field measurement and analysis to demonstrate lighting system conforms to the requirements in Section 2.2.

5. Measure spill lighting levels at property boundary to ensure light level is within requirements detailed in paragraph 2.2.B of this Section

6. Report results in writing. Discuss any discrepancies with Engineer

E. Malfunctioning Fixtures and Components: Replace or repair, then retest. Repeat procedure until units operate properly.

F. Corrosive Fixtures: Replace during warranty period.

3.7 COMMISSIONING (FOR LIGHTING CONTROL SYSTEMS)

A. Check the lighting systems start up and ensure that the all lamps are operational and fixtures are clean.

B. Check motion sensor placement and test reliability of activation/deactivation.

C. Test photocells for functionality and accuracy.

D. Check switches to ensure proper operation and circuiting.

E. Check lighting schedules to ensure they are programmed per the ENGINEER direction.

F. Test operation of circuits by changing system date and time to cause various circuits to switch modes.

G. For exterior fixtures, simulate night mode to validate function. Measure and record light level to ensure they meet the requirements and are generally provide adequate security. Check for excessive light level fluctuations or dark spots.

END OF SECTION

SECTION 28 31 00

LIFE SAFETY FIRE ALARM SYSTEMS

PART 1 - GENERAL

1.1 SCOPE

A. Required: Furnish all labor, materials, equipment, services, permits, fees and transportation necessary for and/or reasonably incidental to the Construction and completion of life safety fire alarms systems.

B. Comply with the General Conditions, General Requirements and the requirements of this Section concerning definitions, guarantees, submittals, as-builts, clean-up, etc.

C. Work Includes, but is not limited to the following:

1. Life safety fire alarm detection and signaling system.

2. Plan check approval.

3. Furnishing and installation of equipment and devices.

4. Wiring in conduit, and connections.

5. Interface with elevator controls.

6. Interface with existing Edwards FACP located in Police Station.

7. Conduit, wire and connections for control and status of H&V motors, smoke dampers, and for shutdown.

8. Testing, cleaning, and adjusting of completed work.

9. Wiring diagrams, shop drawings, equipment data.

10. Complete maintenance and off-site fire monitoring service for one year. Proposal for subsequent maintenance contract and monitoring service.

11. All work and material for complete and operable systems as indicated or specified.

12. Record drawings.

13. Permits, inspections, fees. See General Conditions.

14. Identification and instruction.

15. Coordination with other trades in the project.

16. Furnishing of special back boxes for installation under electrical section.

1.2 RELATED WORK SPECIFIED ELSEWHERE

A. General Electrical Requirements (Section 26 05 00).

B. Painting, except shop finishing and field touch-up (Section 09 90 00).

C. Sprinkler Fire Protection Systems (Section 21 13 13).

D. Passenger Elevators and elevator controls (Section 14 24 00).

1.3 LEGAL REQUIREMENTS AND STANDARDS

A. Legal: Conform to all applicable requirements of California State, Los Angeles City Fire and Building Departments concerning life safety and smoke control systems and requirements of local authorities having jurisdiction.

B. Standards: Comply with guidelines of the Electronics Industries Association, the National Fire Protection Association (NFPA) and Underwriters Laboratories (U.L.).

1.4 APPROVALS

Prepare complete plans, risers, wiring diagrams, battery calculations, and installation drawings for the fire alarm system. Obtain City Fire Department and Building Department approval for fire alarm system after incorporating all shop drawing review comments. Submit voltage drop calculations conforming to fire code limitations. Install system per review shop drawings.

1.5 QUALITY ASSURANCE

A. Manufacturer: Company specializing in smoke detection and fire alarm systems with five years documented experience.

B. Installer:

1. Submit evidence of completion and satisfactory operation of five projects of equal scope for the specified systems.

2. Submit evidence that installers are factory authorized agents.

3. Submit letter from equipment manufacturers indicating intent to maintain local service organizations or direct factory service.

4. Installers to be prepared to offer a service contract on expiration of guarantee.

1.6 SUBMITTALS

A. Comply with applicable provisions of General Requirements.

B. Shop Drawings:

1. Provide schematic layout, floor plan, drawings indicating location of all components and equipment, required size and location of conduit and outlets and type and quantity of system conductors. Include voltage drop calculations and battery calculations.

2. Riser Diagram.

3. Include wiring diagrams for overall system and components.

4. Include physical and electrical characteristics of equipment to indicate conformance with the Specifications.

5. Describe system characteristics and function.

C. Data Sheets: Show California State Fire Marshall Listing, U.L. listing, equipment ratings, dimensions and finishes.

D. Manufacturer's Certificate: Note that system meets or exceeds specified requirements.

E. Test Procedures: Provide one copy for necessary review.

F. Operating and Maintenance Instruction Manual:

1. Conform to applicable provisions of Subsection 1. 6N of Section 16020.

2. Manual shall include the following:

a. Operational description.

b. Coded cabling plan.

c. Two wire circuit diagrams.

d. Wiring destination schedule.

e. Schematic component diagrams and PC board layouts.

f. Maintenance and alignment procedures.

1.7 COORDINATION

Refer to the electrical and mechanical drawings and specifications to determine quantities and location of devices and required scope of work and coordinate work with mechanical and electrical installers. Provide function described under mechanical section Sequence of Control, for fire and/or emergency conditions. Submit cable requirements to elevator supplier. Submit conduit requirements to electrical installer. For self-contained door release, coordinate with door supplier.

1.8 SYSTEM DESCRIPTION

A. General: System to be listed by Underwriters Laboratories and the California State Fire Marshal, designed to meet the functional requirements of NFPA 72A, 72B, 72D and the California High Rise Code (as applicable).

B. Features:

1. Coordinate with and modify as required existing Main fire Alarm control panel with graphic annunciator located in Police Station.

2. Remote annunciators at the main entry (existing FACP) and at entry to Parking Structure (new FACP subpanel).

3. Alarm/trouble point transmitters.

4. Manual alarm reporting stations.

5. Ionization smoke detectors.

6. Ionization smoke detectors in elevator lobbies, elevator machine rooms and the top of each elevator hoistway. Provide two contacts on elevator lobby detectors. Wire one to fire alarm panel and second to elevator control panel.

7. Combination fixed temperature/rate of rise heat detectors.

8. Combination horn/visual alarm signal devices. Visual alarm signal devices.

9. Connection to sprinkler water valves, flow and pressure switches.

10. Operating and supervising electrical power for the system at 120-volt single phase, three-wire from the emergency system to the fire command center. Internal battery backup, sized for24 hours of standby and 5 minutes of alarm.

11. Interface with the fire protection system (sprinklers) for alarm and trouble reporting.

12. Interface with package AC units for “shut-off” on alarm.

13. Interface with the elevator system for elevator capture, status and control.

1.9 SYSTEM OPERATION

A. System to be the active interrogate/respond type alarm system, 24 volt DC non-coded, positive, non-interfering, successive operation, in which all devices are constantly sending status signals to the main fire control command center from remote data transmitter panels approximately every one second. A change in status to be reported twice to determine that it is a valid signal, and be automatically and permanently recorded. The requirements in NFPA 72B for 60 hours standby power to be met by the emergency standby generator system.

B. Wiring, equipment and devices for alarm initiation, annunciation, and audible signaling to be continuously supervised for open circuits, shorts or grounds (trouble). Each alarm initiating device circuit to be provided with illuminated and audible annunciation of both trouble and alarm conditions. Non-illumination indicates a normal condition. Wiring to the equipment in one conduit, the return portion of the loop in the second conduit. Wiring between reporting devices to the field equipment cabinets to be Class "B" wiring in conduit, with end-of-line device.

C. Any alarm or trouble condition to sound an audible signal at the fire command center and the remote annunciator. Signal to be silenced by a momentary contact switch which shall transfer the signal to a visual indicator. Subsequent trouble conditions to cause the signal to resound and in turn may be silenced. Upon restoration to normal, the trouble signal silencing indicator to extinguish automatically.

D. Activation of any automatic or manual alarm initiating device to cause the following to occur:

1. Sound an audible alarm and illuminate the visual indicator for zone and type of alarm at the fire command center and the remote annunciator.

2. Sound, by building of origin, the slow whoop alarm signal over the system speakers and activate the visual signal devices.

3. Transmit signal to release the electromagnetic hold open devices on corridor doors by floor.

4. Transmit signal by one to close smoke dampers, via autodialer.

5. Transmit alarm signal to the central station office.

E. System not to incorporate a time delay for any of the alarm initiating devices. All alarms to be considered confirmed alarms.

F. Ionization type smoke detectors in the elevator lobbies interfaced with the elevator controls system for recall of elevators to first floor under fire alarm conditions, and report to fire central station.

G. Detection and reporting of fire conditions to be accomplished by the following basic methods:

1. Manual stations.

2. Smoke detectors.

3. Heat detectors.

4. Duct detectors.

5. Water flow switches.

H. Fire alarm system inputs to be further subdivided as follows, for a more defined indication of the location and nature of the fire or trouble condition:

1. Manual station. By floor and zone.

2. Smoke detector in elevator shaft. By device.

3. Smoke detector in an elevator lobby. By device.

4. Smoke detectors at smoke dampers. By device.

5. Smoke and/or heat detector in mechanical and electrical rooms. By floor and room.

6. Door held open detector. By floor and location.

7. Water flow or pressure switch. By floor and zone.

8. Sprinkler valve position indication. By floor and zone.

I. Alarm condition to override trouble indication. Trouble indication to reappear after alarm reset.

J. Selective manual testing of any device point in the system to determine normal trouble or alarm status

K. Remote annunciator to duplicate annunciation from the main fire alarm control panel.

L. System to be capable of manual operation in the event of malfunction of the central processor. Supplier to include a statement in the system shop drawing submittal explaining the manual operating capability of the system. Provide redundant processor to duplicate primary processor function.

M. Sequence of Operation Under Alarm Condition:

1. Sound an audible alarm at the main fire control command center and the remote annunciator and simultaneously illuminate the visual indicator for zone and type of alarm.

2. Manual acknowledge switch operation, to illuminate alarm acknowledge light and silence and audible signal. Visual indicator for zone of alarm to remain illuminated. New alarm to re-sound the audible alarm and repeat sequence.

3. Transmit signal to off-site central station office.

4. Correction of alarm condition to provide return to normal status and to print out.

5. Sound building alarm as described in "System Features and Operation."

N. Sequence of Operation for Supervision:

1. The following trouble conditions to sound an audible alarm and illuminate the visual trouble zone indicator at the main fire control command center and the remote annunciators:

a. Malfunction or trouble in any equipment or component of the fire alarm system.

b. Opens, shorts or grounds in the fire alarm system wiring.

c. Closed sprinkler system valve.

d. Removal of any fire alarm detection or reporting device.

e. Wet system water flow switch - tamper switch.

2. Manual acknowledge switch operation, to illuminate trouble acknowledge light and silence audible signal. Visual indicator for zone of trouble to remain illuminated.

O. HVAC Interface: Coordinate system function with sequence of control described in the mechanical section.

P. Operation: All components connected in accordance with the manufacturer's instructions to provide a complete and operable system.

1.10 LOADS OF EQUIPMENT AND COMPONENTS

A. Follow Electronics Industries Association Standard where applicable.

B. Provide fuse protection for equipment and spare fuses.

C. Design systems for operation at 120 volts, normal or emergency power as indicated, 60 Hz nominal input.

D. Operating voltage dissipated by resistors shall not exceed 25% of ratings.

E. Operating voltage of capacitors shall not exceed 80% of rated voltage.

F. Operating loads and voltages on transistors and solid-state devices shall not exceed manufacturer's recommendation for normal full load operation.

G. Use electronic components of types and rating commonly available from stock of established commercial distribution.

1.11 GUARANTEE

A. Conform to applicable provisions of the General Conditions.

B. Service technicians and replacement components for the system shall be available locally from a service representative of the manufacturer who is able to provide evidence of technical training and authorization by the manufacturer.

C. For a period of one year from date of final acceptance, the system shall be under full guarantee for materials and labor at no cost to the City. The system shall be under a service contract with a technician authorized by the manufacturer. Replacement parts and labor shall be readily available during normal business hours while the service contract is in effect. A complete system inspection and test shall be performed at five months and again at eleven months after final acceptance. Tests shall include all smoke detector sensitivity settings.

D. Any component failures shall be remedied to the satisfaction of the Owner.

E. A continuing service contract shall be offered at time of bid to commence at the expiration of warranty included with the system.

PART 2 - PRODUCTS

2.1 GENERAL

A. Manufacturers: Equipment descriptions refer to the Edwards System Technology. Equivalent systems conforming to the Specifications are acceptable.

B. Provide materials and equipment of new and recent manufacture, UL labeled and/or listed for specific use.

C. The system and equipment described and furnished under these Specifications are to be the standard product of the manufacturer specified for each system. All reference to model numbers and other pertinent information herein is intended to establish the standards of performance, quality, and appearance.

D. System and equipment proposed as equivalent to that specified shall conform to the standards herein. Contractor and Manufacturer to supply evidence of having produced and installed similar equipment for at least five years, and list systems of equal scope rendering satisfactory service. Obtain the Project Manager's approval in writing ten working days prior to bidding equipment other than as specified. Submit the manufacturer's name, model numbers, and three copies of working drawings and engineering data sheets for approval.

Include in the submittal a certified statement from the manufacturer of the substitute equipment that it does, in fact, equal the electronic and physical features and functions of the specified equipment.

E. A continuing service contract shall be offered at time of bid to commence at the expiration of warranty included with the system.

2.2 FIRE ALARM CONTROL PANEL

A. Modular design with all modules and spacing panels to be the same size. All solid-state circuitry and components. Battery backup.

B. Dead front panel construction. Panels to be mounted in heavy gauge steel cabinets finished in read with module front plates finished in black. Hinged cabinet doors with locks to provide access to field wiring terminals. Internal audible signal.

C. Fire alarm control panel to Incorporate the Following Basic Components for Fire Alarm System Functions:

1. Operators control module.

2. Remote annunciator (approved by Fire Department).

3. Signal generator module.

4. Amplifier module or modules.

D. Operators Control Module to Incorporate:

1. Eighty-character alpha-numeric display for continuous indication of time-of-day, day-of-week, month, date-of-month and year or for indication of manual function entries.

2. LED indicators for operating and supervising power, common alarm, alarm silenced, manual mode, system trouble, audible silenced, common trouble, loop fault, alarm circuit trouble and disconnect and auxiliary circuit trouble.

3. Keypad for the following entries and call ups displayed on the alpha-numeric display:

a. Alarm silence.

b. Audible silence.

c. System reset.

d. Auxiliary disconnect for central station circuit.

e. Call up of all system troubles not annunciated.

f. Call up of the status of any system point.

g. Set time, day-of-week, month, date-of-month and year.

h. Annunciator LED test.

E. Annunciator Module to Incorporate:

1. LED indicators for zone alarm and trouble.

2. Provision for indicating zone designations.

F. Signal Generator Module to Incorporate:

1. Two separate electrically supervised fire tone circuits.

2. Failure of one circuit to sound a trouble signal and the second circuit to take over automatically.

G. Battery Backup: Sealed lead acid type, with automatic battery charger. Four hour standby, five minute alarm.

H. Model EST-2, EST-3 or equal.

2.3 REMOTE ANNUNCIATOR

A. The remote annunciator to be a Graphic type. The Graphic Annunciator to have a display of LED's for displaying individual initiating devices and be approved by the Architect.

B. Model "ENVOY" Series or equal.

2.4 ALARM/TROUBLE POINT TRANSMITTERS

A. Single, four or eight input point Class "B" units as required by the system design and layout.

B. Number of units in any one zone as required by the system design and layout.

C. For mounting in standard module cabinets.

D. Power supplied from the main fire alarm control panel.

E. Model SIGA-CT1, or equal.

2.5 MANUAL ALARM REPORTING STATIONS

A. Non-coded, semi-flush, double action with "Lift to Break - Pull Lever Down" lettering on clear plastic shield.

B. Mechanically locked until manually reset, rigid metal construction with raised lettering "Pull Down".

C. Model SIGA-270 single action or equal.

D. Manual Stations shall have a protective clear plastic cover model "Stopper II".

2.6 AUTOMATIC SMOKE DETECTORS

A. Solid-state dual chamber type ionization detector, allowing for compensation for pressure and humidity changes.

B. Equipped with solid state voltage regulator to maintain detection sensitivity over varying voltages, and current regulator to insulate from power surges.

C. Detector mounted LED visual alarm indicator.

D. Model SIGA-IS with base model SIGA-SB or equal.

2.7 HEAT DETECTORS

A. Combination fixed temperature and rate-of-rise type, 135 degrees Fahrenheit fixed temperature rating, 15 degrees F per minute rate-of-rise rating, normally open contacts.

B. Flush mounted in finished areas, surface mounted in unfinished areas, off-white finish.

C. Model SIGA-HFS with base model SIGA-SB or equal.

2.8 AUDIBLE/VISUAL SIGNAL DEVICES

A. Combination speaker/lamp units, steel back box, recessed or surface mounted as indicated, on supervised circuits. Visual portion to flash on alarm condition.

B. Model 757-8A-T, Model 757-7A-T, Model 757-5A-T or equal.

2.9 VISUAL SIGNAL DEVICES

A. Solid-state lamp flasher, built-in lamp unit, red thermoplastic lens, steel back box, red molded phenolic front panel, recessed or surface mounted as indicated, on supervised circuits. Unit to flash on alarm condition.

B. Model 202-5A-Tor equal.

2.10 DUCT DETECTORS

A. Furnished under H.V.A.C. scope, connected under this section.

B. Coordinate with H.V.A.C..

2.11 WATERFLOW AND/OR PRESSURE SWITCHES

A. Furnished under Fire Protection Sprinklers section, connected under this section.

B. Coordinate with Fire Protection Sprinklers section.

2.12 SPRINKLER VALVE TAMPER SWITCH

A. Furnished under Fire Protection Section, connected under this section.

Coordinate with Fire Protection section.

2.13 CONDUCTORS

No. 14 AWG, 600 volt, minimum shielded as required. Twisted pairs for audio. Conductor layout and quantities to be delineated on the shop drawing submittals as described in Paragraph 1.B. of the specifications. Calculate voltage drop and increase conductor size as required.

2.14 SUPPLEMENTARY RELAYS

A. Designed to activate or deactivate external circuit controls such as fans, smoke dampers, door releases.

B. Contacts rated two amperes minimum, but adequate for circuit controlled.

C. Relay coil supplied from system power supply.

D. Where remote from command center, enclose in NEMA 12 dust tight enclosure.

E. State Fire Marshal approved for use in fire alarm system.

2.15 DIGITAL COMMUNICATOR

A. Furnish and install a digital communicator by “Silent Night” Model 5104 or equal with all required accessories to send alarm and trouble signals to the Park Rangers Station located in Griffith Park.

B. The Contractor shall arrange for the activation of the Building fire alarm system to the Park Rangers Station located in Griffith Park.

C. The Contractor shall pay for all accessories, including communicator.

2.16 DOOR HOLD OPEN DEVICES

Electromagnetic type at doors where required, 24 VDC. Door release on activation of fire alarm system by floor.

PART 3 - EXECUTION

3.1 GENERAL

A. Install system(s) in accordance with manufacturer's instructions.

3.2 GROUNDING

All equipment to be grounded by means of green ground wire to "U" contact of duplex receptacles and bonded to ground provided under Electrical Section.

3.3 INSPECTION

Systems to meet all the requirements of the code enforcing agency and shall be approved thereby before installation.

3.4 TESTING

After all equipment specified herein for each system has been installed and is in operating condition, conduct performance tests to determine if the installation and components comply with these specifications. Furnish competent personnel, all test material and approved test instruments and conduct the tests under supervision of factory personnel, in the presence of the Project Manager, and the City building and fire inspecting agencies.

3.8 COMMISSIONING

A. Spot check location of sensors and switches to ensure conformance with requirements.

B. Verify sampling of all types of devices. Cause activation of the device, assure alarms are initiated and resulting response is per the requirements.

C. Verify interfaces with all other inter-related systems or equipment.

D. Validate output devices (speakers and strobes) meet the code criteria (96 dBa at 10' and 117 candela at peak)

E. Test all functions and sequences associated with the elevator recall system.

F. Activate high temperature detectors in the elevator machine room. Verify all sequences including elevator shunt off, elevator recall including alternate floors when main floor is in alarm.

G. Activate smoke detectors and verify alarm function.

H. Activate a sample of sprinkler flow switches. Validate that appropriate zone enunciates and alarms sound.

I. Ensure that the system functions while using all sources of power including normal, emergency, and battery. Check battery life by simulating an extended outage.

3.8 REPORT

Prepare written report of final test results, signed by witnessing parties. Submit to the Project Manager in triplicate.

END OF SECTION

SECTION 31 00 00

EARTHWORK

PART 1 - GENERAL

1.1 SUMMARY

A. Provided and execute earthwork as indicated on the Contract Drawings or in the Project Manual including but not limited to the following:

1. General excavating and trenching for various trades.
2. General exterior grading and cutting.
3. General excavating for site improvements.

1.2 QUALITY ASSURANCE

A. Labor: Use adequate numbers of skilled laborers to are thoroughly trained and experienced in the necessary crafts and who are completely familiar with specified requirements and the methods needed for proper performance of the Work of this Section.

B. Equipment: Use equipment adequate in size, capacity, and numbers to accomplish the work of this Section in a timely manner.

C. Codes and Standards: Perform excavation work in compliance with applicable ordinance of governing authorities having jurisdiction including, but not limited to, the current L. A. City Building Code and applicable Amendments; Division 1-DEPARTMENT OF INDUSTRIAL RELATIONS of Title 8 of the California Code of Regulations; Section 300 - EARTHWORK of SSPWC, as amended by Brownbook.

1. In addition to complying with Codes and Standards having jurisdiction, comply with directions of the Soil Engineer.

D. The Contractor shall provide necessary measures for storm water pollution control and water quality protection. The Contractor shall meet the standards of good housekeeping at all time.

E. Testing and Inspection Services: The City will engage a qualified soil testing and inspection service for quality control testing during earthwork operations. Testing shall be performed in accordance with the soil investigation reports and testing standards, the instructions of the Soil Engineer and the applicable Sections of General Conditions.

F. Soil Engineer: The City will retain the services of a Soil Engineer for the purpose of soil investigations and testing, all the necessary inspections and observations, and certifications.

G. Survey: The Contractor shall employ the services of a California licensed surveyor for the purposes of survey control, layout, grade and cross-sections required to control work.

1.3 SUBMITTALS

A. Test Reports-Excavating: Contractor shall submit the following reports directly to the Los Angeles City Department of Building & Safety, prepared by the Soil Engineer and the testing service, with a copy to the Engineer.

1. Test reports on borrow material.

2. Verification of each footing subgrade.

3. Field density test reports.

4. One optimum moisture-maximum density curve for each type of soil encountered.

5. Other test reports as required by the Soil Engineer and the local cognizant agency.

1.4 PERMITS

A. The Contractor shall perform all work in accordance with the permit requirements of the Los Angeles City Department of Building and Safety, including obtaining the grading permit, hauling permit and bond, and making the notification to the adjacent property owners; no additional compensation will be allowed therefore.

B. Contractor shall furnish Engineer with a duplicate copy of OSHA excavation permit, and all other required permits prior to the start of the excavation work.

C. The City shall obtain and pay for Calif General Construction Activity Stormwater Permit.

D. The City shall obtain Waste Discharge Identification Number after submitting Wet Weather Erosion Control Plan (WWECP) pursuant to Section 61.02 and 64.72 of L.A.M.C. Submit Stormwater Pollution Prevention Plan (SWPPP) pursuant to Section 91.106 of L.A.M.C. to the Los Angeles City Dept. Building and Safety for reviews.

E. The Contractor shall make all necessary notifications, obtain and pay for required permits and file manifests with the South Coast Air Quality Management District (S.C.A.Q.M.D.).

1.5 JOB CONDITIONS

A. Required Work Coordination: The Contractor shall fully coordinate the work operations of this Section with that of other trades involved and with the Engineer to assure proper sequence of work, limitations, methods and time of work so as to minimize or avoid interference with the existing utilities as well as performance of work by the other Contractors.

1. When directed by the City, the Contractor shall include minimum two weeks in its Construction Schedule to allow the Soil Engineer to prepare final Soil Report to be submitted to the Los Angeles City Department of Building and Safety Grading Division for final approval if the Soil Engineer is obtained by the City.

2. The Contractor shall coordinate and arrange for all the inspections with the local authorized agencies and the Bureau of Contract Administration.

B. Trench Safety: Attention is directed to the provisions of Section 6705 of the Labor Code concerning trench excavation safety plans.

C. Air Pollution Control: The Contractor shall comply with all air pollution control rules, regulations, ordinances and statutes which apply to work performed pursuant to the Contract, including any air pollution control rules, regulations, ordinances and statutes, specified in Section 1107 of the Government Code.

D. Use of Pesticides: The Contractor shall comply with all rules and regulations of the Department of Food and Agriculture, the Department of Health, the Department of

Industrial Relations and all other agencies which govern the use of pesticides required in the performance of the Work on the Contract.

1. Pesticides shall include, but shall not be limited to herbicides, insecticides, fungicides, rodenticides, germicides, menatocides, bactericides, inhibitors, fumigants, defoliants, soil sterilants, and repellents.

2. Any substance or mixture of substances intended for preventing, repelling, mitigating or destroying weeds, insects, diseases, rodents, or nematodes and any substance of mixture for substances intended for use as a plant regulator, defoliant shall be considered as a pesticide.

E. Sound Control Requirements: The Contractor shall comply with all local sound control and noise level rules, regulations and ordinances which apply to any work performed pursuant to the Contract.

Each combustion engine, used for any purpose on the job or related to the job, shall be equipped with a muffler of a type recommended by the manufacturer. No internal combustion engine shall be operated on the project without said muffler.

F. Use of Explosives: The use of explosives is not permitted.

1.6 PROTECTIONS

A. Protections of Persons and Property: Provide and install signs, lights and barricades at danger points on and off the job-site to guard against accidents, etc.

1. Barricade open excavations occurring as part of this work and post with warning lights.

2. Operate and maintain warning lights as recommended by authorities having jurisdiction.

3. Protect structures, utilities, sidewalks, pavements and other facilities from damage caused by settlement, lateral movement, undermining, washout and other hazards created by earthwork operations.

4. Perform excavation within drip-line of large trees to remain by hand, and protect the root system from drainage or dry out to the greatest extent possible. Maintain moist condition for root system and cover exposed roots with burlap. Paint root cuts of 1" diameter and larger with emulsified asphalt tree paint.

B. Existing Improvements (including trees and shrubs Indicated to Remain): Protect against damage resulting from Contractor's operations. Repair or replace damaged items to the full satisfactions of the City at no added cost to the City.

C. Water: Divert or pump out of all excavations until concrete and other items are placed therein, forms removed and backfilling is completed. The Contractor shall provide a means for solids removal before discharging the water.

D. Existing Utilities: Utilities shown on the drawings are shown pursuant to a search of available records and are shown as a matter of information and not as a matter of fact. The Contractor shall locate existing underground utilities in areas of work. If utilities are to remain in place, provide adequate means of support and protection during earthwork operations.

1. Should uncharted or incorrectly charted piping or other utilities be encountered during excavation, consult City immediately for directions. Cooperate with City and utility companies in keeping respective services and facilities in operation. Repair damaged utilities to satisfaction of utility Company.

2. Do not interrupt existing utilities serving facilities occupied and used by City and others, during occupied hours, except when permitted in writing by the Engineer and then only after acceptable temporary utility services have been provided.

3. Provide a minimum of 48-hour notice to the Engineer, and receive written notice to proceed before interrupting any utility. Obtain clearance and notify all utility companies in the area and call Underground Service Alert by calling (800) 422-4133. Deliver utility clearance ticket number to the Engineer prior to the start of any work.

4. Demolish and completely remove from site existing underground utilities indicated to be removed. Coordinate with utility companies for shut-off of service if lines are active.

1.7 INSPECTION

A. Required: All excavations and trenches shall be inspected by the Los Angeles City Building and Safety Inspector, and the Soil Engineer before filling, backfilling and/or other subsequent work is placed therein.

B. Earthwork backfill for structures shall comply with requirements of Section 300-3.5 - STRUCTURAL BACKFILL of SSPWC and/or requirements in the Project Manual.

1.8 SOILS INFORMATION

A. Soils Report indicated on the drawings is a part of Project Manual. Contractor shall comply with all Soils Report recommendations specified and other instruction directed by the Engineer.

1.9 MATERIAL HANDLING

A. Delivery: All materials, tools, equipment, etc. to be delivered to the job-site, in such a manner coordinated with progress of work of this Section.

B. Material Storage: Stockpile satisfactory excavated materials where directed, until required for backfill or dispose of in accordance with Section 300-2.6 - SURPLUS MATERIALS of SSPWC. Place, grade and shape stockpiles for proper drainage.

1. Locate and retain soil materials away from edge of excavations. Do not store within drip line of trees indicated to remain.

2. Dispose of excess soil material and waste materials as herein specified.

PART 2 – PRODUCTS

2.1 SOIL MATERIALS

A. Suitable Excavated Material: Suitable materials from excavations for use in fill and embankments shall be free from shale, sod, large clods or hard lumps of earth, roots, trash or other debris; that has a liquid limit of less than 30 and a plasticity index of less than 9; and is readily compatible to specified density. No rock, cobbles or broken

concrete exceeding 2 inches in maximum dimension shall be placed in compacted fill without the specified approval of the Engineer. No rock, cobles or broken concrete exceeding 1 inch in maximum dimension shall be placed in compacted fill of the utility trench.

B. Fill Material: Furnish imported earth material as necessary; if specified in the contract requirements or if the amount of suitable earth materials obtained from the job-site excavations is not sufficient to properly construct the required fill, subject to the approval of the Engineer or the Soil Engineer prior to use.

1. Submit imported fill material samples and testing results for the Engineer's approval prior to importing to the job site in accordance with Section 300-5 BORROW EXCAVATION of SSPWC.

2. Imported fill material shall be free of foreign materials, vegetable growths, sod, rocks, expansive soils and all debris.

3. Lime for Treatment of Imported Fill Material: As here after specified in accordance with Section 301-5 - LIME-TREATED SOIL of SSPWC.

4. Where fill material exhibits a wide variation in consistency, the Engineer may require blending to stabilize and upgrade the material as directed by the Engineer.

5. In landscape (planting area), fill shall not be saline or contain anything that would prevent normal plant growth:.

C. Base Material: "Crushed Aggregate Base", 3/4-inch maximum size aggregate, or "Crushed Miscellaneous Base", 1-1/2-inch maximum size aggregate, as specified in Section 200-2 - UNTREATED BASE MATERIALS of SSPWC.

D Pipe Bedding and Trench Backfill Material:

1. Use clean earth materials previously removed from job-site excavations or use imported fill materials free from clay, rock or gravel larger than 1-inches for utility trenches, or clay, rock or gravel larger than 2" inches in an area other than utility trench subject to the Soil Engineer's approval prior to use.

2. For sanitary sewer pipe, use Case I bedding material and extend 12-inch above said pipe, the balance of backfill to be approved clean earth materials.

3. For storm drain pipe, use approved washed sand and extend 4 inches above said pipe, the balance of backfill to be approved clean earth materials. For storm drain pipe section located beneath the sidewalk paving and connected to concrete curb outlet, sand bedding and backfill are not applicable.

4. For water pipe or pipe rise, use approved washed sand and extend 12-inches above said pipe, the balance of backfill to be approved clean earth materials.

5. For electrical conduits, use approved washed sand and extend 4 inches above said conduits, the balance of backfill to be approved clean earth materials. For utility service connection, provide bedding and backfill material in accordance with utility company's instructions.

6. For the landscape irrigation piping, use approved washed sand and extend 4-inches above said pipe, the balance of backfill to be an approved clean earth materials.

7. Conforming to applicable Sections of the Project Manual for the pipe bedding widths and depths.

E. Soil Cement: Use the soil-cement to form a dense, uniform mass conforming to the lines, grades and cross sections shown on the Contract Drawings. The soil cement shall be mixed, placed and compacted at least 95% of the relative compaction, in accordance with Section 301-3 of SSPWC and the instructions of the Soil Engineer.

F. Structural Backfill: The structural backfill shall have a sand equivalent of not less than 20 in accordance with Section 300-3.5 - STRUCTURAL BACKFILL and Section 300-4.5 - PLACING MATERIALS FOR FILLS of SSPWC, and placed and compacted to 90% of relative compaction.

G. Slurry Backfill: Slurry backfill shall be 60 E 0.7 (Class 100-E-100) and placed in accordance with Section 306-1.3.1 - BACKFILL AND DENSIFICATIONS of SSPWC.

PART 3 - EXECUTION

3.1 SURFACE CONDITIONS

A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until detrimental conditions are corrected.

3.2 WATER QUALITY PROTECTION

A. Eroded sediments and other pollutants must be retained on side and may not be transported from the site via sheet flow, swales, area drains, natural drainage, or wind.

B. Stockpiles of earth and other construction-related materials must be protected from being transported from the site by wind or water.

C. Fuels, oils, solvents, and other toxic materials must be stored in accordance with their listing and are not to contaminate the soil ~~n~~or the surface waters. All approved toxic storage containers are to be protected from the weather. Spills must be cleaned up immediately and disposed of in a proper manner. Spills may not be washed into the drainage system.

D. Excess or waste concrete may not be washed into the public way or any drainage system. Provisions shall be made to retain concrete wastes on-site until they can be appropriately disposed of or recycled.

E. Trash and construction-related solid wastes must be deposited into a covered receptacle to prevent contamination of rainwater and dispersal by wind.

F. Sediments and other materials may not be tracked from the site by vehicle traffic. The construction entrance roadways must be stabilized so as to inhibit sediments from being deposited into the public ways. Accidental depositions must be swept up immediately and may not be washed down by rain or by any other means.

G. Comply with requirements shown in Wet Weather Erosion Control Plan (WWECP).

1. a local water treatment facility.

3.3 SITE PREPARATION

A. Remove the existing soil including fill material, debris, roots and foreign materials to natural soil at the proposed building site. Removal shall be continued to at least 5 feet beyond the exterior faces of the exterior foundation.

B. Subgrades: Scarify for recompaction to a depth of 6-inches, bring to optimum moisture content and then recompact to at least 95% maximum density for subgrade as per ASTM D1557 - TESTED METHOD FOR LABORATORY COMPACTION CHARACTERISTICS OF SOIL USING MODIFIED EFFORT (56,000 FT - LBF/FT^3.). Prepare subgrade in accordance with Section 301-1 - SUBGRADE PREPARATION of SSPWC.

C. Holes and trenches existing on the job-site or resulting from Contractor's operations shall be filled with clean existing or imported earth materials (free of large clods and stone).

Unless indicated otherwise, construct fill in accordance with Section 300-4.5 - PLACING MATERIALS FOR FILLS of SSPWC in 8-inch layers and each layer compacted to 95% relative compaction and finished to elevations necessary to require cutting by fine grading. Inspection by Los Angeles City Building and Safety Inspector and the Soil Engineer are required prior to filling. Obtain minimum one compaction test for each layer or volume specified by Code.

D. Grading: To elevations of existing adjoining street surfaces, private property and surfaces immediately adjacent to the job-site limits indicated on the Contract Drawings; make all grades in a straight line from any point to any other perimeter point.

E. Dewatering:

1. Remove all water, including rain water, encountered during trench and sub-structure work to an approved location by pumps, drains, and other approved methods.

2. Keep excavations and site construction area free from water.

F. Dust Control: Use means necessary to prevent dust becoming a nuisance to the public, to neighbors, and to other work being performed on or near the job-site.

G. Moisture Control: Where subgrade or layer of soil material must be moisture conditioned before compaction, uniformly apply water to surface of subgrade, or layer of soil material. Apply water in manner to prevent free water appearing on surface during or subsequent to compaction operations.

1. Remove and replace, or scarify and air dry, soil material that is too wet to permit compaction to specified density.

2. Soil material that has been removed because it is too wet to permit compaction may be stockpiled or spread and allowed to dry. Assist drying by discing, harrowing, or pulverizing until moisture content is reduced to a satisfactory value.

H. Rework: Any previously compacted or tested subgrade and fill material, which are affected or disturbed, in the opinion of the Soil Engineer, by the inclemency of the weather such as rains, floods, earthquake or others shall be reworked, retested and re-inspected at no additional cost to the City.

I. Approval of Subgrade: By the Soil Engineer and the Los Angeles City Building and Safety Inspector prior to placing any fill.

3.4 EXCAVATING

A. General:

1. Excavation consists of the removal and disposal of materials necessary to establish required grade elevations and certified compacted fill for new construction pursuant to Section 300-2 UNCLASSIFIED EXCAVATION of SSPWC.

2. Excavated materials suitable for use as fill and/or backfill to be stockpiled where directed by the Engineer.

3. Non-approved and excess excavated materials to be legally removed and disposed of from the job-site.

4. Shoring, Bracing and Bulkheading of Trenches: All to be provided, installed and maintained where required to support trenches, See Subsection 1.6 of this Section. Conform to the requirements prescribed by the Los Angeles City Department of Building and Safety, CAL/OSHA, Section 02240 - SHORING and other Sections of the Project Manual.

5. Access to Trenches: Conform to Section 306-1.1.4 - ACCESS TO TRENCHES of SSPWC. Provide safe and suitable ladders, which project 2 feet above the top of the trench. It shall be provided for all trenches over 4 feet in depth. Minimum one ladder shall be provided for each 50 feet of open trench or fraction thereof, and be so located that the workers in the trench need not move more than 25 feet to a ladder.

6. Encountered Existing Underground Piping or Conduits: Immediately stop the trench operations at the point of encounter, notify the Engineer of such condition and submit support drawings to the Engineer for approval. The support drawings shall be in conformance with the Los Angeles City Bureau of Engineering Standard Plans S-253, SUPPORTS FOR STORM DRAIN AND SEWER PIPES ACROSS TRENCHES, latest edition; CAL/OSHA and the utility company's requirements.

B. Conduit and Piping: Conforming to the requirements as specified on the drawings, Los Angeles City Plumbing Code, SSPWC and other sections of the Project Manual. Any piping with 8 feet or less cover or backfill, Case 1 Bedding Installations of Los Angeles City Bureau of Engineering Standard Plan S-251, latest edition, shall be used for all piping laying unless otherwise specified on the drawings or noted.

C. Corrections: Required of all unauthorized excavations made below indicated depths, as recommended by the Soil Engineer at no added cost to the City.

3.5 FILLING

A. General: Construct in accordance with Section 300-4- UNCLASSIFIED FILL of SSPWC and place in layers not exceeding 8-inches thickness, compacted to a relative compaction of not less than 95% when tested in accordance with Section 211-2 - COMPACTION TESTS of SSPWC, except that fill in planting areas may be compacted to 90% relative compaction.

B. In Planting Areas and Tree Wells: If flooding method is specified for fill material, place saturated fill (exclusive of topsoil fill) prior to construction of adjacent improvements to minimize settlement as follows:

1. Planting Areas and Holes: Cultivate and soak the specified backfill mix for a minimum of two days using a common lawn soaker.

2. Tree Wells: Excavate a sump approximately 3-feet square by 3-feet deep and flood each sump for about 3 days.

C. Fill all holes on the existing job-site or resulting from site-clearing or demolition operations.

D. Inspection Required: Prior to placement of fill materials. See Subsection 1.7A of this Section.

3.6 BACKFILLING

A. Prior to Backfilling: Remove debris, trash and form materials from excavations.

B. Inspection Required: Prior to backfilling operations.

C. Placement of Backfill: In layers not exceeding 8-inches thickness, moisten to optimum moisture content and tamp until required 95% relative compaction is secured and finish to suitable elevations to provide for anticipated settlement and shrinkage.

D. Pipe Bedding And Backfill Over Underground Piping And Conduit: Place bedding and backfill material in conformance with provisions specified Subsection 2.1 (D) herein. Do not place backfill materials until the Inspector has inspected and approved the pipe installation. The bedding shall be compacted and shaped to form a firm base for the pipe and conduit. The initial backfill shall be placed in two lifts. The first lift shall be to the spring line of the pipe or conduit.

E. For Parking Lot Jobs: Use clean material previously removed from excavations or use imported materials as hereinbefore specified subject to approval by the Inspector or Engineer.

F. In Planting Areas Holes and Tree Wells: After planting, cultivate and soak the specified backfill mix for a minimum of two days using a common lawn soaker if specified.

G For Voids Left by the Removal of Sheeting, Piles and Similar Shoring Supports: Immediately backfill with structural backfill of clean sand slurry backfill which shall be jetted into place to ensure a dense and complete filling of the voids.

H. Slurry Backfill: In areas where specified and/or around the utilities, vaults or other structures where the Soil Engineer determines that it is not practical to attain the required compaction by the mechanical methods or water densification, provide a trench slurry backfill 60-E0.7 (Class 100-E-100).

3.7 DISPOSAL OF EXCESS AND WASTE MATERIALS

A. Removal from City's Property: Remove waste materials, including unacceptable excavated material, trash and debris, and dispose of it off City's property in a legal manner and to conform with the requirements shown in Section 01572 – CONSTRUCTION AND DEMOLITION WASTE MANAGEMENT of Division 1 - General Requirements.

B. Provide written consent of the owner of the property upon which the surplus material is to be deposited, pursuant to Section 01 57 20 – CONSTRUCTION AND DEMOLITION WASTE MANAGEMENT specified above and Section 300-26 - SURPLUS MATERIAL of SSPWC.

END OF SECTION

SECTION 31 11 05

CLEARING, GRUBBING AND STRIPPING

PART 1 - GENERAL

1.1 DESCRIPTION

A. All site clearing and grubbing on the job-site **[**indicated on the Contract Drawings and in the Project Manual**]**.

B. Site clearing shall consist of removing all vegetable growth such as trees, roots, stumps, shrubs, brush, limbs; and stone, boulders, clods, wood and other vegetative growth from the growth surface. Clearing shall also include the removal and disposal of trash piles, rubbish, etc.

C. Grubbing shall consist of the removal and disposal of wood roots, stumps, shrubs, brush, stone, boulders, clods, vegetable growth, etc. below the ground or subgrade surface.

D. CONTRACTOR shall furnish all tools, equipment materials and supplies and shall perform all labor to complete the work associated with removal of all natural and artificial objectionable material from the designated areas of work as indicated in the Contract Documents.

E. This work shall also include the protection from injury and preservation of existing improvements, adjacent property, utility vegetation and existing objects designated to remain.

F. Prior to commencing the work, obtain acceptance from the ENGINEER regarding methods to be used and disposal of removed materials.

G. Related Sections:

1. Documents affecting work of this Section included, but are not necessarily limited to the GENERAL CONDITIONS, SUPPLEMENTARY CONDITIONS, DIVISION 1 - GENERAL REQUIREMENTS and other Sections of the Project Manual.

[2. Building Demolition in Section 02215.**]**

or

[2. Site Demolition in Section 02220.**]**

3. Earthwork in Section 02310.

[4. Soil Treatment for Termite Control in Section 02340.**]**

[5. Irrigation System in Section 02810.**]**

[6. Chain Link Fencing in Section _____.**]**

[7. Concrete work in Section 03300.]

1.2 QUALITY ASSURANCE

A. Labor: Use adequate numbers of skilled laborers thoroughly trained in site-clearing operations and experienced in the necessary crafts and completely familiar with the specified requirements and methods needed for the proper performance of the work of this Section.

B. Codes and Regulations: Perform all work of this Section in strict accordance with applicable Government Codes and Regulations especially meeting all safety standards and requirements of CAL/OSHA, County and [1999] Los Angeles City Building Code and applicable Amendments. [Conform to all storm water pollution control measures as required and provided in Section 02310 - EARTHWORK of the Project Manual.] Provide additional measures, added materials and devices as may be needed as directed by the City Engineer or the Consultant at no added cost to the City.

C. Miscellaneous Requirements:

1. Erection and maintenance of protections

2. Dust Control

3. Repair of Damages

4. Cleaning and Removal of Rubbish

D. Permits and Licenses: Procure all City, County and State Permits and Licenses, including Municipal Business License and pay all charges and fees for the same.

E. Contractor Submittals - Submit schedule of clearing, grubbing, and erosion control measures to be put in place for all work scheduled during the rainy season (October - April).

PART 2 - PRODUCTS

2.1 MATERIALS

A. Soil Sterilant: As specified in [Section 02310 - EARTHWORK].

B. Soil Treatment for Termite Control: As specified in [Section 02310 - EARTHWORK] [Section 02340 - TERMITE CONTROL].

C. Provide Materials not specifically described but required for completion of the work of this Section as selected by the Contractor subject to the approval of the City Engineer or the Consultant.

PART 3 - EXECUTION

3.1 SITE CONDITIONS

Examine the job-site and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper site-clearing operations, as directed by the City Engineer or the Consultant. Do not proceed until such detrimental conditions have been corrected.

3.2 PROTECTION

A. Protect Existing Structures and Site Improvements indicated to remain from damage by approved methods and/or as authorized by the City Engineer. Removal of all protections shall be when work of this Section is completed or when so authorized by the City Engineer or the Consultant. Apply protections to adjacent properties as required and directed by the City Engineer.

B. Protect Existing Utilities [Indicated or made known to remain] traversing the job-site and serving existing adjacent facilities.

C. Protect Existing Trees and Shrubs [Indicated to remain] by providing temporary surrounding fencing so located a sufficient distance away so that trees and shrubs will not be damaged by site-clearing operations.

D. Protection of Persons and Property (existing structures and site improvements).

1. Provide barricades, warning signs at open depressions and holes on adjacent property and public accesses.

2. Provide operating warning lights during hours from dusk to dawn each day or as otherwise required.

3. Protect existing remaining structures, utilities, sidewalks, pavements other facilities from damage as caused by settlement, undermining, washout or other hazards created by site-clearing operations of this Section.

4. Provide and maintain pedestrian and vehicular access in accordance with Work Area Traffic Control Handbook (WATCH), latest edition.

E. Use means necessary to prevent air pollution or dust from becoming a nuisance to the public, to neighbors and to others performing work on or near the job-site. Comply with governing regulations.

F. Maintain access to the job-site, other neighboring property, street and alley at all times.

G. The project site shall be maintained in conformance with Section 7-8 - PROJECT SITE MAINTENANCE of the Standard Specifications for Public Works Construction (SSPWC) and the requirements of this Project Manual.

3.3 SITE CLEARING AND GRUBBING

A. General:

1. For drawing clarity, not all trees, shrubs, brush, grass, weeds, or exact amount of trash or debris are shown on the drawings. Contractor shall carefully study the Contract Drawings, **[**the Soil Investigation Report and the Survey**]**, visit the job site and verify the extent of the work to be done prior to the Bid.

2. Prior to starting job-site clearing operations in the company of the City Engineer or Consultant Architect, Soil Engineer and Inspector; visit the job site and verify the extent of the work.

3. Site clearing and grubbing shall conform to Section 300-1 - CLEARING AND GRUBBING of SSPWC and applicable requirements of the Project Manual.

4. Site clearing and grubbing shall be done in the presence of the Soil Engineer. Contractor shall notify the City Engineer 72 hours prior to clearing operation.

B. Site Clearing and Grubbing Operations

1. To a depth of at least **[**_____ feet**]** below **[**finish grade indicated on contract drawings**] [**existing ground surfaces**] [**or new graded surfaces whichever is lower**] [**or to a depth where settlement will not occur as caused by decomposition of roots**]**. Clean out all vegetable growth, roots, stomps, clods and other objective materials.

2. Treat roots remaining in the soil with a weed killer approved and as directed by the City Engineer or the Consultant.

3. Remove all concrete and masonry debris. Remove stones, boulders, clods which are **[**one (1) inch**] [**two (2) inches**]** or larger. Remove stones, boulders, clods which are one (1) inch or larger from all utility trenches.

4. Remove all existing rubbish and debris or those resulting from work operations of this Section as soon as possible, do not allow to pile up. Do not burn rubbish and debris on the job-site.

5. Remove all growths including trees and shrubs on the job-site within property lines including trees in tree wells and elsewhere **[**as noted on the Contract Drawings**]**.

6. Where active utility lines need to be capped or plugged, perform such work in accordance with requirements of the Utility Company or government agency having jurisdiction and conform to provisions of Section 01140 - CONTRACTOR□S USE OF THE PREMISES, and Subsection 3.2B of this Section.

[7. For Cesspools, septic tanks and line serving the same which are not shown on drawings: Determine location and lines leading from existing structures to the cesspool or septic tank and notify the City Engineer or the Consultant for instructions.

8. Existing Services to remaining structures are to be maintained at all times.

[9. Removal of existing sewer line to the cesspool or septic tanks and construction of the new sewer lines shall be done by the City Force or by Change Order.**]**

3.4 STRIPPING

A. Stripping shall include the removal and disposal of all organic sod, topsoil, grass and grass roots, and other objectionable material remaining after clearing and grubbing from the areas designated to be stripped. The depth of stripping shall be as shown on the Drawings and specified herein.

B. Topsoil from the strippings shall be stockpiled and used for the finished site grading. Excess topsoil will be placed in the waste disposal areas designated by the ENGINEER.

C. Prior to beginning any excavation or fill, strip the topsoil **[to a depth of [X] inches.] [to a depth sufficient to remove all organic material.] [and stockpile for future use.]** In general, topsoil shall be removed where structures are to be built, trenches dug, and roads, parking lots, walks, and similar improvements constructed within the areas

presently covered with topsoil. Topsoil shall be stored clear of the construction area. Take reasonable care to prevent the topsoil from becoming mixed with subsoil. **[In lieu of reusing stockpiled, use imported topsoil as required for final grading.]**

3.5 TOPSOIL

A. Strip and remove existing sod, and stock pile existing sod if specified for reuse in the Contract Works.

B. After proposed planting area(s) has been cleared of vegetation and grubbed, strip the existing topsoil to a depth specified and to provide at least a [6-inch depth of topsoil] [in areas shown on the Contract Drawings] to be turfed or planted and to fill planters without contamination with subsoils.

C. If on site topsoil is specified for reuse, stock pile topsoil in an area clear of new construction or where directed by the City Engineer or the Consultant.

[D. Maintain topsoil stockpiles in a manner which will not obstruct the natural flow of drainage.

1. Maintain the stockpiled topsoil free from debris and trash.

2. Keep the stockpiled topsoil damp to prevent drying out and creating a dusts source.

3. Soil samples shall be obtained and analyzed for agricultural suitability and fertility.

4. Place and compact backfill in the planting area. Add soil amendments to topsoil in accordance with the recommendation and cultivate.

5. Provide Soil Sterilization in accordance with Section 02310 – EARTHWORK of the Project Manual.**]**

or

[D**.** Remove and dispose of the stock pile topsoil prior to the delivery of any new imported top soil.**]**

3.6 REMOVAL AND DISPOSAL OF CLEARING AND GRUBBING DEBRIS

A. General: All materials removed shall be disposed of outside of the right-of-way. No accumulation of flammable material shall remain on or adjacent to the right-of-way. The roadway and adjacent areas shall be left with a neat and finished appearance.

B. Bituminous Pavement: Bituminous pavement removal shall be in conformance with SSPWC Section 300-1.3.2.

C. Concrete Pavement: Concrete pavement removal shall be in conformance with SSPWC Section 300-1.3.2.

D. Concrete Curb, Walk, Gutters, Cross Gutters, Driveways, and Alley Intersections: Concrete removal shall be in conformance with SSPWC Section 300-1.3.2.

3.7 STORAGE OF MATERIALS AT THE JOB-SITE

Storage not permitted beyond brief accumulation awaiting pick up by removal trucks. Delays in the removal of site-clearing materials from the job-site shall be subject to the approval of the City Engineer or the Consultant.

END OF SECTION

SECTION 31 41 40

SHEETING, SHORING AND BRACING

PART 1 - GENERAL

1.1 SUMMARY

A. Provide shoring at open excavations and elsewhere where greater than 5-feet in depth. Shoring shall be furnished, placed, maintained and removed by the Contractor, as needed to protect workers, materials, other properties and the public.

1.2 SYSTEM DESCRIPTION

A. General:

1. Shoring systems are not fully detailed on the Drawings, which are diagrammatic and show design intent of finished profiles, shapes and forms

2. Specifications are of the performance type and include the minimum requirements of the excavation support system without limiting the Contractor to methods of achieving such performance.

B. Survey of existing conditions:

1. Employ California licensed surveyor or civil engineer to make a survey of existing adjacent structures and improvements

a. Establish precise elevations at fixed points to act as benchmarks

b. Clearly identify benchmarks and record existing elevations

2. Photographs conditions encountered to highlight defects in existing construction. Notify the Engineer and registered owners of adjacent properties in writing when the survey is to be made and photographs taken so they may have representatives present.

a. Have those representatives' present sign the survey and photographs as witnesses.

b. Upon completion of this work, make a similar examination of the properties originally surveyed, giving similar notice to all interested parties so they may be present during the final examination of the properties. Send a record of the original and final examinations to all concerned parties.

*C. Performance Criteria

1. The Contractor shall be solely responsible for and bear the sole burden of cost for any and all damages resulting from improper shoring or failure to shore.

2. The safety of workmen, the protection of adjacent structures, property and utilities, and the installation of adequate supports for all excavations shall be the sole responsibility of the Contractor.

3. The design, planning, installation, and removal of all shoring shall be accomplished in such a manner as to maintain stability of the required excavation or trench section and to prevent any movement of soil that may cause damage to adjacent structures and utilities, damage or delay the work, or endanger life and health.

1.3 CONTRACTOR SUBMITTALS

A. Comply with pertinent provisions of Section 01330 - SUBMITTALS of DIVISION 1 - GENERAL REQUIREMENTS.

B. Permits: The Contractor shall submit shoring drawings and calculations to the Los Angeles City Department of Building and Safety and obtain and pay for the required permit.

1. Obtain permit(s) as required by Title 8, Division 1-DEPT. OF INDUSTRIAL RELATIONS, Chapter 4 –DIVISION OF INDUSTRIAL SAFETY of the California Code Of Regulation, and pursuant to Subsection 7-10.4.1 - SAFETY ORDERS of SSPWC, prior to excavating to the depth of 5-feet or greater. A duplicate copy of the permit shall be submitted to the Engineer for review prior to a start of excavation.

C. Certification Form: Contractor shall completely fill out a Competent Person Trench/Excavation Certification Form provided by Inspector of Bureau of Contract Administration prior to any worker access to trench or excavations and return it to the Inspector. Contractor shall certify by this form; the name of the competent person administering the work, the soil classification, and the type of excavation protective system provided/installed.

1.4 QUALITY ASSURANCE

A. Use adequate numbers of skilled workers who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

B. Employ a qualified engineer having at least five (5) year experience to design the shoring system and to inspect and report on the quality of its construction.

C. Comply with pertinent requirements of governmental agencies having jurisdiction.

D. Coordinate the shoring design and construction with:

E. Regulatory Requirements:

1. Conform to provisions of Section 01410 - REGULATORY REQUIREMENTS in the GENERAL REQUIREMENTS.

2. Comply with applicable requirements, but not necessarily limited to, shown on the contract Drawings; latest adopted version of the Los Angeles City Building Code, Section 1802 – QUALITY AND DESIGN and Section 3301 – EXCAVATION AND FILLS; State of California, Code of Regulations, Title 8 – INDUSTRIAL RELATIONS, Division 1-DEPARTMENT OF INDUSTRIAL RELATIONS, Chapter 4 – DIVISION OF INDUSTRIAL SAFETY, Subchapter 4 – CONSTRUCTION SAFETY ORDERS, Section 1539, 1540 and 1541.

1.5 PROTECTIONS

A. Protect adjacent existing improvements against damage by Contractor's operations. Protect all excavation so that the soil of adjoining property will not cave in or settle. Repair or replace damaged items to the full satisfaction of the City at no extra cost to the City.

B. Shore, crib or lag excavations and earth banks as necessary to prevent caving in, erosion or gullying of sides.

C. Divert or pump water out of all excavations and trenches until all installation work and backfilling are completed and inspected.

1.6 INSPECTIONS

A. Excavation of existing fills, reworking of natural soils and compaction of all required fills will be inspected and tested by the City of Los Angeles Building and Safety Inspector and the Soils Engineer who will be responsible to the Engineer and will be paid for by the City.

B. Place all such backfill under the full supervision of the Soils Engineer.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 SURFACE CONDITIONS

A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the work. Do not proceed until detrimental conditions are corrected.

B. Existing Utilities: Contract Drawings show major utilities, but all utilities may not be shown. The Contractor will obtain all as-built records of existing utilities from local government authorities or Utility Companies and field check locations of utilities with representatives of the Utility Company. Protect and provide utility trench support to any sewer, water, gas, electric or other pipelines or conduits uncovered during work from damage.

1. Excavate by hand or other excavation methods acceptable to the utility owner.

2. If existing utilities interfere with Contractor's proposed method of support, any required modification or relocation shall be performed at no additional cost to the City.

3. Contact Underground Service Alert, (800) 422-4133, and obtain underground service alert inquiry I.D. Number 48 hours prior to digging. Report the I.D. Number to the Bureau of Contract Administration when calling for inspection.

3.2 PREPARATION

A. Protection:

1. Protect or repair utilities damaged by operations of this Section.

2. Protect adjacent structures and property from damage and disfiguration.

B. Dewatering:

1. Where applicable, no excavation shall commence until the Contractor has demonstrated to the satisfaction of the Engineer that the groundwater level has been lowered. Dewatering and that the soils inside the excavation are in the dewatered condition that was assumed in the Contractor's shoring design and submittal.

3.3 INSTALLATION

A. All trench and excavation openings shall be lighted and fenced or barricaded during nights, weekends, and other times as necessary and meet CAL/OSHA safety requirements.

B. All shoring shall be installed to the lines and elevations shown on the Contractor's review working drawings. No component of the shoring shall infringe on the minimum dimensions of any permanent structure shown in the Contract Drawings.

C. The excavation shall be staged as shown in the Construction Drawings or on required work documents and in such a manner as to provide a stable system of support at all times.

3.4 REMOVAL OF SHORING

A. Shoring shall be designed to be gradually removed as necessary to allow backfill to be placed and compacted. All voids existing behind the shoring which remains in place shall be backfilled with approved material.

B. Shoring shall be removed as backfilling progresses. Removal shall be conducted in such a manner so as to avoid any damage to adjacent facilities, or to other members of the shoring system. All wood forms, loose or casual wood and debris shall be removed.

C. During backfilling, temporary support elements shall not be removed until alternative support is available, such as substituted struts, backfill, or ability of the support system to act as a cantilever without detrimental deflection.

END OF SECTION

SECTION 32 01 90

OPERATION AND MAINTENANCE OF PLANTING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Work Specified in this Section: Furnish all labor, material, equipment, and services required to maintain the landscape in an attractive condition as specified herein for a period of 90 calendar days.

B. Related Work Specified in Other Sections:

1. Section 32 84 00 - Planting Irrigation
2. Section 32 90 00 – Planting

C. Definition: The word Architect as used herein shall refer to the Landscape Architect or the Owner's authorized representative.

1.2 QUALITY ASSURANCE

A. The Contractor's representatives and employees shall be experienced in landscape maintenance.

1.3 90 CALENDAR DAY MAINTENNANCE PERIOD

A. The Contractor shall continuously maintain all areas involved in this Contract during the progress of work. Maintenance period shall not start until all elements of construction, planting, and irrigation for the entire project are in accordance with Plans and specifications.

1. A prime requirement is that all lawn and groundcover areas shall have been planted and that all lawn areas shall show an even, healthy stand of grass seedlings or sod, either of which shall have been mowed twice. Maintenance period will not be shortened when this criteria is met, but may be lengthened if not met.

2. The Contractor’s maintenance period will be extended if the provisions required within the Plans and specifications are not fulfilled. Project may not be segmented into maintenance phases.

3. The Contractor shall request a Pre-Maintenance inspection by the Owner and Architect at the completion of the installation process.

4. The Maintenance Period shall begin upon successful completion of the Pre-Maintenance walk-through punch list and acceptance of the landscape installation by the Owner.

5. If such criteria are met to the satisfaction of the Owner, a field notification will be issued to the Contractor to establish the effective beginning date of the maintenance period.

B. The Maintenance Period continues for 90 calendar days until final acceptance of the work by the Owner. Improper maintenance or poor condition of planting at the termination of the scheduled maintenance period may cause postponement of the final completion date of the Contract.

C. Any day when the Contractor fails to adequately maintain planting, replace unsuitable plants or do weed control or other work, as determined necessary by the Owner, will not be credited as one of the maintenance period working days.

1.4 ALTERNATE BID DESCRIPTIONS

A. Guarantee: All plant material installed under the contract shall be guaranteed for a period of one year. Plants found to be dead or in poor condition due to faulty materials or workmanship, as determined solely by the Architect, shall be replaced by the Contractor at his expense.

1. Replacement: Materials found to be dead, missing, or in poor condition during the Maintenance period shall be replaced immediately.

2. The Architect shall be the sole judge as to the condition of material.

3. The Contractor shall replace material rejected during the Guarantee period within fifteen (15) days of written notification by the Owner.

1.5 OBSERVATION VISIT

A. The Contractor shall request progress visits from the Architect at least 48 hours in advance of anticipated visits. Normal observation visits are as follows:

1. Immediately prior to the commencement of the work in this section.
2. Completion of first 90 days of maintenance.
3. Final acceptance.

B. Prior to the date of the final observation visit, the Contractor shall acquire from the Architect-approved reproducible Plans and record (from the job record set) all changes made during construction, label these Plans "Record Drawings", and deliver to the Architect for review and approval.

C. Prior to the date of final inspection, the Contractor shall deliver to the Architect a written "Landscape and Irrigation Guarantee" as required herein.

PART 2 - PRODUCTS

2.1 MATERIALS

A. All materials used shall either conform to landscape specifications in other sections or shall otherwise be acceptable to the Owner.

B. The Owner shall be given a monthly record of all herbicides, insecticides, and disease control chemicals used. Failure to provide such a record will continue maintenance period until compliance occurs.

PART 3 - EXECUTION

3.1 MAINTENANCE

A. Maintenance shall be performed according to the following standards:

1. All areas shall be weeded and cultivated at intervals of not more than ten (10) days.

2. Watering, mowing, rolling, edging, trimming, fertilization, spraying, and pest and rodent control, as may be required, shall be included in the maintenance period.

3. Street gutters shall be cleaned as part of the maintenance program.

4. The Contractor shall be responsible for maintaining adequate protection of the area.

   a. Damaged areas shall be repaired at the Contractor's expense.

5. Between the 15th day and the 20th day of the maintenance period, the Contractor shall reseed and re-sod all spots or areas within the lawn where normal turf growth is not evident.

B. The Contractor shall be responsible for reporting to the Owner conditions beyond his control that prevent or have negative impact on the work required herein.

3.2 TREE AND SHRUB CARE

A. Watering

1. Apply enough irrigation water so that moisture penetrates throughout root zone and only as frequently as necessary to maintain healthy growth.

   a. Do not maintain soils in a constantly wet condition.

   b. Contractor shall be responsible for familiarizing himself with the particular water requirements for the various plantings and shall be responsible for setting and maintaining the automatic controller to optimum minimum levels.

   c. Damage to the plantings caused by over-watering or under-watering shall be the responsibility of the Contractor to replace at no cost to Owner.

2. Maintain a water basin around newly planted plants so that water can be applied to moisturize throughout the root zone. At the end of the maintenance period these basins shall be flattened out to match surrounding grades.

3. If hand-watering, use a fan spray nozzle to break the water force.

B. Tree Pruning

1. Nursery grown trees will not normally require pruning for the first year. Prune trees only if directed by Architect or Owner, and only for these purposes:

   a. Selection and development of permanent scaffold branches that have a vertical spacing of from 18" to 48" and radial orientation so as not to cross each other,

   b. Elimination of diseased or damaged growth,

   c. Elimination of narrow V-shaped branch forks that lack strength,

   d. Reduction of toppling and wind damage by thinning out crowns,

   e. Maintenance of growth within space limitations,

f. Maintenance of natural appearance,

g. Balancing of crown-to-root ratio.

2. Under no circumstances will stripping of lower branches ("rising up") of young trees be permitted.

a. Lower branches shall be retained in a “tipped-back" or pinched condition with as much foliage as possible to promote caliper trunk growth (tapered trunk).

b. Lower branches can be cut flush with trunk only after the tree is able to stand erect without staking or other support.

3. Evergreen trees shall be thinned out and shaped when necessary to prevent wind and storm damage. The primary pruning of deciduous trees shall be done during the dormant season. Damaged trees or those that constitute health or safety hazards shall be pruned at any time of the year as required.

C. Shrub Pruning

1. The objectives of shrub pruning are the same as for trees. Shrubs shall not be clipped into balled or boxed forms unless such is required by the design.

2. All pruning cuts shall be made to lateral branches or buds or flush with the trunk. "Stubbing" will not be permitted.

D. Staking and Guying: Stakes and guys shall remain in place until final acceptance and are to be continuously inspected and adjusted to prevent girdling of trunks or branches and to prevent rubbing that causes bark wounds and to allow trees to sway freely. Stakes and guys are to be removed when trees become sufficiently well rooted or after one year. When stakes or guys are removed, tree heads may be thinned to reduce wind load.

E. Weed Control: Keep all areas, including basins and areas between plants, free of weeds

.

1. Use recommended legally approved herbicides only when mechanical removal methods are not feasible.

2. Avoid frequent soil cultivation next to trees or shrubs that destroys shallow roots.

3. Use mulches to help prevent weed seed germination.

F. Pest and Disease Control: Maintain control of insect and rodent infestations. The preferred method of control shall be biological control, or with non-toxic, biodegradable, organic materials. If stronger materials are needed, only materials that are recommended by a licensed Pest Control Advisor and are EPA approved and regulated shall be used. Only registered and licensed Pest Control Operators shall apply insecticide or chemical applications. Notify Owner a minimum of five (5) working days before chemical applications.

G. Fertilization

1. Fertilize all planting areas at 30-day intervals, with fertilizer and at rate as recommended by Soils Report.

a. Avoid applying fertilizer to root balls and bases of main stems

b. Spread fertilizer evenly around plants to drip line.

c. Distribute fertilizer evenly over turf or groundcover areas to avoid patchy coloration.

H. Replacement of Plants: Replace dead, dying, and missing plants with plants of a size, condition, and variety acceptable to Architect or Owner at Contractor's expense.

3.3 GROUND COVER CARE

A. Weed Control: Control weeds preferably with mechanical methods, and also with preemergent herbicides and selective systemic herbicides. Hoe weeds as little as possible since this may result in plant damage. Foot traffic in planted areas shall be minimized, and soil compaction shall be loosened immediately.

B. Watering: Water enough so that moisture penetrates throughout root zone and only as frequently as necessary to maintain healthy growth.

1. Do not maintain soils in a constantly wet condition.

2. Contractor shall familiarize himself with the particular water requirements for the planting and shall be responsible for setting and maintaining the automatic controller to optimum minimum levels.

3. Damage to the planting caused by over-watering or under-watering shall be the responsibility of the Contractor to replace.

C. Trash: Remove trash weekly. Remove debris, clippings or branches produced by maintenance activities within 8 hours.

D. Edging and Trimming: Edge ground cover to keep in bounds and trim top growth as necessary to achieve an overall even appearance.

E. Replacement: Replace dead and missing plants at Contractor's expense.

3.4 LAWN AND TURF CARE

A. Mowing and Edging:

1. Mowing of turf will commence when the grass has reached a recommended height for the specified species. Mowing will be at least twice a week after the first cut. Turf must be well-established and free of bare spots and weeds to the satisfaction of the Architect prior to final acceptance.

2. Edges shall be trimmed at least weekly or as needed for neat appearance.

3. Grass clippings if visible in piles regardless of size shall be removed from the premises.

B. Watering: Lawns shall be watered at such frequency as weather conditions require to replenish soil moisture below root zone and maintain healthy growth.

C. Fertilizing:

1. Fertilize all on-grade lawn areas as follows or as recommended by soils report:

a. At the end of the first 30 calendar days and at 30 to 90 calendar day intervals thereafter - 5 lbs. per 1,000 square feet of maintenance fertilizer.

b. After application, irrigate thoroughly.

D. Weed Control: Remove broad leaf weeds manually or control with selective herbicides. Turf areas shall be kept weed-free.

E. Renovating:

1. If required, remove thatch by verticutting, preferably in the fall but otherwise in the spring. At this time, fertilize with maintenance fertilizer and over-seed if needed.

2. Aerify compacted areas to improve water penetration whenever needed.

3.5 IRRIGATION SYSTEM

A. System Inspection: Contractor shall continuously check all systems for proper operation. Lateral lines shall be flushed out after removing the last sprinkler head or two at each of the lateral. All heads are to be continuously adjusted as necessary for proper coverage and to eliminate over-spray on buildings or paving. Contractors regular maintenance personnel shall test, observe, and adjust each sprinkler system no less than once per month.

B. Controllers: Set and program automatic controllers for seasonal water requirements and minimum optimum water use. Give Owner's representative a key to controllers and instructions on how to turn off system in case of emergency.

C. Repairs: Repair all damage to irrigation system at Contractor's expense. Repairs shall be made within one watering period.

END OF SECTION

SECTION 32 11 00

SITE CLEARING

PART 1 GENERAL

1.1 SUMMARY

A. All site clearing on the job-site noted on or indicated on the Contract Drawings and in these Specifications.

1. Site clearing shall be conducted in a manner that will cause the least disturbance to the existing site.

B. LEED Goal #1: Comply with the Erosion and Sedimentation Control Plan.

C. LEED Goal #2: Recycle 75% of demolition and construction waste The Contractor shall conduct the demolition activities in a manner that will preserve all salvageable materials and divert them to the appropriate recycling centers.

D. Related Sections: Documents affecting work of this Section included, but are not necessarily limited to the GENERAL CONDITIONS, SUPPLEMENTARY CONDITIONS and Sections in DIVISION 1 -GENERAL REQUIREMENTS of these Specifications.

1.2 QUALITY ASSURANCE

A. Labor: Use adequate numbers of skilled laborers thoroughly trained in site-clearing operations and experienced in the necessary crafts and completely familiar with the specified requirements and methods needed for the proper performance of the work of this Section.

B. Codes and Regulations: Perform all work of this Section in strict accordance with applicable Government Codes and Regulations especially meeting all safety standards and requirements of CAL/OSHA, County and City of Los Angeles. Provide additional measures, added materials and devices as may be needed as directed by the City Engineer at no added cost to the City.

1. The Contractor shall submit engineered sheeting, shoring and bracing plans to Building and Safety for review and approval. The Contracting shall obtain separate permits for sheeting, and shoring as required by OSHA and Building and Safety.

C. Miscellaneous Requirements:

1. Erection and maintenance of protections
2. Dust Control
3. Repair of Damages
4. Cleaning and Removal of Rubbish
5. Water runoff control.

PART 2 PRODUCTS

2.1 MATERIALS:

Not specifically described but required for completion of the work of this Section as selected by the Contractor subject to the approval of the City Engineer.

PART 3 EXECUTION

3.1 SITE CONDITIONS

A. Examine the job-site and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper site-clearing operations, as directed by the City Engineer. Do not proceed until such detrimental conditions have been corrected.

3.2 PROTECTION

A. Protect Existing Structures and Site Improvements: (Indicated to remain) from damage by approved methods and/or as authorized by the City Engineer. Removal of all protections shall be when work of this Section is completed or when so authorized by the City Engineer. Maintain pedestrian and vehicular access and provide traffic control to the satisfaction of the City Engineer.

B. Protect Existing Utilities indicated or made known to remain traversing the job-site and serving existing adjacent facilities.

C. Protect Existing Trees and Shrubs indicated to remain by providing temporary surrounding fencing so located a sufficient distance away so that trees and shrubs will not be damaged by site-clearing operations.

D. Protection of Persons and Property (existing structures and site improvements)

1. Provide barricades, warning signs at open depressions and holes on adjacent property and public accesses.

2. Provide operating warning lights during hours from dusk to dawn each day or as otherwise required.

3. Protect existing remaining structures, utilities, sidewalks, pavements other facilities from damage as caused by settlement, undermining, washout or other hazards created by site-clearing operations of this Section.

4. Provide sheeting, shoring and bracing as necessary to protect adjacent improvements from site clearing operations of this section.

E. Use means necessary to prevent dust from becoming a nuisance to the public, to neighbors and to others performing work on or near the job-site.

1. Fencing
2. Screening
3. Tarping
4. Water
5. Tackifiers

F. Use means necessary to prevent water from running off the site

G. Maintain access to the job site at all times.

3.3 SITE CLEARING

A. General:

1. Prior to starting job-site clearing operations carefully study the Contract Drawing as these Specifications.

2. In the company of the City Engineer, prior to starting site clearing operations, visit the job-site and verify the extent of work to be done under this Contract.

B. Site Clearing Operations: Debris generated out of site clearing operations shall be recycled to the maximum practicable extent.

1. Remove all growths including trees, shrubs, weeds and grass on the job-site as shown on Contract Drawings including trees in tree wells and elsewhere as noted on the Contract Drawings.

2. Clean out all roots 1-inch and larger to a depth of a least 2 feet below finish grade or existing ground surface or new graded surface whichever is lower or to a depth where settlement will not occur as caused by decomposition of roots.

3. Treat roots remaining in the soil with a weed killer approved and as directed by the City Engineer.

4. Remove all rubbish and debris existing and resulting from work operations of this Section as soon as possible, do not allow to pile up. Do not burn rubbish and debris on the job-site.

5. Where active utility lines need to be capped or plugged, perform such work in accordance with requirements of the Utility Company or government agency having jurisdiction.

3.4 CLEAN-UP

A. Contractor shall comply with the provisions of Section 017100 - CLEANING, DIVISION 1 of these Specifications.

3.5 STORAGE OF SPOIL MATERIALS AT THE JOB-SITE

A. Storage is not permitted beyond brief accumulation awaiting pick-up by removal trucks. Delays in the removal of site-clearing materials from the job-site shall be subject to the approval of the City Engineer.

END OF SECTION

SECTION 32 11 23

AGGREGATE BASE MATERIALS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Furnish and install aggregate base materials for fill, drainage, and grading purposes as indicated on the drawings and specified.

1.3 REFERENCES

A. ASTM C136 - Method for Sieve Analysis of Fine and Coarse Aggregates.

B. ASTM D698 - Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures, Using 5.5 lb Rammer and 12 inch Drop.

1.4 SUBMITTALS

A. Submit under provisions of Section 01 33 00 – Submittals.

B. Samples: Submit, in air-tight containers, 10 lb sample of each type of fill to testing laboratory.

C. Prior to import, submit written certification to the city engineer that crushed miscellaneous base (CMB) does not contain polychlorinated biphenyls (PCB) above laboratory detection limits, when tested in accordance with EPA method 8082, and obtain written approval from jurisdictional agency prior to import at the subject site.

1.5 REGULATORY REQUIREMENTS

A. Base materials shall conform to the requirements of the Standard Specifications for Public Works Construction: Section 200 - Rock Materials.

PART 2 - PRODUCTS

2.1 COARSE AGGREGATE MATERIALS

A. Base materials shall conform to the requirements of the Standard Specifications for Public Works Construction: Section 200 - Rock Materials.

2.2 FINE AGGREGATE MATERIALS

A. Base materials shall conform to the requirements of the Standard Specifications for Public Works Construction: Section 200 - Rock Materials.Fine Aggregate Type A2 (Sand): Natural river or bank sand; washed; free of silt, clay, loam, friable or soluble materials, and organic matter; graded in accordance with ASTM C136 Group Symbol SW; within the following limits:

Sieve Size	Percent Passing
No. 4	100
No. 14	10 to 100
No. 50	5 to 90
No. 100	4 to 30
No. 200	0

2.3 SOURCE QUALITY CONTROL

A. Coarse Aggregate Material - Testing and Analysis: Perform in accordance with ASTM D698.

B. Fine Aggregate Material - Testing and Analysis: Perform in accordance with ASTM D698.

C. If tests indicate materials do not meet specified requirements, change material or material source and retest.

D. Provide materials of each type from same source throughout the Work.

E. Sampling and testing of imported and/or exported crushed miscellaneous base (CMB) shall be performed in accordance with the following schedule:

TABLE 1: MINIMUM SAMPLING FREQUENCY	
Volume (CY)	Sampling Frequency
0 to 500	1 per 100 Cubic Yards
501 to 1,000	1 per 250 Cubic Yards
1,001 to 5,000	1 per 250 Cubic Yards for first 1,000 Cubic Yards 1 per 500 CY thereafter
5,001 to 20,000	12 samples for first 5,000 Cubic Yards 1 per 1,000 Cubic Yards thereafter
over 20,000	1 per 2,000 Cubic Yards for first 20,000 Cubic Yards 1 per 2,500 CY thereafter

2.4 MATERIAL APPROVAL

A. Base material shall be inspected by the Project Inspector for gradation and material content prior to installation. The City may choose to have additional tests performed by the City Engineer before installation.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install base course material in layers, not exceeding 4 inches in thickness, unless required otherwise. Grade and compact to indicated levels or grades, cut and fill, water and roll until the surface is hard and true to line, grade and required section. Provide a relative compaction of at least 95 percent, unless otherwise required.

3.2 STOCKPILING

A. Stockpile materials on site at locations designated by the Owner.

B. Stockpile in sufficient quantities to meet Project schedule and requirements.

C. Separate differing materials with dividers or stockpile apart to prevent mixing.

D. Direct surface water away from stockpile site so as to prevent erosion or deterioration of materials.

3.3 STOCKPILE CLEANUP

A. Remove stockpile, leave area in a clean and neat condition. Grade site surface to prevent freestanding surface water.

B. If a borrow area is indicated, leave area in a clean and neat condition. Grade site surface to prevent freestanding surface water.

END OF SECTION

SECTION 32 17 27

CAST-IN-PLACE DETECTABLE WARNING SURFACES

PART 1 - GENERAL

1.1 SUMMARY

A. Furnish and install detectable warning surfaces as indicated on the drawings and specified.

1.2 ACTION SUBMITTALS

A. Product Data: Submit manufacturer's literature describing products, installation procedures and routine maintenance.

B. Shop drawings are required for products specified showing fabrication details; composite structural system; plans of tile placement including joints, and material to be used as well as outlining installation materials and procedure.

C. Material Test Reports: Submit test reports from qualified independent testing laboratory indicating that materials proposed for use are in compliance with requirements and meet the properties indicated. All test reports shall be conducted on a cast-in-place tactile tile system as certified by a qualified independent testing laboratory.

1.3 QUALITY ASSURANCE

A. Americans with Disabilities Act (ADA): Provide tactile warning surfaces which comply with the detectable warnings on walking surfaces section of the Americans with Disabilities Act (Title 49 CFR TRANSPORTATION, Part 37.9 STANDARDS FOR ACCESSIBLE TRANSPORTATION FACILITIES, Appendix A, Section 4.29.2 DETECTABLE WARNINGS ON WALKING SURFACES.

B. California Code of Regulations (CCR): Provide only approved DSAAC detectable warning products as provided in the California Code of Regulations (CCR). Title 24, Part 1, Articles 2, 3 and 4 and Part 2, Section 205 definition of "Detectable Warning". Section 1127B.5 for "Curb Ramps" and Section 1133B.8.5 for "Detectable Warnings at Hazardous Vehicle Area's".

PART 2 - PRODUCTS

2.1 CAST IN PLACE DETECTABLE WARNING SURFACES

A. Subject to compliance with requirements, warning surfaces shall be the product of Armor Tile Tactile Systems, or an Architect approved substitute by one of the following:

1. Detectable Warning Systems, Inc.
2. Engineered Plastics, Inc.
3. Wausau Tile Co.

B. The Vitrified Polymer Composite surfaces shall be an epoxy polymer composition with an ultra violet stabilized coating employing aluminum oxide particles in the truncated domes. The surfaces shall incorporate an in-line dome pattern of truncated domes 0.2” in height, 0.9” diameter at the base, and 0.4” diameter at top of dome spaced 2.35” nominal as measured on ad diagonal and 1.70” nominal as measured side by side.

C. Color: Yellow conforming to Federal Color No. 33538. Color shall be homogeneous throughout the tile. Tiles are also available in Light Grey, Dark Grey, Onyx Black, Pearl White, Brick Red.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install units as recommended by the product manufacturer. During tile installation procedures, ensure adequate safety guidelines are in place and that they are in accordance with the applicable industry and government standards.

B. The specifications of the structural adhesives, fasteners, and related materials shall be in strict accordance with the contract documents and the guidelines set by their respective manufacturers.

C. The physical characteristics of the concrete shall be consistent with the contract specifications while maintaining a slump range of 4 to 7 inches to permit solid placement of the Cast-In-Place System. An overly wet mix will cause the Cast-In-Place System to float. Under these conditions, suitable weights such as 2 concrete blocks or sandbags (25 lb) shall be placed on each tile.

D. Prior to placement of the Cast-In-Place System, the contract drawings shall be reviewed.

E. The concrete pouring and finishing operations require typical mason's tools, however, a 4' long level with electronic slope readout, 25 lb. weights, and a large non-marring rubber mallet are specific to the installation of the Cast-In-Place System. A vibrating mechanism such as that manufactured by Vibco can be employed, if desired. The vibrating unit should be fixed to a soft base such as wood, at least 1 foot square.

F. The factory-installed plastic sheeting must remain in place during the entire installation process, to prevent the splashing of concrete onto the finished surface of the tile.

G. When preparing to set the tile, it is important that NO concrete be removed in the area to accept the tile. It is imperative that the installation technique eliminates any air voids under the tile. Holes around the tile perimeter allow air to escape during the installation process. Concrete will flow through the large holes in each vane on the underside of the tile. This will lock the tile solidly into the cured concrete.

H. The concrete shall be poured and finished true and smooth to the required dimensions and slope prior to the tile placement. Immediately after finishing concrete, the electronic level should be used to check that the required slope is achieved. The tile shall be placed true and square to the curb edge in accordance with the contract drawings. The Cast-In-Place Tiles shall be tamped (or vibrated) into the fresh concrete to ensure that the field level of the tile is flush to the adjacent concrete surface. The contract drawings indicate that the tile field level (base of truncated dome) is flush to adjacent surfaces to permit proper water drainage and eliminate tripping hazards between adjacent finishes.

I. Immediately after tile placement, the tile elevation is to be checked to adjacent concrete. The tile elevation and slope should be set consistent with contract drawings to permit water drainage to curb as the design dictates.

J. While concrete is workable, a 3/8" radius edging tool shall be used to create a finished edge of concrete, then a steel trowel shall be used to float the concrete around the tile's perimeter, flush to the field level of tile.

K. During and after the tile installation and the concrete curing stage, it is imperative that there is no walking, leaning or external forces placed on the tile to rock the tile, causing a void between the underside of tile and concrete.

L. Following tile placement, review installation tolerances to contract drawings and adjust tile before the concrete sets. Two suitable weights of 25 lb each shall be placed on each tile as necessary to ensure solid contact of the underside of tile to concrete.

M. Following the curing of the concrete, protective plastic wrap is to be removed from the tile face by cutting the plastic with a sharp knife, tight to the concrete/tile interface. If concrete bled under the plastic, a soft wire brush will clean the residue without damage to the tile surface.

N. If desired, individual tiles can be bolted together using 1/4 inch or equivalent hardware. This can help to ensure that adjacent tiles are flush to each other during the installation process. Tape or caulking can be placed on the underside of the bolted butt joint to ensure that concrete does not ooze up between the tiles during installation. Any protective plastic wrap which was peeled back to facilitate bolting or cutting, should be replaced and taped to ensure that the tile surface remains free of concrete during the installation process.

O. Tiles can be cut to custom sizes, or to make a radius, using a continuous rim diamond blade in a circular saw or mini-grinder. Use of a straightedge to guide the cut is advisable where appropriate.

P. Any sound-attenuating plates on the underside of the tile, which are dislodged during handling or cutting, should be replaced and secured with construction adhesive. The air gap created between these plates and the bottom of the tile is important, in preserving the detectability properties of the Armor-Tile System.

Q. Clean tactile tiles not more than four days prior to date scheduled for inspection intended to establish date of substantial completion in each area of project. Clean tactile tile by method specified by tactile tile manufacturer.

END OF SECTION

SECTION 32 31 14

CHAIN LINK FENCING AND GATES

PART 1 - GENERAL

1.1 SUMMARY

A. All permanent chain link fencing and gates indicated on the Contract Drawings, as specified herein and as needed for complete and proper installation.

B. Related Work Sections:

1. Documents affecting work of this Section include, but are not necessarily limited to the GENERAL CONDITIONS, SUPPLEMENTARY CONDITIONS, GENERAL REQUIREMENTS in Division 1 and other Sections of the Project Manual.

1.2 QUALITY ASSURANCE

A. Labor: Use adequate number laborer's who are thoroughly trained and skilled in the fencing trade and who are completely familiar with the specified requirements and methods needed for the proper executions of the work of this Section.

B. Codes and Regulations: Perform all work in strict accordance with applicable Government Codes and Regulations, meeting all "Safety Standards" of CAL/OSHA, County and the Los Angeles City Building Code and applicable Amendments.

C. Qualification of Fabricators: Provide adequate number of fabricators who are thoroughly familiar with the specified requirements regarding fabrication of fencing fabrics, posts and gates.

D. Quality of All Materials and Accessories: As recommended by the manufacturer, subject to the acceptance by the City Engineer. All materials and accessories shall conform with the requirements of the Standard Specifications for Public Works Construction (SSPWC) and specified herein.

1.3 SUBMITTALS

A. General: Comply with applicable provisions of Section 01 33 00 – SUBMITTALS in DIVISION 1 - GENERAL REQUIREMENTS and other Sections of the Project Manual.

B. Product Data:

1. Manufacturer's list of items proposed to be provided under this Section.

2. Manufacturer's Specifications and other data needed to prove compliance with the specified requirements.

3. Shop drawings in sufficient detail to show layout of fence and gate, elevation details, fabrication, assembly, hardware, installation, anchorages and interface of work of this Section with work of adjacent trades.

4. Manufacturer's recommended installation procedures which when reviewed by the City Engineer or Consultant, will become the basis for accepting or rejecting actual installation procedures used on the Work.

5. Manufacturer's certification of compliance for chain link fabric posts and rails.

1.4 PRODUCT HANDLING

A. Protection: Protect fencing fabric, posts and gate assemblies before, during and after installation. Properly package and identify and note location of unassembled items (hardware, etc.) for protection against damage.

B. Delivery: Deliver all items to be built into concrete or masonry work in time, so as not to delay construction and installation operations.

C. Storage: Store all fencing and gate assemblies where directed by the City Engineer until time for installation.

PART 2 - PRODUCTS AND FABRICATION

2.1 MATERIALS

A. General: All materials for fencing, posts and gates and fasteners to be new and hot-dipped galvanized.

B. Galvanizing: Comply with requirements of Section 210-3 - GALVANIZING of SSPWC, except as modified herein.

1. Fabric: As per ASTM A392 - SPECIFICATION FOR ZINC COATED STEEL CHAIN LINK FENCE FABRIC and A817 - SPECIFICATION FOR METALLIC - COAT STEEL WIRE FOR CHAIN LINK FENCE FABRIC, 2-inch mesh chain link of 9-gage steel wire (minimum 75,000 psi tensile strength) galvanized 1.2 oz/ft2 zinc in single fabric width for entire height and with top and bottom selvedges twisted and barbed.

2. Fabric Tie: 11 gage galvanized steel used to fasten the fabric to posts, rails and gate frame.

D. Posts:

1. Schedule 40 Standard weight pipe conforming to ASTM F-1083 - SPECIFICATION FOR PIPE, STEEL, HOT-DIPPED ZINC - COATED (GALVANIZED) WELDED, FOR FENCE STRUCTURES.

2. Line Posts: 2 3/8-inch O.D. complete with malleable iron eye-top of suitable design to provide moisture-proof cap.

3. Terminal (End) and/or Corner Posts: 2 7/8-inch O.D. with malleable iron moisture-proof cap.

4. Gate Posts: 4-inch O.D. complete with malleable iron moisture-proof cap.

E. Top and Bottom Rails: 1-5/8-inch O.D. standard weight steel pipe complete with end caps and end clamps for attachment to posts.

F. Horizontal and Diagonal Bracing:

1. Horizontal Rails with Diagonal Bracing to all Sections: Intermediate horizontal rail, 1-5/8-inch O.D. standard weight steel pipe complete with end caps and clamps for attachment to posts.

2. Diagonal: 3/8-inch diameter steel truss rods complete with turn buckles and attachments to post.

G. Tension Wire: No. 7-gage galvanized coiled spring steel wire for fabric lighter than 9-gage; for fabric of 9-gage and heavier use 6-gage galvanized coiled spring steel wire.

H. Extension Arms for Barbed Wire: 45-degree angle of pressed steel with provisions for anchorage to top of posts and anchorage of 3 rows of barbed wire, 5 inch centers, thereto; and which shall also act as a weather cap and allow for passage of top rail.

I. Barbed Wire (as necessary for special security): 12 ½- gage, two-strand galvanized steel wire, with 14-gage, 4-point pattern barbs spaced approximately 5-inches on center as per ASTM A-121 - SPECIFICATION FOR ZINC (HOT-DIP GALVANIZED) COATINGS ON IRON AND STEEL PRODUCTS, Class 3.

J. Galvanizing Repair Material: Hot repair compound conforming to Federal Specification O-G-93, "Galvalloy" by Metalloy Products Co., Los Angeles, California or "Re-Galv" by Galvweld applied as recommended by the manufacturer.

K. Galvanized Steel Brace Bands, Tension Bands or Bars and Tension Rods: Brace bands shall be galvanized, minimum of 3/16 inch x 3/4-inch wide; tension bands or bars shall be 3/16 inch x 3/4-inch wide and tension rods shall be 3/8 inch diameter galvanized steel rod with galvanized turnbuckles or other suitable tightener or tightening devices.

L. Non-Shrink Grout: An approved non-shrinking premixed material; Embecco, manufactured by Master Builders Inc., or equal.

2.2 GATE HARDWARE

A. Sliding Gate:

1. Lower and Rear Wheels: 6-inch diameter "V" grooved steel wheel running on 3/4-inch x 3/4-inch steel angle and plate assembly, with anchors for anchorage to 6 inches wide x 6 inches high concrete footing. Fabricate wheel box of galvanized bent steel plate and weld to sliding gate frame.

2. Upper Rear Wheels: Flanged steel wheels, located near top of gate frame in vertical alignment, complete with lubricating fittings; to run on top tracks. Steel housing inside attached to wall or fence.

3. Wheel Shafts: Tool steel, threaded as necessary for nuts and suitable size.

4. Top Track, Wheel Housing And Mounting Bracket: As per ASTM A36 and ASTM A123, inverted galvanized steel channel to run on by the flanged steel wheel; galvanized steel channel housing to conceal the steel wheel from view; top track and steel housing and mounting bracket are a one piece extension; mounting bracket with suitable fasteners for attachment to fence post, and with necessary end stops.

5. Locking Device: Heavy-duty device with provisions for padlocking from both side of the gate as directed by the CITY.

6. Gate Pulls: Provide bent rod gate pulls, weld to each side of leading vertical member of each gate frame assembly.

B. Swinging Gate:

1. Hinges: Heavy-duty ball and socket, industrial service, offset type, minimum 3 inch in width.

2. Latch for Single Swing Gate: Heavy malleable iron, fork type with provisions for padlocking.

3. Latch for Double Swing Gate: Heavy center drop rod latch assembly with provisions for padlocking. For hold-back sleeves provide steel pipe of diameter greater than the drop rod diameter.

2.3 GATE CONSTRUCTION

A. Sliding Gate Frame Construction:

1. All welded assembly of 1 7/8-inch O.D., galvanized steel pipe, consisting of two or more panels wide, All welded joints to be ground smooth and coated with a galvanizing repair material in accordance with reviewed Shop Drawings.

2. Frame Bracing: Brace each panel with galvanized steel truss rods (with galvanized turn buckles).

3. Fabric: Place on exterior side of gate frame assembly.

4. Barbed Wire: Stretch taut 3 lines and securely fasten to vertical gate frame members.

B. Swinging Gate Frame Construction:

1. All welded, fabricated of 1 7/8-inch O.D., galvanized steel pipe; all welded joints ground smooth and coated with a galvanizing repair material; all in accordance with reviewed Shop Drawings.

2. Frame Bracing: Use galvanized steel truss rods with galvanized turn buckles as hereinbefore specified.

3. Fabric: Same as hereinbefore specified for fencing, placed on exterior side of gate frame, as indicated, in same manner as specified for fencing.

PART 3 - EXECUTION

3.1 SURFACE CONDITIONS

A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the work. Do not proceed until detrimental conditions are corrected.

3.2 CHAIN LINK FENCE INSTALLATION

A. General: By manufacturer, or his authorized representative, in accordance with manufacturer's specifications and best practice.

B. Post Setting: In concrete foundations or in preformed holes in walls; minimum 36 inches depth and 12 inch diameter foundation as indicated for gate post; minimum 30 inches depth and 12 inches diameter foundation as indicated for line posts; minimum 24 3/8

inches diameter x 12 inches deep performed hole and minimum 5 7/8 inches diameter x 12 inches deep performed hole in wall as indicated for the line post and end/corner posts, respectively; set plumb, at proper height and spacing in straight alignment for uniform installation.

1. Excavating and Backfilling: Neatly and accurately excavate foundation holes for posts as indicated. Compact subgrade or any loose material. Solidly and firmly backfill around completed concrete foundations with excavated earth materials to finish grade or to proper elevation, as necessary for required paving as applicable.

2. Concrete Foundation: Standard 3250 psi concrete conforming to the Los Angeles City Building Code and applicable Amendments; finish top of foundation smooth and even, sloped to shed water and with edges at finish grade of adjoining ground or paved surfaces. Allow concrete to attain at least 75% of its 28-day strength before installation of fencing components.

3. Secure line and end/corner posts set in specified diameter preformed hole with minimum one (1) inch of an approved non-shrink type grout cover all around. Top of grout shall be □ inch above the wall surface and shaped or sloped to drain water away from the post. For concrete masonry unit wall, minimum 8 inches wide concrete block shall be used.

C. Top Rail: Extend through post eye-top caps and attach ends to corner, gate, and/or terminal (end) posts.

D. Horizontal and Diagonal Bracing:

1. Horizontal Rail: Locate mid-height in fencing panels adjacent to gates, corner, and terminal (end) posts.

2. Diagonal Bracing: Extend from the joint of horizontal brace (with adjacent post) diagonally to the base of gate, corner, or terminal post.

E. Fabric:

1. Install tension wire at bottom fabric before stretching fabric or attach to each post with ties. The fabric shall be installed so that the top edge projects over the top rail of the fence and the bottom tension wire or bottom rail by 3 inches. The bottom of the fabric shall extend to within 2 inches of the natural ground or final grade. High points of ground shall be excavated to clear the bottom of the fabric and depression shall be filled and compacted to within 2 inches of the bottom of fabric. Secure fabric to tension wire with galvanized clip rings or wire ties spaced not more than 18 inches apart.

2. Tightly stretch and secure to line posts, with adequate tie wires, space maximum 18-inches apart or as recommended by manufacturer.

3. Secure fabric to top rail, terminal (end) and gate posts by means of heavy, galvanized steel bands bolted to 1/4-inch x 3/4-inch tension bars passing vertically through full height of fabric 16 inches interval.

F. Extension Arms: Set at 45-degree angle with vertical on inside of fence on all posts. On gates and in line posts adjacent to gates, set extension arms in vertical position to avoid interference with gate operation.

G. Barbed Wire: Stretch taut 3 lines and securely fasten within slots on extension arms by means of heavy galvanized wire pins.

3.3 SLIDING GATE INSTALLATION

A. Tracks: Securely attach top and floor tracks in level and parallel position on fencing or structure, or concrete footing, as indicated on the Drawings, with adjustable clamp on wheel stops at each end of each track.

B. Gate Frames: Properly hang on tracks and adjust for smooth and trouble-free operation; to be centered on and roll on concrete pad full length of front wheel run.

3.4 SWINGING GATE INSTALLATION

A. Properly hang or set gate(s) in plumb and level position for full opening without interference and adjust the hardware for smooth and trouble-free operation; complete with heavy center drop and cane bolt, hold-back sleeves properly located and concreted in place. Concrete foundation for sleeve shall be domed or sloped at top to shed water and with edges at finish grade or adjoining ground or paved surfaces.

3.5 MISCELLANEOUS

A. Use U-shaped tie wires, conforming to diameter of pipe to which attached, clasping pipe and fabric firmly with ends twisted at least two full turns.

B. Bend ends of wire to minimize hazards to persons and clothing.

C. Fasteners:

1. Install galvanized nuts for tension band and hardware bolts on side of fence opposite fabric side.

2. Peen the ends of bolts to prevent removal of the nuts.

D. Repairs: Repair fencing coatings damaged in the shop or during field erection using a hot-applied repair compound applied in accordance with repair compound manufacturer's recommendations as approved by the City Engineer; at no added cost to the City.

E. Cleanup: Remove from the site all rubbish, all equipment, unused materials, temporary structures and/or facilities no longer required.

END OF SECTION

SECTION 32 31 18

SECURITY STEEL PICKET FENCING AND GATES

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Furnish and install security steel picket fending and gates as indicated on the drawings and specified.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product incorporated to be in the fencing system.

B. Shop Drawings: For fencing and gates. Include plans, elevations, sections, gate locations, post spacing, mounting attachment details, and anchoring details

C. Samples: For each finishing material and for each color specified.

1.4 CLOSEOUT SUBMITTALS

A. Maintenance Data: For gate operators to include in maintenance manuals.

1.5 MOCKUPS

A. Mockups: Build mockups of fencing and gates to set quality standards for fabrication and installation.

1. Build not less than 10-foot length of fence complying with requirements.

2. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

B. Accessibility Minimum Requirements:

1. Gates that are part of the accessible route shall meet all the requirements of an accessible door in compliance with the CBC Section 11B-404.

2. The levels of lever actuated latches or locks for accessible gates shall be curved with a return to within ½“ of the gate surfaces to prevent catching on the clothing or persons. California Referenced Standards Code. T-24 Part 12, Section 12-10-202, Item (f).

3. Swing gate surfaces within 10” of the ground shall have a smooth surface on the push side extending the full width of the door and gate. Parts creating horizontal or vertical joints in these surfaces shall be within 1/16” of the same plane as the other and be free of sharp or abrasive edges. Cavities created by adding kick plates shall be capped. CBC Section 11B-404.2.10

1.6 REFERENCES

A. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy Coated (Galvannealed) by the Hot Dip Process

B. ASTM A924/A924M - Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot Dip Process

C. ASTM A1011/A1011M - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength and High-Strength Low-Alloy with Improved Formability

D. ASTM B117 - Practice for Operating Salt Spray (Fog) Apparatus

E. ASTM D523 - Test Method for Specular Gloss

F. ASTM D822 - Practice For Conducting Tests On Paint and Related Coatings and Materials Using Filtered Open-Flame Carbon-Arc Light and Water Exposure Apparatus

G. ASTM D1654 - Test Method for Evaluation of Painted or Coated Specimens Subjected to Corrosive Environments

H. ASTM D2244 - Test Method for Calculation of Color Differences From Instrumentally Measured Color Coordinates

I. ASTM D2794 - Test Method for Resistance of Organic Coatings to The Effects of Rapid Deformation (Impact)

J. ASTM D3359 - Test Method for Measuring Adhesion by Tape Test

1.7 PRODUCT HANDLING AND STORAGE

A. Upon receipt at the job site, all materials shall be checked to ensure that no damage occurred during shipping or handling.

B. Materials shall be stored in such a manner to ensure proper ventilation and drainage, and to protect against damage, weather, vandalism, and theft.

PART 2 - PRODUCTS

2.1 SECURITY STEEL PICKET FENCING AND GATES

A. Subject to review of action submittals by the Architect for compliance with requirements, provide the products indicated on the drawings, or an acceptable substitution by one of the following:

1. Ameristar Fence Products Inc.
2. Grand Fence Co.
3. Republic Fence Co.
4. Herrera Ornamental Ironworks.
5. King Fence Co.
6. United Steel Fence Co.
7. Magnum Fence & Security Co.

B. Steel material for fence framework (i.e., tubular pickets, rails, and posts), galvanized after forming, shall conform to the requirements of ASTM A1011/1011M, with a minimum yield strength of 50,000 psi (344 MPa). The exterior shall hot-dip galvanized with a 0.45 oz/ft2

(138 g/m2) minimum zinc weight. The interior surface shall be coated with a minimum 81% nominal zinc pigmented coating, 0.3 mils (0.0076mm) minimum thickness.

C. Steel material for fence framework (i.e., tubular pickets, rails, and posts), when galvanized prior to forming, shall conform to the requirements of ASTM A924/924M, with a minimum yield strength of 50,000 psi (344 MPa). The steel shall be hot-dip galvanized to meet the requirements of ASTM A653/A653M with a minimum zinc coating weight of 0.90 oz/ft2 (276 g/m2), Coating Designation G-90.

D. Material for fence pickets shall be 14 gauge. tubing. The cross-sectional shape of the rails shall conform to the manufacturer's standard design dimensions and profiles. Picket retaining rods shall be galvanized steel. Posts shall be a minimum 12 gauge. High quality PVC grommets shall be supplied to seal all picket-to-rail intersections.

E. Pickets, rails, and posts shall be precut to designed lengths. Rails shall be pre-punched to accept pickets. Grommets shall be inserted into the pre-punched holes in the rails and pickets shall be inserted through the grommets so that pre-drilled picket holes align with the internal upper raceway of the rails. Retaining rods shall be inserted into each rail so that they pass through the predrilled holes in each picket, thus completing the panel assembly.

F. Completed panels shall be capable of supporting a 600 lb. load (applied at midspan) without permanent deformation. Panels without rings shall be biasable to a 25% change in grade; panels with rings shall be biasable to a 12.5% change in grade.

G. Gates shall be fabricated using matching panel material and gate ends having the same outside cross-section dimensions as the rail. All rail and upright intersections shall be joined by welding. All picket and rail intersections shall also be joined either by welding or by the same retaining rod process used for panel assembly.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install fencing and gates in accordance with the approved shop drawings.

END OF SECTION

SECTION 32 31 19

CORRUGATED METAL FENCING AND GATES

PART 1 - GENERAL

1.1 SUMMARY

A. Furnish and install corrugated metal fencing and gates employing steel tube pickets as indicated on the drawings and specified.

1.2 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.3 ACTION SUBMITTALS

A. Product Data: Submit descriptive information.

B. Shop Drawings: For gates. Include plans, elevations, sections, details, and attachments to other work.

C. Samples: For each fence material and for each color selected by the Architect.

1. Provide Samples 12 inches in length for linear materials.

2. Provide Samples 12 inches square for bar grating and sheet or plate materials.

1.4 CLOSEOUT SUBMITTALS

A. Maintenance Data: Include in maintenance manuals.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: Fabricator of products.

B. Mockups: Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for fabrication and installation.

1. Include 10-foot length of fence complying with requirements.

2. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

PART 2 - PRODUCTS

2.1 CORRUGATED FENCES AND GATES EMPLOYING-STEEL TUBULAR PICKETS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following or an Architect evaluated, accepted and approved substitution:

1. Hill & Smith Inc.
2. Iron Eagle Industries, Inc.
3. Iron World Manufacturing, LLC.
4. Master Halco.
5. Merchants Metals.

6. Virginia Railing and Gates, LLC.
7. Xcel Fence.
8. Equal.

B. Fencing shall comply with ASTM F2589.

C. Pickets: Provide galvanized square steel tubular members manufactured per ASTM A-924/A-924M, having a 45,000 psi (310 MPa) yield strength and hot-dip galvanized per ASTM A653/A653M with a G90 zinc coating, 0.90 oz/ft2 (0.27 kg/M2. Secure each picket to each rail with 1/4" (6 mm) industrial drive rivets, size number 4..

D. Rails: Provide minimum 11 gauge, 0.120" (3.05mm) thick galvanized steel "U" channel per ASTM A-653/A-653M, having a 50,000 psi (344 MPa) yield strength and G90 zinc coating, 0.90 oz/fl2 (o.27 kg/M2). Punch rails to receive pickets and rivets and attach rails to rail brackets with 2 each, 1/4" (6 mm) industrial drive rivets.

E. Posts shall be made of galvanized steel tube, galvanized inside and outside, produced per ASTM A-653/653M -G90 zinc coating, 0.90 oz/fl2 (o.27 kg/M2), steel to have 45,000 psi (310 MPa) yield strength.

F. Finish coatings shall be as standard with the fence manufacturer, comply with the standards of the Master Painters Institute (MPI), and meeting the performance requirements for each quality characteristics shown below:

COATING PERFORMANCE REQUIREMENTS

Quality Characteristics	ASTM Test Method	Performance Requirements
Adhesion	D3359 – Method B	Adhesion (Retention of Coating) over 90% of test area (Tape and knife
Corrosion Resistance	B117 & D1654	Corrosion resistance over 3,500 hours (Scribes per D1654; Failure mode is accu-mulation or 1/8" coating loss from scribe or medium #8 blisters).
Impact Resistance	D2794	60 inch pound Impact Resistance. (Forward impact using 0.625 ball).
Weathering Resistance	D822, D2244, & D523 (600 Angle Method)	Weathering Resistance over 1,000 hours (Failure mode is 60% loss of gloss or color variance of more than 3.0 delta-E color units).

2.2 CORRUGATED SHEET METAL FENCE PANELS

A. Subject to review of action submittals by the Architect for compliance with specified requirements, metal wall panels shall be by the manufacturer indicated on the drawings or an "or equal" product by one of the following:

1. Berridge Manufacturing Company.
2. IMETCO.
3. AEP-Span.
4. Peterson Aluminum Corporation.
5. Una-Clad Copper Sales, Inc.
6. McElroy Metal Inc.
7. Morin Corp.

B. Fence Wall panel profiles (corrugated As selected by the Architect) and materials shall be one of the following:

1. Galvanized Steel: ASTM A 653, Coating Class G90.

2. Galvalume (Zincalume): Steel sheets coated with 55 percent aluminum and 45 percent zinc/mischmetal by weight, conforming to ASTM A 792, 0.55 ounces per square foot.

3. Aluminum: ASTM B 209, for sheets, alloy 3003-H14 aluminum not less than 0.040 inch thick. For fasteners, clips, and accessories, alloy 6063-T5 extruded aluminum, 0.051 inch minimum thickness.

C. Clips, sections, closures and other accessories: Manufacturer's standard, finished to match wall sheets where exposed.

2.3 FINISHES (AS SELECTED BY THE ARCHITECT)

A. Corrugated Fence Panels and Accessories:

1. Two-Coat Fluoropolymer: AAMA 621. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

2. Three-Coat Fluoropolymer: AAMA 621. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in both color coat and clear topcoat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

3. Mica Fluoropolymer: AAMA 621. Two-coat fluoropolymer finish with suspended mica flakes containing not less than 70 percent PVDF resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

4. Metallic Fluoropolymer: AAMA 621. Three-coat fluoropolymer finish with suspended metallic flakes containing not less than 70 percent PVDF resin by weight in both color coat and clear topcoat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

5. FEVE Fluoropolymer: AAMA 621. Two-coat fluoropolymer finish containing 100 percent fluorinated ethylene vinyl ether resin in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

6. Siliconized Polyester: Epoxy primer and silicone-modified, polyester-enamel topcoat; with a dry film thickness of not less than 0.2 mil for primer and 0.8 mil for topcoat.

7. Concealed Finish: Apply pretreatment and manufacturer's standard white or light-colored acrylic or polyester backer finish consisting of prime coat and wash coat with a minimum total dry film thickness of 0.5 mil.

2.2 SWINGING GATES

A. Equip swing gates with hardware that complies with the City Building Code. Gates shall always be operable from the inside by simple turn of a lever. The inside lever shall be

protected from unwanted intrusion by steel shields and plates. The outside lever shall be pinned.

B. Hinges: Heavy-duty ball and socket, offset type.

C. Provide ANSI Security Level 5 lockset operable with bitted key having protected front, two cylinders (one cylinder each side), latch bolt retracted by lever from either side, as manufactured by Schlage, Sargent, Marks, or equal. Equip cylinders with hardened guard rings.

D. Frame Construction: All welded framing with welded joints ground smooth.

1. Brace gate frames with truss rods or gusset plates to prevent racking.

2.3 STEEL SLIDING GATES

A. Steel: All steel angles, and miscellaneous steel shapes and plates shall conform to ASTM A36.

B. Welding electrodes and Filler Metal: Conform to AWS standards.

C. Machine screws: Conform to Fed Spec FF-S-111.

D. Shop prime all ferrous metal with zine rich primer “Tnemec 99” or equal. Finish paint the gate and accessories at the point of installation after it has been operated successfully. Color shall be as selected by the Architect.

E. Hardware: Provide top guide rollers, bottom wheels, bumpers, pulls track cleaners and other hardware required for a complete and properly operating installation.

F. Wheel Bearings: Provide tapered roller or spherical bearing, either internal or cartridge type. Bearing shall be tightly sealed and equipped with high-pressure grease fittings.

G. Lock: Furnish detachable padlock and chain for temporary locking of the gate. Provide permanent lock cylinders, latches, hasp, or staple, or other locking devices as directed by the Owner.

2.4 MISCELLANEOUS MATERIALS

A. Welding Rods and Bare Electrodes: Select according to AWS specifications for metal alloy welded.

1. For aluminum, provide type and alloy as recommended by producer of metal to be welded and as required for strength and compatibility in fabricated items.

B. Concrete: Normal-weight, air-entrained, ready-mix concrete complying with requirements in Section 033000 "Cast-in-Place Concrete" with a minimum 28-day compressive strength of 3000 psi (20 MPa), 3-inch (75-mm) slump, and 1-inch (25-mm) maximum aggregate size or dry, packaged, normal-weight concrete mix complying with ASTM C 387/C 387M mixed with potable water according to manufacturer's written instructions.

C. Non-shrink Grout: Factory-packaged, non-staining, noncorrosive, nongaseous grout complying with ASTM C 1107/C 1107M and specifically recommended by manufacturer for exterior applications.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install fences and gates according to manufacturer's written instructions.

B. Install fences by setting posts as indicated and fastening rails to posts. Peen threads of bolts after assembly to prevent removal.

C. Post Excavation: Drill or hand-excavate holes for posts in firm, undisturbed soil. Excavate holes to a diameter of not less than 4 times post size and a depth of not less than 24 inches (600 mm) plus 3 inches (75 mm) for each foot (300 mm) or fraction of a foot (300 mm) that fence height exceeds 4 feet (1.2 m).

D. Post Setting: Set posts in concrete at indicated spacing into firm, undisturbed soil.

1. Verify that posts are set plumb, aligned, and at correct height and spacing, and hold in position during setting with concrete or mechanical devices.

2. Concrete Fill: Place concrete around posts and sleeves and vibrate or tamp for consolidation. Protect aboveground portion of posts from concrete splatter.

a. Exposed Concrete: Extend 2 inches (51 mm) above grade. Finish and slope top surface to drain water away from post.

b. Concealed Concrete: Top 2 inches (51 mm) below grade as indicated on Drawings to allow covering with surface material. Slope top surface of concrete to drain water away from post.

3. Posts Set in Concrete: Extend post to within 6 inches (150 mm) of specified excavation depth, but not closer than 3 inches (75 mm) to bottom of concrete.

4. Posts Set into Concrete in Sleeves: Use galvanized-steel pipe sleeves with inside diameter at least 3/4 inch (20 mm) larger than outside diagonal dimension of post, preset and anchored into concrete for installing posts.

a. Extend posts at least 5 inches (125 mm) into sleeve.

b. After posts have been inserted into sleeves, fill annular space between post and sleeve with non-shrink grout, mixed and placed to comply with grout manufacturer's written instructions; shape and smooth to shed water. Finish and slope top surface of grout to drain water away from post.

5. Posts Set into Voids in Concrete: Form or core drill holes not less than 3/4 inch (20 mm) larger than outside diagonal dimension of post.

a. Extend posts at least 5 inches (125 mm) into concrete.

b. Clean holes of loose material, insert posts, and fill annular space between post and concrete with non-shrink grout, mixed and placed to comply with grout manufacturer's written instructions. Finish and slope top surface of grout to drain water away from post.

3.2 GATE INSTALLATION

A. Install gates according to manufacturer's written instructions, level, plumb, and secure for full opening without interference. Secure hardware using tamper-resistant or concealed means. Install ground-set items in concrete for anchorage. Adjust hardware for smooth operation and lubricate where necessary.

B. Adjust gates to operate smoothly, easily, and quietly, free of binding, warp, excessive deflection, distortion, nonalignment, misplacement, disruption, or malfunction, throughout entire operational range. Confirm that latches and locks engage accurately and securely without forcing or binding.

END OF SECTION

SECTION 32 31 22

SELF CLOSING TRASH ENCLOSURE DOORS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Furnish and install self-closing doors for trash enclosure as indicated on the drawings and specified.

1.3 ACTION SUBMITTALS

A. Submit dimensioned shop drawings.

PART 2 - PRODUCTS

2.1 SELF CLOSING TRASH ENCLOSURE DOORS

A. Plates, shapes, and bars shall conform to ASTM A36.

B. Doors shall be self closing. Steel sheets shall be hot- or cold-rolled, in the profile indicated on the drawings. Sheets shall be not lighter than the metal gage or thickness indicated on the drawings.

C. Submit data for hardware approval. Provide pad lockable cane bolts for each door, and 3 hinges per jamb.

D. Corner joints shall be coped or mitered, well-formed, and in true alignment. Joints exposed to the weather shall be formed and fabricated to exclude water.

E. Primer: Shop prime doors with "Tnemec Series 10" or equal, applied to a minimum dry film thickness of 2.0 mils.

F. Finish paint doors 2 coats of industrial enamel, color as selected by the Architect.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install doors in accordance with the approved shop drawings. The frames shall be drilled and tapped as required for finish hardware.

B. Doors shall be hung to be self-closing but to remain open when set in the fully open position. Hinges shall operate freely without excessive looseness.

END OF SECTION

SECTION 32 51 30

ASPHALTIC CONCRETE PAVING

PART 1 - GENERAL

1.1 SUMMARY

A. All labor, materials and equipment necessary to furnish and install recycled asphalt concrete as indicated on the drawings and specified including:

1. Concrete wheel bumpers.
2. Parking lot striping, letters and arrows.
3. "Street Work" asphaltic concrete repairs.
4. Parking lot paving.

B. Related Sections: Documents affecting Work of this Section include, but are not necessarily limited to the GENERAL CONDITIONS, SUPPLEMENTARY CONDITIONS and Sections in DIVISION 1 - GENERAL REQUIREMENTS of these Specifications.

C. LEED Goals: The project requirements are to use materials with recycled content such that the sum of the postconsumer recycled content plus ½ of the preconsumer content constitutes at least 10%, based on cost, of the total value of the materials in the project.

1.2 QUALITY ASSURANCE

A. Employees: Use adequate number of skilled Contractor's employees who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for the proper performance of the work of this Section.

B. Asphaltic Concrete Producers Qualifications: Use only materials furnished by a bulk asphaltic concrete producer regularly engaged in production of recycled asphaltic concrete.

C. Materials and Installations: In accordance with the following documents referred to as the "Standard Specifications". "Standard Specifications for Public Works Construction, Current Edition, City of Los Angeles Department of Public Works/Standard Plan S-610, Notice to Contractors-Comprehensive, City of Los Angeles current revision, Department of Building and Safety, General Specifications, Form B-164 Standard Drawings."

1.3 SUBMITTALS

A. Product Data:

1. A recent mix Design for recycled asphaltic concrete prepared by a materials laboratory under the direction of a California Registered Engineer or a standard mix design proven in actual performance.

2. The Contractor shall have the option of utilizing asphalt concrete removed under the contract, if any, or old asphalt concrete from an existing stockpile in order to meet the LEED goals listed above. If removed from an existing stockpile, the old asphalt concrete used must be uniform in gradation, asphalt content, and asphalt viscosity. Should the Contractor elect to use 20 percent or less of recycled materials, the recycled materials need not be uniform as long as the asphalt

concrete meets the specifications for the class specified. Recycled materials shall not be used in asphalt concrete Class D.

3. Proportions of Materials: For asphalt concrete Class A, B, E, F, and G produced using recycled asphalt materials and placed in areas other than the wearing course of the traveled lane, the gradation for the U.S. No. 200 sieve is revised as follows:

Proportions of Materials, Maximum Passing US # 200:
50%-60% Recycled Material 8.0%
61%-70% Recycled Material 9.0%

9-03.8(6)A Basis of Acceptance
Aggregate passing No. 200 sieve...+2% Note 1
Asphalt cement.....+0.5% Note 2
Note 1--2.0% is less than 50% RAP, 2.5% for 50% RAP or more
Note 2--0.5% if less than 20% RAP, 0.7% for over 20% RAP,
but not less than 50% RAP, 1.0% for 50% RAP or greater.

B. Certificates: Current signed by the materials producer and the asphalt paving subcontractor, stating that materials meet or exceed the specified requirements.

C. Waybills and delivery tickets shall be submitted to the City Engineer during progress of the work. Before the final payment is allowed, the Contractor shall file with the City Engineer certified waybills and certified delivery tickets for all aggregates, reclaimed asphalt pavement, and bituminous materials actually used in construction covered by the contract.

D. Submit a certificate covering recycling agent prior to use.

1.4 DELIVERY STORAGE AND HANDLING

A. Conform to applicable BMP's noted in the SWPPP.

B. Deliver asphaltic concrete to the job-site in canvas covered trucks if necessary to maintain the specified spreading temperature.

C. Mineral aggregates and reclaimed asphalt pavement shall be delivered to the site of the bituminous mixing plant and stockpiled in such manner as to preclude fracturing of aggregate particles, segregation, contamination, or intermingling of different materials in the stockpiles or cold-feed hoppers. Mineral filler shall be delivered, stored, and introduced into the mixing plant in a manner to preclude exposure to moisture or other detrimental conditions.

D. Bituminous materials shall be maintained at appropriate temperature during storage but shall not be heated by application of direct flame to walls of storage tanks or transfer lines. Storage tanks, transfer lines, and weigh bucket shall be thoroughly cleaned before a different type or grade of bitumen is introduced into the system. The asphalt cement should be heated sufficiently to allow satisfactory pumping of the material.

1.5 ENVIRONMENTAL CONDITIONS

A. Apply bituminous primer, paint primer and seal coat only when the ambient temperature is above 50 degrees F. and when the temperature has not been below 35 degrees F. for 12 hours immediately prior to application.

B. Do not apply bituminous materials when the base surface is wet or contains an excess of moisture which would prevent uniform distribution and the required penetration.

C. Construct asphaltic concrete surface course only when the ambient temperature is above 40 degrees F. when the underlying base is dry and when it is not raining.

1.6 PROTECTION

A. Furnish, erect and maintain fences, barrier lights and signs as necessary to adequately protect the public, existing work and work under this Contract as prescribed by the Los Angeles City Department of Building and Safety. Incorporate the WATCH Handbook as applicable.

B. Protect the asphaltic concrete paved areas from traffic until the sealer is set and cured and does not pick up under foot or wheeled traffic.

1.7 ALTERATIONS, REPAIRS AND REPLACEMENT

A. As required for complete construction of the project; materials and construction to match existing adjacent work in quality and appearance and to conform to applicable provisions of these specifications.

1.8 GUARANTY-WARRANTY

A. The Contractor shall and does hereby warrant and guaranty that all work executed under this Contract be free from defects of materials and workmanship for a period of one (1) year from the date of final acceptance of the project by the Board of Public Works, except certain specific items of work, materials and equipment requiring a guaranty or warranty for a greater period of time is specified.

PART 2 PRODUCTS

2.1 MATERIALS

A. Recycled Asphalt Concrete:

1. Recycled asphalt concrete shall consist of reclaimed asphalt pavement, coarse aggregate, fine aggregate, mineral filler, asphalt cement, recycling agent, and approved additives, if required, of the qualities and in the proportions required, and shall conform to the requirements contained SSPWC for non-recycled asphalt concrete.

2. Aggregates shall consist of aggregate contained in the reclaimed asphalt pavement and also include crushed stone, crushed gravel, crushed slag, screening, sand, and mineral filler, as required. The portion of materials retained on the No. 4 sieve shall be known as coarse aggregate, the portion passing the No. 4 sieve and retained on the No. 200 sieve as fine aggregate, and the portion passing the No. 200 sieve as mineral filler. Aggregate gradation will conform to gradation specified in SSPWC. The percentage passing various sieves may be changed by the City Engineer when aggregates of varying specific gravities are used.

3. Coarse aggregate shall consist of clean, sound, durable particles meeting the requirements for recycled aggregates in SSPWC.

4. Fine aggregate shall consist of clean, sound, durable, angular particles produced by crushing stone, slag, or gravel that meet requirements for wear and

soundness specified for coarse aggregate. Fine aggregate produced by crushing gravel shall have at least 90 percent by weight of crushed particles having two or more fractured faces in the portion retained on the No. 30 sieve. This requirement shall apply to material before blending with natural sand when blending is necessary. Quantity of natural sand to be added to the mixtures shall not exceed 15 percent by weight of new aggregate added to the recycled mixture. Natural sand shall be clean and free from clay and organic matter.

5. Mineral filler shall conform to SSPWC.

6. The quantity of reclaimed asphalt pavement used in the recycled mixture shall not exceed 49 percent.

7. New asphalt cement shall conform to the requirements of SSPWC.

8. Recycling agents used in preparation of recycled mixtures shall have a proven record of satisfactory performance.

B. Aggregate Base: As specified in the EARTHWORK.

C. Soil Sterilant: Tinted for visual identification, shall be as follows subject to EPA approval:

1. Pacific Coast Borax Co.: "Polyborchlorate"
2. Amspray Corp. "Pavex"
3. Elanco "Spike 80W".
4. United States Borax Corp. "Polyborchlorate".

D. Paint Binder: Standard Specifications, Article 203-3 for Classification SS1H anionic asphalt emulsion.

E. Asphalt Binder: Provide asphalt binder grade conforming to relevant provisions of Section 203 - Bituminous Materials of the Standard Specifications for Public Works Construction. Unless otherwise shown on plans asphalt binder grade shall conform to the following

Area	**Binder Grade**
South Coast (Los Angeles Basin, Santa Clarita Valley, Santa Monica Mountains)	PG 64-10

F. Asphalt Concrete Surface Course: Standard Specifications Article 203-6 for hot plant mixed aggregate and asphalt, produced by a commercial asphalt paving plant, except as modified hereinafter:

1. Asphalt Cement: Standard Specification, Article 203-1, for steam refined paving asphalt, AR8000 Viscosity Grade, mixed with the aggregate at a rate specified in Article 203-6.3.

G. Surface Sealer: AASHTO Designation SS-1h emulsion type.

H. Concrete Materials: Materials, form work and reinforcing shall be furnished in accordance with applicable requirements specified in Section 0330O0 - CAST-IN-PLACE CONCRETE.

I. Parking Lot Striping and Markings: Material shall be fuller "Traffic Line Paint" or J.E. Bauer Co. "Zonelac Traffic Paint" or Sinclair "Traffic-Lack No. 70". Color shall be white

except that handicapped emblem and adjacent parking stall lines shall be "blue" color". Parking lot striping shall be per Section 210 and 310-5.6 of the Standard Specifications. The coating shall be minimum 15 mil thick.

J. Headers and Stakes: Redwood, Construction Grade, in dimensions shown on the Contract Drawings or as required for the use where dimensions are not shown on the Drawings in conformance to Standard Specifications Section 302.5.4. Headers to be 2-inch x 6-inch size with 2-inch by 4-inch stakes.

1. LEED Goal: Project requirements are that 50% of the wood-based products used in the building be certified in accordance with the Forest Stewardship Council Guidelines.

K. Concrete Wheel Bumpers:

1. Units: Precast reinforced concrete bumpers.

2. Size: Four feet long; 5 1/4 inches high x 6 3/4 inches wide with sides chamfered so that top side will be 2 ¼ inches wide as indicated on the Contract Drawings:

3. Materials:

a. 3500 psi concrete at 28 days.

b. Steel drift pin or pipe (3/4-inch diameter by 24-inches long), two required for each unit.

c. No. 4 reinforcing bar by length of unit, 2 required.

4. Construction:

a. Forms and reinforcement in conformance with requirements of Concrete Section 03300, including 28-day curing period prior to delivery.

b. Holes formed for drift pins; located 4-inches from each end of unit; reinforcing to run full length of the unit.

c. Finished to simulate poured-in place concrete; without rock pockets, broken corners and other defects.

5. Curing: Allow units to cure full 28 days before installation.

2.2 PROPORTIONING OF MIXTURE

A. The Job Mix Formula (JMF) for the bituminous mixture shall be furnished to the Contractor to the City Engineer for approval. No payment will be made for mixtures produced prior to the approval of the JMF. The JMF shall indicate the percentage of each aggregate and mineral filler, the percentage of reclaimed asphalt pavement, the percentage of bitumen, and the temperature of the completed mixture when discharged from the mixer. Tolerances are given in for asphalt content, temperature, and aggregate grading for tests conducted on the mix as discharged from the mixing plant; however, the final evaluation of aggregate gradation and asphalt content will be based on the ACCEPTABILITY OF WORK. Recycled asphalt mix that deviates more than 25 degrees from the JMF shall be rejected. The JMF may be adjusted during construction to improve paving mixtures, as directed, without adjustments in the contract unit prices.

PART 3 - EXECUTION

3.1 SURFACE CONDITIONS

Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the work. Do not proceed until detrimental conditions are corrected.

3.2 FINAL PREPARATION OF SUBGRADES

A. In pavement areas, the upper fill soils shall be overexcavated to a depth of at least 2 feet below the existing grade or at least 18-inches below the bottom of the proposed pavement section, whichever is deeper. The exposed soils shall be scarified, moisture conditioned, and recompacted to a relative compaction of at least 90 percent relative compaction (ASTM D 1557-91). The excavated materials or approved fill material shall be compacted to a minimum of 95 percent relative compaction. All aggregate base material shall be compacted to at least 95 percent relative compaction (ASTM D 1557-91) prior to placing pavement. Base material shall conform to the requirements for "Crushed Miscellaneous Base Materials", Section 200-2.4 of the 1997 Standard Specifications for Public Works Construction ("Green Book").

B. Laboratory testing results indicated the near-surface silty soils have an R-value between 20 and 21. Based on an R-value of 20 and 21 for the pavement subgrade soils, and Traffic Index (TI) values of 5.0 through 6.0 for the parking areas and access lanes, the following preliminary recommendations for flexible pavement should be complied with:

		Pavement Thickness (inches)	
Pavement Description	Traffic Index (TI)	Asphalt Concrete	Crushed Miscellaneous Base (Min. R-Value=80)
Car Drive Areas	5	2.5	12
Parking Areas	5	2.5	12
Fire Truck Traffic	6	4	15

Crushed miscellaneous base shall satisfy the specifications contained in the Standard Specifications for Public Works Construction, for gradation and should have a minimum R-value of 80. With the addition of recycled materials per Section 02220 – EARTHWORK, this material complies with the LEED goals listed above. All gradation and R-Value shall be confirmed by Geotechnical Engineer during construction. All base materials shall be compacted to a minimum of 95% of the maximum dry density per ASTM D-1557.

3.3 PLACEMENT OF BASE COURSES (In accordance with Section 301-2 of the "Standard Specifications")

A. Base:

1. Spread the specified base material to a thickness providing the compacted thickness shown on the Drawings.

2. Compact to 95%.

B. Just prior to placement, the upper 18-inches of the subgrade soil, whether fill or natural shall be compacted to 90% relative compaction in accordance with Section 301-1 of the "Standard Specifications".

C. Thickness Tolerance: Provide the compacted thicknesses shown on the Contract Drawings within a tolerance of minus 0.0" to plus 0.5".

D. Smoothness Tolerance: Provide the lines and grades shown on the Contract Drawings within a tolerance of 3/8" in ten feet.

1. Deviations: Correct by removing materials, replacing with new materials, and reworking or recompacting as required.

E. Moisture Content: Use only the amount of moisture needed to achieve the specified compaction.

3.4 CONSTRUCTION OF RECYCLED ASPHALT CONCRETE PAVING:

A. Install in accordance with the "Standard Specifications for Public Works Construction", latest Edition.

1. Transportation from paving plant to site shall be in trucks having tight, clean, smooth beds lightly coated with an approved releasing agent to prevent adhesion of mixture to truck bodies. Excessive releasing agent shall be drained prior to loading. Each load shall be covered with canvas or other approved material of ample size to protect mixture from weather and prevent loss of heat. Loads that have crusts unworkable material or have become wet will be rejected. Hauling over freshly placed material will not be permitted.

2. Surface of previously constructed base course shall be sprayed with a coat of bituminous prime coat material conforming to SSPWC.

3. Contact surfaces of previously constructed pavement, curbs, manholes, and other structures shall be sprayed with a thin coat of bituminous tack coat material conforming to SSPWC.

4. Bituminous courses shall be constructed only when the base course or existing pavement has no free water on the surface. Recycled asphalt mixtures shall not be placed without ample time to complete spreading and rolling during daylight hours.

5. Rolling shall begin as soon after placing as mixture will bear roller without undue displacement. Delays in rolling freshly spread mixture will not be permitted. After initial rolling, preliminary tests of crown, grade, and smoothness shall be made by the Contractor. Deficiencies shall be corrected so that finished course will conform to requirements for grade and smoothness specified herein. Crown, grade, and smoothness will be checked in each lot of completed pavement by the City Engineer for compliance with the contract requirements. After the Contractor is assured of meeting crown, grade, and smoothness requirements, rolling shall be continued until a mat density of 98.0 to 100.0 percent and a joint density of 96.5 to 100.0 percent of density of laboratory-compacted specimens of the same mixture are obtained.

6. Mixtures that become contaminated or are defective shall be removed to the full thickness of course. Edges of the area to be removed shall be cut so that sides are perpendicular and parallel to direction of traffic and so that edges are vertical. Edges shall be sprayed with bituminous tack coat materials. Fresh paving mixture shall be placed in the excavated areas in sufficient quantity so that finished surface will conform to grade and smoothness requirements. Paving

mixture shall be compacted to the density specified hereinbefore. Skin patching of an area that has been rolled will not be permitted.

7. The City Engineer reserves the right to sample and test any area which appears to deviate from the specification requirements. Apply suitable binder continuously on concrete surfaces to which asphalt concrete is placed, abutted or joined to provide tight bond at joints, which shall be neat, straight-line and close.

B. Thickness: Thickness as indicated on the Contract Drawings.

C. Flood Tests: After completion of the paving and prior to acceptance of the work, a water flood test shall be made in the presence of the Inspector. The flooding shall be done by water tank truck. All depressions, where the water ponds to a depth of more than 1/8-inch shall be filled or slope shall be corrected to provide proper drainage to catch basins. Filling shall be done with hot materials only. The edges of the fill shall be feathered and smoothed so that the joint between the fill and the original surfacing is invisible.

3.5 APPLICATION OF SEAL COAT

A. Prepare the surfaces, mix the seal coat material, and apply in accordance with the manufacturer's recommendations as approved by the City Engineer.

B. Achieve a finished surface seal which, when dry and thoroughly set, is smooth, tough, resilient, of uniform black color, and free from coarse textured areas, lap marks, ridges, and other surface irregularities.

3.6 PARKING AREA STRIPING AND MARKINGS

A. Materials: As herein before specified.

B. Lines: 4-inches wide.

C. Arrows: 12-inch stroke, with proportionate head.

D. Words: 24-inches high, 4-inch and 2-inch strokes as noted on the Contract Drawings.

E. Disabled Emblem: As noted on the Contract Drawings.

F. Preparations: All surfaces to be free of dirt, grease or other foreign materials.

G. Application: Apply one heavy undiluted coat with traffic line painting equipment in locations indicated on the Contract Drawings in uniform coverage, free from light spots and with all edges clean-cut, straight line and true.

3.7 CONCRETE WHEEL BUMPERS

A. Located as indicated on the Contract Drawings.

B. Secure bumpers in place with steel drift pins, two per bumper, driven to at least 1/4-inch below top surface of unit; fill holes with Thiokol base caulking compound or nonshrink "Por-Rok" grout or equal.

3.8 "STREET WORK" ASPHALTIC CONCRETE REPAIRS

A. Required: As necessary to accommodate construction of new curbs, gutters and driveways as indicated on the Contract Drawings; as necessary due to excavation, trenching and utility connections.

B. Application: Upon completion of all work within existing asphalt concrete paved areas, Contractor shall repair the existing asphalt concrete paving conforming to requirements of the "Standard Specifications" and Bureau of Engineering standards as follows:

1. Properly prepared sub-base and aggregate base using existing removed aggregate base materials as approved by the City Engineer, to match existing adjoining work.

2. Soil Sterilization: Apply weed killer (soil sterilant) on areas to be paved with asphalt concrete; soil sterilant to be applied recommended by the manufacturer; Contractor shall certify in writing that material has been applied.

3. Tack coat surfaces of the existing asphalt concrete surfaces as per 302-5.4 of the "Standard Specifications" over which new materials will be laid or edges of existing saw cut asphalt concrete and/or concrete against which new asphalt concrete will be placed, with suitable grade asphalt or asphalt emulsion (Fed. Spec. SS-1h); terminate tack coat or concrete surfaces at top asphalt concrete paving.

4. Lay new asphalt concrete paving conforming to Section 203-6 of the "Standard Specifications" to match adjoining work using material of a heavier density than the "in-place" adjacent work. Use hot smoothing iron to obtain inconspicuous, straight and flush joint lines. Properly grade to provide the desired drainage as indicated on the Contract Drawings.

5. Restore any removed striping or curb markings to original new condition.

END OF SECTION

SECTION 32 52 00

PORTLAND CEMENT CONCRETE PAVING

PART 1 GENERAL

1.1 SUMMARY

A. The requirements of the "General Conditions of the Contract" and of Division 1, "General Requirements", shall apply to all work in this Section with the same force and effect as though repeated in full herein.

B. LEED goal #1: The project requirements are to use a minimum of 25% of the building materials that contain in aggregate a minimum weighted average of 20% post-consumer and /or 40% of post-industrial recycled content.

C. LEED goal #2: The project requirements are to use light-colored materials (with an SRI of at least 29) for 50% of the site's non-roof impervious surfaces.

1.2 SUBMITTALS

A. The specific submittal requirements of this Section shall be guided by Division 1.

B. Product Data: The Contractor shall submit manufacturers' catalog cuts, or a typed listing of all products used in this Section.

C. Shop Drawings: Contractor shall submit Shop Drawings for all reinforcing steel and accessories in accordance with ACI 315.

D. Laboratory and Cement Test Reports: Submit copies of laboratory test reports for concrete materials and a certificate with each concrete mixer truck, stating: mix design, cement quantity, water, fine and coarse aggregate and color additives.

1.3 SCOPE OF WORK

A. Furnish all materials, labor, transportation, services, and equipment necessary to install concrete paving as indicated on the Drawings, the City of Los Angeles Standards, the Standard Specifications for Public Works and as specified herein.

B. Work included in this Section: Concrete paving on-grade.

1.4 DEFINITIONS

A. The word Owner's Authorized Representative as used herein shall refer to the City of Los Angeles.

1.5 REQUIREMENTS OF REGULATORY AGENCIES

A. All Federal, State, and local laws and regulations governing this work are hereby incorporated into and made part of this Section. When this Section calls for certain materials, workmanship or a level of construction that exceeds the level of Federal, State, or local requirements, the provisions of this Section shall take precedence.

1.6 APPLICABLE STANDARDS

A. The specifications and recommended practices of the American Concrete Institute (ACI), American Society for Testing and Materials (ASTM), the Standard Specifications for Public Works (Green Book), and the Uniform Building Code (UBC) referred to in this specification with their individual designations are to be considered part of this Specification. The latest revision of each recommended practice or specification shall apply.

1.7 QUALITY CONTROL

A. Manufacturer's Directions: Manufacturer's directions and drawings shall be followed in all cases where the manufacturers of articles used in the Section furnish directions covering points not shown in the Drawings and Specifications.

B. Permits, Fees, Bonds and Inspections: Permits, Fees, Bonds and Inspections are covered in Division 1.

1.8 INSPECTION OF THE SITE

A. Verify conditions at site that affect work of this Section, and take field measurements as required. Report any major discrepancies between drawings and field dimensions to the City Engineer's prior to commencing work.

1.9 ON-SITE MOCK-UPS

A. Furnish one 5-foot x 5-foot x 3 1/2-inch sample of each type of concrete finish and color specified in this Section and on the Drawings. Samples are to contain all proposed jointing. Locate the samples in a safe and convenient location. Approved samples shall be standards for finishes in later concrete work.

B. Completely remove the mock-up from the site upon completion of the project at no cost to the Owner.

1.10 PROJECT CONDITIONS

A. The Contractor shall keep his work area clean, and in a safe and workmanlike condition so that rubbish, waste and debris do not interfere with the work of other trades.

1.11 PRODUCT HANDLING

A. Store materials in a dry and protected location. Protect from rusting, deformation, staining and moisture damage.

B. Any cement delivered to job shall be packed in strong paper or jute bags with brand name and manufacturer's name stamped thereon. Cement shall be stored under cover and should it become wet or show any signs of caking or deterioration of any kind, it shall be immediately removed from the site. Concrete materials shall be protected from contamination.

C. Brand of cement or source of aggregate shall not be changed during course of work without prior written permission of the City Engineer.

D. All cement and cement products shall be controlled by the contractor to prevent run off from the site.

1.12 COORDINATION

A. The Contractor shall notify the General Contractor and all other contractors related to the installation of his Work in ample time, so as to allow sufficient time for those contractors to perform their portions of the Work.

1.13 GUARANTY-WARRANTY

A. The Contractor shall and does hereby warrant and guaranty that all work executed under this Contract be free from defects of materials and workmanship for a period of one year from the date of final acceptance of the project by the Board of Public Works, except certain specific items of work, materials and equipment requiring a guaranty or warranty for a greater period of time is specified.

PART 2 PRODUCTS

2.1 PRODUCTS AND MATERIALS

A. Products and materials shall meet City of Los Angeles Standards and the Standard Specifications for Public Works and the following.

B. Concrete, Mortar and Related Materials: To conform to applicable provisions of Section 201 - "Concrete, Mortar and Related Materials" of the Standard Specifications for Public Works Construction, except as modified herein.

1. Concrete 28 day compressive strength shall be indicated on the drawings but not less than 2,500 psi unless specified otherwise.

2. Reinforcing Mesh: ASTM A185, 4x4/W1.4 x W1.4 welded wire mesh, furnished in flat sheets.

3. Expansion Joint Filler: Preformed expansion joint filler (bituminous type) ASTM D994.

4. Rebars shall be as specified in Section 032000.

C. Form Materials

1. Side forms: Douglas fir, Construction grade or better or metal forms.

2. Stakes: Douglas fir, Construction grade or better or metal stakes.

PART 3 EXECUTION

3.1 EXECUTION

A. The Contractor shall provide all materials, labor, transportation, services and equipment to furnish and install Portland cement concrete paving in accordance with City of Los Angeles Standards and the Standard Specifications for Public Works (Green Book).

B. The Contractor shall provide all materials, labor, transportation, services and equipment to furnish and install jointing in the Portland cement concrete paving as indicated on the Drawings and as specified herein.

C. Concrete pavements shall be provided as shown on the plans and in trash collection areas. For traffic indexes of 5.0, an R-value of 9 and a minimum 28-day compressive

strength of 3,500 pounds per square inch, the concrete pavement shall have a minimum thickness of 6 inches. Base material shall conform to the requirements of "Crushed Miscellaneous Base Materials", Section 200-2.4 of the 1997 Standard Specifications for Public Works Construction ("Green Book").

3.2 FINISHES

A. Light Sandblast Finish

1. After surface water disappears and floated surface is sufficiently hardened, steel trowel and re-trowel to smooth surface. After concrete has set enough to ring trowel, retrowel to a smooth uniform finish free from trowel marks or other blemishes.

2. Provide sandblasting to a light finish. The wet coefficient of friction shall be a minimum of 0.60 on level surfaces and a minimum of 0.80 on ramped surfaces. Care shall be taken to provide even and consistent strokes with the air nozzle to minimize pockmarking the surface.

3. Provide necessary protection of adjacent improvements and landscaping from direct contact with sand particles. Any damage to adjacent improvements shall be repaired or replaced in kind.

4. Prevent runoff from site and provide clean up per Division 1 requirements.

3.3 JOINTING

A. Isolation Joints

1. Shall be constructed in concrete paving as shown on the Drawings or as specified herein. 1/2-inch thick felt expansion joint material shall extend the full depth of the concrete being placed. The top of joint shall be flush with the specified grade.

2. All expansion joint filler strips shall be installed vertically, and extend to the full depth and width of the work in which they are installed, and be constructed perpendicular to straight curb or radially to the line of the curb constructed on a curve. During placing and tamping of the concrete, the expansion joint shall be held rigidly and securely in proper position.

3. Foam expansion joint material, 1/2-inch thick x 3 maximum inches high with 1/2-inch high removable portion, (to be removed prior to sealing). Install per manufacturer's instructions. Deck-O-Foam is available from DCF Company, 13340 South Central Avenue, Los Angeles, California 90059, (213) 636-1214 or approved equal.

4. Isolation joints shall be provided at all joints with vertical surfaces, manholes, valve boxes, catch basins and similar structures.

5. Isolation joints shall be provided at 50' on center both ways within the field of paving.

6. Caulking to be two-part polyurethane, non-sagging compound. Color of caulking shall match color of adjacent concrete. Install per manufacturer's instructions.

B. Sawcut Control Joints

1. Width shall be 1/4 inch. Depth shall be as indicated on the Drawings (See exception below). All joints shall be cut in a straight line with minimal over cut. At the edges of all sawcutting, i.e. curbs, walls, bands, etc. hand cut as necessary to achieve minimal over cut. Sawcut joints shall be made after sandblast finish has been applied.

   Exception: Where sawcutting is to be performed over building drain lines, reduce the depth of the joints from 1-1/4 inches to 1/2 inch.

2. Sawcut control joints shall be provided as shown on the drawings, and at a minimum of 10' maximum on center both ways within the filed of paving.

3.4 CLEANUP

A. Upon completion of the work under this Section, the Contractor shall remove all rubbish, waste and debris resulting from his operations offsite or as directed by the City Engineer. Remove all equipment and implements of service, and leave the entire work area in a neat and clean condition as accepted by the City Engineer.

B. The contractor shall control the runoff wash down from these activities by vacuum or means to prevent waste discharge from the site.

END OF SECTION

SECTION 32 53 00

PAVEMENT MARKING AND SIGNS

PART 1 GENERAL

1.1 SUMMARY

A. Extent of painted pavement surface striping is shown on the plans.

B. Prepare surface for painting.

C. Layout and obtain approval of the proposed striping before starting work.

D. Provide templates for stenciled lettering and legend painting.

E. Paint surface striping 4" wide, unless otherwise indicated.

F. Clean up.

G. Furnish and install all traffic control signs, posts and delineators.

1.2 RELATED DOCUMENTS

A. The latest adopted edition of the Standard Specifications for Public Works Construction apply to the work of this section.

B. The latest revision to the Cal Trans Traffic Manual applies to the work of this section. Applicable plans are stipulated on drawings.

C. The latest adopted edition of the Caltrans Specifications, Manuals and Standard Plans apply to the work of this section.

1.3 QUALITY ASSURANCE

A. All painted surface striping shall conform to Section 310-5.6 Painting, Traffic Striping, Pavement Markings and Curb Markings of the Standard Specifications for Public Works Construction, latest edition. Where specific items are not addressed in the Standard Specifications, or are required by conditions of a construction permit comply with the State of California Standard Specifications, latest edition, and Caltrans Traffic Manual, latest edition.

B. Submit material list and specifications to engineer and City representative for approval.

1.4 GUARANTY-WARRANTY

A. The Contractor shall and does hereby warrant and guaranty that all work executed under this Contract be free from defects of materials and workmanship for a period of one year from the date of final acceptance of the project by the Board of Public Works, except certain specific items of work, materials and equipment requiring a guaranty or warranty for a greater period of time is specified.

PART 2 PRODUCTS

2.1 MATERIALS

A. Paint for traffic striping, pavement marking and curb marking shall conform to Section 210.16 of the Standard Specifications for Public Works Construction. Paint shall be vinyl-epoxy emulsion based, water thinned, without glass beads; Dunn Edwards "Vin-L-Stripe Traffic Paint W-801", Sinclair Paint "162 Vinyl Traffic Marking Paint", or equal. Accessibility symbol color shall be Federal Standard 595A "Blue #15090".

B. Paint shall comply with local environmental regulations.

C. Signs: Provide roadside signs complete with posts and braces and sign panel fastening hardware in accordance with City of Los Angeles Standard Plans and the APWA Standard Plans for Public Works Construction, and as shown on the drawings. Provide vandal proof connections. Posts shall be Qwik Punch or equal.

D. Custom Parking Lot Signs: Signs shall be constructed of reflective aluminum. Locate signs as indicated on the plans. Size and vandal proof mounting hardware shall be in accordance with Caltrans Standard Plans. Provide Western Highway signs or equal.

PART 3 EXECUTION

3.1 INSTALLATION

A. Painted traffic striping, pavement markings and curb markings shall comply with Section 301.5.6 of the Standard Specifications for Public Works Construction.

1. Preparation of Surfaces: All surfaces to be painted shall be dry and thoroughly free from oil, grease, and loose material.

2. At no cost to City, any painted traffic striping which is unacceptable (i.e., tire prints, etc.) shall be removed by wet-type sandblasting and repainted.

3. Application rate shall be in accordance with manufacturers' printed recommendations, but not over 400 sq. ft. per gallon.

4. Protection: Protect the painted surfaces from traffic until thoroughly dry, one day minimum.

B. Traffic sign installation procedures shall comply with Section 56 of the Caltrans Traffic Manual.

C. Cleanup: Remove all splash discoloration, over spray, and other blemishes from adjacent surfaces by wet type sandblasting. Remove excess material, debris, cartons, and containers from premises immediately upon completion of work.

END OF SECTION

SECTION 32 84 00

IRRIGATION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Automatically controlled trees and shrub irrigation system, controllers and all other appurtenances.

1.2 RELATED REQUIREMENTS

A. California Codes and Regulations : Model Water Efficient Landscape Ordinance 2015

1.3 ABBREVIATIONS

A. NPT: National pipe thread.
B. PTFE: Polytetrafluoroethylene.
C. PVC: Polyvinyl chloride plastic.

1.4 DEFINITIONS

A. Lateral Piping: Downstream from control valves to sprinklers, specialties, and drain valves.

B. Main Line Piping: Downstream from point of connection to water distribution piping to, and including, control valves.

C. Low Voltage: As defined in NFPA 70 for circuits and equipment operating at less than 50 Volts or for remote control, signaling power limited circuits.

1.5 APPLICABLE PUBLICATIONS

A. Comply with references to extent specified in this section.

B. ASTM International (ASTM):

1. B88 14/B88M 13 - Seamless Copper Water Tube.

2. B813 10 - Liquid and Paste Fluxes for Soldering of Copper and Copper Alloy Tube.

3. D1785 15 - Poly(Vinyl Chloride) (PVC) Plastic Pipe, Schedule 40, 80, and 120.

4. D2239 12 Polyethylene (PE) Plastic Pipe (SIDR) Based on controlled Inside Diameter.

5. D2241 15 - Poly(Vinyl Chloride) (PVC) Pressure Rated Pipe (SDR Series).

6. D2464 15 - Threaded Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80.

7. D2466 15 - Poly(Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 40.

8. D2564 12 - Solvent Cements for Poly (Vinyl Chloride) (PVC) Plastic Piping Systems.

9. D2609 15 - Plastic Insert Fittings for Polyethylene (PE) Plastic Pipe.

10. D2683 14 - Socket Type Polyethylene Fittings for Outside Diameter Controlled Polyethylene Pipe and Tubing.

11. D2855 15 - Two Step (Primer and Solvent Cement) Method of Joining Poly (Vinyl Chloride) (PVC) or Chlorinated Poly (Vinyl Chloride) (CPVC) Pipe and Piping Components with Tapered Sockets.

12. F477 14 - Elastomeric Seals (Gaskets) for Joining Plastic Pipe.

C. American Water Works Association (AWWA):

1. C504 15 - Rubber Seated Butterfly Valves.

2. C906 15 - Polyethylene (PE) Pressure Pipe and Fittings, 4 In. Through 65 In. (100 mm Through 1,650 mm), for Waterworks.

D. American Welding Society (AWS):

1. A5.8/A5.8M 04 - Filler Metals for Brazing and Braze Welding.

1.6 PREINSTALLATION MEETINGS

A. Conduct preinstallation meeting at project site minimum 30 days before beginning Work of this section.
1. Required Participants:

a. Agency Representative.
b. Landscape Architect
c. Landscape Contractor.

2. Meeting Agenda: Distribute agenda to participants minimum 3 days before meeting.

a. Installation schedule.
b. Installation sequence.
c. Preparatory work.
d. Protection before, during, and after installation.
e. Installation.
f. Terminations.
g. Transitions and connections to other work.
h. Inspecting and testing.
i. Other items affecting successful completion.

3. Document and distribute meeting minutes to participants to record decisions affecting installation.

1.7 SUBMITTALS

A. Submittal Procedures: Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.

B. Equipment Submittal

C. Manufacturer's Cutsheets and Data:

1. Description of each product.

a. Highlight specified irrigation equipment model numbers per master irrigation legend

2. Installation instructions.

3. Warranty.

D. Qualifications: Substantiate qualifications comply with specifications.

1. Irrigation Installer with project experience list.

2. Service provider with project experience list.

1.8 QUALITY ASSURANCE

A. Installer Qualifications:

1. Regularly installs specified products.

2. Installed specified products with satisfactory service on five similar installations for minimum five years.

a. Project Experience List: Provide contact names and addresses for completed projects.

1.9 DELIVERY, STORAGE, AND HANDLING

A. Deliver products in manufacturer's original sealed packaging.

B. Mark packaging, legibly. Indicate manufacturer's name or brand, type, production run number, and manufacture date.

C. Before installation, return or dispose of products within distorted, damaged, or opened packaging.

D. Store plastic piping protected from direct sunlight. Support pipe to prevent sagging and bending.

1.10 WARRANTY

A. Construction Warranty: 1 year after 90 day maintenance of guaranteed operation.

PART 2 - PRODUCTS

2.1 SYSTEM DESCRIPTION

A. Provide system that operates with minimum water pressure of 61 psi at point of connection to backflow prevention device and 30 psi at last emitter of each zone.

B. Irrigation Zone Control: Automatic operation with controller and automatic control valves.

2.2 MATERIALS

A. Piping Materials:

1. Copper Tubes: ASTM B88, Type L

a. Fittings: ASME B16.18 and ASME B16.22 solder joint fittings.

b. Bronze Flange: ASME B16.24, class 150, ASTM B32 solder joint end.

c. Union: Cast copper alloy with ball and socket, solder joints or threaded ends.

d. Brazing Filler Metal: AWS A5.8.

e. Solder: ASTM B32, tin antimony. Flux soldering, ASTM B813.

2. Polyvinyl Chloride (PVC) Pipe: ASTM D1785 PVC 1120, Schedule 40 and 80

a. Fittings:

(1) Socket Type: Schedule 40

(2) Threaded Type: ASTM D2464, Schedule 80.

(3) Swing Joints: Threaded fittings with elastomeric seals and minimum 1380 kPa (200 psi) working pressure.

b. Solvent Cement: ASTM D2564.

c. Flange Gaskets, Bolts, and Nuts: Type as recommended by manufacturer.

B. Valves:

1. Underground Shut Off Valves:

a. Butterfly Valves 50 mm (2 Inches) and Larger: AWWC504, iron body, bronze mounted, double disc with parallel or inclined seats, non rising stem turning clockwise to close, 150 psi (1025 kPa) minimum working pressure.

b. Ball Valves, Isolation valves, 38 mm (1 1/2 Inch) and Smaller: Full port ball valves with bronze body, PTFE seats, and 90 degree on/off handle. Ball valves to have NPT female end connections.

c. Operations:

(1) Underground Applications: Use valves with 50 mm (2 inch) nut

for T Handle socket wrench operation.

(2) Aboveground and Valve Pit Applications: Use valves with handwheels.

(3) Provide enclosed gear drive operators for all butterfly valves 150 mm (6 inches) and larger.

(4) Valve ends: Accommodate type of main pipe adjacent to valve.

2. Swing Check Valves:

a. Valves Smaller than 100 mm (4 inches): ASTM B61 or ASTM B62, 850 kPa (125 psi) bronze body and bonnet.

b. Valves 100 mm (4 inches) and Larger: ASTM B61 or ASTM B62 , 1380 kPa (200 psi), iron body, bronze trim, vertical or horizontal installation, flange connection.

3. Pressure Reducing Valve: Cast steel body with renewable seats and stainless steel trim. Design flow passages and all parts to withstand high velocity applications, flange connected.

4. Remote Control Valves: Hunter ICV Valves

a. The valve shall be normally closed, electronically-actuated, diaphragm operated, remote control valve.

b. The body and bonnet shall be molded of non-corrodible, glass-reinforced nylon, rated to 220 PSI (15 bars, 1500 kPa). The body of the valve shall have brass inserts, with through-holes, which will accept the bonnet bolts. The bonnet bolts shall be serviceable with a slotted screwdriver, Phillips screwdriver, or a hex wrench, and shall be held captive in the bonnet when the bonnet is removed from the valve body. The diaphragm assembly shall be of molded construction, reinforced with nylon fabric and have a thermoplastic elastomer seating material. The valve shall be equipped with an internal filter as well as a self-cleaning metering rod, so only clean water can enter the solenoid chamber. An optional filter cleaning system, that cleans a stainless steel filter each time the valve opens and closes, shall be available. All metal parts internal to the valve shall be manufactured from corrosion-resistant stainless steel.

c. Provide valve with pressure regulating dial. Hunter Accu-Sync AS-ADJ.

d. Provide valves with unions and housing with minimum working pressure, 1025 kPa (150 psi).

5. Remote Control Drip Assemblies Hunter ICZ-101-LF for Flows .5-20 gpm ICZ-151-XL for 20-60 gpm

a. 1" ICV inline valve
b. 1" x ¾" filter regulator with 150-mesh (100-micron) stainless steel screen
c. Pressure regulation: 25 or 40 PSI

6. Quick Couplers: Hunter HQ33d-RC

   a. Brass parts, two piece unit consisting of coupler water seal valve assembly and removable upper body to allow spring and key track to be serviced without shut down of main.

   b. Lids: Lockable vinyl cover with springs for positive closure on key removal.

   c. Provide 2 hose swivels and operating keys for each size coupler to Contracting Officer's Representative.

7. Reduced Pressure Principle Backflow Preventer: Febco 825YA

8. Master Valve: Superior 3300 Series

   a. Brass Body Construction
   b. Normally Open
   c. No minimum flow function

9. Flow Sensor: Flomec QS-200-20

   a. 2" Ultrasonic Flow Sensor
   b. Minimum Flow Reading .92 and Max 309

10. Sub Meter: Hunter HC-200-FLOW

    a. Used if meter is not dedicate for landscape

C. Sleeve Material: ASTM D2241, Schedule 40.

2.3 AUTOMATIC CONTROL EQUIPMENT-ELECTRIC

A. Control Equipment: Hunter A2C-1200-M with ACC-PED. Pedestal Mount Smart irrigation controller with automatic time adjustments through on site ET data provided by Solar Sync Sensor.

1. Electric Controller: Programmed for various schedules by operating individual remote control valves, with following manufacturer's standard recommended components:

   a. Cloud based control capable.
   b. Flow sensing.
   c. ET (evapotranspiration).
   d. Rain shutoff device.
   e. Accessories required to operate system.

2.4 WATER EMISSION

A. Emission Devices

1. Drip Emitters: Pressure compensating with check valve for subsurface installation.

2. Emitter Distribution Tubing: Constructed of UV resistant vinyl material

2.5 LOW VOLTAGE CONTROL VALVE WIRE

A. Wire: NFPA 70, solid copper wire, minimum1.8 mm (14 gage), UL LLC approved for direct burial in ground.

2.6 TRACER WIRE

A. Tracer Wires: Plastic coated copper tracer wire, 1.8 mm (14 gage), green, Type TW, installed with non metallic irrigation main lines.

2.7 SPLICING MATERIALS

A. Epoxy waterproof sealing packet.

2.8 ACCESSORIES

A. Valve Box

1. Valve Box in Plant Bed Areas:

a. Color: Green
b. Size: Standard Size. One valve per box only

2. Valve box for drip irrigation equipment (flush and air relief) in 6” round green box.

B. Backflow Preventer Cage. Strong Box SBBC-22SS

C. Water Meters:

1. Meters: Comply with Section 25 10 10, ADVANCED UTILITY METERING SYSTEM. Connect irrigation system as follows:

a. Use existing water meter.

PART 3 - EXECUTION

3.1 PREPARATION

A. Examine and verify substrate suitability for product installation.

B. Protect existing construction and completed work from damage.

C. Examine proposed irrigation areas for compliance with requirements and conditions affecting installation and performance.

D. Set stakes to identify locations of proposed irrigation system. Obtain Contracting Officer’s Representative's approval before excavation.

3.2 INSTALLATION-GENERAL

A. Install products according to manufacturer's instructions and approved submittal drawings.

1. When manufacturer's instructions deviate from specifications, submit proposed resolution for Contracting Officer's Representative consideration.

B. Perform excavation, trenching, and backfilling for sprinkler system as specified in Section 31 20 00, EARTHWORK.

3.3 PIPE INSTALLATION-GENERAL

A. Layout work as indicated on drawings. Lines are to be in common trench wherever possible.

B. Install sprinkler lines to avoid HVAC trenches, electric ducts, storm and sanitary sewer lines, and existing water and gas mains; all of which have right of way.

C. Cut existing sidewalks and curbs during trenching and installation of pipe. Install pipe under sidewalks and curbs by jacking, auger boring, or by tunneling. Repair or replace any cracked concrete, due to settling, during warranty period.

D. Do not lay pipe on unstable material, in wet trenches or, in opinion of Contracting Officer's Representative, when trench or weather conditions are unsuitable for work.

E. Allow minimum of 75 mm (3 inches) between parallel pipes in same trench.

F. Clean interior portion of pipe and fittings of foreign matter before installation. Securely close open ends of pipe and fittings with caps or plugs to protect fixtures and equipment against dirt, water and chemical or mechanical injury. At completion of all work thoroughly clean fixtures, exposed materials and equipment.

G. Install full length of each section of pipe resting upon pipe bed with recesses excavated to accommodate bells or joints. Do not lay pipe on wood blocking.

H. Hold pipe securely in place while joint is being made.

I. Do not work over, or walk on, pipe in trenches until covered by layers of earth, well tamped, in place to depth of 300 mm (12 inches) over pipe.

3.4 PLASTIC PIPE INSTALLATION

A. Install plastic pipe snaked in trench at least 1 m per 30 m (1 foot per 100 feet) to allow for thermal construction and expansion and to reduce strain on connections.

B. Joints:

1. Solvent Welded Socket Type: ASTM D2855.

2. Threaded Type: Apply liquid Polytetrafluoroethylene (PTFE) thread lubricant or PTFE thread tape. After joint is made hand tight (hard), strap wrench should be used to make up to two additional full turns.

3. Elastomeric Gasket: ASTM F477.

3.5 VALVE INSTALLATION

A. Group remote control valves wherever possible and aligned at set dimension back of curb along roads.

B. Do not install valves under roads, pavement or walks.

C. Clean interior of valves of foreign matter before installation.

D. House pressure control valves installed adjacent to remote control valve in same valve box.

E. Install valve box with cover flush with finished grade.

F. Install control valves minimum 3 inches below finished grade.

3.6 SLEEVE INSTALLATION

A. Install sleeves where pipe and control wires are installed under walks, paving, walls, and other similar areas.

B. Install sleeves twice line size or greater extend 12 inches beyond edges of paving or construction.

C. Bed sleeves with minimum 4 inches sand backfill above top of pipe in areas where pipe is placed before hardscape is installed.

3.7 EMITTER HOSE INSTALLATION

A. Joint: Solvent weld connection.

3.8 SPRINKLER AND QUICK COUPLER INSTALLATION

A. Install sprinkler heads and quick couplers on temporary nipples extending at least 3 inches above finished grade. After turf is established, remove temporary nipples, install sprinkler heads and quick couplers at ground surface.

B. Locate part circle heads to maintain maximum distance of 6 inches from edges and other boundaries.

C. Provide swing joint assembly in all sprinklers, shrub sprays and quick couplers.

3.9 DRIP IRRIGATION SPECIALTY INSTALLATION

A. Install drip line 3”-4” below finish grade. Stake with landscape staples at every 3’ O.C.

3.10 AUTOMATIC IRRIGATION - CONTROL SYSTEM INSTALLATION

A. Determine exact location of controllers in field before installation. Coordinate electrical service to these locations. Install according to manufacturer's instructions.

3.11 CONTROL WIRE INSTALLATION

A. Install electric control cable in trenches with new main line.

B. Install wiring bundles located with piping 2 inches below bottom of pipe. Color code each wire in bundle differently. Bundle multiple wires and tape together at 15 foot intervals. Tag wires at controllers and control valve location with plastic tie wire tags. Provide same number and color of wire at each ends.

C. Hold splicing to minimum. Provide pullbox at each splice. No splices will be allowed between field located controllers and remote control valves.

D. Provide 12 inch expansion loops in wiring at each wire connection or change in wire direction. Provide 24 inches loop at remote control valves.

E. Do not install power wires for operation of irrigation system in same conduit as irrigation control wires.

3.12 TRACER WIRE INSTALLATION

A. Install tracer wire on bottom of trench, adjacent to vertical pipe projections, and continuous throughout length of pipe, with spliced joints soldered and covered with insulation type tape.

B. Install tracer wire following main line pipe and branch lines and terminate in yard box with gate valve controlling these main irrigation lines. Provide sufficient length of wire to reach finish grade, bend back end of wire to make loop and attach plastic label with designation "Tracer Wire."

C. Record locations of tracer wires and their terminations on project record documents.

3.13 FRAMED INSTRUCTIONS

A. Post framed instructions, containing wiring and control diagrams under glass or in laminated plastic,. Condensed operating instructions, prepared in typed form, framed and posted beside diagrams. Post framed instructions before acceptance testing of system. Submit labels, signs, and templates of operating instructions that are required to be mounted or installed on or near product for normal, safe operation. Prepare controller charts and programming schedule after as built drawings are approved by Contracting Officer. Provide one black line chart for each controller as reduced drawing of actual as built system that will fit maximum dimensions inside controller housing. Indicate each station coverage area with different pastel or transparent color on chart. After chart is completed and approved for final acceptance, laminate chart, sealed between two 0.5 mm (20 mil) pieces of clear plastic.

3.14 FIELD TRAINING

A. Provide field training course for designated operating and maintenance staff after system is functionally complete but before final acceptance tests. Submit information describing training to be provided, training aids to be used, samples of training materials to be provided, and schedules and notification of training. Cover items contained in operating and maintenance manuals.

3.15 FIELD QUALITY CONTROL

A. Field Tests and Inspections:

1. Pressure test lines before joint areas are backfilled. Backfill minimum of 300 mm (12 inches) over pipe to maintain pipe stability during test period. Test piping at hydraulic pressure of 1030 kPa (150 psi) for two hours.

a. Maximum Loss: 3 L/25 mm pipe diameter/300 m (0.8 gallons per inch pipe diameter per 1,000 feet). Locate pump at low point in line and apply pressure gradually. Install pressure gage shut off valve and safety blow off valve between pressure source and piping. Inspect each joint and repair leaks. Repeat test until satisfactory results are achieved and accepted by Contracting Officer's Representative.

2. After testing, flush system with minimum 150 percent of operating flow passing through each pipe beginning with larger mains and continuing through smaller

mains in sequence. Flush lines before installing sprinkler heads and quick couplers.

3. Charge system and test for leaks after installation. Repair leaks and retest until no leaks exist.

4. After electrical circuitry has been energized and final adjustment of sprinkler heads is complete, test each sprinkler section by pan test and visual test to indicate uniform distribution within any one sprinkler head area and over entire area. Operate controllers and automatic control valves to demonstrate complete and successful installation and operation of all equipment.

B. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment. Any irrigation product will be considered defective if it does not pass tests and inspections.

C. Prepare test and inspection reports.

3.16 PROTECTION

A. Remove protective materials immediately before acceptance.
.

B. Repair damage.

END OF SECTION

SECTION 32 90 00

PLANTING

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes materials, soil and installation in over-structure planters, soil preparation, planting, palm planting, seeding, staking and guying, and cleanup.

1. Planting occurs at street level and on upper building levels.

B. Related work:

1. Section 32 84 00 - Landscape Irrigation

2. Section 32 01 90 - Operation and Maintenance of Planting

C. Definitions: Section includes automatic-control irrigation system as shown on the Drawings and as follows:

1. Architect: the Landscape Architect or the Owner's authorized representative.

2. Soil Test: Required testing performed by Contractor after site is rough graded. A current soil report is also required for import soil prior to transport to the site.

3. Punch List: List of work within the Contract, generated by Architect that needs to be completed, repaired, replaced, or rectified by Contractor.

4. Pre-construction Soils Report: Soil analysis provided to Contractor for bidding purposes.

5. Punch List: List of work within the Contract, generated by Architect that needs to be completed, repaired, replaced, or rectified by Contractor.

6. Pre-maintenance review: Observation by Architect to verify substantial completion of the Work. The Architect will generate a Punch List during this review. Maintenance Period will commence when Contractor has completed items on this Punch List and Architect has verified that the Punch List is complete.

7. Maintenance Period: See Specification section 32 01 90.

8. Final Acceptance: Observation review by Architect at end of the specified Maintenance Period to verify completion and acceptance of the Work.

1.2 QUALITY ASSURANCE

A. Standards:

1. Provide plants and planting materials that meet or exceed specifications of Federal, State, and County laws requiring inspection for plant disease or insect control.

2. Provide quality and size conforming to current edition of “Horticultural Standards” for number one nursery stock as adopted by the American Nursery & Landscape Association.

3. Provide plants that are true to name. Tag one of each bundle or lot with the name and size of plants in accordance with the standards of practice the American Nursery & Landscape Association.

4. Botanical names shall take precedence over common names.

B. Workmanship: Perform work in accordance with the best standards of practice for landscape work and under the continual supervision of a competent foreman capable of interpreting the Drawings and Specifications.

C. Quantities and Types: Plant materials shall be furnished in the quantities and/or spacings as shown or noted for each location, and shall be of the species, kinds, sizes, etc., as symbolized and/or described in the Plant List, and as indicated on the Drawings.

D. Verification of dimensions and quantities: scaled dimensions are approximate. Before proceeding with work, carefully check and verify dimensions and quantities and immediately inform the Architect of discrepancies between the Drawings and/or specifications and actual conditions. Do not start work in areas where there are discrepancies until approval for same has been given by the Architect.

1.3 SUBMITTALS

A. Submit documentation to Architect 60 days before start of planting that plant material is available. Include:

1. A list of plants stating quantity, size, and supplier.

a. Requests for substitutions due to unavailability must be made in writing.

b. Substitutions may not be made without approval of the Architect.

c. Contractor shall notify Architect 24 hours in advance of delivery of plant materials, and shall submit an itemized list of plants in each delivery.

2. Photographs of trees 24” box and larger.

a. Label each photo with plant name, plant height, spread and trunk caliper.

b. Label each photo with nursery name, nursery contact and phone number.

c. Photograph shall include a person in picture for scale purposes.

B. Soil Test: Contractor shall have import soil and the soil of the site tested for fertility, agricultural suitability, and appraisal by Soil and Plant Laboratory Inc. (714) 282-877 or Wallace Labs (310) 617-0116.

1. Submit a copy of the Planting Plan and Plant Legend to the laboratory with the samples.

2. Soil report shall include:

a. pH measurement.

b. Nutrients and elements:

(1) Measurement (low, medium, high) of: Boron, calcium, copper, iron, magnesium, manganese, molybdenum, phosphorus, potassium, sodium, sulfur, and zinc.

(2) Analyze saturation extract for: calcium, magnesium, sodium, boron, chloride, phosphorus, nitrate and sulfate.

(3) Trace metals: Aluminum, arsenic, cadmium, chromium, cobalt, lead, lithium, nickel, selenium, silver, strontium, tin and vanadium.

(4) The presence of calcium carbonate and/or magnesium carbonate.

c. Soil Texture (gravel, sand, silt and clay). Determine organic matter content by the measurement of organic carbon. The quality of the organic matter shall be determined by measuring organic carbon and total nitrogen.

(1) Methods of Soil Analysis, Part 1, Physical and Mineralogical Methods, Soil Science Society of America, Inc., 1986, chapter 36, pgs 901-926 and Methods of Soil Analysis, Part 3 Chemical Methods, Soil Science Society of America, Inc, 1996, chapter 34, pgs 965-977 & pgs 1001-2 and chapter 37, pg 1088

d. Interpretation and recommendations for correction of nutritional deficiencies/ excesses and potential toxicities.

3. Soil shall be tested from a minimum of four (4) locations per acre of planted area. Contractor shall record locations where samples were taken.

4. A copy of the soil test results shall be submitted to the Owner and Architect before work begins.

5. Contractor shall pay cost of soil tests.

C. Cut sheets of materials to be used: tree stakes, tree guys, root barriers, amendments, mycorrhizal fungi, etc.

D. Legible copies of delivery slips for soil amendments, including mycorrhizal fungi.

E. The Contractor shall submit samples or specifications of items being used upon the request of the Architect, and as required by this Part 2 of this Specification.

1.4 OBSERVATION SCHEDULE

A. Contractor shall be responsible for notifying the Architect, in advance, for the following observations, according to the time indicated:

1. Pre-construction conference – seven (7) days
2. Tree tagging at nursery (trees 24” box size and larger) – 72 hours
3. Final grade, soil preparation and planting area layout review - 72 hours

4. Plant materials review – 72 hours
5. Plant layout review - 72 hours
6. Planting operations - 72 hours
7. Completed planting (Pre-maintenance) walk through – seven (7) days

B. Contractor shall be responsible for scheduling site Observation visits with Architect as work progresses. Failure to schedule required Observations shall not relieve Contractor of responsibility for obtaining approvals. Contractor shall redo, at no cost to the Owner, work that does not satisfy the Owner.

C. Observations may be waived or combined at the discretion of the Architect.

D. When someone other than the Architect conducts Observations, the Contractor shall show evidence in writing of when and by whom these observations were made.

E. No site visits shall commence without adequate preparation or items noted in previous Observation Reports, either completed or remedied, unless the Owner has waived such compliance. Failure to adequately prepare or accomplish previous punch list items shall make the Contractor responsible for reimbursing the Architect for the site visit at his current billing rates per hour plus transportation costs. No further inspections will be scheduled until this charge has been paid and received.

1.5 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Deliver fertilizer or soil amendments to site in original unopened containers bearing manufacturer's guaranteed chemical analysis, name, trademark, and conformance to state law. Protect material from damage or breakage. Immediately remove empty containers from site.

B. Deliver plants with legible identification labels. Store plant material in shade and protect from weather or injury. Maintain in a healthy, vigorous condition. Architect may at time reject plant material not maintained in this condition.

C. Handling: Do not drop plants or pick up container plants by their stems or trunks.Volume 56, Number 44.

1.6 SAMPLES AND TESTS

A. Contractor shall submit soil samples for testing, per this Specification.

B. Architect reserves the right to take and analyze samples of materials for conformity to specifications at any time. Contractor shall furnish samples upon request by Architect.

C. Rejected materials shall be immediately removed from the site at the Contractor's expense.

D. Contractor shall pay cost of testing or replacement of materials not meeting specifications.

1.7 WARRANTY AND REPLACEMENT

A. Contractor shall fully warrant and agree to replace poor, inadequate, or defective materials and workmanship for one year from date of acceptance of completed planting work.

B. Palm Trees: Guarantee newly planted palm trees for a period of two years following planting and acceptance by Owner.

C. Replacement: Materials found to be dead, missing, or in poor condition during the establishment period shall be replaced immediately. The Architect shall be the sole judge as to the condition of material. Material to be replaced during the warranty period shall be replaced by the Contractor within fifteen days of written notification by Owner.

PART 2 - PRODUCTS

2.1 SOIL

A. Site Soil: Use only new materials of brands and types noted on the Drawings, as specified herein, or approved equivalents.

1. Site soil used to form landscape planting areas or backfill planters shall be clean, fertile, loamy soil, free of stones, sticks, stumps, or other deleterious matter one inch in diameter or larger. It shall also be free from wire, plaster, construction debris, or similar objects that would be a hindrance to planting or maintenance.

2. The Architect shall approve suitability of soil of the site after reviewing results of the soil test.

B. Import Top Soil: Clean, fertile, sandy loam soil, free of stones or other deleterious matter one inch in diameter or larger. It shall also be free of pockets of coarse sand, noxious weeds, sticks, lumber, brush and other litter. It shall not be infested with nematodes or other undesirable disease-causing organisms such as insects and plant pathogens. Import top soil must conform to the following:

1. Particle size

Class	Particle Size Range	Maximum %	Minimum %
Coarse sand	0.5 - 2.0mm	15	0
Silt plus clay	<0.05mm	50	15
Other classes			
Gravel	2-13mm	15	0
Rock	1/2 - 1”	5% by volume with none > 1”	

2. Chemistry

a. Salinity: Saturation Extract Conductivity (ECe) - less than 3.0 sD/m @ 25° C
b. Sodium: Sodium Absorption Ratio (SAR) - less than 6.0
c. Boron: Saturation Extract Concentration - Less than 1.0 ppm
d. Reaction: pH of Saturated Paste - 5.5-7.8 without high lime content

3. Soil shall contain sufficient quantities of available nitrogen, phosphorus, potassium, calcium and magnesium to support normal plant grown. In the event of nutrient inadequacies, provisions shall be made to add required material prior to planting.

4. In order to insure conformance, samples of the import soil shall be submitted to an approved laboratory for analysis prior to and following backfilling.

5. Obtain imported topsoil from approved local sources.

C. Palm Backfill Sand:
   1. The backfill material shall consist of washed plaster sand.
   2. Do not mix soil with the sand.
   3. Do not use other types of sand such as fill sand.

D. On-Structure Soil: a non-shrinking combination of the following materials, by volume:

   1. Top Layer:

      a. 8 inches depth unless noted otherwise on the drawings. For soil depths less than 12 inches, use top layer only.

      b. Use the following amounts of ingredients per cubic yard of mix:

Amount	Ingredient
0.3 cubic yards	Fir Bark
0.7 cubic yards	Sand
2 pounds	Dolomite lime
2 pounds	Calcium carbonate lime
2 pounds	Nitroform
2 pounds	6-24-24 Commercial fertilizer

      c. Estimated dry bulk density: 1,900 lbs/cubic yards

      d. Estimated wet bulk density: 2,400 lbs/cubic yards

   2. Bottom Layer for soil depths 12 inches or greater shall be comprised of unamended sand.

   3. Top layer should be thoroughly blended off-site with a pug mill prior to placement. A bucket mix is not acceptable. The saturated bulk density of the top layer as formulated above should shall not exceed 115 lbs./cubic feet.

   4. No fir bark shall be delivered to the site without prior approval of the architect or his appointed agent. Contractor shall supply architect or his appointed representative with a sample of amendment accompanied by analytical data from an approved laboratory illustrating degree of compliance.

   5. Fir Bark:

      a. The Fir Bark (0-1/4 inch) shall meet the following criteria:

         (1) Percent Passing Sieve Designation

Percent	Sieve Sizes
100	9.51 mm (3/8 inch)
95-100	6.35 mm (1/4 inch)
0-30	500 micron

         (2) Dry bulk density, lbs./cubic yard, = 450-580

         (3) Soluble salts: Maximum 3.0 millimohs/centimeter at 25 degree C as determined by saturated extract.

(4) Organic content: Minimum 90% based on dry weight and determined by ash method.

6. Sand

a. Gradation (Weight Percent Passing):

Percent	Sieve Sizes (mm)
100	10
95-100	18
65-100	35
0-50	60
0-10	140
0-5	300 (270 sieve)

b. Chemical Specifications:

Permissible Range	
Salinity (dS/M of saturated extract at 25 degrees C)	Nil - 3.0
Boron (ppm in saturation extract)	Nil - 1.0 ppm
Sodium (sodium absorption ration - SAR)	Nil - 6.0

c. Estimated dry bulk density 2,500 lbs./cubic yard

d. Estimated wet bulk density 3,000 lbs./cubic yard

7. Units are mg/kg dry weight

8. In order to insure conformance, samples of the import soil shall be submitted to an approved laboratory for analysis prior to and following backfilling.

E. Backfill for at grade trees and shrubs shall be per Soils Report.

F. Backfill for over-structure planters: On-Structure Soil.

G. Planter Pot backfill: "Successoil", produced by Green House Nurseries, Inc. (818) 899-0977.

1. Blend of Canadian Peat, volcanic rock, cypress shavings, composted pine bark and coarse builder's sand, with slow release Nutricote fertilizer.

2. Soil shall have the following characteristics:

a. Low compaction rate.
b. Good bulk density.
c. Natural capillary action for sub-irrigation.

H. Special mixes: see Drawings.

2.2 SOIL AMENDMENTS

A. Soil amendments shall be as required by Soils Test. As a reference, a pre-construction Soils Report follows this Section as Appendix A. Use this report as a basis for bidding. Contractor is still required to provide Soil Reports for cleared and graded planting areas.

B. Contractor shall provide amendments recommended by Soils Report at no additional cost to Owner, including recommendations for the quality of organic amendment.

C. Mycorrhizal fungi shall be added in all planting areas, regardless of Soils Report. Mycorrhizal inoculum consists of a combination of :

1. Innoculum shall contain a blend of eight top types of Endospores: Glomus aggregatum, G. clarum, G. deserticola, G. intraradices, G. monosporus, G. mosseae, Gigaspora margarita, and Paraglomus brasilianum, and seven top types of Ecto fungi spores:Lacarria laccata, Pisolithus tinctorius, Rhizopogon amylpogon, R. fulvigleba, R. rubescens, R. villosuli, and Scleroderma spp. The guaranteed Endo spore count shall be a minimum 50 spores/cc, and the Ecto spore count shall be a minimum 50,000 spores/cc

2. Manufacturers:

a. BioOrganics Mycorrhizae Inoculants, (888) 332-7676
b. Mycorrhizal Applications, Inc, (866) 476-7800
c. Or equal.

2.3 PLANT TABLETS

A. 7 gram planting tablet designed for 12 month slow release. 12-8-8 NPK, 20% humus, 4% humic acids, 3.5% sulfur, 2% iron, micronutrients.

2.4 PLANT MATERIAL

A. Plants shall be in conformance with the California State Department of Agriculture's regulation for nursery inspections, rules, and ratings. Plants shall be healthy, vigorous, and free of insect infestations, plant diseases, sunscalds, frostburns, abrasions, or other disfigurement. Plants shall be grown in climatic conditions similar to that of the planting site, and well hardened off. Plants shall have vigorous fibrous root systems which are not rootbound or potbound. The Architect is the sole judge as to acceptability of plant material.

B. The size of the plants will correspond with that normally expected for species and variety of commercially available nursery stock or as specified on Drawings.

C. The Architect shall approve plant material prior to planting. Plants shall be subject to review and approval of Architect at place of growth or upon delivery for conformity to specifications, and for injury, insect infestation, and trees and shrubs for improper pruning. Such approval shall not impair the right of review and rejection during progress of the work. Architect reserves the right to refuse review if, in his/her judgment, a sufficient quantity of plants is not available for review.

D. Plants not conforming to the requirements herein specified shall be considered defective, and such plants, whether in place or not, shall be marked as rejected and immediately removed from the site and replaced with new plants at the Contractor's expense.

E. Plant material shall be true to botanical and common name and variety as specified in "Sunset Western Garden Book."

F. Substitute plant material will not be permitted unless specifically approved in writing by the Architect.

2.5 PALM TREES

A. Palms shall be grown under climatic conditions similar to those in locality of project.

B. Unless otherwise stated on Plans, Washingtonia palms are to be skinned, with straight trunks.

C. Palms must be planted within 24 hours of digging.

2.6 GUYING AND STAKING METERIALS

A. Wood tree stakes: Lodgepole pine, fully treated with CuNap, ACQ or other non-arsenic wood preservative. Do not use split stakes.

1. 24” box trees and smaller: 2" (nom.) diameter by 10' long.
2. 36” box trees: 3” (nom.) diameter by 12’ long.

B. Tree Ties:

1. Flexible vinyl tree ties meeting ASTM-D-412 standards for tensile and elongation strength. Material shall be black.
2. Each tie shall be a single piece, not multiple ties joined together.
3. Manufacturers: VIT Cinch Tie, VIT Cinch Belt (larger trees), Villa Root Barrier E-Z Band, or equal.

C. Guying Hardware:

1. Wire: Pliable 1/8” galvanized steel cable.
2. Hose: 1/2" new black rubber hose.
3. Turnbuckles: galvanized or dip-painted, size as required.
4. Cable clamps: galvanized, size as required.
5. Safety Sleeve: 1/2" white PVC full length of wire.
6. Steel Guy Anchor: Duckbill Anchor by Foresight Products (800) 325-5360; Platypus Tree Anchoring Systems (866) 752-8478, or equal. Size as needed.

2.7 WATER

A. Furnished by Owner.

B. Transport by Contractor as required.

2.8 MULCH

A. Decorative Bark:

1. Walk-On-Bark as supplied by Sequoia Forest Products, telephone: (559) 591-1177.

2. Small Deco Bark by Aguinaga Fertilizer Company, (949) 786-9558.

B. Submit mulch samples for approval by Architect. No shredded lumber products will be accepted.

C. Rock mulches: per Plans.

2.9 METAL EDGING

A. Aluminum edging shall be 3/16” x 5 ½”, with black anodized finish, with 18” aluminum stake.

1. Manufacturer: Sure-Loc. (800) 787-3562.

2.10 DRAINAGE MATERIAL - 3/8" CRUSHED ROCK

A. 95% -100% passing through a 3/8" screen.
B. 0-5% passing through No. 8 mesh.

C. 80-100# per cubic yard.

2.11 SOIL SEPARATOR

A. Nonwoven polypropylene fabric, needle-punched, with UV Resistance of 70%, AOS of 70 US Standard sieve, water flow rate of 110 gpm/ft2.

1. Geotex 701, manufactured by Propex, or equal.

2.12 WEED CONTROL FABRIC

A. Spun-bonded polypropylene with UV inhibitors, non-degrading geotextile fabric that blocks 95% of weed growth and is permeable to air, water, gasses and fertilizer. Typar 3301 or equal.

B. Properties:

1. Unit Weight: 3.0 oz/yds2
2. Tensile Strength: 135 pounds
3. Puncture Strength: 35 pounds
4. Air Opening Size: 60/70 equivalent sieve
5. Elongation at Break: <70%
6. Trap Tear: 50 pounds
7. Flux: 70 gal/ft2/min
8. Permitivity: 1.2 sec-2
9. Color: Black

2.13 ROOT BARRIER

A. Polyethylene (0.08 inch thick) or polypropylene (2.032 - 2.16 mm thick), with self-locking joiners, ½” raised 90 degree molded root deflecting ribs, ground lock tabs, double top edge, UV inhibitors. Use 24" barrier unless otherwise stated.

2.14 TREE TRUNK PROTECTOR

A. 9” height with 4” diameter, expandable, ventilated, 1.52 mm thick UV inhibited polyethylene, gray-brown color.

2.15 DRAIN PIPES

A. Sub-Surface perforated or non-perforated as indicated on Plans, size and type noted, manufactured by Lasco, National Diversified Sales (NDS) or Advanced Drainage Systems, Inc. Perforated pipe shall be completely wrapped with a water permeable nylon screen that is lapped and welded around the pipe, and surrounded by minimum 4" thickness of gravel, unless otherwise noted on Plans.

B. Planter Area Drainpipe and Fixtures: National Diversified Sales (NDS) SDR 35 fittings and SDR 35 drain pipes with specified grates, color black, and size and type per plan. NDS, Newbury Park, California, telephone: (800) 726-1994.

2.16 PALM TREE VENT

A. 4” ID single-wall, corrugated, polyethylene, perforated (slots) drain pipe with soil separator sock. ADS-401 with sock, or equal.
B. 4” round PVC drain grate. Color: to be selected.

2.17 SIPHON DEVICE / DRAIN CLEANOUT

A. Construct PVC assemblies per drawings.

PART 3 - EXECUTION

3.1 INSPECTION AND PREPARATION

A. Site acceptance:

1. The Contractor shall be responsible for coordinating his work with the General Contractor and other Sub-Contractors so no damage occurs to plantings after installation.

2. The Contractor shall be responsible for verifying grades and site conditions before beginning work. No change in Contract price will be owed for actual or claimed discrepancy between existing grade and those shown on the plan after Contractor has accepted existing grades and moved on the site.

B. Scheduling: Perform planting only when weather and soil conditions are suitable, as approved by District.

C. The irrigation system shall be operational and approved prior to planting.

D. Utilities: Prior to excavation for planting or installation of stakes or guys, Contractor shall locate utility lines and cables, so that proper precautions will be taken not to damage them. In the event of a conflict between utility lines and plant locations, promptly notify the District, who shall arrange for the relocation of one or the other. Failure to follow this procedure shall make the Contractor responsible for repairing damages at his own expense.

E. Waterproofing: Verify that waterproofing is complete and water-tight prior to planting.

3.2 SOIL PREPARATION

A. Planting Areas:

1. Uniformly spread amendments and thoroughly cultivate by means of mechanical tiller per Soils Report.

2. Use nutrients recommended in the Soil Report.

3. Add the appropriate Mycorrhizal inoculum and incorporate at manufacturer’s recommended rate.

4. Perform soil preparation after irrigation is installed and tested, and prior to planting.

B. Final Grades and Planting Area Layout:

1. At time of planting, the top two (2) inches of areas to be planted or seeded shall be free of stones, sticks, stumps, or other deleterious matter one inch in diameter or larger. It shall also be free from wire, plaster, construction debris, or similar objects that would be a hindrance to planting or maintenance.
2. Contractor shall be responsible for shaping planting areas as indicated on Plans or as directed by District.

3. Minor modifications to grade may be required to establish the final grade. Remove soil generated by excavations to an approved off-site location unless said soil can be utilized to obtain desired grade.

4. Finish grading shall insure proper drainage of the site as determined by the District.

5. Areas shall be graded so that the final grades will be 1" below adjacent paved areas, sidewalks, valve boxes, headers, cleanouts, drains, manholes, etc. or as indicated on Plans.

6. Surface drainage shall be away from building foundations.

7. Eliminate erosion scars prior to commencing maintenance period. Depressions due to settling shall be eliminated before and after planting.

8. Slopes of two to one (2:1) or steeper shall be protected with erosion control fabric. Contractor shall request clarification from District for fabric and methods.

C. Compacted Soil / Percolation Testing: Soil may be heavily compacted which can hinder root development, drainage and aeration.

1. Severely compacted areas shall be ripped or tilled to a depth of at least 9” prior to planting.

2. Percolation tests of water through the soil shall be performed where trees 24” box size and larger are proposed. If trees are to be planted over a large area, several percolation tests will be required.

a. Excavate two planting pits 24” deep by 2 times rootball diameter. Install sand filled drainage sump as specified in 3.3.D.4, below, in one of the pits.

b. Fill the pits with water and allow to drain completely.

c. Fill the pits with water a second time.

d. Results:

(1) If the pit with no sump drains completely within 24 hours, no drain sump is necessary for trees planted within the vicinity of the test pit.

(2) If the pit with no sump does not drain completely within 24 hours, but the pit with the sump does, sumps are required for trees planted in the vicinity of the test pit.

(3) If the pit with the sump does not drain completely within 24 hours, advise the Owner prior to planting.

D. Pre-Plant weed Control:

1. "Grow & Kill": If weeds exist on site at the beginning of work, spray with a non-selective systemic contact herbicide, recommended by an approved licensed landscape Pest Control Advisor and applied by a licensed Pest Control Operator. Leave sprayed plants intact to allow systemic kill as directed by Advisor. After recommended kill period, water thoroughly to encourage new weed growth, and re- apply systemic herbicide.

2. Treat planting areas, except for those to be seeded, with pre-emergent herbicide, recommended by an approved licensed landscape Pest Control Advisor and applied by a licensed Pest Control Operator

3. Maintain site weed free until final acceptance by District's Representative by utilizing mechanical, manual, or chemical treatment.

E. Slope Stabilization

1. Slopes greater than 3:1 are to be stabilized with jute mesh.

2. Prepare soil as noted above.

3. Unroll jute from top of slope to bottom. Secure at top of slope by toeing jute in 6" deep. Reinforce with a row of at least five staples, spacing each about a foot apart, and covering with soil.

4. Place staples 18" to 24" apart throughout to secure matting to ground. Staples must be driven flush with soil surface.

5. Overlap edges of rolls 6", minimum. Securely staple the two layers to the ground.

6. Install jute mesh loosely - do not stretch.

7. Check slots may be needed on steep slopes to prevent subsurface erosion.

   a. Dig 6" deep trench perpendicular to water flow.
   b. Drop two or three folds of fabric in the slot.
   c. Staple fabric securely in bottom of trench, and continue rolling downhill.

8. Use approximately 200 staples per 100 square yards of fabric. Comply with manufacturer's written instructions for installing access doors and frames.

3.3 PLANTING

A. Planting Layout: Plant layout is to be approved by Architect before planting begins. Layout of trees and major plantings shall be approved first. One tree with each type of specified staking shall be approved prior to planting of trees. Bring conflicts regarding the exact locations of plant pits to the attention of Owner's representative and Architect. If underground utility lines or other unknowns are encountered in excavation for planting, alternate locations for planting may be selected by the Architect. It is the Contractor's responsibility to verify with the Owner's superintendent and governing agencies the location and depth of underground utilities.

B. Planting of Palms (at grade):

1. Protect planting areas from excessive compaction when trucking plants or other material to the planting site.
2. Excavated planting pits shall have vertical sides with roughened surfaces and shall be of a size that is at least 12-inches larger in diameter and 6-inches deeper than the rootball.

3. Soil from the planting holes that is not used on site as backfill or in establishing the final grades shall be removed from the site.

4. Install sand-filled drainage sump, 12-inches in diameter by 6-feet deep, in each pit.

5. Center palms in pit or trench. Align palms per Plans. Set palm plumb and hold rigidly in position until sand has been tamped firmly around rootball.
6. Plant at original grade. Do not bury trunk below grade unless specified in Plans.

7. Install aeration vent per Drawings.

8. Install linear root control barrier, 6-foot length, minimum, where palm rootball is within 12-inches of pavement.

9. Backfill with specified sand.

C. Planting of Trees and Shrubs (at grade):

1. Do not plant rootbound, dried out, undersized, or damaged plants.

2. Install trees, shrubs, and groundcovers before planting seed or sod.

3. Excavated holes shall have vertical sides with roughened surfaces and shall be twice the diameter and the depth of the root ball.

4. Drainage: Drainage sumps are to be provided in each tree pit. Drain sumps (12-inch diameter by 6 feet deep) may be augured. Sump is to be filled with coarse sand. Planting may proceed after sump installation.

5. Fill excavations with water and allow percolating out, before positioning trees and shrubs.

6. Install root control barriers where indicated on Plans and where site conditions (trees within three feet of pavement) dictate. Install per manufacturer's instructions.

7. Center plant in pit or trench. Remove boxes and cans without damage to rootball. Add the appropriate Mycorrhizal inoculum next to rootball at manufacturer’s recommended rate. Set plant plumb and hold rigidly in position until soil has been dampened firmly around b or roots. An earthen basin shall be constructed around each plant. Each basin shall be of a depth sufficient to hold at least two inches (2”) of water. Remove basin in turf areas after initial watering. Plants that settle deeper than the surrounding grade shall be raised to surrounding grade level.

8. No plant installation without a District Representative present.

D. Planting Tablets: Place the following numbers of 7-gram planting tablets within the backfill of each plant:

Container size	Number of tablets
1 gallon	3
5 gallon	8
15 gallon	12
24" box	16
36" box	24
48" box	32Use “Grow Power” per the manufacture specifications.

E. Staking and Guying: Staking and Guying of trees shall be completed immediately upon planting. Stakes shall be installed plumb and as indicated in details. Guy locations and methods shall be reviewed prior to planting of boxed trees. Bring conflicts of locating guys or stakes to the attention of District. Remove nursery stakes when site stakes have been installed.

F. Ground covers: Ground covers or seedlings shall be planted in straight rows and evenly spaced, unless otherwise noted, and at intervals called out in the drawing. Triangular spacing shall be used unless otherwise noted on the drawing. Fill in bare areas with plants at the required spacing. Damage to plants by trampling or other work in this contract shall be repaired immediately.

G. Mulch covers:

1. Complete planting and finish grades before placing mulch.
2. Place mulch material in a continuous layer 3" deep adjacent to plant crown in shrub and groundcover areas, and in areas between shrubs
3. Place mulch in a 2” deep layer in areas with flatted groundcover and annual color.

H. Install tree trunk protector on trees planted in turf areas. Install per manufacturer's instructions.

3.4 CLEAUP

A. After planting operations have been completed, remove trash, excess soil, empty plant containers, and rubbish from the property, and dispose of legally.

B. Cleanup shall be performed at the end of each working day, with a maximum cleanup effort (in a manner satisfactory to the District’s Representative) for each weekend or Holiday.

C. The Contractor shall sweep the site and shall wash down pavement within the Contract area, leaving the premises in a clean condition.

D. Walks shall be left in a clean and safe condition.

E. Scars, ruts, or other marks in the ground caused by this work shall be repaired and the ground left in a smooth condition throughout the site.

END OF SECTION

SECTION 32 91 19

LANDSCAPE GRADING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes: weeding and finish grading of lawn and planting areas.

B. Related work:

1. Section 32 84 00: Planting Irrigation
2. Section 32 90 00: Planting

1.2 DEFINITION

A. Finish grading: finish grading shall consist of adjusting and finishing soil surfaces with site or imported topsoil, raking grades to a smooth, even, uniform plane. Remove and legally dispose of all extraneous matter off site. Facilitate natural run-off water and establish grades and drainage indicated as part of the contract work.

B. The word Architect as used herein shall refer to the Landscape Architect or the Owner's authorized representative.

PART 2 – PRODUCTS

2.1 MATERIALS

A. Import Top Soil: Import top soil shall be classified as sandy loam, and must conform to the following:

1. Particle size

Class	Particle Size Range	Maximum %	Minimum %
Coarse sand	0.5-2.0mm	15	0
Silt plus clay	<0.05mm	50	15
Other classes:			
Gravel	2-13mm	15	0
Rock	1/2 - 1”	5% by volume with none > 1”	

2. Chemistry

a. Salinity: Saturation Extract Conductivity (ECe) - less than 3.0 sD/m @ 25° C
b. Sodium: Sodium Absorption Ratio (SAR) - less than 6.0
c. Boron: Saturation Extract Concentration - Less than 1.0 ppm
d. Reaction: pH of Saturated Paste - 5.5-7.8 without high lime content

3. Soil shall contain sufficient quantities of available nitrogen, phosphorus, potassium, calcium and magnesium to support normal plant grown. In the event of nutrient inadequacies, provisions shall be made to add required material prior to planting.

B. In order to insure conformance, samples of the import soil shall be submitted to an approved laboratory for analysis prior to and following backfilling.

C. Obtain imported topsoil from approved local sources.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verification of conditions: Prior to commencing the finish grading, review the installed work of other trades and verify that their work is complete.

1. Rough Grading: Grading in planting areas (except raised planter areas) shall be established to within plus or minus 0.10 foot prior to beginning of finish grading.

2. Moving onto the site and/or commencing work shall be construed as acceptance of rough grade conditions by the Contractor.

B. Import topsoil only when necessary to supplement site soil to achieve grades shown on Drawings, or if site soil is unsuitable for planting.

3.2 PREPARATION

A. Weeding: Before finish grading, weeds and grasses shall be dug out by the root or sprayed with an herbicide and disposed of off-site. This procedure is outlined under the Landscape Planting Section.

B. Debris: Remove stones and debris 1 inch in diameter and greater and clumps of earth that do not break up. Dispose of off-site.

3.3 INSTALLATION

A. General: When rough grading and weeding have been completed, and the soil has dried sufficiently to be readily worked, lawn and planting areas shall be graded to the elevations indicated on the Drawings.

1. Grades indicated on Drawing are grades that will result after thorough settlement and compaction of the soil.

2. Grades not otherwise indicated shall be uniform finish grades and, if required, shall be made at the direction of the Architect.

3. Finish grades shall be smooth, even, and a uniform plane with no abrupt change of surfaces.

4. Soil areas adjacent to buildings shall slope away from the building to allow a natural run-off of water, and surface drainage shall be directed as indicated on the drawings by remodeling surfaces to facilitate the run-off water at 2% minimum grade.

5. Low spots and pockets shall be graded to drain properly.

B. Drainage: Finish grade with proper slope to drains.

1. Flow lines, designated or not, shall be graded and maintained to allow free flow of surface water.

2. If any drainage problems arise during construction period due to Contractor's work (such as, but not limited to, low spots, slides, gullies and general erosion), the Contractor shall be responsible for repairing these areas to a condition equal

to their original condition, and in so doing shall prevent further drainage problems from occurring.

C. Toe of slope: To prevent soil creep or erosion across pavement, where pavement (walk, curb, etc.) is at the toe of a slope, finish grade is to level out or swale slightly at least 6" before reaching pavement.

D. Moisture Content: The soil shall not be worked when the moisture content is so great that excessive compaction occurs, nor when it is so dry that dust may form in the air or that clods do not break readily. Water may be applied, if necessary, to provide moisture content for tilling and planting operations. It is the Contractor's responsibility to control dust that is spread as a result of grading operations.

E. Grades: The finish grade shall be 1-1/2 inch below grade of adjacent pavement, walks, curbs, or headers except when drainage conditions require flush grades, as directed by the Owner's Representative, or if otherwise indicated on Drawings.

F. Compaction: Soils in planted areas shall be loose and friable, yet firm enough that no settling occurs from normal foot traffic or irrigation.

3.4 FIELD OBSERVATION

A. Contact the Architect 48 hours or two working days in advance of each agreed observation or conference.

B. Schedule for On-Site Reviews: At completion of finish grading and prior to any planting operations.

END OF SECTION

SECTION 33 11 16

WATER DISTRIBUTION

PART 1 - GENERAL

1.1 THE REQUIREMENT

A. This Section includes piping and specialties for combined potable and fire protection water service outside the building and complete water distribution system as indicated on the Drawings and/or specified in the Contract Documents.

B. This Section includes tapping of Los Angeles Department of Water and Power Water Main.

C. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 RELATED SECTIONS INCLUDE THE FOLLOWING

A Division 31 Section 31 00 00-Earthwork for trench excavation and backfill.

B. Division 21 Section 21 13 13 – Fire Protection Sprinkler System.

1.3 SYSTEM PERFORMANCE REQUIREMENTS

A. Minimum Working Pressures: The following are minimum pressure requirements for piping and specialties, unless otherwise indicated:

1. Combined Potable Water and Fire Protection Water Service: 200 psig (1380 kPa).

1.4 SUBMITTALS

A. General: Submit each item according to the GENERAL REQUIREMENTS. Submit layout and shop drawings include detail of field conditions found to be contrary to those shown.

B. Product Data: Submit copies of manufacturer's specifications and installation instructions for each material including certification or other data verifying compliance with required characteristics. Indicate by transmittal form that copy of each has been distributed to the Installer.

For the following:

1. Pipe and fittings.
2. Valves.
3. Fire hydrants.
4. Fire department connections.

C. Purging and Disinfecting Reports: As specified in "Cleaning" Article in Part 3.

1.5 QUALITY ASSURANCE

A. Unless otherwise specified, all materials and work shall be in accordance with General Conditions, General Requirements and "The Standard Specifications for Public Works Construction" (the Standard Specifications), latest edition.

B. Ductile iron pipe shall be in accordance with Section 207-9 of the Standard Specifications. Pipe shall be lined and coated per AWWA C 151 or AWWA C 110. Valves and fittings shall be encased per Section 207-9.2.6.

C. Valves: The manufacturer's name and pressure rating shall be marked on valve body.

D. Pipe Laying and trenching shall be per Section 306 of the Standard Specifications and pipe joints shall be per Section 306-1.2.3 of the Standard Specification unless otherwise shown on the plans or specified in these specifications.

E. Trench excavations may be backfilled with onsite soils under the observation of a representative of the City Geotechnical Division (GED). After pipes have been laid and properly bedded, the space around the pipe shall be backfilled with clean sand (having sand equivalent of 30 or greater) or gravel to a depth of 1 foot over the top of the pipe, before the controlled backfill is placed. The controlled backfill shall be moisture conditioned, placed and compacted in accordance with the recommendations presented in Section 6.2.7 of the Geotechnical Engineering Report dated August 28, 2019, GED File #E170121D. Compaction shall be 95% relative compaction.

F. Water meters and fire service connection shall be per City of Los Angeles requirements. Contractor shall obtain a Private Fire Hydrant Permit from the City Fire department, Hydrant and Access Unit, located at 121 Figueroa Street, suite 1500. Contractor shall contact Inspector [} at (213) [XXX-XXXX]. This is a "fee exempt" permit.

G. On-site 2", 3" and 4" potable water mains shall be constructed of Type "K" hard copper per AWWA specifications. Lines shall be coated with 20-mill plastic tape and be electrically insulated (isolated) from above grade metals by means of dielectric fittings in ferrous utilities and/or exposed metal structures breaking grade

H. Comply with the Los Angeles Department of Water and Power standards for potable water-service piping for testing and disinfection.

I. Comply with NFPA 24, "Installation of Private Fire Service Mains and Their Appurtenances," for materials, installations, tests, flushing, and valve and hydrant supervision.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Preparation for Transport: Prepare valves, including fire hydrants, according to the following:

1. Ensure that valves are dry and internally protected against rust and corrosion.
2. Protect valves against damage to threaded ends and flange faces.
3. Set valves in best position for handling. Set valves closed to prevent rattling.

B. During Storage: Use precautions for valves, including fire hydrants, according to the following:

1. Do not remove end protectors, unless necessary for inspection; then reinstall for storage.
2. Protect from weather. Store indoors and maintain temperature higher than ambient dew-point temperature. Support off the ground or pavement in watertight enclosures when outdoor storage is necessary.

C. Handling: Use sling to handle valves and fire hydrants whose size requires handling by crane or lift. Rig valves to avoid damage to exposed valve parts. Do not use handwheels or stems as lifting or rigging points.

D. Deliver piping with factory-applied end-caps. Maintain end-caps through shipping, storage, and handling to prevent pipe-end damage and to prevent entrance of dirt, debris, and moisture.

E. Protect stored piping from moisture and dirt. Elevate above grade. Do not exceed structural capacity of floor when storing inside.

F. Protect flanges, fittings, and specialties from moisture and dirt.

1.7 PROJECT CONDITIONS

A. Verify existing utility locations. Contact utility locating service.

B. Verify that it is possible to install water service piping to comply with original design and referenced standards.

C. Site Information: Reports on subsurface condition investigations made during design of Project are available for informational purposes only; data in reports are not intended as representations or warranties of accuracy or continuity of conditions between soil borings. Owner assumes no responsibility for interpretations or conclusions drawn from this information.

1.8 SEQUENCING AND SCHEDULING

A. Coordinate connection to water main with the Los Angeles Department Of Water And Power.

B. Coordinate piping materials, sizes, entry locations, and pressure requirements with building water distribution piping.

C. Coordinate piping materials, sizes, entry locations, and pressure requirements with building fire-protection water piping.

D. Coordinate with other utility work.

PART 2 – PRODUCTS

PVC Pipe: ASTM D1785, Schedule 40:

1. Fittings: ASTM D2466, PVC.

2. Joints: ASTM D2855, solvent weld.

3. Trace Wire: Magnetic detectable conductor, brightly colored plastic covering, imprinted with "Water Service" in large letters.

A. Polyvinyl Chloride Plastic (PVC) Pressure Pipe: Suitable for potable water distribution and manufactured in compliance with NSF standards.

1. Pipe sizes 1 ½” – 3”: ASTM D2241 with 160 psi minimum working pressure, unless otherwise indicated.

2. Pipe sizes 4” or greater: AWWA C-900 with 200-psi minimum working pressure, unless otherwise indicated.

a. Joints: ASTM D3139 elastomeric gasket bell ends, conforming to ASTM

D2122 for bell measurements. The wall thickness of joint assembly shall be suitable to withstand internal pressures not less than pipe pressure class rating.

2.1 PIPES AND TUBES

A. General: Applications of the following pipe and tube materials are indicated in Part 3 "Piping Applications" Article.

B. Ductile-Iron, Push-on-Joint Pipe: AWWA C151, with cement-mortar lining and seal coat according to AWWA C104. Include rubber compression gasket according to AWWA C111.

2.2 PIPE AND TUBE FITTINGS

A. General: Applications of the following pipe and tube fitting materials are indicated in Part 3 "Piping Applications" Article.

B. Ductile-Iron, Push-on-Joint Fittings: AWWA C110, ductile-iron or cast-iron; or AWWA C153, ductile-iron, compact type. Include cement-mortar lining and seal coat according to AWWA C104 and rubber compression gaskets according to AWWA C111.

2.3 JOINING MATERIALS

A. General: Applications of the following piping joining materials are indicated in Part 3 "Piping Applications" Article.

B. Ductile-Iron Piping: The following materials apply:

1. Push-on Joints: AWWA C111 rubber gaskets and lubricant.

2.4 PIPING SPECIALTIES

A. Dielectric Fittings: Assembly or fitting with insulating material isolating joined dissimilar metals to prevent galvanic action and corrosion.

1. Description: Combination of copper alloy and ferrous; threaded, solder, plain, and weld-neck end types and matching piping system materials.

2. Dielectric Unions: Factory-fabricated union assembly, designed for 250-psig (1725-kPa) minimum working pressure at 180 deg F (82 deg C). Include insulating material isolating dissimilar metals and ends with inside threads according to ASME B1.20.1.

3. Dielectric Flanges: Factory-fabricated companion-flange assembly, for 150- or 300-psig (1035- or 2070-kPa) minimum pressure to suit system pressures.

4. Dielectric-Flange Insulation Kits: Field-assembled companion-flange assembly, full-face or ring type. Components include neoprene or phenolic gasket, phenolic or polyethylene bolt sleeves, phenolic washers, and steel backing washers.

a. Provide separate companion flanges and steel bolts and nuts for 150- or 300-psig (1035- or 2070-kPa) minimum working pressure to suit system pressures.

5. Dielectric Couplings: Galvanized-steel couplings with inert and non-corrosive thermoplastic lining, with threaded ends and 300-psig (2070-kPa) minimum working pressure at 225 deg F (107 deg C).

6. Dielectric Nipples: Electroplated steel nipples with inert and non-corrosive thermoplastic lining, with combination of plain, threaded, or grooved end types and 300-psig (2070-kPa) working pressure at 225 deg F (107 deg C).

2.5 PE ENCASEMENT

A. PE Encasement for Ductile-Iron Piping: ASTM A 674 or AWWA C105, PE film, 0.008-inch (0.20-mm) minimum thickness, tube or sheet.

2.6 VALVES

2.2 GATE VALVES - UP TO 3 INCHES

A. Manufacturers:

1. Hammond Valve.
2. Stockham Valves and Fittings.
3. American Valve.
4. Crane Valve
5. Walworth.
6. Milwaukee Valve Co.

B. Brass or Bronze body, non-rising stem, inside screw, single wedge or disc, compression ends, with control rod, extension box and valve key.

2.3 GATE VALVES - 3 INCHES AND OVER

A. Manufacturers:

1. Hammond Valve.
2. Stockham Valves and Fittings.
3. American Valve.
4. Crane Valve
5. Walworth.
6. Milwaukee Valve Co.

B. AWWA C500, Iron body, bronze trim, non-rising stem with square nut, single wedge, flanged ends, control rod, extension box and valve key.

2.4 BALL VALVES - UP TO 2 INCHES

A. Manufacturers:

1. Hammond Valve.
2. Stockham Valves and Fitting
3. Jenkins Valves Inc.

B. Brass body, teflon coated brass ball, rubber seats and stem seals, Tee stem pre-drilled for control rod, AWWA inlet end, compression outlet, with control rod, extension box and valve key.

2.5 SWING CHECK VALVES - FROM 2 INCHES TO 24 INCHES

A. Manufacturers:

1. General Controls or equal.

B. AWWA C508, iron body, bronze trim, 45 degree swing disc, renewable disc and seat,

flanged ends.

2.6 BUTTERFLY VALVES - FROM 2 INCHES TO 24 INCHES

A. Manufacturers:

1. Hammond Valve.
2. Stockham Valves and Fittings.
3. Jenkins Valves Inc.

B. AWWA C504, iron body, bronze disc, resilient replaceable seat, water or lug ends, ten position lever handle.

1. Non-rising-Stem, Resilient-Seated Gate Valves, 3-Inch NPS (DN80) and Larger: AWWA C509, gray- or ductile-iron body and bonnet; with bronze or gray- or ductile-iron gate, resilient seats, bronze stem, and stem nut. Include 200-psig (1380-kPa) minimum working-pressure design, interior coating according to AWWA C550, and push-on- or mechanical-joint ends.

2. Butterfly Valves: AWWA C-504, Class 150B valve construction. Flanged, or mechanical joint as required. Iron body, stainless steel shaft, ductile Ni-Resist iron disc with rubber seat. Fit valves with corrosion resistant, self-lubricating, sleeve-type bearings. 150 psi design working pressure. Direction of turning for valve opening shall be counter-clockwise.

B. Valve Boxes: Cast-iron box with top section and cover with lettering "WATER", bottom section with base of size to fit over valve and barrel approximately 5 inches (125 mm) in diameter, and adjustable cast-iron extension of length required for depth of bury of valve.

1. Provide steel tee-handle operating wrench with each valve box. Include tee handle with one pointed end, stem of length to operate valve, and socket-fitting valve-operating nut. After installation of valve box cover and after installation of adjacent paving, if any, covers shall be sandblasted or wire-brushed as necessary and painted with bituminous black paint, unless another color is required by the Architect.

C. Indicator Posts: UL 789, FM-approved, vertical-type, cast-iron body with operating wrench, extension rod, and adjustable cast-iron barrel of length required for depth of bury of valve. Posts above and including connection to riser shall be sandblasted, if necessary, after installation and painted red, unless another color is required by the Architect.

2.7 FREESTANDING FIRE HYDRANTS

A. Description: Cast-iron body, compression-type valve, opening against pressure and closing with pressure, 6-inch (DN150) mechanical-joint inlet, and 150-psig (1035-kPa) minimum working-pressure design.

B. Outlet Threads: NFPA 1963, with external hose thread used by the City of Los Angeles Fire Department. Include cast-iron caps with steel chains.

C. Operating and Cap Nuts: Pentagon 1-1/2 inch (40 mm) point to flat. Shall be pursuant to AWWA C503. Size and shape of operating nuts and threads on hose and pumper connections shall match those on existing hydrants in the vicinity.

D. Direction of Opening: Open hydrant valve by turning operating nut to left or counterclockwise.

E. Exterior Finish: Red or yellow (as directed by LOS ANGELES DEPARTMENT OF WATER AND POWER) alkyd-gloss enamel paint. Entire hydrant above and including connection to riser shall be sandblasted, if necessary, after installation and re-painted.

F. Wet-Barrel Fire Hydrants: AWWA C503, two 2-1/2-inch NPS (DN65) and one 4-1/2-inch NPS (DN115) outlets, 6-inch NPS (DN150) threaded or flanged inlet, and base section with 6-inch NPS (DN150) mechanical-joint inlet. Include interior coating according to AWWA C550.

2.8 FIRE DEPARTMENT CONNECTIONS

A. Exposed Fire Department Connections: UL 405, cast-brass body, with thread inlets according to NFPA 1963 and matching local fire department hose threads, and threaded bottom outlet. Include lugged caps, gaskets, and chains; lugged swivel connection and drop clapper for each hose-connection inlet; 18-inch- (460-mm-) high brass sleeve; and round escutcheon plate.

1. Connections: Two 2-1/2-inch NPS (DN65) inlets and 6-inch NPS (DN150) outlet.
2. Inlet Alignment: Inline, horizontal.
3. Finish Including Sleeve: Polished chrome-plated.
4. Escutcheon Plate Marking: "AUTO SPKR."

2.9 ANCHORAGES

A. Concrete Reaction Backing: Portland cement concrete mix, 3000 psig (20.7 MPa).

1. Cement: ASTM C 150, Type I.
2. Fine Aggregate: ASTM C 33, sand.
3. Coarse Aggregate: ASTM C 33, crushed gravel.
4. Water: Potable.

2.10 IDENTIFICATION

A. Refer to Division 31 Section 31 00 00 "Earthwork" for underground warning tape materials.

B. Arrange for warning tapes made of solid blue film with continuously printed black-letter caption "CAUTION--WATER LINE BURIED BELOW."

2.11 ACCESSORIES

A. Concrete for Thrust Restraints: Concrete type specified in Section 03 30 00 – Cast-In-Place Concrete.

B. Backflow Preventer: Type as required by the City of Los Angeles.

C. Meter: Type as required by the City of Los Angeles.

D. Extension Stems for Valve Operators:

1. Where depth of valve is such that center-line is more than 3 feet below grade, provide operating extension stem to bring operating nut 6 inches below surface of ground and flash or box cover.

2. Construct extension stems of steel, complete with 2 inch square operating nut.

PART 3 - EXECUTION

3.1 EARTHWORK

A. Refer to Division 31 Section 31 00 00 "Earthwork" for excavation, trenching, and backfilling.

B. Refer to Standard Specifications for Public Works Construction – Green Book for cutting and patching of existing paving.

C. Refer to Standard Specifications for Public Works Construction – Green Book for cutting and patching of paving.

3.2 INSTALLATION - PIPE

A. Maintain separation of water main from sewer piping in accordance with code.

B. Install pipe to indicated elevation to within tolerance of 5/8 inches.

C. Install grooved and shouldered pipe joints to AWWA C606.

D. Route pipe in straight line.

E. Install pipe to allow for expansion and contraction without stressing pipe or joints.

F. Slope water pipe and position drains at low points.

G. Form and place concrete for thrust restraints at each elbow or change of direction of pipe main.

H. Establish elevations of buried piping to ensure not less than 2 ft of cover.

I. Install trace wire continuous over top of pipe.

3.3 INSTALLATION - VALVES AND HYDRANTS

A. Set valves on solid bearing.

B. Center and plumb valve box over valve. Set box cover flush with finished grade.

3.4 SERVICE CONNECTIONS

A. Provide water service to utility company requirements with reduced pressure backflow preventer and water meter with by-pass valves and sand strainer.

B. Provide sleeve in retaining wall for service main. Support with reinforced concrete bridge. Calk enlarged sleeve watertight.

C. Anchor service main to interior surface of foundation wall.

D. Provide 18 gage galvanized sheet metal sleeve surrounding service main to 6 inches above floor and 6 feet minimum below grade. Size for 2 inches minimum of glass fiber insulation stuffing.

3.5 INSPECTION

A. Examination: Examine substrates, adjoining construction and conditions under which Work is to be installed. Do not proceed with Work until unsatisfactory conditions have been corrected.

3.6 PREPARATION

A. Field Measurements: Verify dimensions before proceeding with Work. Obtain field measurements for work required to be fitted to other construction. Be responsible for accuracy of such measurements and precise fitting and assembly of finished work.

3.7 PIPING APPLICATIONS

A. General: Use pipe, fittings, and joining methods for piping systems according to the following applications:

B. Transition couplings and special fittings with pressure ratings at least equal to piping pressure rating may be used in applications below, unless otherwise indicated.

C. Do not use flanges or keyed couplings for underground piping.

D. Fire-Protection Water-Service Piping: Use the following:

1. 4- to 8-Inch NPS (DN100 to DN200): Ductile-iron, push-on-joint pipe; ductile-iron, push-on-joint fittings; and gasketed joints.

3.8 VALVE APPLICATIONS

A. Drawings indicate valve types to be used. Where specific valve types are not indicated, the following requirements apply:

1. Underground Valves, 3-Inch NPS (DN80) and Larger: AWWA, gate valves, non-rising stem, with valve box.

2. Underground Valves, 4-Inch NPS (DN100) and Larger: UL/FM, gate valves, non-rising stem, with indicator post.

3.9 JOINT CONSTRUCTION

A. Ductile-Iron Piping, Gasketed Joints for Fire-Service Piping: According to UL 194 and AWWA C600.

B. Dissimilar Materials Piping Joints: Use adapters compatible with both piping materials, OD, and system working pressure. Refer to "Piping Systems - Common Requirements" Article below for joining piping of dissimilar metals.

3.10 PIPING SYSTEMS - COMMON REQUIREMENTS

A. General Locations and Arrangements: Drawings indicate general location and arrangement of piping systems. Install piping as indicated, unless deviations to layout are approved in advance by the Architect or the Los Angeles Department of Public Works.

B. Install components with pressure rating equal to or greater than system operating pressure.

C. Install piping free of sags and bends.

D. Install fittings for changes in direction and branch connections.

G. Piping Connections: Unless otherwise indicated, make piping connections as specified below:

1. Install dielectric fittings to connect piping of dissimilar metals.

3.11 SERVICE ENTRANCE PIPING

A. Extend water-service piping and connect to water-supply source and building water piping systems at outside face of building wall in locations and pipe sizes indicated.

1. Terminate water-service piping at building wall until building water piping systems are installed. Terminate piping with caps, plugs, or flanges as required for piping material. Make connections to building water piping systems when those systems are installed.

B. Sleeves and mechanical sleeve seals are specified in Division 22 Section "Mechanical".

C. Install underground piping with restrained joints at horizontal and vertical changes in direction. Use restrained-joint piping, thrust blocks, anchors, tie-rods and clamps, and other supports.

3.12 PIPING INSTALLATION

A. Pipe Laying: inspect pipe for cracks or other defects before installation. Do not use defective damaged or unsound pipe. Remove foreign matter from pipe interior before lowering into trench. Keep work clean and prevent water, earth or other substances from entering pipes or fittings. Do not lay pipe in water or when trench or weather conditions are unsuitable for work. Start laying at lowest point and lay pipe sections with spigot or tongue pointing in direction of flow. Lay pipe true to line and grade to form smooth and uniform invert. Place pipe with uniformly distributed bearing for bottom quarter of pipe. Excavate recesses to accommodate pipe bells, sleeves, glands or other fittings. Do not allow cinders, loam, humus, or brickbats to come in contact with pipe, valves, or fittings. Take up and re-lay pipe that has grade or joint disturbed after lying.

B. Curves and Offsets: Do not exceed pipe manufacturer's recommendations for deflections from straight line or grade, between extended center lines of 2 connecting pipes as made necessary by curves or offsets. If alignment requires deflections in excess of pipe manufacturer's recommendations, provide special bends or sufficient number of shorter lengths of pipe to provide angular deflections within limit set forth, as authorized by Engineer.

C. Pipe Joints: Provide in accordance with manufacturer's recommendations. Architect may require that manufacturer's representative be present at start of pipe laying operations to instruct contractor's workmen in proper methods to be employed. Obtain full contact between joined surfaces and keep each joint clean so that joint is not damaged or displaced. After joint is installed, immediately coat exposed bolt threads with bituminous compound.

D. Water-Main Connection: Arrange for tap to me made by the Los Angeles Department of Water and Power or their water main, of size and in location indicated.

E. Comply with NFPA 24 for fire-protection water-service piping materials and installation.

F. Install ductile-iron piping according to AWWA C600.

1. Encase piping with PE film according to ASTM A 674 or AWWA C105.

2. Install encasement per manufacturer's written instructions. Close seams and overlaps in the polyethylene tubes with polyethylene compatible adhesive tape. The tape shall be approximately two inches wide and shall have the ability to bond securely to a metal surface and the polyethylene material. Repair all rips, tears and other damage with suitable adhesive tape.

D. Bury piping with depth of cover over top at least 30 inches (750 mm) and according to the following:

1. Under Driveways: With at least 36 inches (900 mm) cover over top.

2. If trenching before rough grading is completed would result in a lesser depth of cover than specified above, then trenching for water piping installation shall not be done until the specified minimum cover depth can be effected. If construction traffic will be allowed to pass over completed water piping installations prior to finish paving, then a protective pavement blanket at least equivalent to the final pavement and base thickness shall be constructed within the vehicle access area for a minimum distance of three feet on either side of the pipe. As an alternative to the temporary pavement blanket, the water pipe shall be installed at a minimum of two (2) feet deeper than specified within construction traffic areas.

3.13 ANCHORAGE INSTALLATION

A. Install anchorages for tees, plugs and caps, bends, crosses, valves, and hydrant branches. Include anchorages for the following piping systems:

1. Gasketed-Joint, Ductile-Iron, Potable-Water Piping: According to AWWA C600.

2. Fire-Service Piping: According to NFPA 24.

B. Apply full coat of asphalt or other acceptable corrosion-retarding material to surfaces of installed ferrous anchorage devices.

3.14 VALVE INSTALLATION

A. General Application: Use mechanical-joint-end valves for 3-inch NPS (DN80) and larger underground installation. Use non-rising-stem UL/FM gate valves for installation with indicator posts.

B. AWWA-Type Gate Valves: Comply with AWWA C600. Install underground valves with stem pointing up and with cast-iron valve box.

C. UL/FM-Type Gate Valves: Comply with NFPA 24. Install underground valves and valves in pits with stem pointing up and with vertical cast-iron indicator post.

3.15 FIRE HYDRANT INSTALLATION

A. General: Install each fire hydrant with separate gate valve in supply pipe, anchor with restrained joints or thrust blocks, and support in upright position.

B. Wet-Barrel Fire Hydrants: Provide for drainage.

C. AWWA-Type Fire Hydrants: Comply with AWWA M17.

D. UL/FM-Type Fire Hydrants: Comply with NFPA 24.

3.16 FIRE DEPARTMENT CONNECTION INSTALLATION

A. Install fire department connection of type and features indicated.

3.17 IDENTIFICATION INSTALLATION

A. Install continuous plastic underground warning tape during back-filling of trench for underground water-service piping. Locate 6 to 8 inches (150 to 200 mm) below finished grade, directly over piping.

3.18 FIELD QUALITY CONTROL

A. Compaction testing will be performed in accordance with ASTM D1557.

B. If tests indicate Work does not meet specified requirements, refer to Section 01 45 40 – Inspection of the Work and Section 01 45 30 – Sampling, Testing and Fabrication Inspection.

C. Provide hydrostatic leak test as indicated in the California Code of Regulations, Title 24 - Building Standards, Part 5, 1998 Basic Plumbing Regulations with State Amendments.

D. Piping Tests: Provide labor and test equipment including test pumps, gauges, instruments and other equipment required. Use test quality pressure gauges with range of approximately twice test pressure. Use calibrated gauges and instruments with current calibration seals or certificates.

1. Conduct piping tests before joints are covered and after thrust blocks have hardened sufficiently. Fill pipeline 24 hours before testing and apply test pressure to stabilize system. Use only potable water.

a. Remove equipment subject to damage by test pressure from systems during testing. Replace removed equipment after testing. Systems may be tested in sections as work progresses; however, previously tested portion shall become part of later test of composite system. Correct leaks by remaking joints with new material. Test time accrues only while full test pressure is on system. Test before backfilling, concealing, insulating, or making connections to potable water system.

b. Testing of the newly laid piping or any valved section of piping shall be accomplished after the lines are laid, the joints and accessories installed, and the trench partially backfilled, leaving the joint exposed for examination. The piping shall be subjected for a minimum of two hours to a pressure of one and one-half times the working pressure, but in no case less than 150 pounds per square inch or at a duration and pressure determined by local codes, whichever is more stringent. Examine all exposed pipe, joints, fittings and accessories during the test period. Replace or repair defective portions of the system, and repeat tests until results are satisfactory

E. Prepare reports for testing activities.

3.19 CLEANING

A. Clean and disinfect water distribution piping as follows:

1. Purge new water distribution piping systems and parts of existing systems that have been altered, extended, or repaired before use.

2. Use purging and disinfecting procedure prescribed by authorities having jurisdiction or, if method is not prescribed by authorities, use procedure described in AWWA C651 or as described below:

   a. Comply with NFPA 24 for flushing of piping. Flush piping system with clean, potable water until dirty water does not appear at points of outlet.

      1) Fill system or part of system with water/chlorine solution containing at least 50 ppm of chlorine. Isolate system or part thereof and allow to stand for 24 hours.

      2) Drain system or part of system of previous solution and refill with water/chlorine solution containing at least 200 ppm of chlorine; isolate and allow to stand for 3 hours.

      3) Following allowed standing time, flush system with clean, potable water until chlorine does not remain in water coming from system.

      4) Submit water samples in sterile bottles to authorities having jurisdiction. Repeat procedure if biological examination shows evidence of contamination.

B. Prepare reports for purging and disinfecting activities.

END OF SECTION

SECTION 33 41 10

STORM DRAIN SYSTEM

PART 1 - GENERAL

*1.1 DESCRIPTION

A. Furnish all labor, materials and equipment necessary to provide "on-site" Storm Drain System as shown on the Contract Drawing and specified herein.

B. Repair and construct paving and bases after removal or installation of Storm Sewerage System.

1.2 QUALITY ASSURANCE

A. Bonded Contractor: For connection to City's Storm Drain System including any catch basin or structure, the Contractor specializing in the Storm Drain System connection work of this section shall be preapproved, bonded, and certified by Los Angeles City Bureau of Engineering. Submit certificates verifying Contractor's qualifications prior to start of work.

B. Labor: Use adequate numbers of skilled laborers who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

*C. Codes and Regulations: Conform to the applicable Los Angeles City Building Code and Amendments, Los Angeles City Bureau of Engineering Standard Plans, and the Standard Specifications for Public Works Construction (SSPWC), latest edition.

*1.3 SUBMITTALS

A. Comply with applicable provisions in the Section 01 33 00 - SUBMITTALS of DIVISION 1 - GENERAL REQUIREMENTS of the Project Manual.

B. Product Data: The Contractor has received the City's "Notice to Proceed", submit:

1. Materials list of items proposed to be provided under this Section and other related Sections;

2. Manufacturer's Specifications and other data needed to prove compliance with the specified requirements;

3. Manufacturer's recommended installation procedures which, when approved by the City Engineer or the Consultant, will become the basis for accepting or rejecting actual installation procedures used on the Work.

C. Contractor's proof of qualification.

*D. Shop Drawings: Submit complete shop fabrication drawings of all steel pipe, pipe specials and joint details. Contractor shall also submit a schedule of pipe marks accompanied by a plan showing the field location of each mark.

E. Closeout Documents: Submit two CD's and one hard copy of the following documents to the City Engineer at substantial completion:

1. Maintenance Log: Provide Microsoft Excel spreadsheet containing the following information:

   a. Maintenance log and upkeep records of the installed post construction BMP. Include the following headers as a minimum: “Date of Service”, “Location of BMP”, “Type of Maintenance or Service”, “Notes”, “Next Scheduled Preventive Maintenance Due”, and “Inspector Signature”.

   b. Maintenance Requirements: Include the following headers as a minimum: “BMP Description”, “Location of BMP and Map Grid Location” and “Type of Maintenance or Service Needed”, i.e.; weekly, monthly, quarterly, etcetera. “Stock No.”, “Manufacturer Contact Information”, along with “Frequency” i.e.: weekly, monthly, quarterly, etcetera and “Special Instructions”.

2. Maintenance Manuals: Provide Maintenance Manual, for installed storm drainage BMP components, along with requirements, replacement or maintenance schedule, and plans with the location of each BMP component. This manual shall include product information cut sheets, shop drawings, vendor information for each component and warranty.

3. Record drawings: ‘As-Builts’ site plan(s) showing post construction BMP. Provide a copy of a marked record set, with red pencil identifying any variations from design documents.

4. Training Documentation:

   a. City designated attendees sign off training sheet.

   b. Two DVD’s of materials covered in the training and components installed.

1.4 DELIVERY, STORAGE AND HANDLING

A. Deliver material and products with certified delivery tickets to the job-site where directed by the City Engineer or the Consultant.

B. Store materials on the job located where directed by the City Engineer or the Consultant and not interfering with work operations of this Section.

C. Handle materials safely in a manner avoiding damage prior to and during installation and not damaging work of other trades.

1.5 PROTECTION

A. Required:

Furnish, erect and maintain barriers, lights and signs as necessary to protect the public, Contractor's and City's personnel and work under this Contract in accordance with Work Area Traffic Control Handbook until such time for backfilling of trenches and subsequent Contracted Site and "Street Work" operations.

*1.6 PERMIT

A. Required:

1. Street Repair A Permit for the installation of storm drain pipes in public right-of-ways.

*1.7 INSPECTION

A. Required:

1. All work outside the property lines regarding storm drain line connections to the street storm drain or gutters through sidewalk and curbs or as called for on the Contract Drawings, by the Storm Drain Connection Inspector of the Bureau of Contract Administration. Contractor shall make necessary arrangement in accordance with the permit requirements.

2. All work inside the property lines regarding storm drain lines shall be inspected by the Los Angeles City Department of Building and Safety.

B. Notification: Contractor shall notify all local governing agencies and arrange for required inspection.

1.8 COORDINATION

A. Required: All on-site storm drain work shall be fully coordinated with other Contracted Work operations as per approved work scheduled.

1.9 TRAINING OF CITY PERSONNEL

A. At substantial completion, and when the storm drainage system is operational, representatives from the contractor and manufacturer(s) of the components, specified and installed at the site, shall provide up to 8 hours of training. Date, time and location for the training shall be coordinated through the City Engineer. Have the City designated attendees sign off training sheet and provide a copy to the City Engineer.

B. Training period shall cover but not be limited to the following:

1. Explain the operation of storm drainage system and its design intent.

2. Explain the maintenance requirements of every component of the system.

3. Provide recommendations of practices to minimize or eliminate negative impact on the system.

4. Provide maintenance schedule, as recommended by the manufacturers, for every component, and review it with the City Maintenance and Operations staff.

5. Conduct a site walk, identify every component of the system and demonstrate its operation.

6. Training shall be conducted with the use of a Maintenance log and Maintenance manual.

1.8 SURPLUS MATERIALS

A. Provide sufficient additional materials for each component of BMP that requires replacement or service during the first year.

PART 2 - PRODUCTS

*2.1 PIPE MATERIAL (As applicable)

A. PVC Pipe: ASTM D2665, Schedule 80:

1. Fittings: ASTM D2466, PVC.

2. Joints: ASTM D2855, solvent weld.

3. Trace Wire: Magnetic detectable conductor, brightly colored plastic covering, imprinted with "Water Service" in large letters.

B. Reinforced Concrete Pipe: As per Section 207-2 - REINFORCED CONCRETE PIPE of the Standard Specifications for Public Works Construction (SSPWC), sizes as indicated on the Contract Drawings.

C. Non-Reinforced Concrete Pipe: "Extra Strength" complying with Section 207-1 - NON-REINFORCED CONCRETE PIPE of SSPWC and ASTM C14 - SPECIFICATION FOR CONCRETE SEWER, STORM DRAIN, AND CULVERT PIPE, sizes as indicated on the Contract Drawings.

D. Cast Iron Pipe: "MG coupling@ type with stainless steel clamp, neoprene gasket and stainless steel bolts and nuts "MG Coupling" trade marked and conforming to APMD Uniform Plumbing Code; sizes as indicated on the Contract Drawings or hubless type pipe with neoprene gasket type joints secured with stainless steel bands.

E. Corrugated Metal Pipe: As per Section 207-11 - CORRUGATED STEEL PIPE AND PIPE ARCHES of the SSPWC; sizes as indicated on the Contract Drawings.

F. Vitrified Clay Pipe: As per Section 207-8 - VITRIFIED CLAY PIPE and for plastic wedge-lock type fittings as per Section 208-2.1.5 of the SSPWC, sizes as indicated on the Contract Drawings.

G. Cleanout: To be located every fifty (100) feet at finish grade or floor inside of building with pipe extensions from horizontal runs installed with long turn radius or at an angle of 45 degrees or less.

1. Paved area - Smith Fig. 4020, secure round top, spigot connection, set in concrete flush with paved surface.

2. Unpaved area - Smith Fig. 4240 with extensions to finish grade.

H. Polyethylene Encasement: Furnished and installed for the protection of Ductile and Cast Iron pipes, fittings, valves and appurtenance if specified on the drawings or the provisions of the Project Manual in accordance with the requirements of ANSI A21.5 (AWWA C-105).

I. Pipe Sleeve: Use Schedule 10 Black Steel Pipe in concrete walls and floorings. Use 24 gage galvanized iron or steel in lath and plaster partition.

*2.2 CONCRETE MATERIALS

A. Required for Catch Basins: Concrete having a compressive strength of 3250 psi at 28 days as per Section 303 of the SSPWC and in Section 03 30 00 - CAST-IN-PLACE CONCRETE of the Project Manual.

*2.3 CATCH BASIN GRATE AND FRAME

Alhambra Foundry Ltd., Alhambra, California, No. A-2012 Standard Heavy Weight Traffic Cast Iron (square or rectangular grate and frame), size as indicated on the Contract Drawings, or equal.

or

Alhambra Foundry Ltd., Alhambra California, No. A-2442 (Rectangular Trench Grate with Steel Angle Frame), sizes as indicated on the Construction Drawings, or equal.

*2.4 CURB DRAIN PIPE

Rectangular in shape conforming to Los Angeles City Bureau of Engineering Standard Plan S-503, latest edition. Material shall be Alhambra Foundry Rectangular Cast Iron Pipes and adaptors, Part A-470 (Rectangular Cast Iron Pipe and Adaptors) and A-480 (Cast Iron Pipe Adaptors, round to rectangular pipe).

2.5 MISCELLANEOUS MATERIALS (As Applicable)

A. Miscellaneous Metals: See Section 05 50 00 - METAL FABRICATIONS of the Project Manual.

1. Conform to Section 206 - Miscellaneous Metal Items of the Standard Specifications for Public Works Construction.

2. Hot-dip galvanize steel parts after fabrication and before installation, in accordance with Section 210 - Paint and Protective Coatings of the Standard Specifications for Public Works Construction.

3. Grates and Frames: Vandal-proof design and construction.

B. Grout: See Section 03 30 00 - CAST-IN-PLACE CONCRETE of the Project Manual.

C. Mortar: Comply with requirements of ASTM C270 - SPECIFICATION FOR MORTAR FOR UNIT MASONRY, Type "M" except the maximum placement time shall be one hour. No mortar shall be used which has begun to set; retempering not permitted.

D. Pipe Bedding and Backfill Materials: See Sub-Section 3.3 hereinafter, Section 02310-EARTHWORK of SSPWC and other Sections of the Project Manual.

1. Sand shall be graded as follow:

Sieve size	Percentage Passing Sieves
3/8"	100%
No. 4	60-100%
No. 8	65 - 90%
No. 16	45 - 70%
No. 30	25 - 45%
No. 50	10 - 20%
No. 100	2 - 8%
No. 200	0 - 4%
No. 220	0 - 3%

2. Concrete shall be in accordance with the Los Angeles City Bureau of Engineering Standard Plan S-251, latest edition.

E. Rock: Rock shall be of such size and shape as to form a stable structure at the discharge end of the corrugated pipe. Rock shall be sound, durable, hard, resistant to abrasion and free from lamination, weak cleavage places and the undesirable effects of weathering. All materials shall be clean and free from deleterious impurities, including alkali, earth, clay and adherent coatings.

PART 3 - EXECUTION

3.1 SURFACE CONDITIONS

Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completions of the Work. Do not proceed until detrimental conditions are corrected as directed by the City Engineer or the Consultant.

3.2 EXCAVATING AND TRENCHING

A. General:

1. Conform to the requirements as specified on the drawings, Los Angeles City Plumbing Code, Standard Specifications for Public Works Construction and other sections of the Project Manual. Case 1 Bedding installation of Los Angeles City Bureau of Engineering Standard Plan S-251, latest edition shall be used for all piping laying. Any piping with 8 feet or more cover or backfill, trench width shall not exceed the maximum allowable trench width as shown in Standard Plan S-251.

2. Excavate trenches to provide for a minimum 4-inch thickness of bedding sand below bottom of pipe couplings. There shall be a minimum side clearance of 6 inches on each side.

*B. Provide excavation and trenches for storm drain piping systems, concrete catch basins indicated on the Contract Drawings in accordance with applicable requirements specified in Section 02 31 00 - EARTHWORK.

3.3 STORM DRAIN SYSTEM CONSTRUCTION

A. General: In strict accordance with pipe manufacturer's recommendations and the Los Angeles City Plumbing Code and the SSPWC.

B. Installation of Pipe: In accordance with Sec. 306-1.2 INSTALLATION OF PIPE of the SSPWS on unyielding bedding foundations with uniform bearing under full length of pipe barrels; walking on or disturbing pipe in any manner after joints have been made, not permitted; at close of each day's work or whenever work is stopped for any reason, protect ends of pipe with temporary tight fitting closures. Slope as per Contract Drawings.

C. For non-ferrous drain pipe, installed with less than 12 inches of cover to finished grade, provide 4-inches concrete encasement.

D. Seal all wall and flooring penetrations and sleeves with applicable fire stopping or sealant material. Obtain inspection prior to wall closure or trench backfill.

E. Bedding:

1. Provide for a minimum 4-inch thickness of bedding sand below bottom of pipe barrels; any over-excavations may require concrete pipe bedding and to be filled with slurry backfill or structural backfill in accordance with Standard Plan S-251, latest edition, at Contractor's expense; bedding sand to be tamped and compacted and accurately graded and shaped to support bottom quadrant of pipe, with coupling holes dug prior to placement of pipe.

2. Backfill: Provide sand backfill to an elevation of 12 inches over the top of the pipe and floor in accordance with Section 306-1.3.3 – WATER DENSIFIED BACKFILL. Use clean earth material for remainder of backfill to required finish grade and compact for yard paving.

F. Pipe Juncture With Concrete Structures: Set pipe ends as necessary for casting-in-place or grouting-in-place after construction of such structures. Junctures with existing storm drain channels to be in accordance with the standards and specifications of the Los Angeles County Flood Control District.

G. Fill Joints: (Other than wedge-lock type) with mortar troweled smooth on inside of pipe; keep mortar joints damp until backfill is placed.

H. Pipe Juncture With Concrete Structures: Set pipe ends as necessary for casting-in-place or grouting-in-place after construction of such structures.

I. Pipe Joints of Corrugated Pipe: Field jointing shall conform to provisions of Section 306-1.2.7 - FIELD JOINTING OF CORRUGATED METAL PIPE of the SSPWC. Provide prefabricated turns and bends on change in direction, joints to meet job needs.

*J. Corrugated Pipe Anchors:

1. Where above grade corrugated pipe shall uniformly bear on grade and be anchored thereto by means of galvanized steel pipe anchors penetrating the grade or slope of earth bank a minimum of 18-inches, as indicated on the Contract Drawings.

2. Where pipe is below grade provide cast-in-place concrete collars where indicated on the Contract Drawings.

*3.4 CONCRETE STRUCTURES

A. Catch Basins: Section 303-1- CONCRETE STRUCTURE and 303-1.4.4(b) - STANDARD CATCH BASIN of the SSPWC as applicable. Forms to be of 1-inch minimum thick plywood; remove forms minimum 24-hours after concrete pour; top surface of catch basins to conform to drawing details or paving grades and as directed by the City Engineer or the Consultant; steel trowel finish and lightly brushed with bristle brush all exposed surfaces; gratings and frames to be set flush and level with top surface of basin or as otherwise indicated on the Contract Drawings.

B. Maintenance Holes: Construct at location and to elevations indicated on the Contract Drawings, in accordance with details and materials noted thereon; set precast concrete segments with full mortar joints troweled smooth on interior of manhole; set cover frames in full mortar bed and accurately to meet paving grades.

*3.5 BACKFILL

A. Place approved washed sand 12-inches above top of pipe and the balance of backfill shall be approved clean earth material free from rock or large clods larger than 1-inch in size. If excavated material is unsuitable or rejected; Contractor shall provide approved imported materials as necessary to complete the work.

B. No backfill material shall be deposited against the concrete structure until the concrete has developed not less than the specified 28 - day compressive strength.

*3.6 STREET WORK

A. Required: All work outside property lines extending under sidewalks and connecting to existing storm drain structures shall comply with applicable sections of the SSPWC and as directed by the Bureau of Engineering. Complete all such work and obtain required approval prior to start of any concrete paving or sidewalk work.

1. Line and grade verification of drainpipe.

2. Trench backfill and compaction.

or

B. Required: All work outside the property lines extending under the sidewalks and discharging into gutter through the curb shall comply with applicable Sections of the SSPWC and as directed by the City Engineer. Complete all such work and obtain inspection prior to start of any concrete paving, curb and gutter, and sidewalk.

3.7 TESTING (As Applicable)

A. Required: Provide personnel and equipment necessary, and perform tests required to demonstrate that the work of this Section has been completed in accordance with the specified requirements.

B. Hydrostatic Test on Watertight Joints:

1. Make a hydrostatic test on each watertight joint. Test one sample of each type watertight joint used. If one sample fails because of faulty workmanship, test an additional joint.

2. Demonstrate that joints in reinforced and unreinforced concrete pipe comply with ASTM C443 - SPECIFICATION FOR JOINTS FOR CIRCULAR CONCRETE SEWER AND CULVERT PIPE, USING RUBBER GASKETS.

3. Comply with ASTM C425 - SPECIFICATION FOR COMPRESSION JOINTS FOR VITRIFIED CLAY PIPE AND FITTINGS for tests of joints in clay pipe.

4. Make tests in concrete pipe and clay pipe at an internal hydrostatic pressure of 10 psi for 24-hours.

5. Replace or repair joints found to be faulty. Repeat the test and repair cycle until joints are demonstrated to meet the specified requirements.

END OF SECTION

SECTION 33 47 77

CHEMICAL RESISTANT GEOMEMBRANE VAPOR BARRIERS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Furnish and install chemical resistant geomembrane vapor barriers as indicated on the drawings and specified.

1.3 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include construction details, material descriptions, and accessories for geomembrane vapor barriers.

B. Shop Drawings: Include panel layout, seams, penetrations, perimeter anchorage, and methods of attachment and sealing to other construction. Differentiate between factory and field seams and joints.

C. Samples: For each exposed product and for each color specified. Include one 12-inch (300-mm) seam length for factory-bonded sheets and one 12-inch (300-mm) seam length for field-bonded sheets.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

B. Product Test Reports: For each geomembrane sheet, for tests performed by a qualified testing agency.

C. Source quality-control reports.

D. Field quality-control reports.

E. Sample Warranty: For manufacturer's special warranty.

1.6 CLOSEOUT SUBMITTALS

A. Maintenance Data: For geomembrane vapor barriers.

1.7 QUALITY ASSURANCE

A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.

1.8 WARRANTY

A. Manufacturer's Special Warranty: Manufacturer agrees to repair or replace geomembrane vapor barrier and that fail(s) in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Leaks in geomembrane vapor barrier.
b. Defects in seams.
c. Cracks and holes in floating cover.

2. Warranty Period: Three years from date of Substantial Completion.

1.9 REFERENCES

A. American Society for Testing and Materials (ASTM)

1. D 1004 Test Method for Initial Tear Resistance of Plastic Film and Sheeting

2. D 1603 Test Method for Carbon Black in Olefin Plastics

3. D 3895 Standard Test Method for Oxidative-Induction Time of Polyolefins by Differential Scanning Calorimetry

4. D 4218 Standard Test Method for Determination of Carbon Black in Polyethylene Compounds

5. D 4833 Standard Test Method for Index Puncture Resistance of Geotextiles, Geomembranes, and Related Products

6. D 5199 Standard Test Method for Measuring Nominal Thickness of Geotextiles and Geomembranes

7. D 5596 Standard Test Method for Microscopic Evaluation of the Dispersion of Carbon Black in Polyolefin Geosynthetics

8. D 5994 Standard Test Method for Measuring Core Thickness of Textured Geomembranes

9. D 6392 Standard Test Method for Determining the Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods

10. D 6693 Standard Test Method for Determining Tensile Properties of Nonreinforced Polyethylene and Nonreinforced Flexible Polypropylene Geomembranes

11. D 7240 Standard Practice for Leak Location using Geomembranes with an Insulating Layer in Intimate Contact with a Conductive Layer via Electrical Capacitance Technique (Conductive Geomembrane Spark Test)

12. GRI GM 13 Test Properties, Testing Frequency and Recommended Warranty for High Density Polyethylene (HDPE) Smooth and Textured Geomembranes

13. GRI GM 17 Test Properties, Testing Frequency and Recommended Warranty for Linear Low Density Polyethylene (LLDPE) Smooth and Textured Geomembranes

1.10 DEFINITIONS

A. Construction Quality Assurance Consultant (CONSULTANT) - Party, independent from MANUFACTURER and INSTALLER that is responsible for observing and documenting activities related to quality assurance during the lining system construction.

B. ENGINEER- The individual or firm responsible for the design and preparation of the project's Contract Drawings and Specifications.

C. Geomembrane Manufacturer (MANUFACTURER) - The party responsible for manufacturing the geomembrane rolls.

D. Geosynthetic Quality Assurance Laboratory (TESTING LABORATORY) - Party, independent from the OWNER, MANUFACTURER and INSTALLER, responsible for conducting laboratory tests on samples of geosynthetics obtained at the site or during manufacturing, usually under the direction of the OWNER.

E. INSTALLER- Party responsible for field handling, transporting, storing, deploying, seaming and testing of the geomembrane seams.

F. Panel- Unit area of a geomembrane that will be seamed in the field that is larger than 100 ft^2.

G. Patch - Unit area of a geomembrane that will be seamed in the field that is less than 100 ft^2.

PART 2 - PRODUCTS

2.1 CHEMICAL RESISTANT GEOMEMBRANE VAPOR BARRIERS

A. Subject to review of action submittals by the Architect for compliance with requirements, products shall be those indicated on the drawings (Monoshield by Land Science) or an acceptable substitution.

B. The vapor barrier system shall be a 30-mil thick composite geomembrane comprised of flexible chemically resistant metallized film laminated to a geotextile, a copolymer polyethylene and tear resistant PET reinforced grid structure.

C. Geomembrane Rolls

1. Geomembrane shall be free of holes, pinholes as verified by on-line electrical detection, bubbles, blisters, excessive contamination by foreign matter, and nicks and cuts on roll edges.

2. Geomembrane material is to be supplied in roll form. Each roll is to be identified with labels indicating roll number, thickness, length, width and manufacturer.

3. All vapor barrier sheets produced at the factory shall be inspected prior to shipment for compliance with the physical property requirements and be tested by an acceptable method of inspecting for pinholes. If pinholes are located, identified and indicated during manufacturing, these pinholes may be *corrected during installation.*

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, with Installer present, for compliance with requirements for soil compaction and grading; for subgrade free from angular rocks, rubble, roots, vegetation,

debris, voids, protrusions, and ground water; and for other conditions affecting performance of geomembrane vapor barrier.

B. Examine surfaces where geomembrane vapor barrier will be placed and the substrate conditions required and for correct location and configuration.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Provide temporary ballast, until edges are permanently secured, that does not damage geomembrane vapor barrier to prevent uplift of geomembrane in areas with prevailing winds.

B. Prepare surfaces of construction penetrating through geomembrane according to geomembrane manufacturer's written instructions.

C. Remove curing compounds and coatings from concrete surfaces to be sealed to geomembrane.

3.3 INSTALLATION

A. General: Place geomembrane vapor barrier over prepared surfaces to ensure minimum handling. Install according to Shop Drawings and in compliance with geomembrane liner manufacturer's written instructions. Begin placing geomembrane at Project's upwind direction and proceed downwind. Install geomembrane vapor barrier in a relaxed condition, free from stress and with minimum wrinkles, and in full contact with subgrade. Do not bridge over voids or low areas in the subgrade. Fit closely and seal around inlets, outlets, and other projections through geomembrane vapor barrier. Permanently secure edges.

B. Field Seams: Comply with geomembrane manufacturer's written instructions. Form seams by lapping edges of panels 2 to 4 inches (50 to 102 mm), unless instructions require a larger overlap. Wipe contact surfaces clean and free of dirt, dust, moisture, and other foreign materials. Use solvent-cleaning methods and grind geomembrane seam surfaces if recommended by geomembrane vapor barrier manufacturer. Proceed with seaming at required temperatures for materials and ambient conditions. Continuously bond sheet to sheet to construct single or double seams of width recommended for method of seaming used. Seal or fuse free seam edges. Inspect seams and reseal voids.

1. Adhesive Bonding: Apply bonding cement to both contact surfaces in seam area and press together immediately, or use other seaming methods as instructed by geomembrane vapor barrier manufacturer. Roll to press surfaces together, to distribute adhesive to leading edges of panels, and to remove wrinkles and fishmouths. Remove excess adhesive.

2. Thermal Bonding: Use thermal-welding technique recommended by geomembrane vapor barrier manufacturer. Apply pressure to smoothly bond surfaces together. Examine for and patch wrinkles and fishmouths.

C. Attachment to Concrete: Use manufacturer's standard system to suit Project conditions. Support adhesive and geomembrane on minimum 8-inch- (200-mm-) wide concrete substrate unless otherwise indicated.

D. Geomembrane Repairs: Repair tears, punctures, and other imperfections in geomembrane field and seams using patches of geomembrane material,

E. Bonding materials, and bonding methods according to geomembrane vapor barrier manufacturer's written instructions. Apply bonding solvent or weld to contact surfaces of both patch and geomembrane vapor barrier, and press together immediately. Roll to remove wrinkles.

3.4 FIELD QUALITY CONTROL

A. Testing Agency: Owner may will engage and will pay (if engaged) a qualified testing agency to perform tests and inspections.

B. Nondestructive Testing: Visually inspect seams and patches. Comply with ASTM D4437 for Air Lance Test, Vacuum Box Testing, or Ultrasonic (High Frequency) Pulse Echo Testing or with GRI Test Method GM6, as applicable to geomembrane vapor barrier and seam construction. Record locations of failed seams and patches. Individually number and date occurrences and details of leak and remedial action. Repair leaking seams and patches.

C. Destructive Testing: Comply with GRI Test Method GM19, as applicable to geomembrane vapor barrier and seam construction. Record locations of sample locations and failed seams. Individually number and date occurrences and details of leak and remedial action. Repair leaking seams and patches, and test sample locations.

D. Prepare test and inspection reports.

3.5 PROTECTION

A. Protect installed geomembrane vapor barrier according to manufacturer's written instructions. Repair or replace areas of geomembrane vapor barrier damaged by scuffing, punctures, traffic, rough subgrade, or other unacceptable conditions.

B. Before initial filling of pond or placement of earth cover, inspect seams and patched areas to ensure tight, continuously bonded installation. Repair damaged geomembrane vapor barrier and seams and re-inspect repaired work.

END OF SECTION

RESEDA SKATING FACILITY

V. GEOTECHNICAL DOCUMENTATION

W.O. No. E170121D

Department of
Recreation and Parks

CITY OF LOS ANGELES
DEPARTMENT OF PUBLIC WORKS
BUREAU OF ENGINEERING

GEOTECHNICAL ENGINEERING DIVISION

GEOTECHNICAL ENGINEERING REPORT
RESEDA SKATE FACILITY PROJECT
18210, 18128, AND 18138 WEST SHERMAN WAY
LOS ANGELES, CALIFORNIA

W.O.# E170121B
GED FILE # 19-080
AUGUST 28, 2019

TABLE OF CONTENTS

1.0 INTRODUCTION 1
2.0 PROJECT DESCRIPTION 1
3.0 GEOTECHNICAL INVESTIGATION 1
3.1 Field Exploration 2
3.2 Laboratory Testing 2
4.0 DISCUSSION OF FINDINGS 2
4.1 Site Conditions 2
4.2 Subsurface Conditions 2
4.3 Groundwater 3
4.4 Soil Engineering Properties 3
5.0 SEISMIC CONSIDERATIONS 4
5.1 2017 LABC Seismic Design Parameters 4
Table 1 – Seismic Design Parameters 4
5.2 Seismic Hazards 4
5.2.1 Surface Fault Rupture 5
5.2.2 Liquefaction 5
6.0 RECOMMENDATIONS 5
6.1 Key Design Issue 5
6.2 Earthwork 5
6.2.1 Site Preparation 5
6.2.2 Over-Excavation 6
6.2.3 Subgrade Preparation and Stabilization 6
6.2.4 Temporary Excavations 6
6.2.5 Temporary Shoring 7
6.2.6 Fill Materials and Placement 7
6.2.7 Utility Trench Backfill 8
6.2.8 Fill Certification 8
6.3 Shallow Foundations 8
6.3.1 Bearing Capacity and Settlement 9
6.3.2 Lateral Load Resistance 9
6.4 Concrete Slab-on-Grade Floors 9
6.5 Corrosion and Sulfate Attack Resistance 10
6.6 Pavement Design 10
Table 2 - AC Pavement Section Layer Thicknesses (inches) 10
7.0 SUPPLEMENTAL GEOTECHNICAL SERVICES 11
7.1 Review of Plans and Specifications 11
7.2 Geotechnical Observation and Testing During Construction 11
8.0 CLOSURE 12

Figure 1 – Vicinity Map
Figure 2 – Site Location Map
Figure 3 – Proposed Site Plan
Figure 4 – Lateral Earth Pressures for Temporary Shoring Systems

Appendix A - Converse Consultants, Geotechnical Data Report, Reseda Ice and Roller Rink Project, 18210, 18128, and 18138 West Sherman Way, Reseda, Los Angeles, California, dated August 28, 2019.

1.0 INTRODUCTION

This report presents the results of our geotechnical investigation for the proposed Reseda Skate Facility project. The project sites, as shown on Figure 1 – Vicinity Map, are located on the south side of Sherman Way between Lindley Avenue and Etiwanda Avenue. The proposed development area, as shown on Figure 2 – Site Location Map, includes six parcels. Three of these six parcels currently have an address and the remaining three don't have an address. The three parcels with addresses are 18210, 18128 and 18138 West Sherman Way.

The purposes of this investigation were to evaluate the nature and engineering properties of the subsurface materials and develop geotechnical recommendations for design and construction of the project. The City of Los Angeles, Department of Public Works, Bureau of Engineering, Geotechnical Engineering Division (GED) has prepared this report in response to the Architectural Division's request on April 29, 2019.

2.0 PROJECT DESCRIPTION

The proposed site plan is presented on Figure 3. As shown on Figure 3, the project consists of constructing a roller rink in the northwest portion (18210 West Sherman Way) and an indoor ice skating rink in the southwest portion (no current address). The east portion will be used for parking. The indoor ice skating rink will extend to the east and west property boundaries; however, it will be set back 10 feet from the north and south property boundaries. The roller rink will extend to the east property boundary. The west side of the roller rink parcel will be used for parking with a fire lane. The proposed grades are expected to be within one to two feet of the existing ones.

Structural loads for the proposed roller rink and ice skating rink were not provided to us at the time of this report. We expect the applied static bearing pressure for shallow foundations will not exceed 2,500 pounds per square foot (psf).

If significant changes to the project are proposed, the findings and recommendations in this report may not be applicable, and a supplemental report may be required. The GED shall be provided an opportunity to review any proposed changes and determine if a supplemental report is required.

3.0 GEOTECHNICAL INVESTIGATION

Our geotechnical investigation included field exploration and laboratory testing, which was completed by Converse Consultants (Converse). A copy of their data report is provided in Appendix A of this report. The findings and information presented in this report are based on the information contained in Converse's data report. The GED has reviewed their report, concurs with the information contained in it, and accepts responsibility for the use of its contents.

3.1 FIELD EXPLORATION

The field exploration consisted of drilling nine hollow-stem auger (HSA) borings, each to a total depth of approximately 16½ feet below ground surface (bgs). The approximate boring locations are presented on the Boring Locations Map in Converse's data report (Appendix A). The subsurface conditions encountered in the borings are discussed in Section 4.2.

The field exploration also included a geophysical survey within the proposed roller rink and ice skating rink sites. The purpose of the geophysical survey was to help identify underground utilities and buried substructures.

3.2 LABORATORY TESTING

The laboratory testing program consisted of in-situ moisture content and dry density, direct shear, consolidation, fines content, hydrometer, Atterberg Limits, expansion index, compaction, Resistance (R-) value, and corrosion potential. The laboratory test results were used to develop the soil engineering properties, which are discussed in Section 4.4.

4.0 DISCUSSION OF FINDINGS

The following discussion of findings is based on our observations and the results of the field exploration and laboratory testing programs (Appendix A).

4.1 SITE CONDITIONS

As shown on Figure 2, the proposed development area consists of four main sites. Each site is accessed from an existing paved alley that extends between Lindley Avenue and Etiwanda Avenue. At the time of our visit, all sites were, for the most part, unoccupied. The ground surface in the proposed south parking area and ice skating rink sites is paved with asphalt concrete (AC). The ground surface in the proposed north parking area and roller rink sites is unpaved. The sites and surrounding areas are relatively flat with an average elevation of approximately 740 feet above mean sea level (NavigateLA).

There is a newly renovated building that occupies the adjacent property on the west side of the proposed roller rink site. This building, which is part of the Magnolia Science Academy charter school, extends to the property boundary. The adjacent property on the west side of the proposed ice skating rink consists of a parking lot, which has been recently paved with AC. The adjacent properties on the east side of the ice skating rink and roller rink sites are vacant (i.e. undeveloped). Also, there is a residential neighborhood on the south side of the proposed development area.

4.2 SUBSURFACE CONDITIONS

Uncertified fill was encountered in all nine HSA borings, and the fill thickness varies from approximately 4 to 5 feet. The fill is mostly comprised of lean clay with sand. Very few fill indicators were observed, and as such, it was difficult to distinguish the fill from the native soil. Based on the field Standard Penetration Test (SPT) blow counts, the fill consistency is generally soft to medium stiff.

The composition of the native soil is similar to that of the uncertified fill. The native soil mostly consists of lean clay with varying amounts of sand. The field SPT blow counts range from 2 to 11 with an average value of 6. The consistency is generally soft to medium stiff.

4.3 GROUNDWATER

Groundwater was not encountered in any of the borings to the maximum explored depth of approximately 16½ feet below ground surface (bgs). Groundwater information obtained from California Department of Conservation, Division of Mines and Geology (DMG, 1997) indicates the shallowest reported historic groundwater depth is approximately 10 feet bgs. Groundwater levels are expected to fluctuate with seasonal rainfalls and dry weather (i.e. drought conditions); however, groundwater is not anticipated during construction.

4.4 SOIL ENGINEERING PROPERTIES

Laboratory tests were performed on selected samples to characterize the engineering properties of the fill and native soil. The individual laboratory test results are included in Converse's data report (Appendix A).

Moisture content and in-situ dry density tests were performed on samples of the native soil to evaluate the total unit weight. The in-situ dry density and moisture content of the native soil was found to range from approximately 72 to 115 pounds per cubic foot (pcf) and 8 to 25 percent, respectively. The total unit weight of the native soil was found to range from approximately 89 to 132 pcf with an average value of 110 pcf.

Direct shear tests were performed on two remolded samples of the existing clayey fill material and on an undisturbed sample of the native lean clay. Both remolded samples were compacted to 90 percent relative compaction (RC) at 2 percent above the optimum moisture content. Based on Converse's interpretation of the test results, the ultimate friction angle and cohesion value of the remolded fill ranges from 25 to 27 degrees and 70 to 100 psf, respectively. The ultimate friction and cohesion value of the native lean clay is 24 degrees and 200 psf, respectively.

Consolidation tests were performed on two remolded samples of the existing clayey fill and on an undisturbed sample of the native lean clay. Both remolded samples were compacted to 90 percent RC at 2 percent above the optimum moisture content. The results indicate the remolded samples have a modified recompression index, C_{er}, ranging from approximately 1.0 to 1.8 percent.

Atterberg Limits tests were performed on two samples of the native lean clay. Each sample was collected at a depth of approximately 5½ feet bgs. The plasticity index (PI) of the lean clay is between 12 and 14, which indicates this material has a moderately low shrink-swell potential.

Expansion index (EI) tests were performed on two samples of the clayey fill material, and the expansion index was found to range from 38 to 46. These EI values indicate the near surface soil has a low expansion potential.

Two compaction tests were performed on bulk samples of the clayey fill material to determine the maximum dry density and optimum moisture content. The compaction test results indicate that the optimum moisture content and maximum dry density of this material ranges from approximately 13 to 14 percent, and 114 to 116 pcf, respectively.

Finally, R-value tests were performed on two samples of the clayey fill material and the R-value was found to range from 20 to 21.

5.0 SEISMIC CONSIDERATIONS

The following sections present seismic design parameters and discuss seismic hazards for the site.

5.1 2017 LABC SEISMIC DESIGN PARAMETERS

Seismic design parameters for the project were developed in accordance with the ASCE 7-16 procedures. The parameters are based on mapped spectral acceleration values and the site conditions.

The seismic design parameters for the site are summarized in Table 1.

TABLE 1 – SEISMIC DESIGN PARAMETERS

Parameter	Value	Reference
Site Class	D	ASCE 7-16
S_s	1.896	ASCE 7-16
S_1	0.645	ASCE 7-16
S_{MS}	1.896	ASCE 7-16
S_{M1}	Null (see Section 11.4.8)	ASCE 7-16
S_{DS}	1.264	ASCE 7-16
S_{D1}	Null (See Section 11.4.8)	ASCE 7-16
T_O (seconds)	0.100	ASCE 7-16
T_S (seconds)	0.501	ASCE 7-16

The peak ground acceleration (PGA_M) at the site is 0.85g.

5.2 SEISMIC HAZARDS

This section provides the results of our evaluation of earthquake-related geologic/geotechnical hazards for the site, including surface fault rupture, and liquefaction.

5.2.1 Surface Fault Rupture

The project sites are not located within a State of California Alquist-Priolo Special Study Zone, and nor are they located within a Los Angeles Preliminary Fault Rupture Study Area (NavigateLA). The closest fault is the Northridge Hills Fault, which is approximately 3 miles northeast of the site. Based on this information, the potential for surface fault rupture to occur at the site is considered remote.

5.2.2 Liquefaction

Based on the Seismic Hazard Zones map for the Canoga Park Quadrangle (California Department of Conservation, DMG, 1998), the site isn't located within a liquefiable area. Therefore, the potential for liquefaction to occur at the site is considered remote.

6.0 RECOMMENDATIONS

Based on the results of our investigation, the proposed project is considered geotechnically feasible provided the recommendations presented in this report are incorporated into the design and construction. If changes in the design are made, or variations or changed conditions are encountered during construction, the GED shall be notified to determine if supplemental recommendations are required.

6.1 KEY DESIGN ISSUE

The key geotechnical issue associated with the proposed development is the presence of soft uncertified fill and soft native soil. These materials are prone to settlement that could adversely impact the proposed structures and improvements. The earthwork and foundation recommendations provided in this report will help reduce the potential for settlement(s) to exceed acceptable limits.

6.2 EARTHWORK

All earthwork shall be performed in accordance with the geotechnical recommendations presented in this report and the Los Angeles Department of Building and Safety (LADBS), Grading Division's requirements. Furthermore, all earthwork shall be performed under the GED's observation.

6.2.1 Site Preparation

Site preparation will initially involve the removal of the existing AC pavement in the paved portions of the site(s). Following demolition, the construction area shall be cleared of any vegetation and stripped of miscellaneous debris and other deleterious material. Organic matter and other material that may interfere with construction shall be removed. Vegetation and organic matter should not be incorporated into the fill material. Organic rich soil, if present, may be stockpiled for future landscaping.

Any utilities, whether active or inactive, shall be identified. If required, these utility lines shall be properly abandoned and/or relocated per project plans and specifications. Any depressions resulting from removal of any existing utility lines shall be properly backfilled and compacted (see Section 6.2.6).

6.2.2 Over-Excavation

All existing fill shall be removed beneath slab-on-grade floors. Vertical over-excavation is not required for footings embedded into native soil. In areas where vertical over-excavation is performed, the existing fill and native soil shall be removed at least 30 inches below the bottom of the footings. The excavation shall extend laterally at least 5 feet beyond the edges of the building or to the property boundaries, whichever is less. Due to property boundary constraints, lateral over-excavation will not be feasible on the east side of the roller rink and on the east and west sides of the ice skating rink.

The existing uncertified fill may be left in-place beneath new paved areas. The earthwork beneath pavement areas, including the subgrade preparation (see Section 6.2.3), shall result in at least 18 inches of compacted fill beneath the pavement section.

6.2.3 Subgrade Preparation and Stabilization

Excavation bottoms shall be scarified at least 6 inches, moisture conditioned to within 3 percent above the optimum moisture content, and compacted to a minimum 90 percent RC, as determined by ASTM D1557. All excavation bottoms shall be observed, tested, and approved by a representative of the GED and the LADBS, Grading Inspector prior to placement of fill.

Based on the laboratory test results (see Section 4.4), the in-situ moisture content of the exposed native soil along excavation bottoms may be significantly higher than the optimum moisture content. An active drying and/or mixing (i.e. blending) operation may be required to achieve adequate compaction.

If adequate compaction cannot be achieved by a drying/mixing/blending operation, bottom stabilization shall be performed. The bottom shall be excavated an additional 12 inches (separate and in addition to the over-excavation discussed in Section 6.2.2). The "new" bottom shall be lined with Mirafi 600X or approved equal stabilization geotextile. A 12-inch thick layer of ¾-inch to 1-inch crushed rock shall be placed on top of stabilization geotextile. The top of the crushed rock layer shall be covered with Mirafi 140N or approved equal filter cloth.

6.2.4 Temporary Excavations

Based on our observations during subsurface investigation and results of laboratory tests, the materials at the site should be readily excavated by conventional earthmoving equipment in good operating condition. All temporary excavations shall conform to the State of California Construction Safety Orders (CAL/OSHA).

Unsurcharged vertical excavations shall not exceed 5 feet. Unsurcharged excavations greater than 5 feet and to a maximum of 10 feet shall be sloped at a 1:1 (H:V) or flatter inclination from the ground surface to the bottom of the excavation. Excavations greater than 10 feet shall be shored.

6.2.5 Temporary Shoring

Cantilever or braced shoring may be considered at this site as an alternative to temporary excavations. The maximum retained height for a cantilever shoring system shall not exceed 15 feet. All shoring systems shall be designed such that the maximum deflection does not exceed ½-inch. Box shoring, trench shields, and/or speed shores may only be used at the discretion of the GED.

Prior to excavation, it is recommended that walls, structures, or portions of structures within a horizontal distance of 1½ times the depth of the excavation be inspected to determine their present condition. For documentation purposes, photographs should be taken of preconstruction conditions.

During construction, deflection of the shoring system shall be initially monitored on a daily basis until it can be demonstrated that adjacent structures/utilities are not adversely impacted. At that time, weekly monitoring can be performed. In addition, structures shall be periodically monitored for signs of distress. If distress is observed, the GED shall be contacted immediately to provide supplemental recommendations.

Lateral Earth Pressures

Cantilever or braced shoring shall be designed for the lateral earth pressures shown on Figure 4. These values are based on the assumption that (1) the shored soil material is level at ground surface, (2) the exposed height of the shoring is no greater than 15 feet, and (3) the shoring is temporary, and will not be required to support the soil longer than about six months. Surcharge coefficients of 0.33 and 0.50 may be used with uniform vertical surcharges for cantilever and braced shoring lateral earth pressures, respectively. These surcharge pressures should be added to the lateral earth pressures.

Soldier Piles and Lagging Design

Drilled holes for soldier piles shall be backfilled with Controlled Low Strength Material (CLSM) per Greenbook Section 201, from the bottom of lagging (i.e. proposed excavation depth) to the ground surface. The CLSM shall contain a minimum of one sack of Portland cement per cubic yard of slurry and a maximum of two sacks of Portland cement per cubic yard of slurry. Drilled holes below the excavation bottom shall be backfilled with structural concrete. To reduce the potential for sloughing and caving of the soils, continuous lagging shall be installed between the soldier piles. All lumber shall be pressure-treated in accordance with Specification C-2 of the American Wood Preservers Association.

6.2.6 Fill Materials and Placement

The onsite clayey fill and native soil may be reused as compacted fill, except as subgrade below the concrete slab-on-grade floor. The onsite soils are suitable for reuse only if they are free of organic material, debris, and don't contain fragments greater than 3 inches in maximum dimension. Drying of wet site soils or mixing of these soils with dryer soils may be required prior to being used as compacted fill.

The upper 12 inches of compacted fill beneath concrete slab-on-grade floors shall consist of import fill. Import fill material shall be predominantly granular (minimum 80% passing number 4 sieve and between 10% and 35% passing the number 200 sieve), and non-expansive (EI less than 25). Also, the import fill material shall be free of organic or inorganic debris, contamination and materials with any dimension larger than 3 inches. Import material shall be reviewed for approval by the GED prior to importing to the job site. The GED shall be notified a minimum of three working days prior to scheduled importing of soil to the project site.

Fill material shall be placed in loose lifts not exceeding 8 inches in thickness, moisture conditioned to within 3 percent above optimum, and mechanically compacted. The hydrometer test results indicate the onsite materials have a clay content greater than 15 percent; therefore, primary structural fill shall be compacted to at least 90 percent RC. Non-structural (i.e. secondary) fill shall also be compacted to at least 90 percent RC. All crushed miscellaneous base (CMB) and/or crushed aggregate base (CAB) beneath pavements shall be compacted to at least 95 percent RC.

Fill placement and compaction shall be observed and tested by the GED. Compacted fill soils shall be kept moist (at or slightly above the specified moisture content at the time of compaction), but not flooded, until covered with subsequent construction. If compacted fill becomes disturbed, it shall be reworked or removed and replaced. Certification and inspection approvals for compromised soils are void and invalid.

6.2.7 Utility Trench Backfill

Trench excavations for utility pipes may be backfilled with the onsite soils under the observation of a representative of the GED. After utility pipes have been laid, properly bedded, and covered per the project specifications, they shall be backfilled to the ground surface or design subgrade with controlled backfill. Controlled backfill shall be moisture conditioned, placed and compacted in accordance with the recommendations presented in Section 6.2.6 of this report. Densification by flooding or jetting is not allowed.

6.2.8 Fill Certification

Upon successful completion of fill placement and compaction, the GED will issue a Compaction Certification for the fill. Unless approved by the Building Inspector during construction, the Contractor shall not pour footings until an approval letter is issued by the LADBS, Grading Division for the Compaction Certification. The contractor may excavate in compacted fill for foundation elements before the fill certification approval letter is issued, but does so at his/her own risk.

6.3 Shallow Foundations

The roller rink and ice skating rink may be supported on shallow foundations consisting of continuous and/or isolated (i.e. column) footings. Recommendations for bearing capacity and settlement and lateral load resistance are provided in the following sections.

6.3.1 Bearing Capacity and Settlement

Continuous and isolated footings bearing on at least 36 inches of compacted fill shall be embedded at least 24 inches below the lowest adjacent grade. Footings in areas where lateral over-excavation is not feasible, shall be embedded at least 6 inches into the native lean clay. Footings underlain by native soil along the property boundaries are expected to be approximately 5 feet deep. Continuous footings shall be at least 18 inches wide, and isolated footings shall be at least 24 inches wide.

Footings underlain by compacted fill may be designed using an allowable (net) bearing capacity of 2,500 psf, which applies to combined dead and sustained live loads. Footings underlain by native soil may be designed using an allowable (net) bearing capacity of 2,000 psf. These allowable bearing capacity values may be increased by ⅓ when considering transient live loads, including wind and seismic forces.

Based on the allowable bearing value recommended above, total static settlement of the shallow footings is anticipated to be less than 1-inch. Differential settlement is expected to be less than ½-inch.

6.3.2 Lateral Load Resistance

Lateral load resistance for footings will be developed by passive soil pressure against the sides of the footing and by friction acting at the base of the footing. An allowable passive pressure of 250 psf per foot of depth, beginning from 1 foot below the lowest adjacent grade, may be used for design purposes. An allowable passive pressure of 250 psf per foot of depth, beginning from the ground surface, may be used if the footing is located adjacent to an exterior slab or paved surface. The allowable passive pressure is only applicable for level (ground slope equal to or flatter than 5:1) conditions. An allowable coefficient of friction of 0.35 may be used for dead and sustained live loads for frictional resistance of the footings constructed directly on compacted fill. A safety factor of 1.5 has been incorporated into both the allowable passive and frictional resistance values. The passive pressure and frictional resistance may be increased by ⅓ under seismic and wind loading conditions.

6.4 Concrete Slab-on-Grade Floors

Concrete slab-on-grade floors shall be supported on compacted fill, and the upper 12 inches of compacted fill shall consist of import granular fill material. In areas where a moisture-sensitive floor covering (such as vinyl, tile, or carpet) is desired, the slab can be protected by placing a minimum 10-mil-thick polyethylene vapor barrier between the slab and compacted subgrade. If the barrier is used, it should be placed between two 1-inch layers of sand to protect it from punctures and to aid in the concrete cure. Vapor barrier seams should be overlapped a minimum of 6 inches and taped or otherwise sealed. The actual requirements for a barrier and protective sand layer shall be determined by the designer.

Structural design information shall include concrete mix design, steel reinforcement, concrete placement procedures, concrete curing, and control joints. In addition, it is imperative that the floor slab is designed such that the subgrade soil beneath the ice skating rink will not freeze.

6.5 Corrosion and Sulfate Attack Resistance

Chemical analyses including, pH, minimum resistivity, chloride, and sulfate content tests were performed on two samples; a sample of the clayey fill material and the native lean clay. The results of the tests are presented in Appendix A.

The soil pH ranges from 7.7 to 7.8, the minimum saturated resistivity ranges from 730 to 860, the chloride concentration ranges from 200 to 215 ppm, and the soluble sulfate is approximately 0.03 percent. Caltrans (2012) considers a soil to be corrosive if one or more of the following conditions exist:

- Chloride concentration is 500 ppm or greater;
- Sulfate concentration is 2,000 ppm or greater;
- pH is 5.5 or less.

Based on Caltran's (2012) criteria, the onsite fill and native soil are not corrosive when in contact with ferrous metals. According to criteria by other agencies such as NAVFAC, however, the onsite soils may be classified as very to severely corrosive. If desired or required, a corrosion specialist should be consulted regarding selection of construction materials and/or protective design. The results of the sulfate concentration tests indicate that, based on the American Concrete Institute (ACI, 2008) criteria, these soils have negligible sulfate attack potential on concrete. Refer to ACI 318-08 for appropriate concrete mix design.

6.6 Pavement Design

Based on the laboratory test results, the R-value of the near surface clayey fill material is between 20 and 21. Traffic indexes were not provided to us at the time of this report. The recommended asphalt concrete (AC) layer thicknesses are as follows:

Table 2 - AC Pavement Section Layer Thicknesses (inches)

Layer	Traffic Index = 5.0	Traffic Index = 6.0	Traffic Index = 7.0	Traffic Index = 8.0	Traffic Index = 9.0
AC	2.5	3.0	3.5	4.0	5.0
Aggregate Base (95% RC)	8.0	10.0	12.0	15.0	16.0
Compacted Subgrade (90% RC)	18	18	18	18	18

AC shall conform to Sections 203 and 302 of the latest edition of the Standard Specifications for Public Works Construction. CAB and CMB shall conform to Section 200 of the latest edition of the Greenbook.

Portland cement concrete (PCC) pavement may also be used in areas of the site that are not paved with AC. For TIs between 6 and 7, a section of 6 inches of PCC over 12 inches of CAB or CMB is recommended. For TIs of 8 and 9, the PCC section should be increased to 7 and 8 inches, respectively. The Portland Cement Concrete should have a minimum modulus of rupture of 650 psi at 28 days.

All pavement areas shall be designed for a minimum surface gradient of at least 1 percent and all flow lines should have gradients of 2 percent in order to prevent water percolation through the pavement and subsequent saturation of the subgrade. It would be desirable to locate the flow lines away from high traffic areas.

7.0 SUPPLEMENTAL GEOTECHNICAL SERVICES

7.1 REVIEW OF PLANS AND SPECIFICATIONS

The grading plans and specifications should implement the recommendations presented in this report and should be reviewed by the GED to ensure proper interpretation and application of our recommendations.

7.2 GEOTECHNICAL OBSERVATION AND TESTING DURING CONSTRUCTION

All grading, excavation, and construction of foundations should be performed under the observation and testing of the GED at the following stages:

- During site preparation;
- During excavation;
- During subgrade preparation;
- During fill placement and compaction;
- During footing excavation(s) and immediately prior to placement of foundation and/or pool concrete
- During excavation and backfilling of all utility trenches; and
- When any unusual or unexpected geotechnical conditions are encountered.

8.0 CLOSURE

If you have any questions about the contents of this report, please contact Easton Forcier at (213) 847-0476.

8-28-19

Easton Forcier, GE 2948
Geotechnical Engineer II

Q:\PROJECTS\2019\19-080 Reseda Skate Park\Geotechnical Report\Geotechnical Report 8-28-19.doc

REFERENCES

American Concrete Institute, 2008, Building Code Requirements for Structural Concrete (ACI 318-08) and Commentary, January.

California Department of Conservation, Division of Mines and Geology, 1997, Seismic Hazard Zone Report for the Canoga Park 7.5-Minute Quadrangle, Los Angeles County.

California Department of Conservation, Division of Mines and Geology, 1998, Earthquake Zones of Required Investigation, Canoga Park Quadrangle, February 1.

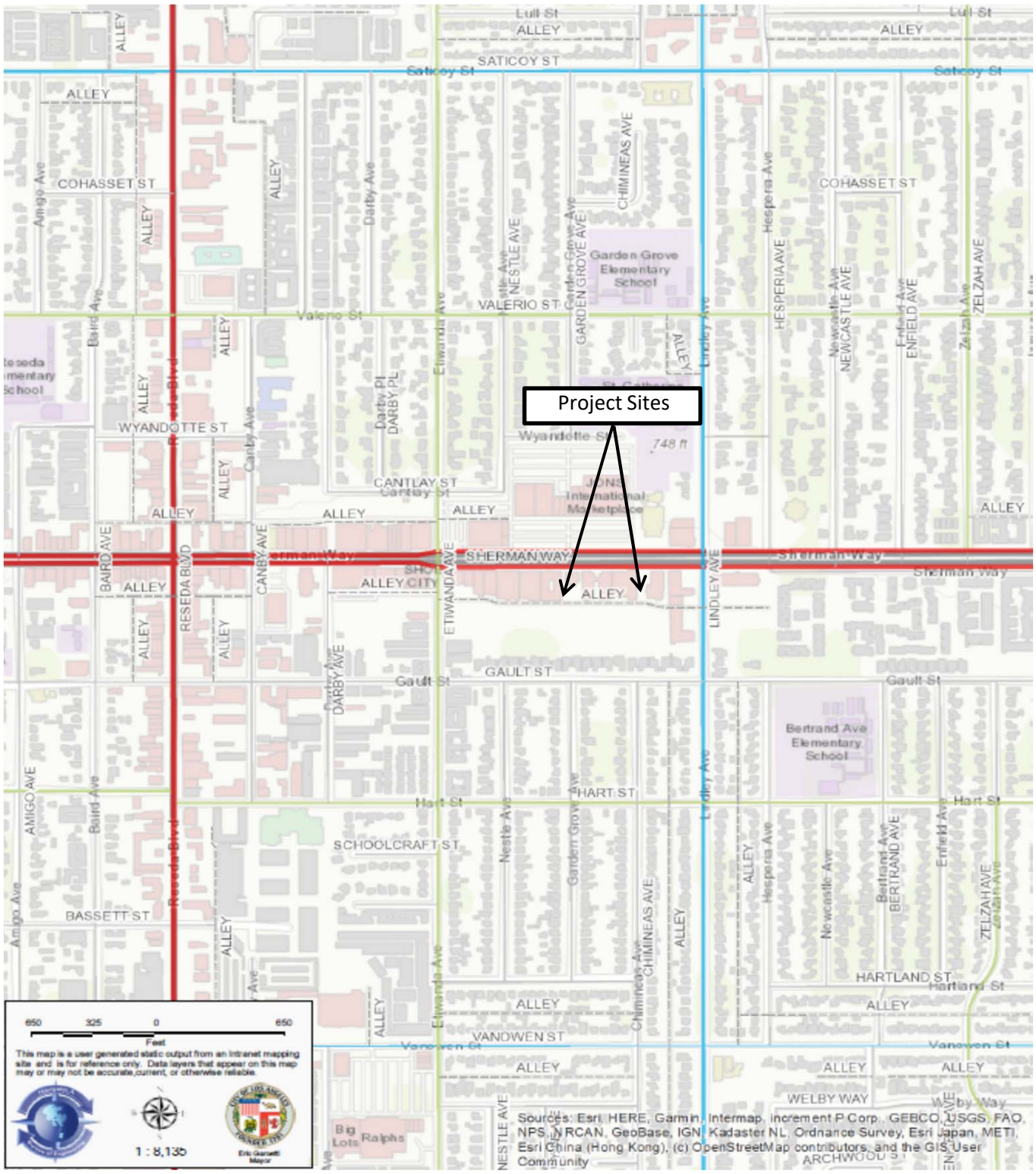
California Department of Transportation (Caltrans), 2012, Corrosion Guidelines, Version 2.0, November.

Converse Consultants, 2019, Geotechnical Data Report, Reseda Ice and Roller Rink Project, 18210, 18128, and 18138 West Shermay Way, Reseda, Los Angeles, California, TOS 19-080, August 29.

Los Angeles Building Code, 2017.

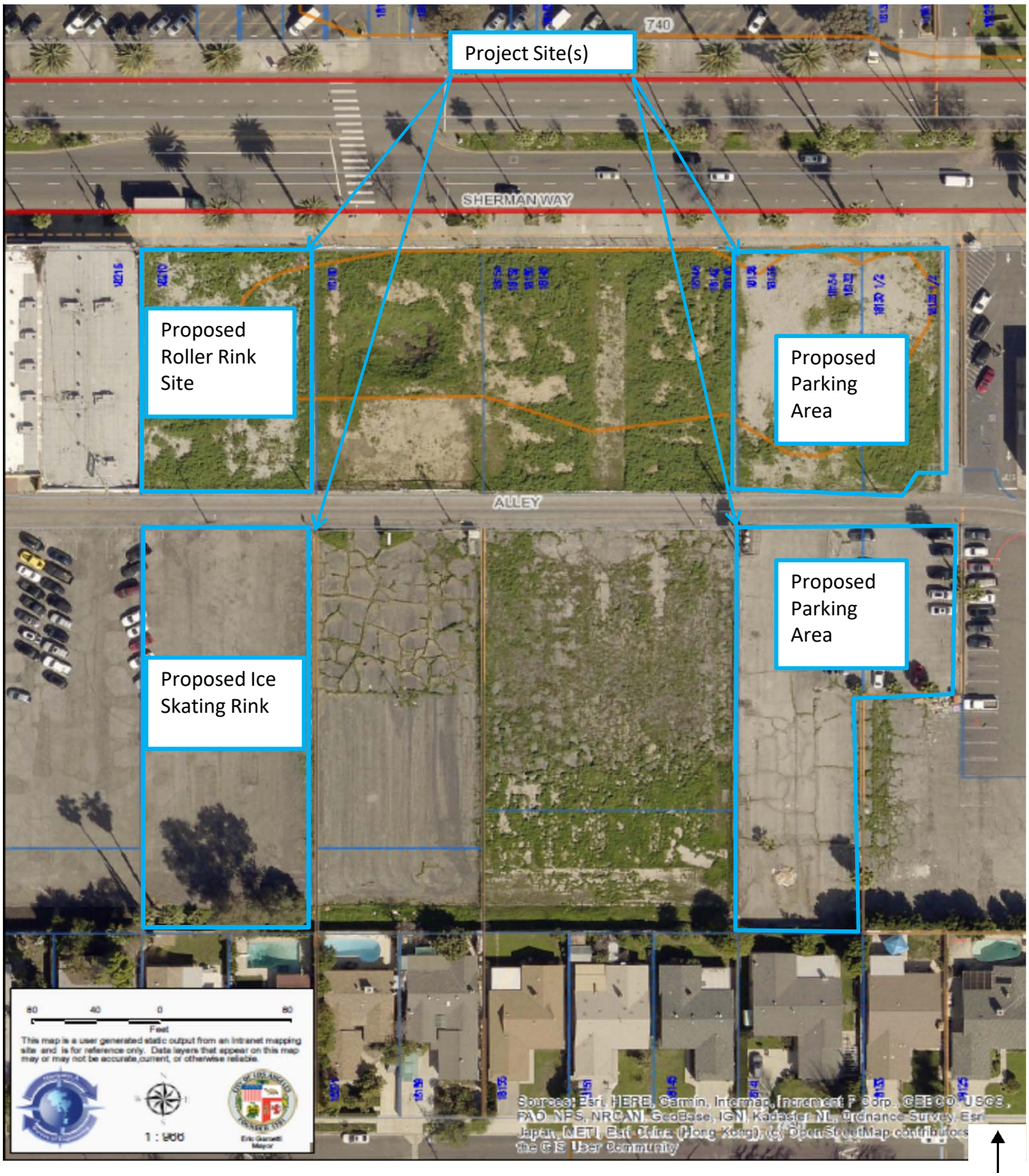
NavigateLA, City of Los Angeles, http://boemaps.eng.ci.la.ca.us/index01.cfm

FIGURES



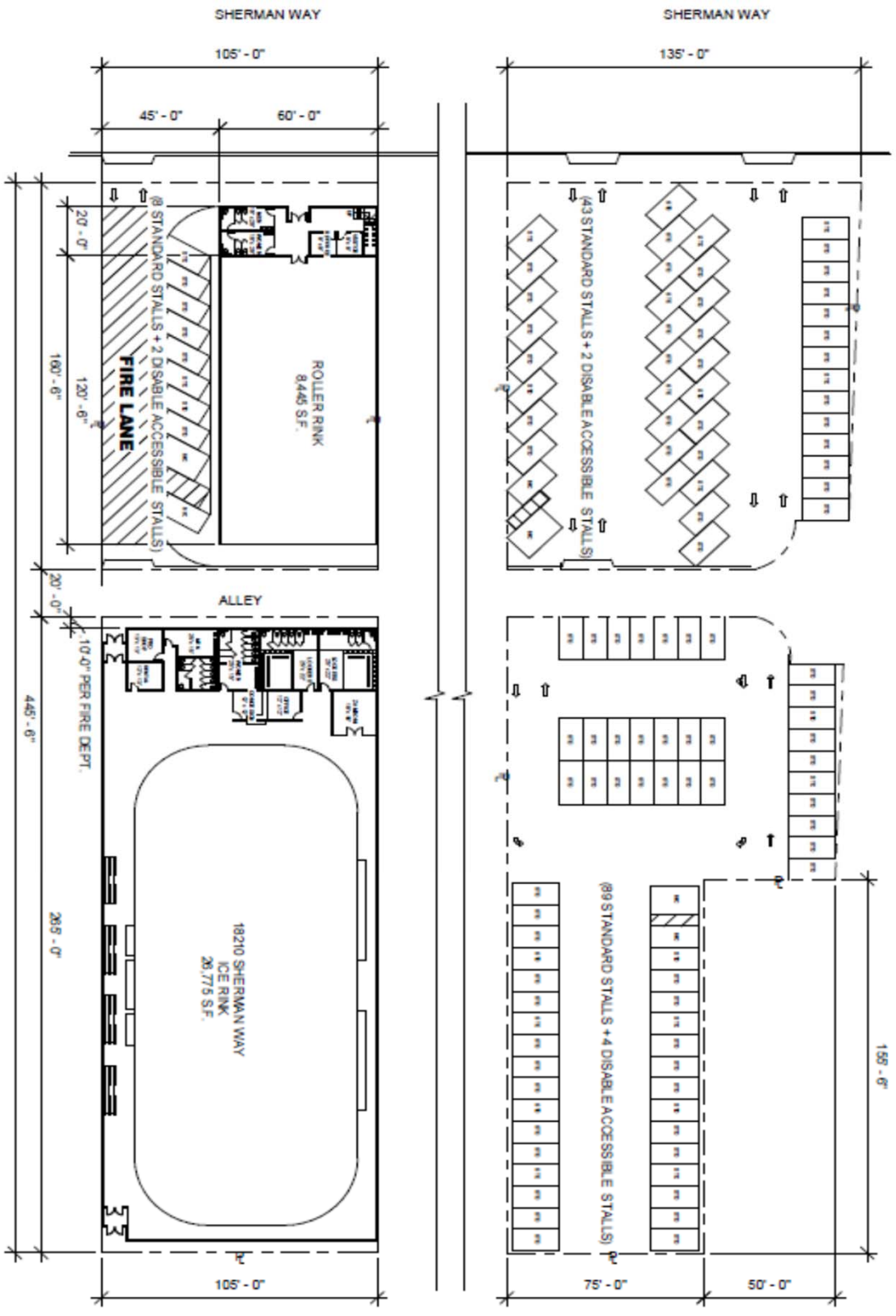
Vicinity Map

Reseda Skate Facility 18210 West Sherman Way Los Angeles	BUREAU OF ENGINEERING GEOTECHNICAL ENGINEERING DIVISION (GED) GED FILE NO.: 19-080 DATE: AUGUST 2019	FIGURE NO. 1



Site Location Map

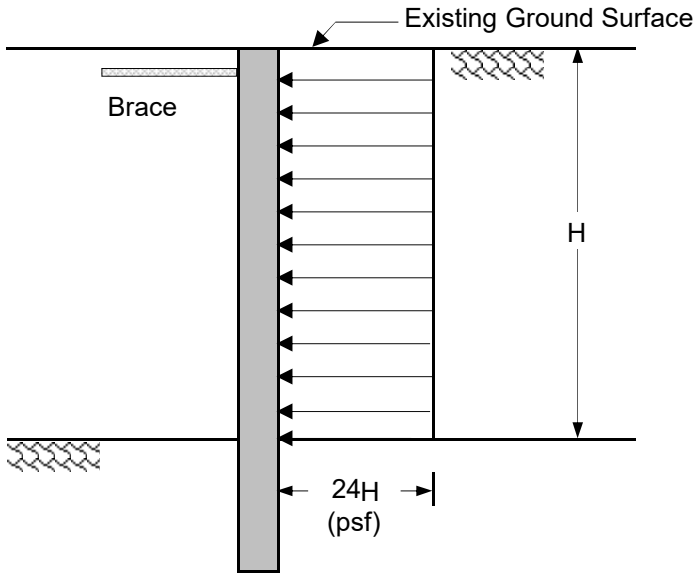
Reseda Skate Facility 18210 West Sherman Way Los Angeles	BUREAU OF ENGINEERING GEOTECHNICAL ENGINEERING DIVISION (GED) GED FILE NO.: 19-080 DATE: AUGUST 2019	FIGURE NO. 2



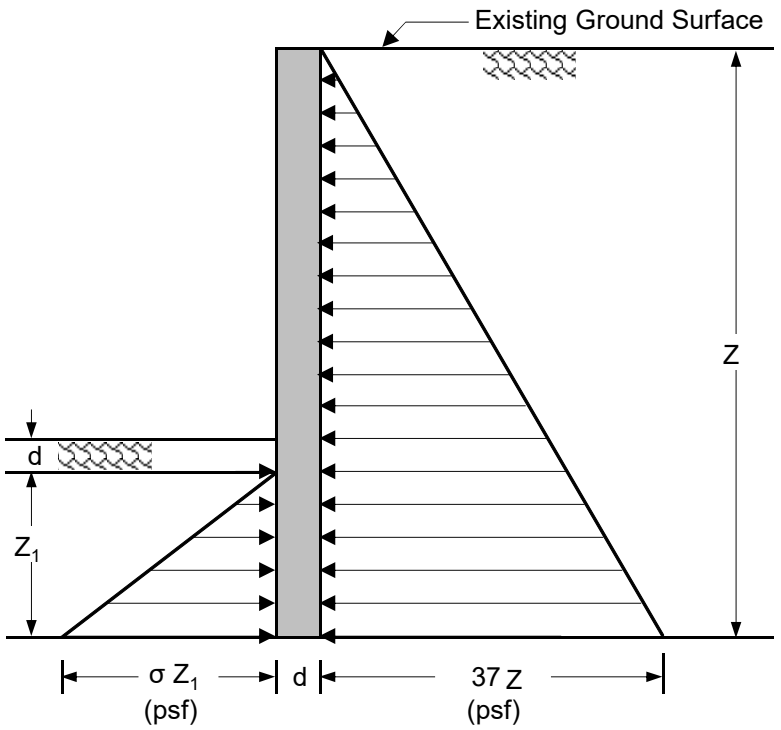
Proposed Site Plan

Reseda Skate Facility 18210 West Sherman Way Los Angeles	BUREAU OF ENGINEERING GEOTECHNICAL ENGINEERING DIVISION (GED) GED FILE NO.: 19-080 DATE: AUGUST 2019	FIGURE NO. 3

Q:\PROJECTS\2019\19-080 Reseda Skate Park\Analysis\Lateral earth pressures shoring



BRACED SHORING



CANTILEVER SHORING

σ = 440 pcf for soldier piles spaced at least 2.5d apart
σ = 220 pcf for soldier piles spaced less than 2.5d apart

Notes:
1. Not to scale.
2. Dimensions are in feet.
3. Earth pressures shown are based on level backfill conditions behind shoring elements and groundwater below bottom of shoring elements.

LATERAL EARTH PRESSURES FOR TEMPORARY SHORING SYSTEMS
RESEDA SKATE FACILITY PROJECT
Los Angeles, California

By: ERF	Date: 8/27/2019	GED Fil No.: 19-080
City of Los Angeles, DPW, BOE, Geotechnical Engineering Division		Figure **4**

APPENDIX A

Geotechnical Data Report
Reseda Ice and Roller Rink Project
18210, 18128, and 18138 West Sherman Way
Reseda, Los Angeles, California
by Converse Consultants
dated August 28, 2019

Converse Consultants
Geotechnical Engineering
Environmental & Groundwater Science
Inspection & Testing Services

GEOTECHNICAL DATA REPORT

RESEDA ICE AND ROLLER RINK PROJECT
18210, 18128 AND 18138 WEST SHERMAN WAY
RESEDA, LOS ANGELES, CALIFORNIA

CONVERSE PROJECT NO. 16-31-260-16

Prepared For:

CITY OF LOS ANGELES BUREAU OF ENGINEERING
Mr. Patrick J. Schmidt, PE, GE
Division Engineer
Geotechnical Engineering Division
Department of Public Works
1149 South Broadway, 1st Floor, MS 495
Los Angeles, California 90015

Presented By:

CONVERSE CONSULTANTS
717 South Myrtle Avenue
Monrovia, California 91016
626-930-1200

August 28, 2019

Converse Consultants
Geotechnical Engineering, Environmental & Groundwater Science, Inspection & Testing Services

August 28, 2019

Mr. Patrick J. Schmidt, PE, GE
Division Engineer
Geotechnical Engineering Division
City of Los Angeles Bureau of Engineering
Department of Public Works
1149 South Broadway, 1st Floor, MS 495
Los Angeles, California 90015

Subject: **GEOTECHNICAL DATA REPORT**
Reseda Ice and Roller Rink Project
18210, 18128 and 18138 West Sherman Way
Reseda, Los Angeles, California
Contract No. C-130603, TOS 19-080, Work Order No. E170121B
Converse Project No. 16-31-260-16

Dear Mr. Schmidt,

Converse Consultants (Converse) has prepared this geotechnical data report to present the findings of a geophysical survey and our geologic and geotechnical study for the proposed Reseda Ice and Roller Rink Project located in the Reseda area of the City of Los Angeles, California.

We appreciate the opportunity to be of continued service to City of Los Angeles. If you should have any questions, please do not hesitate to contact us at (626) 930-1275.

Sincerely,

CONVERSE CONSULTANTS

Siva K. Sivathasan, PhD, PE, GE, DGE, QSD, F. ASCE
Senior Vice President/Principal Engineer

REGISTERED PROFESSIONAL ENGINEER
KATHIRAVETPILLAI SIVATHASAN
No. 2708
Exp. 6-30-20
GEOTECHNICAL
STATE OF CALIFORNIA

Dist: 4/Addressee
Copy: Easton Forcier

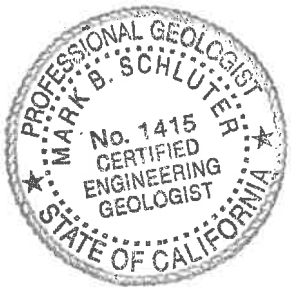
PA/MBS/SKS:jjl

PROFESSIONAL CERTIFICATION

This data report for the Proposed Reseda Ice and Roller Rink Project located in the Reseda area of the City of Los Angeles, California, has been prepared by the staff of Converse under the professional supervision of the individuals whose seals and signatures appear hereon.

The findings contained in this report were prepared in accordance with generally accepted professional engineering and engineering geologic principles and practice in this area of Southern California. There is no warranty, either expressed or implied.

Parameswaran Ariram, EIT
Senior Staff Engineer



Mark B. Schluter, PG, CEG, CHG
Senior Engineering Geologist

Siva K. Sivathasan, PhD, PE, GE, DGE, QSD, F. ASCE
Senior Vice President/Principal Engineer

Copyright 2019 Converse Consultants

TABLE OF CONTENTS

1.0 INTRODUCTION 1

2.0 SITE AND PROJECT DESCRIPTION 2

2.1 SITE DESCRIPTION 2
2.2 PROJECT DESCRIPTION 2

3.0 SCOPE OF WORK 3

3.1 SITE RECONNAISSANCE 3
3.2 GEOPHYSICAL INVESTIGATION 3
3.3 SUBSURFACE EXPLORATION 3
3.4 LABORATORY TESTING 4
3.5 DATA REPORT 4

Drawings

Following Page Number
Figure No.1, Boring Location Map 4

Appendices

Appendix A ..... Field Exploration
Appendix B ..... Laboratory Testing Program
Appendix C ..... Spectrum Geophysical Investigation Dated August 12, 2019

Copyright 2019 Converse Consultants

1.0 INTRODUCTION

This report contains the findings of our geotechnical study performed at the site of the proposed Reseda Ice and Roller Rink project located in the Reseda area of the City of Los Angeles, California.

This data report is written for the project described herein and is intended for use solely by city of Los Angeles and its design team. It should not be used as a bidding document but may be made available to the potential contractors for information on factual data only. For bidding purposes, the contractors should be responsible for making their own interpretation of the data contained in this report.

Copyright 2019 Converse Consultants

2.0 SITE AND PROJECT DESCRIPTION

2.1 Site Description

The project site consists of four (4) separate parcels that are located along the south side of West Sherman Way. The parcels are divided by an existing east-west alley way, parcel fences and private properties located southwest of the intersection of West Sherman Way and Lindley Avenue in the Reseda area of Los Angeles.

The subject site for the proposed ice and roller rink has ground surface elevations ranging from approximately 733 feet to 735 feet relative to mean-sea-level (MSL) respectively, with surface gradients flowing down gradient toward the south and southwest. The site coordinates are: North latitude: 34.20044 degrees, West longitude: 118.52981 degrees.

2.2 Project Description

The project site consists of four (4) separate parcels that are divided by an existing alley way and private properties located southwest of the intersection of West Sherman Way and Lindley Avenue in the Reseda area of Los Angeles. Existing structures have been demolished and removed from the properties and the parcels are vacant and undeveloped. The project consists of construction of a new roller rink and indoor ice-skating rink in Reseda along the south side of Sherman Way. The roller rink and ice-skating rink will occupy a footprint of approximately 8,500 and 27,000 square feet, respectively. The northeast and southeast parcels will be used for parking.

Copyright 2019 Converse Consultants

3.0 SCOPE OF WORK

The scope of our work included a site reconnaissance, subsurface exploration with soil sampling, laboratory testing, engineering analysis, and preparation of this report.

3.1 Site Reconnaissance

Our field exploration included a site reconnaissance by a Converse geologist on August 24th, 2019. The purpose of the site reconnaissance was to observe surface conditions and to mark exploratory boring locations based on a proposed boring location map provided by Geotechnical Engineering Division, City of Los Angeles. The borings were located using existing boundary features as a guide and should be considered accurate only to the degree implied by the method used. Underground Service Alert (USA) of Southern California was notified of our proposed drilling locations at least 48 hours prior to initiation of the subsurface field work.

3.2 Geophysical Investigation

A geophysical investigation of the northwest and southwest parcels was performed by Spectrum Geophysics on July 24th and 25th, 2019. The purpose of the investigation was to locate buried features such as footings, debris or metallic utility lines. The equipment used during the geophysical investigation included a Geonics EM-31 terrain conductivity meter, EM-61 MK2 digital metal detector, Noggin Smart Cart ground penetrating radar, Fisher TW-6 M-Scope shallow focus metal detector, and RadioDetection RD4000 electromagnetic utility locator. The systems were linked to a NavCom DGPS unit and Allegro field computer to map geographic coordinates and record survey data positions for a site map. Results of the geophysical investigation are presented in a separate report in Appendix C.

3.3 Subsurface Exploration

Nine (9) exploratory borings (BH-1 through BH-9) were drilled at the project site on July 29th, 2019. The borings were advanced using a truck mounted drill rig with an 8-inch diameter hollow stem auger to depths of 16.5 feet below the existing ground surface (bgs). Each boring was visually logged by a Converse engineer and sampled at regular intervals and at changes in subsurface soils. Detailed descriptions of the field exploration and sampling program are presented in Appendix A, *Field Exploration*.

California Modified Sampler (Ring samples), Standard Penetration Test samples , and bulk soil samples were obtained for laboratory testing. Standard Penetration Tests (SPTs) were performed in selected borings at selected intervals using a standard (1.4 inches inside diameter and 2.0 inches outside diameter) split-barrel sampler. The bore holes were backfilled with cement grout and patched with cold mix concrete to match the surface conditions if applicable following the completion of drilling.

Copyright 2019 Converse Consultants

A MultiRAE Lite PID meter calibrated to hexane was used to screen the soil samples for volatile organic compounds during drilling. The results of the PID meter screening are presented on the boring logs.

The approximate locations of the exploratory borings are shown in Figure No. 1, *Boring Location Map.* For a description of the field exploration and sampling program see Appendix A, *Field Exploration*.

3.4 Laboratory Testing

Representative samples of the site soils were tested in the laboratory to aid in the classification and to evaluate relevant engineering properties. The tests performed included:

- *In situ* moisture contents and dry densities (ASTM Standard D2216)
- Hydrometer (ASTM Standard D7928)
- Maximum dry density and optimum-moisture content relationship (ASTM Standard D1557)
- Direct shear (ASTM Standard D3080)
- Expansion Index (ASTM Standard D4829)
- Consolidation (ASTM Standard D2435)
- R-value (ASTM Standard D2844)
- Atterberg Limits (ASTM Standard D4318)
- Soil Corrosivity Tests (Caltrans 643, 422, 417, and 532)

3.5 Data Report

Data obtained from the exploratory fieldwork and laboratory-testing program were analyzed and evaluated with respect to the planned construction. This report was prepared to provide the findings and data developed during our study and evaluation.

Copyright 2019 Converse Consultants

BORING LOCATIONS MAP

Converse Consultants

Reseda Ice and Roller Rink
West Sherman Way
Los Angeles, CA

Project No.
16-31-260-16

Drawing No.
1

Appendix A

Field Exploration

APPENDIX A: FIELD EXPLORATION

Field exploration included an initial site reconnaissance, and subsurface drilling. During the site reconnaissance, surface conditions were noted, and the locations of the test borings were determined. Borings were approximately located using existing features as a guide.

Nine (9) exploratory borings (BH-1 through BH-9) were drilled at the project site on July 29th, 2019. The borings were advanced using a truck mounted drill rig with an 8-inch diameter hollow stem auger to depth of 16.5 feet below the existing ground surface (bgs). Each boring was visually logged by a Converse engineer and sampled at regular intervals and at changes in subsurface soils.

Relatively undisturbed ring and bulk samples of the subsurface soils were obtained at frequent intervals in the borings. The undisturbed samples were obtained using a California Steel Sampler (2.4 inches inside diameter and 3.0 inches outside diameter) lined with thin sample rings. The sampler was driven into the bottom of the boreholes with successive drops of a 140-pound hammer falling 30 inches by means of a mechanically driven pulley. The number of successive drops of the driving weight ("blows") required for every 6-inch of penetration of the sampler are shown on the Logs of Borings in the "blows" column.

The soil sample was retained in brass rings (2.4 inches in diameter and one inch in height). The central portion of the sample was retained and carefully sealed in waterproof plastic containers for shipment to the laboratory. Bulk soil samples from boreholes BH-1 to BH-4, BH-8 and BH-9 were also collected in plastic bags as per the field direction and brought to the laboratory.

Standard Penetration Tests (SPTs) were also performed. In this test, a standard split-spoon sampler (1.4 inches inside diameter and 2.0 inches outside diameter) was driven into the ground with successive drops of a 140-pound hammer falling 30 inches by means of an automatic hammer. The number of successive drops of the driving weight ("blows") required for every 6-inch of penetration of the sampler are shown on the Logs of Borings in the "blows" column. The soil retrieved from the spoon sampler was carefully sealed in waterproof plastic containers for shipment to the laboratory.

It should be noted that the exact depths at which material changes occur cannot always be established accurately. Changes in material conditions that occur between driven samples are indicated in the logs at the top of the next drive sample. A key to soil symbols and terms is presented as Figure No. A-1, *Soil Classification Chart*. The logs of the exploratory boring are presented in Figure Nos. A-2 through A-10, *Log of Borings.*

Copyright 2019 Converse Consultants

SOIL CLASSIFICATION CHART

MAJOR DIVISIONS			SYMBOLS GRAPH	SYMBOLS LETTER	TYPICAL DESCRIPTIONS
COARSE GRAINED SOILS — MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	GRAVEL AND GRAVELLY SOILS — MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	CLEAN GRAVELS (LITTLE OR NO FINES)		GW	WELL-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
				GP	POORLY-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
		GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES)		GM	SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES
				GC	CLAYEY GRAVELS, GRAVEL - SAND - CLAY MIXTURES
	SAND AND SANDY SOILS — MORE THAN 50% OF COARSE FRACTION PASSING ON NO. 4 SIEVE	CLEAN SANDS (LITTLE OR NO FINES)		SW	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
				SP	POORLY-GRADED SANDS, GRAVELLY SAND, LITTLE OR NO FINES
		SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)		SM	SILTY SANDS, SAND - SILT MIXTURES
				SC	CLAYEY SANDS, SAND - CLAY MIXTURES
FINE GRAINED SOILS — MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILTS AND CLAYS	LIQUID LIMIT LESS THAN 50		ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY
				CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
				OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS	LIQUID LIMIT GREATER THAN 50		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS
				CH	INORGANIC CLAYS OF HIGH PLASTICITY
				OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
HIGHLY ORGANIC SOILS				PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS

SAMPLE TYPE

STANDARD PENETRATION TEST
Split barrel sampler in accordance with ASTM D-1586-84 Standard Test Method

DRIVE SAMPLE 2.42" I.D. sampler.

DRIVE SAMPLE No recovery

BULK SAMPLE

GRAB SAMPLE

GROUNDWATER WHILE DRILLING

GROUNDWATER AFTER DRILLING

BORING LOG SYMBOLS

LABORATORY TESTING ABBREVIATIONS

TEST TYPE
(Results shown in Appendix B)

CLASSIFICATION

Plasticity	pi
Grain Size Analysis	ma
Passing No. 200 Sieve	wa
Sand Equivalent	se
Expansion Index	ei
Compaction Curve	max
Hydrometer	h

STRENGTH

Pocket Penetrometer	p
Direct Shear	ds
Direct Shear (single point)	ds*
Unconfined Compression	uc
Triaxial Compression	tx
Vane Shear	vs
Consolidation	c
Collapse Test	col
Resistance (R) Value	r
Chemical Analysis	ca
Electrical Resistivity	er

UNIFIED SOIL CLASSIFICATION AND KEY TO BORING LOG SYMBOLS

Converse Consultants

Project Name
Reseda Ice and Roller Rink
West Sherman Way
Los Angeles, CA

Project No. **16-31-260-16**

Figure No. **A-1**

Log of Boring No. BH-1

Dates Drilled: 7/29/2019 Logged by: PA Checked By: MBS

Equipment: HSA 8" diameter Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 734' Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	SAMPLES DRIVE	SAMPLES BULK	BLOWS/6"	MOISTURE (%)	DRY UNIT WT. (pcf)	PID and Lab Tests
		FILL (Af): **LEAN CLAY WITH SAND (CL):** dry to moist, soft, light brown.	■		2/2/3	12	88	39 PPM
5		**ALLUVIUM (Qal):** **LEAN CLAY (CL):** Moist, firm, olive brown.	■		2/3/4	20	95	31 PPM
			■		4/6/9	15	95	24 PPM
10			■		3/6/9	15	101	18 PPM
		moist, stiff, brown to dark brown	■		7/8/11	20	110	41 PPM
15			■		4/7/7	14	89	30 PPM
		End of boring at 16.5 below ground level. No ground water encountered. Borehole was backfilled with cement grout on 7/29/2019. Soil Cuttings were stockpiled on site and adjacent to borehole. Coordinates: N34.20090, W118.52971 Bottom elevation of boring is 717.5 feet Location of BH-1: 18 feet south from north fence and 15 feet west from east fence						

Converse Consultants

Project Name
Reseda Ice and Roller Rink
West Sherman Way
Los Angeles, CA

Project No. **16-31-260-16**

Figure No. **A-2**

Log of Boring No. BH-2

Dates Drilled: 7/29/2019 Logged by: PA Checked By: MBS

Equipment: HSA 8" diameter Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 734' Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	SAMPLES DRIVE	SAMPLES BULK	BLOWS/6"	MOISTURE (%)	DRY UNIT WT. (pcf)	PID and Lab Tests
		FILL (Af): **LEAN CLAY WITH SAND (CL):** rock fragments, soft, light brown.						ds, c, max, h, ei
			X		2/2/2			9 PPM
5		**ALLUVIUM (Qal):** **LEAN CLAY WITH SAND (CL):** few gravel, rock fragments, stiff, moist, light brown.	X		2/3/4			18 PPM
			X		2/3/3			14 PPM
10		firm to stiff, moist, light brown to brown	X		3/5/6			3 PPM
			X		3/4/3			9 PPM
15		stiff, moist, light brown	X		3/3/5			3 PPM
		End of boring at 16.5 below ground level. No ground water encountered. Borehole was backfilled with cement grout on 7/29/2019. Soil Cuttings were stockpiled on site and adjacent to borehole. Coordinates: N34.20076, W118.52979 Bottom elevation of boring is 717.5 feet Location of BH-2: 97 feet north from center of the alley and 47 feet west from east fence						

Converse Consultants

Project Name
Reseda Ice and Roller Rink
West Sherman Way
Los Angeles, CA

Project No. **16-31-260-16**

Figure No. **A-3**

Log of Boring No. BH-3

Dates Drilled: 7/29/2019 Logged by: PA Checked By: MBS

Equipment: HSA 8" diameter Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 734' Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	SAMPLES DRIVE	SAMPLES BULK	BLOWS/6"	MOISTURE (%)	DRY UNIT WT. (pcf)	PID and Lab Tests
		FILL (Af): **LEAN CLAY WITH SAND (CL):** rock fragments, trace fine sand, medium stiff, moist, light brown.	■		3/3/5			3 PPM
5		**ALLUVIUM (Qal):** **LEAN CLAY (CL):** few sand and gravel, medium stiff, dry to moist, light brown.	■		3/4/5			4 PPM, pi
		few gravel, light brown	■		3/5/7			5 PPM
10		stiff, moist, brown	■		5/7/8			8 PPM
			■		7/8/10			3 PPM
15		stiff, moist, dark brown	■		8/8/10			
		End of boring at 16.5 below ground level. No ground water encountered. Borehole was backfilled with cement grout on 7/29/2019. Soil Cuttings were stockpiled on site and adjacent to borehole. Coordinates: N34.20065, W118.52968 Bottom elevation of boring is 717.5 feet Location of BH-3: 45 feet north from center of the alley and 18 feet west from east fence.						

Converse Consultants

Project Name
Reseda Ice and Roller Rink
West Sherman Way
Los Angeles, CA

Project No. **16-31-260-16**

Figure No. **A-4**

Log of Boring No. BH-4

Dates Drilled: 7/29/2019 Logged by: PA Checked By: MBS

Equipment: HSA 8" diameter Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 733' Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	SAMPLES DRIVE	SAMPLES BULK	BLOWS/6"	MOISTURE (%)	DRY UNIT WT. (pcf)	PID and Lab Tests
		ASPHALT 3" BASE 0"						ds, c, max, h, ei
		FILL (Af):						
		LEAN CLAY WITH SAND (CL): with trace gravel, soft, moist, brown.	X		1/1/1			2 PPM
		ALLUVIUM (Qal):						
5		**LEAN CLAY (CL):** soft, moist, brown.	X		1/1/1			4 PPM
			X		1/1/1			4 PPM
10		moist, brown	X		1/2/2			5 PPM
			X		2/2/3			1 PPM
15		medium stiff, moist, light brown	X		2/3/4			4 PPM
		End of boring at 16.5 below ground level. No ground water encountered. Borehole was backfilled with cement grout and patched with quick set concrete on 7/29/2019. Soil Cuttings were stockpiled on site and adjacent to borehole. Coordinates: N34.20044, W118.52981 Bottom elevation of boring is 716.5 feet Location of BH-4: 20 feet south from center of the alley and 50 feet west from east fence.						

Converse Consultants

Project Name
Reseda Ice and Roller Rink
West Sherman Way
Los Angeles, CA

Project No. **16-31-260-16**

Figure No. **A-5**

Log of Boring No. BH-5

Dates Drilled: 7/29/2019 Logged by: PA Checked By: MBS

Equipment: HSA 8" diameter Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 734' Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	SAMPLES DRIVE	SAMPLES BULK	BLOWS/6"	MOISTURE (%)	DRY UNIT WT. (pcf)	PID and Lab Tests
		ASPHALT 5" BASE 0"						
		FILL (Af): **LEAN CLAY (CL):** few gravel, medium stiff, moist, brown.	■		3/3/3	18	117	2PPM
5		**ALLUVIUM (Qal):** **LEAN CLAY (CL):** soft, moist, light brown.	■		1/2/2	12	115	3PPM, c, ds
			■		3/4/5	25	85	3PPM
10		Clay with trace fine sand, moist, light brown to brown	■		2/4/5	24	103	4PPM
			■		5/12/15	23	86	1PPM
15		stiff, moist, brown	■		4/5/6	19	85	8PPM
		End of boring at 16.5 below ground level. No ground water encountered. Borehole was backfilled with cement grout and patched with quick set concrete on 7/29/2019. Soil Cuttings were stockpiled on site and adjacent to borehole. Coordinates: N34.20025, W118.52967 Bottom elevation of boring is 717.5 feet Location of BH-5: 87 feet south from center of the alley and 15 feet west from east fence.						

Converse Consultants

Project Name
Reseda Ice and Roller Rink
West Sherman Way
Los Angeles, CA

Project No. **16-31-260-16**

Figure No. **A-6**

Log of Boring No. BH-6

Dates Drilled: 7/29/2019 Logged by: PA Checked By: MBS

Equipment: HSA 8" diameter Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 733' Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	SAMPLES DRIVE	SAMPLES BULK	BLOWS/6"	MOISTURE (%)	DRY UNIT WT. (pcf)	PID and Lab Tests
		ASPHALT 3" BASE 0"						
		FILL (Af):						
		LEAN CLAY (CL): soft, dry to moist, dark brown.	X		2/2/1			2 PPM
		ALLUVIUM (Qal):						
5		**LEAN CLAY (CL):** stiff, moist, light brown.	X		1/1/6			3 PPM
			X		1/2/3			3 PPM
10		soft, moist, light brown	X		1/1/2			1 PPM
			X		3/4/6			2 PPM
15		medium stiff, moist, light brown	X		1/2/3			3 PPM
		End of boring at 16.5 below ground level. No ground water encountered. Borehole was backfilled with cement grout and patched with quick set concrete on 7/29/2019. Soil Cuttings were stockpiled on site and adjacent to borehole. Coordinates: N34.20009, W118.52981 Bottom elevation of boring is 716.5 feet Location of BH-6: 150 feet south from center of the alley and 55 feet west from east fence.						

Converse Consultants

Project Name
Reseda Ice and Roller Rink
West Sherman Way
Los Angeles, CA

Project No. **16-31-260-16**

Figure No. **A-7**

Log of Boring No. BH-7

Dates Drilled: 7/29/2019 Logged by: PA Checked By: MBS

Equipment: HSA 8" diameter Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 733' Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	SAMPLES DRIVE	SAMPLES BULK	BLOWS/6"	MOISTURE (%)	DRY UNIT WT. (pcf)	PID and Lab Tests
		ASPHALT 4" BASE 0"						
		FILL (Af):						
		LEAN CLAY (CL): medium stiff, moist, brown.	■		5/4/3			2 PPM
		ALLUVIUM (Qal):						
5		**LEAN CLAY (CL):** medium stiff, moist, brown.	■		1/3/4			6 PPM
			■		2/5/6			7 PPM
10		stiff, moist, brown to light brown	■		4/6/8			1 PPM
			■		5/9/10			2 PPM
15		moist, stiff, light brown	■		5/8/8			4 PPM
		End of boring at 16.5 below ground level. No ground water encountered. Borehole was backfilled with cement grout and patched with quick set concrete on 7/29/2019. Soil Cuttings were stockpiled on site and adjacent to borehole. Coordinates: N34.19987, W118.52970 Bottom elevation of boring is 716.5 feet Location of BH-7: 220 feet south from center of the alley and 16 feet west from east fence.						

Converse Consultants

Project Name
Reseda Ice and Roller Rink
West Sherman Way
Los Angeles, CA

Project No. **16-31-260-16**

Figure No. **A-8**

Log of Boring No. BH-8

Dates Drilled: 7/29/2019 Logged by: PA Checked By: MBS

Equipment: HSA 8" diameter Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 735' Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	SAMPLES DRIVE	SAMPLES BULK	BLOWS/6"	MOISTURE (%)	DRY UNIT WT. (pcf)	PID and Lab Tests
		FILL (Af): **LEAN CLAY WITH SAND (CL):** trace gravel, soft, dry, light brown.	X		1/1/1			r 3 PPM
5		**ALLUVIUM (Qal):** **LEAN CLAY (CL):** few silt, soft, dry to moist, brown.	X		1/1/1			3 PPM
			X		1/2/2			3 PPM
10		trace gravel, soft, moist,	X		1/1/1			2 PPM
			X		2/4/5			1 PPM
15		medium stiff, moist, light brown	X		1/2/2			1 PPM
		End of boring at 16.5 below ground level. No ground water encountered. Borehole was backfilled with cement grout on 7/29/2019. Soil Cuttings were stockpiled on site and adjacent to borehole. Coordinates: N34.20073, W118.52860 Bottom elevation of boring is 718.5 feet Location of BH-8: 77 feet north from center of the alley and 65 feet west from east fence.						

Converse Consultants

Project Name
Reseda Ice and Roller Rink
West Sherman Way
Los Angeles, CA

Project No. **16-31-260-16**

Figure No. **A-9**

Log of Boring No. BH-9

Dates Drilled: 7/29/2019 Logged by: PA Checked By: MBS

Equipment: HSA 8" diameter Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 735' Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	SAMPLES DRIVE	SAMPLES BULK	BLOWS/6"	MOISTURE (%)	DRY UNIT WT. (pcf)	PID and Lab Tests
		ASPHALT 2.5" BASE 0"						
		FILL (Af):						
		LEAN CLAY WITH SAND (CL): dry, stiff, light brown.	■		4/7/5	15	84	r
5		**ALLUVIUM (Qal):**	■		1/2/3	8	92	34 PPM, pi
		LEAN CLAY (CL): with trace sand, medium stiff, dry to moist, light brown.	■		4/6/8	23	72	58 PPM
10			■		2/4/8	18	86	16 PPM
			■		6/9/9	17	103	3 PPM
15		stiff, moist, olive brown	■		4/6/8	19	86	4 PPM
		End of boring at 16.5 below ground level. No ground water encountered. Borehole was backfilled with cement grout on 7/29/2019. Soil Cuttings were stockpiled on site and adjacent to borehole. Coordinates: 34.20014, W118.52862 Bottom elevation of boring is 716.5 feet Location of BH-9: 58 feet east from west fence and 8 feet south from parking lot curb						

Converse Consultants

Project Name
Reseda Ice and Roller Rink
West Sherman Way
Los Angeles, CA

Project No. **16-31-260-16**

Figure No. **A-10**

Appendix B

Laboratory Testing Program

APPENDIX B: LABORATORY TESTING PROGRAM

Tests were conducted in our laboratory on representative soil samples for the purpose of classification and evaluation of their relevant physical characteristics and engineering properties. The amount and selection of tests were based on the geotechnical requirements of the project. Test results are presented herein and on the Logs of Borings in Appendix A, *Field Exploration*. The following is a summary of the laboratory tests conducted for this project.

Moisture Content and Dry Density

Results of moisture content and dry density tests performed on relatively undisturbed ring samples were used to aid in the classification of the soils and to provide quantitative measure of the *in situ* dry density. Data obtained from this test provides qualitative information on strength and compressibility characteristics of site soils. For test results, see the Logs of Borings in Appendix A, *Field Exploration*.

Grain-Size Analysis

To assist in hydrometer analyses Converse retained the AP Engineering and Testing, Inc., located in Pomona, California. hydrometer analysis was performed on two (2) selected samples. Testing were performed in general accordance with the ASTM Standard D7928 test method. Grain-size curves are shown in Figure No. B-1, *Grain Size Distribution Curve*.

Maximum Dry Density Test

Laboratory maximum dry density-moisture content relationship test was performed on two (2) representative bulk samples. The test was conducted in accordance with ASTM Standard D1557 laboratory procedure. The test result is presented on Figure No. B-2, *Moisture-Density Relationship Results*.

Direct Shear

Direct shear tests were performed on two (2) remolded soil samples and one (1) undisturbed sample. For samples BH-2 (one foot to 5 feet below ground level) and BH-4 (one foot to 5 feet below ground level), remolded bulk samples to 90% relative compaction at 2% above the moisture content were prepared. For the sample BH-5 at the depth of 5 feet to 6 feet, contained in brass sampler rings, was placed directly into the test apparatus and subjected to a range of normal loads appropriate for the anticipated conditions. The tests were performed at soaked moisture conditions. The samples were then sheared at a constant strain rate of 0.004 inch/minute. Shear deformation was recorded until a maximum of about 0.25-inch shear displacement was achieved. Ultimate strength was selected from the shear-stress deformation data and plotted to determine the shear strength parameters. For test data, including sample density and moisture content, see Figure No. B-3a through B-3c, *Direct Shear Test Results,* and in the following table:

Copyright 2019 Converse Consultants

Table No. B-1, Direct Shear Test Results

Boring No.	Depth (feet below ground level)	Soil Classification	Ultimate Strength Parameters	
			Friction Angle (degrees)	Cohesion (psf)
BH-2	1-5	Lean Clay with Sand (CL)	27	100
BH-4	1-5	Lean Clay with Sand (CL)	25	70
BH-5	5-6	Lean Clay (CL)	24	200

Consolidation Test

Consolidation test was performed on two (2) remolded soil samples and one (1) undisturbed sample. For samples BH-2 (one foot to 5 feet below ground level) and BH-4 (one foot to 5 feet below ground level), remolded bulk samples to 90% relative compaction at 2% above the moisture content were prepared. For the sample BH-5 at the depth of 5 feet to 6 feet, contained in brass sampler rings, was placed directly into the test apparatus. Preparation for this test involved trimming the sample and placing the 1-inch high brass ring into the test apparatus, which contained porous stones, both top and bottom, to accommodate drainage during testing. Normal axial loads were applied to one end of the sample through the porous stones, and the resulting deflections were recorded at various time periods. The load was increased after the sample reached a reasonable state equilibrium. Normal loads were applied at a constant load-increment ratio, successive loads being generally twice the preceding load. The sample was tested at field and submerged conditions. The test results, including sample density and moisture content, are presented in Figure No. B-4a through B-4c, *Consolidation Test Results*.

Atterberg Limits

Atterberg limits test was performed on two (2) sample to assist the classification of the soil and fill materials according to ASTM Standard D4318 test method. The test results are presented in the following table and on Figure No. B-5, *Atterberg Limit Test Results*.

Table No. B-2, Atterberg Limit Test Results

Boring No.	Depth (feet)	Soil Classification	Liquid Limit (%)	Plastic Limit (%)	Plastic Index (%)
BH-3	5.5	Lean Clay (CL)	24	12	12
BH-9	5.5	Lean Clay (CL)	27	13	14

Expansion Index Test

Two (2) representative bulk samples were tested to evaluate the expansion potential of material encountered at the site. The tests were conducted in accordance with California Building Code (CBC, 2019). Test results are presented in the following table:

Copyright 2019 Converse Consultants

Table No. B-3, Expansion Index Test Result

Boring No.	Depth (feet)	Soil Description	Expansion Index	Expansion Potential
BH-2	1 - 5	Lean Clay with Sand (CL)	46	Low
BH-4	1 - 5	Lean Clay with Sand (CL)	38	Low

R- Value

Two (2) representative bulk soil sample was tested for resistance value (R-value) in accordance with ASTM D2844 Standard. This test is designed to provide a relative measure of soil strength for use in pavement design. The test results are shown in the following table:

Table No. B-4, R-value Test Result

Boring No.	Depth (feet)	Soil Classification	Measured R-value
BH-8	1-5	Lean Clay with Sand (CL)	20
BH-9	1-5	Lean Clay with Sand (CL)	21

Soil Corrosivity

Converse retained the Environmental Geotechnology Laboratory, Inc., located in Arcadia, California, to test two (2) bulk soil samples taken in the general area of the proposed structures. The tests included minimum resistivity, pH, soluble sulfates, and chloride content, with the results summarized on the following table:

Table No. B-5, Corrosivity Test Result

Boring No.	Sample Depth (feet)	pH (Caltrans 643)	Soluble Chlorides (Caltrans 422) ppm	Soluble Sulfate (Caltrans 417) (%) by weight	Saturated Resistivity (Caltrans 532) Ohm-cm
BH-3	5-6	7.76	215	0.029	730
BH-4	1-5	7.71	200	0.030	860

Sample Storage

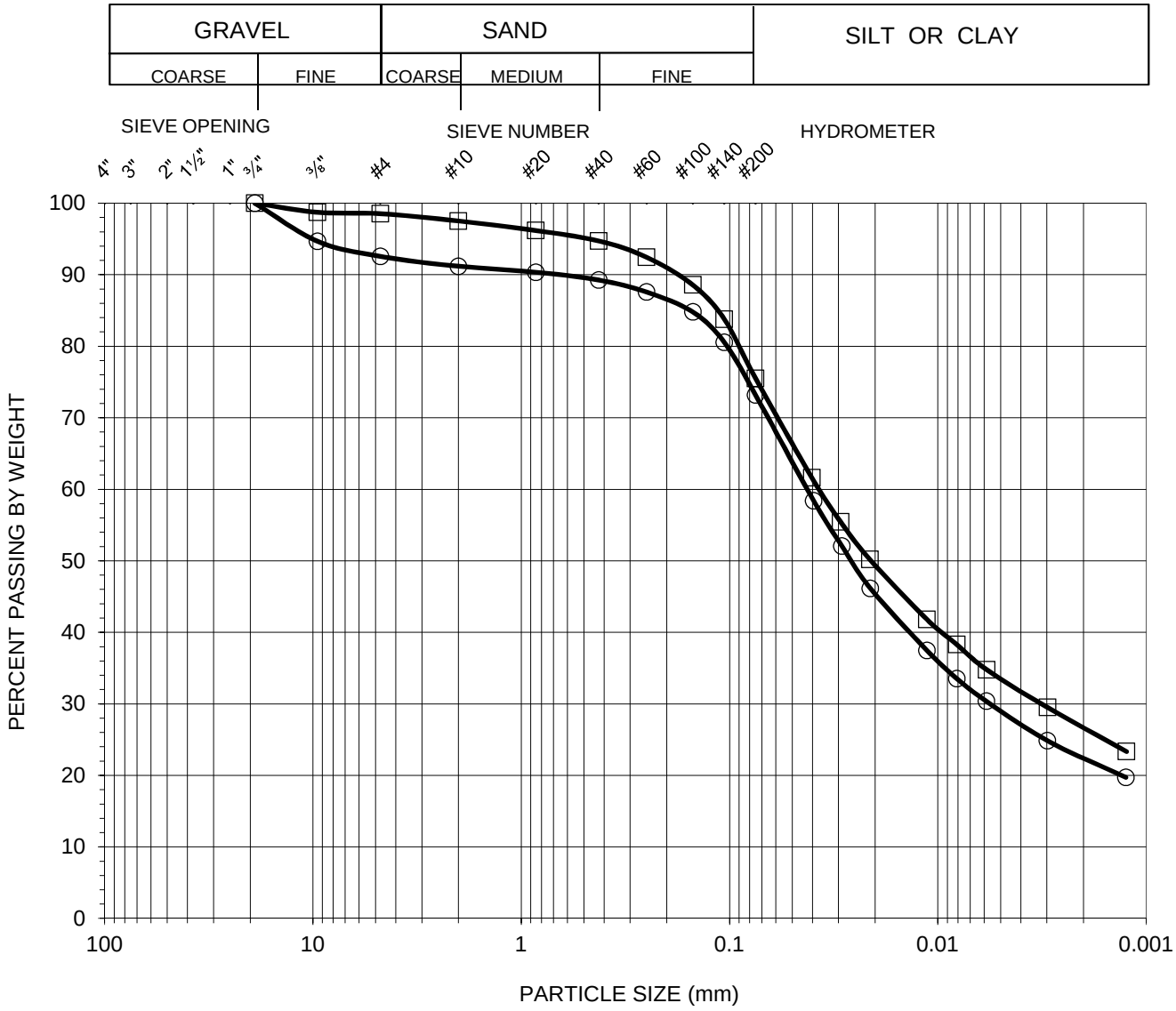
Soil samples presently stored in our laboratory will be discarded 30 days after the date of this report, unless this office receives a specific request to retain the samples for a longer period.

Copyright 2019 Converse Consultants

AP Engineering and Testing, Inc.
DBE|MBE|SBE
2607 Pomona Boulevard | Pomona, CA 91768
t. 909.869.6316 | f. 909.869.6318 | www.aplaboratory.com

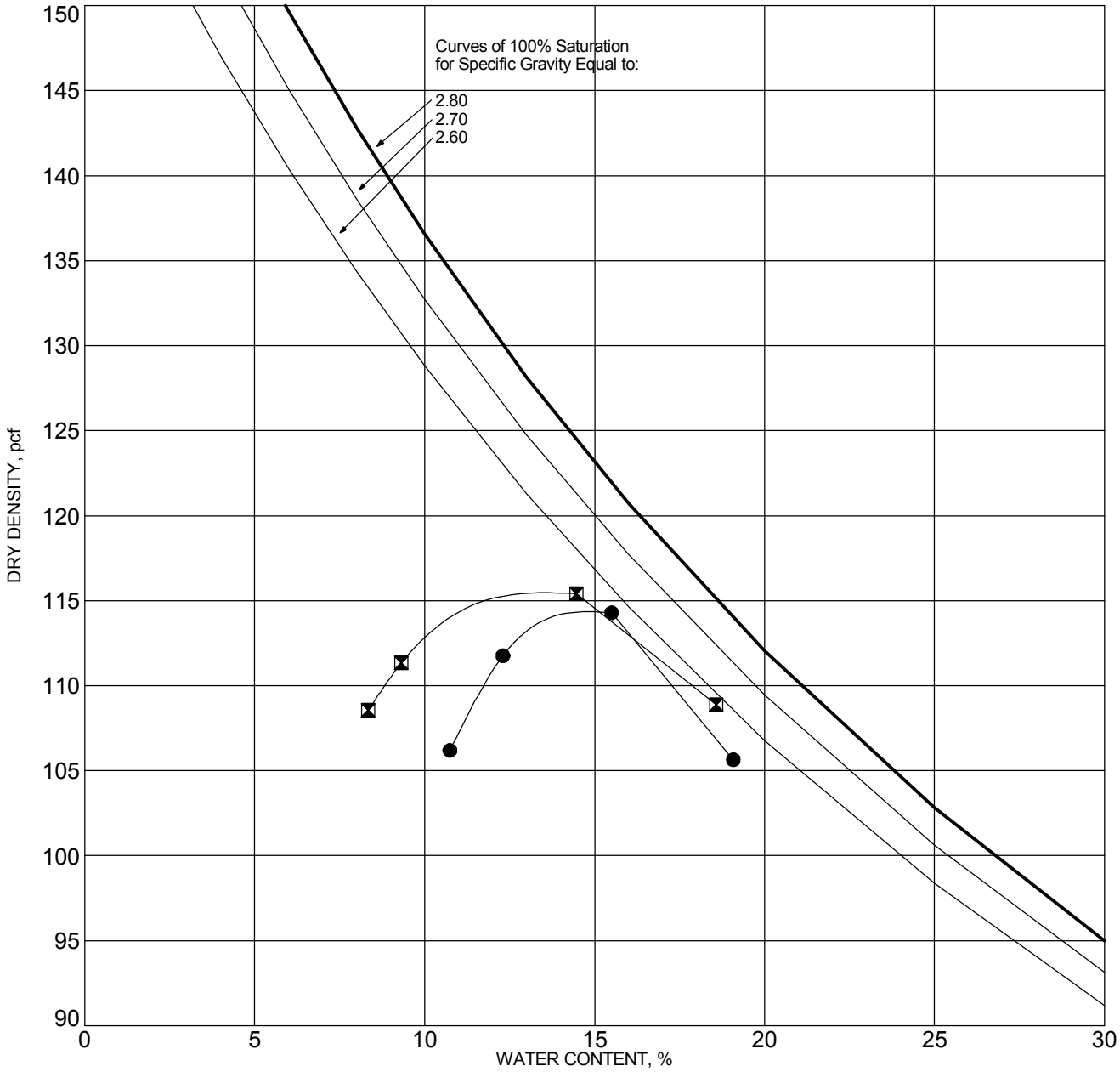
GRAIN SIZE DISTRIBUTION CURVE
ASTM D 6913 & D 7928

Client Name:	Converse Consultants	Tested by:	NG	Date:	08/14/19
Project Name:	Reseda Ice Rink and Roller Rink Project	Computed by:	NR	Date:	08/15/19
Project Number:	16-31-260-16	Checked by:	AP	Date:	08/15/19



Symbol	Boring No.	Sample No.	Sample Depth (feet)	Percent			Atterberg Limits LL:PL:PI	Soil Type U.S.C.S
				Gravel	Sand	Silt & Clay		
○	BH-2	1	1-5	7	20	73	N/A	CL*
□	BH-4	1	1-5	1	23	76	N/A	CL*

**Note: Based on visual classification of sample*



SYMBOL	BORING NO.	DEPTH (ft)	DESCRIPTION	ASTM TEST METHOD	OPTIMUM WATER, %	MAXIMUM DRY DENSITY, pcf
●	BH-2	1-5	Lean Clay with Sand (CL)	D1557 Method B	14	114.3
⊠	BH-4	1-5	Lean Clay with Sand (CL)	D1557 Method B	13	116

NOTE:

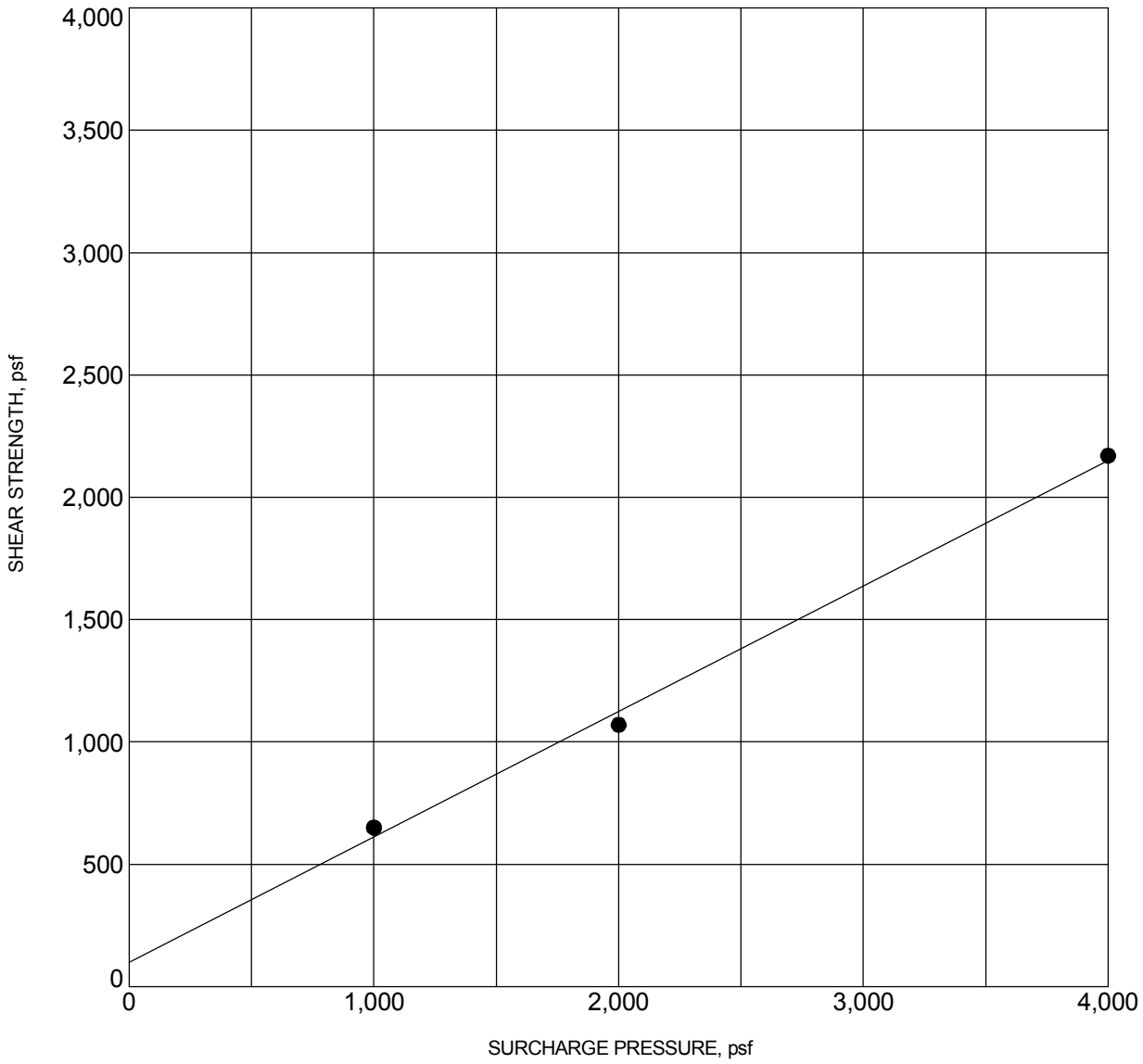
MOISTURE-DENSITY RELATIONSHIP RESULTS

Converse Consultants

Project Name
Reseda Ice and Roller Rink
West Sherman Way
Los Angeles, CA

Project No.
16-31-260-16

Figure No.
B-2



BORING NO.	:	**BH-2**	DEPTH (ft)	:	**1-5**
DESCRIPTION	:	**Lean Clay with Sand (CL)**			
COHESION (psf)	:	**100**	FRICTION ANGLE (degrees)	:	**27**
MOISTURE CONTENT (%)	:	**17.0**	DRY DENSITY (pcf)	:	**104.0**

NOTE: Ultimate Strength.

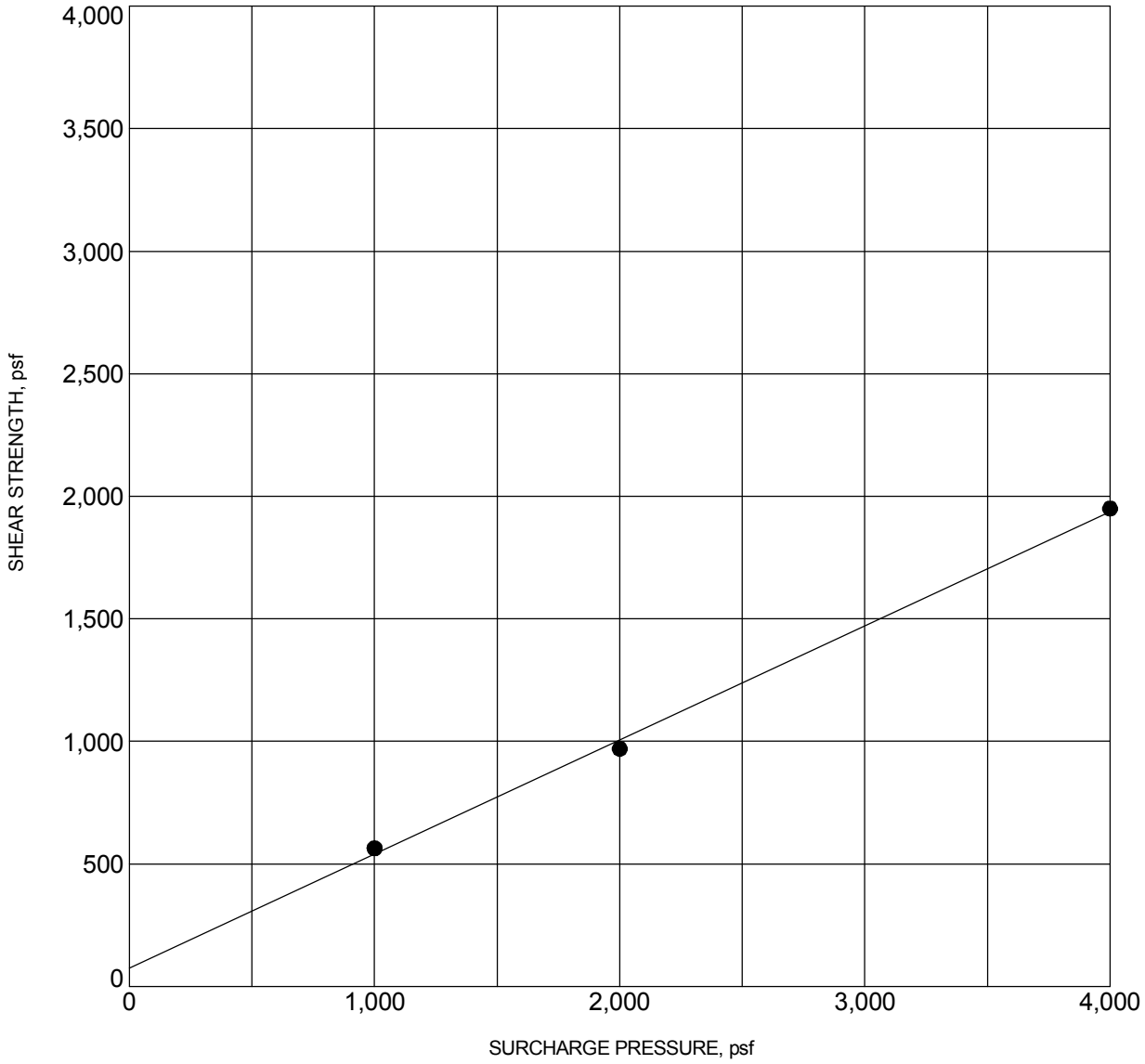
DIRECT SHEAR TEST RESULTS

Converse Consultants

Project Name
Reseda Ice and Roller Rink
West Sherman Way
Los Angeles, CA

Project No.
16-31-260-16

Figure No.
B-3a



BORING NO.	:	**BH-4**	DEPTH (ft)	:	**1-5**
DESCRIPTION	:	**Lean Clay with Sand (CL)**			
COHESION (psf)	:	**70**	FRICTION ANGLE (degrees)	:	**25**
MOISTURE CONTENT (%)	:	**16.0**	DRY DENSITY (pcf)	:	**107.5**

NOTE: Ultimate Strength.

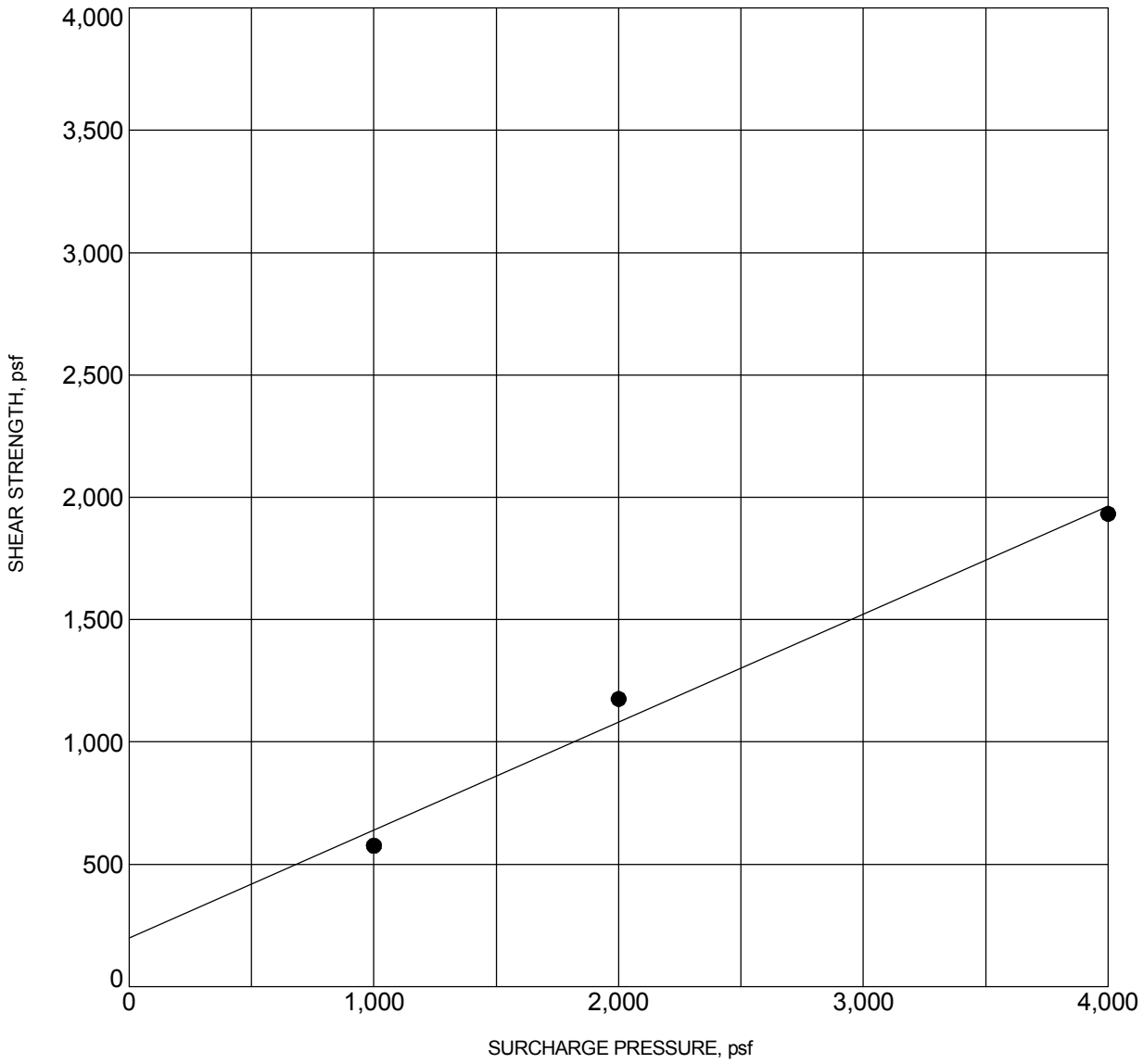
DIRECT SHEAR TEST RESULTS

Converse Consultants

Project Name
Reseda Ice and Roller Rink
West Sherman Way
Los Angeles, CA

Project No.
16-31-260-16

Figure No.
B-3b



BORING NO.	:	**BH-5**	DEPTH (ft)	:	**5-6**
DESCRIPTION	:	**Lean Clay (CL)**			
COHESION (psf)	:	**200**	FRICTION ANGLE (degrees)	:	**24**
MOISTURE CONTENT (%)	:	**12.0**	DRY DENSITY (pcf)	:	**115.0**

NOTE: Ultimate Strength.

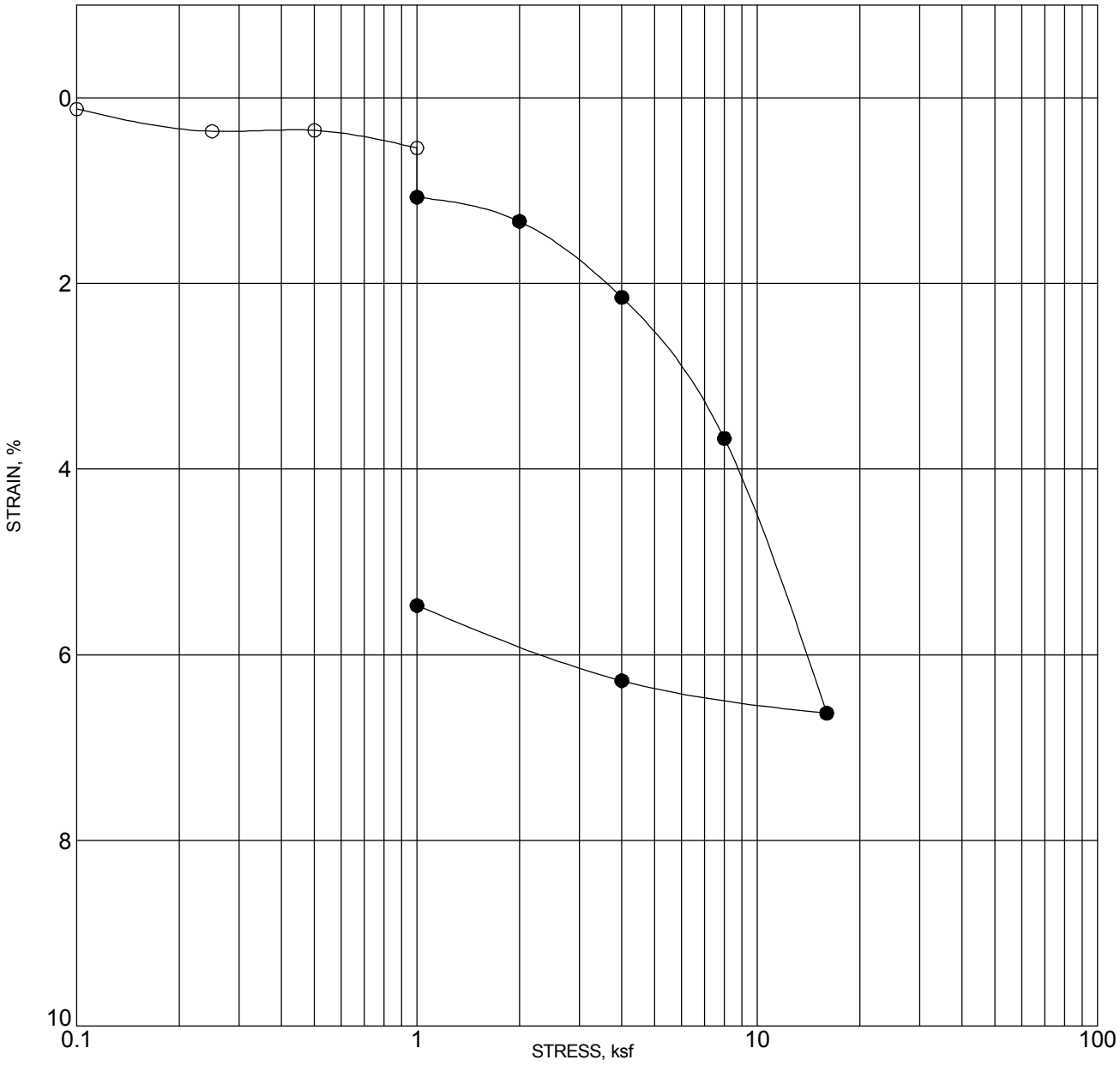
DIRECT SHEAR TEST RESULTS

Converse Consultants

Project Name
Reseda Ice and Roller Rink
West Sherman Way
Los Angeles, CA

Project No.
16-31-260-16

Figure No.
B-3c



BORING NO. :	**BH-2**	DEPTH (ft) :	**1-5**
DESCRIPTION :	**Lean Clay with Sand (CL)**		

	MOISTURE CONTENT (%)	DRY DENSITY (pcf)	PERCENT SATURATION	VOID RATIO
INITIAL	**16.5**	**108.3**	**83**	**0.527**
FINAL	**14.7**	**116.5**	**90**	**0.419**

NOTE: SOLID CIRCLES INDICATE READINGS AFTER ADDITION OF WATER

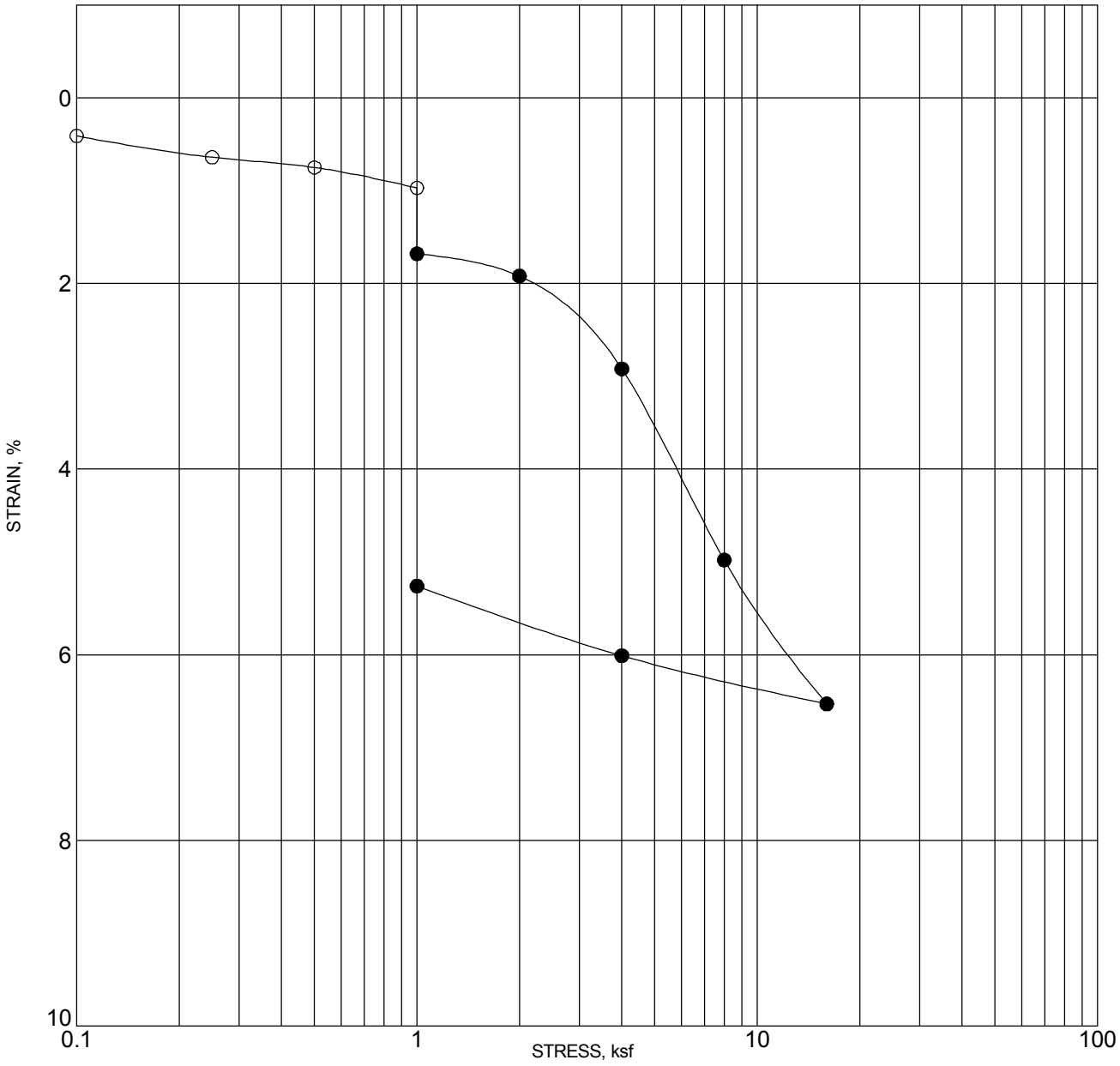
CONSOLIDATION TEST RESULTS

Converse Consultants

Project Name
Reseda Ice and Roller Rink
West Sherman Way
Los Angeles, CA

Project No. **16-31-260-16**

Figure No. **B-4a**



BORING NO. :	BH-4	DEPTH (ft) :	1-5
DESCRIPTION :	Lean Clay with Sand(CL)		

	MOISTURE CONTENT (%)	DRY DENSITY (pcf)	PERCENT SATURATION	VOID RATIO
INITIAL	15.4	107.9	77	0.532
FINAL	13.1	115.6	80	0.430

NOTE: SOLID CIRCLES INDICATE READINGS AFTER ADDITION OF WATER

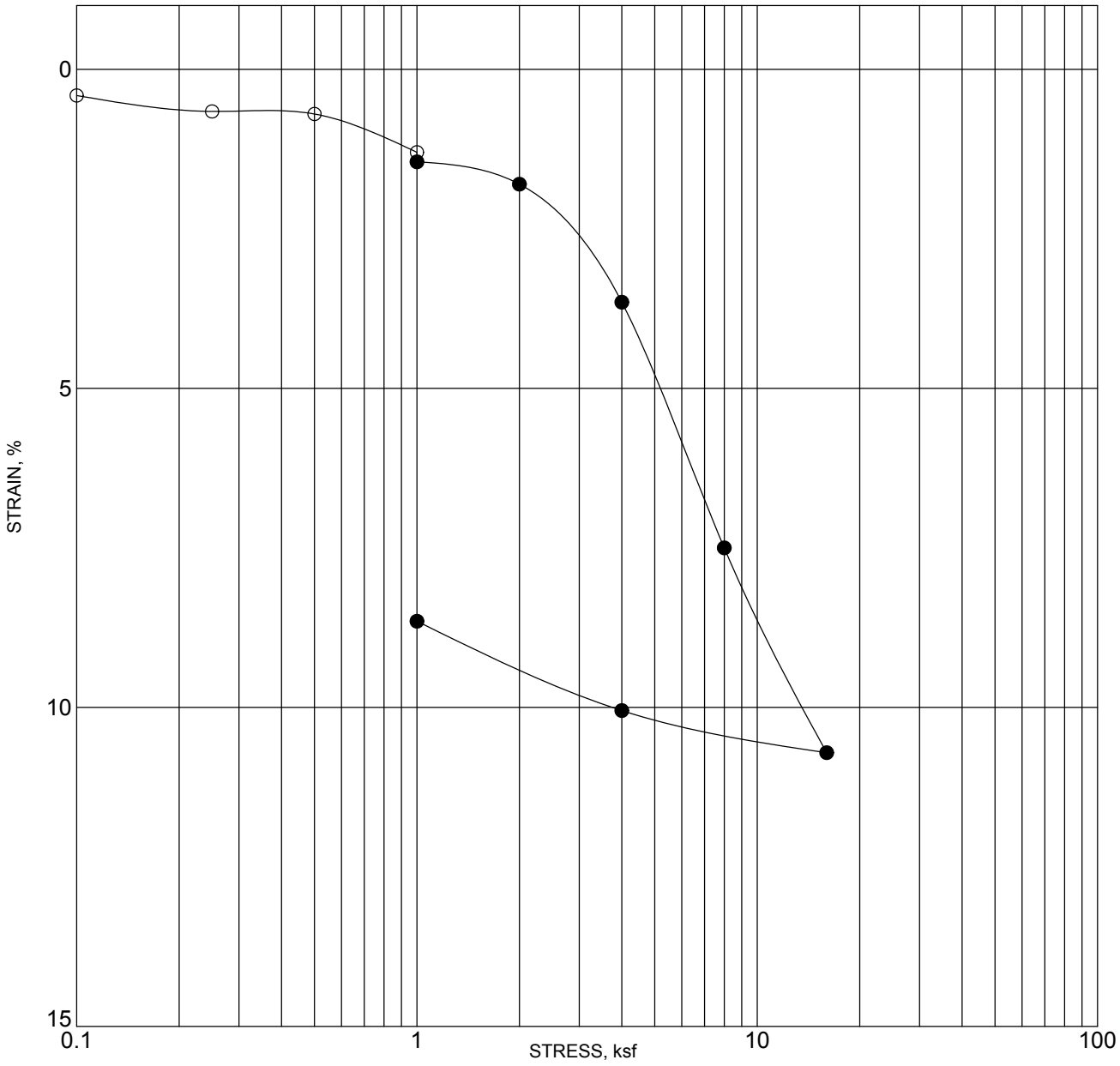
CONSOLIDATION TEST RESULTS

Converse Consultants

Project Name
Reseda Ice and Roller Rink
West Sherman Way
Los Angeles, CA

Project No. **16-31-260-16**

Figure No. **B-4b**



BORING NO. :	**BH-5**	DEPTH (ft) :	**5**
DESCRIPTION :	**Lean Clay (CL)**		

	MOISTURE CONTENT (%)	DRY DENSITY (pcf)	PERCENT SATURATION	VOID RATIO
INITIAL	**12**	**115.9**	**75**	**0.426**
FINAL	**6.5**	**129.6**	**60**	**0.276**

NOTE: SOLID CIRCLES INDICATE READINGS AFTER ADDITION OF WATER

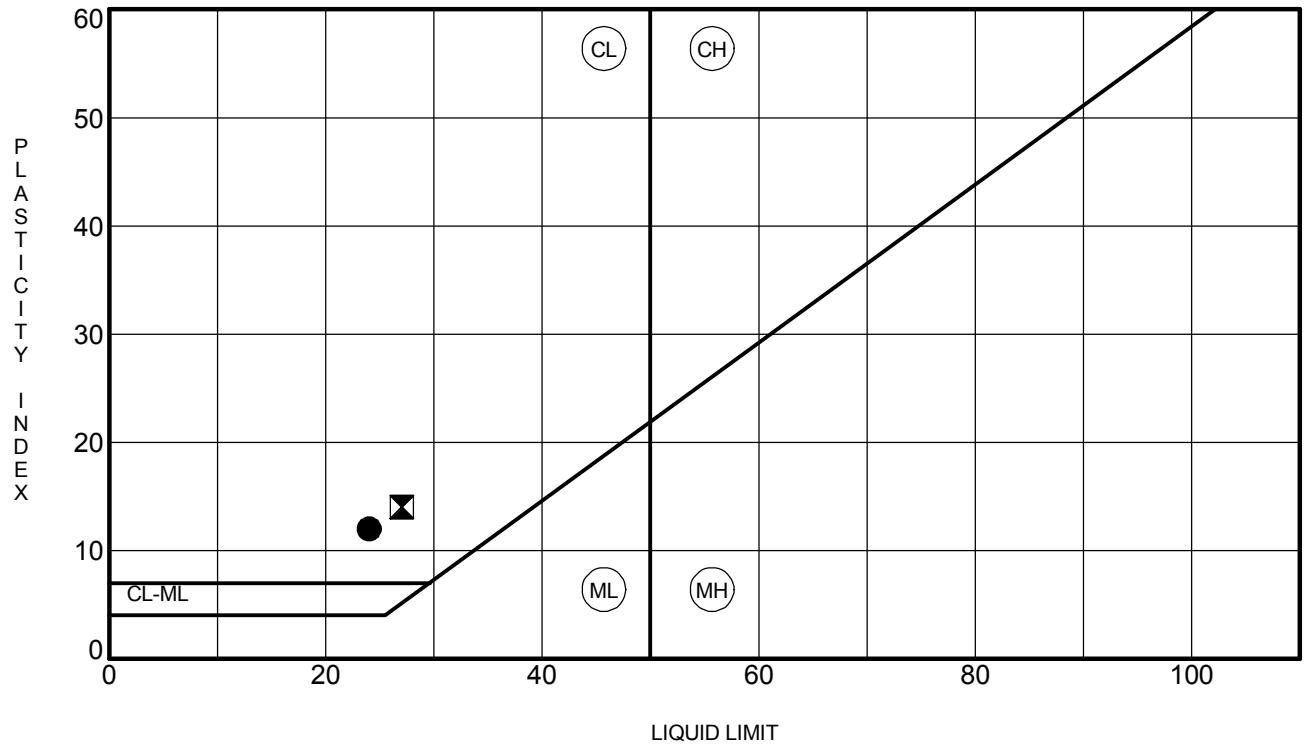
CONSOLIDATION TEST RESULTS

Converse Consultants

Project Name
Reseda Ice and Roller Rink
West Sherman Way
Los Angeles, CA

Project No. **16-31-260-16**

Figure No. **B-4c**



Symbol	Boring No.	Depth (ft)	LL (%)	PL (%)	PI (%)	Description
●	**BH-3**	**5.5**	**24**	**12**	**12**	**Lean Clay (CL)**
⊠	**BH-9**	**5.5**	**27**	**13**	**14**	**Lean Clay (CL)**

ATTERBERG LIMITS RESULTS

Converse Consultants

Project Name
Reseda Ice and Roller Rink
West Sherman Way
Los Angeles, CA

Project No.
16-31-260-16

Figure No.
B-5

Appendix C

Geophysical Investigation

Geophysical Investigation

Converse Consultants
Reseda Ice and Roller Rink
18210 Sherman Way
Reseda, California
Project #1244

spectrum geophysics
REVEALING THE SUBSURFACE
20434 Corisco Street
Chatsworth, California 91311
1-877-565-3595

Geophysical Investigation
Reseda Ice and Roller Rink
18210 Sherman Way
Reseda, California

Prepared For:
Converse Consultants
717 South Myrtle Avenue
Monrovia, CA 91016

Prepared By:
Spectrum Geophysics
20434 Corisco Street
Chatsworth, CA 91311

August 12, 2019

Charles Carter
California Professional Geophysicist, P.Gp. 1051

spectrum geophysics
REVEALING THE SUBSURFACE

TABLE OF CONTENTS

TABLE OF CONTENTS **Page**

1.0 INTRODUCTION 3
2.0 EQUIPMENT 3
3.0 METHODS AND FIELD PROCEDURES 3
3.1 EM-31 Terrain Conductivity Meter 4
3.2 EM-61 Digital Metal Detector 5
3.3 Ground Penetrating Radar 5
3.4 Electromagnetic Utility Location 6
4.0 RESULTS 6
4.1 EM-31 7
4.2 EM-61 7
4.3 GPR 8
5.0 LIMITATIONS 8
5.1 EM-31 & EM-61 8
5.2 GPR 8

spectrum geophysics
REVEALING THE SUBSURFACE

LIST OF FIGURES

FIGURE	TITLE
1	Site Map with Geophysical Interpretation
2	Contour Map of EM-31 Conductivity Data
3	Contour Map of EM-31 In-Phase Data
4	Contour Map of EM-61 Differnetial Data
5	Contour Map of GPR Signal Intensity (0 – 9ns)

1.0 INTRODUCTION

Spectrum Geophysics conducted a geophysical investigation on July 24th and 25th, 2019 in the vacant lots located at 18210 Sherman Way in Reseda, California. The purpose of the investigation was to locate buried features such as footings, debris or metallic utility lines. The area of investigation, as designated by Mark Schluter of Converse Consultants, included the soil covered lot in the northern portion of the property and the asphalt lot in the southern portion of the property. The lots were separated by an alley way and were surrounded by construction fences although the southern lot was bounded by a block wall at the southern limit of the property. The approximate dimensions of the survey areas were 90 feet by 160 feet and 90 feet by 260 feet for the north and south lots, respectively.

The survey area was located within an area mapped as Quaternary alluvial valley deposits consisting of unconsolidated clay, silt, sand and gravel. The depth to the water table was expected to be below the maximum depth of investigation (approximately 15 feet), but moisture in the upper five feet of soil can contribute to signal attenuation in ground penetrating radar data and corrosion of survey targets. Site interferences included the fences, construction equipment and surface obstructions like pallets and a metal plate.

2.0 EQUIPMENT

The equipment used during this investigation consisted of a Geonics EM-31 terrain conductivity meter (EM-31) and EM-61 MK2 digital metal detector (EM-61) both linked to a Juniper Systems Allegro CX field computer (Allegro), a NavCom SF-2050G Differential Global Positioning System (DGPS) unit with submeter accuracy, a Sensors & Software "Noggin Smart Cart" ground penetrating radar (GPR) unit coupled to a 500-MHz antenna, a Fisher TW-6 M-Scope shallow-focus metal detector (M-Scope) and a RadioDetection RD4000 electromagnetic utility locator (RD4000). The NavCom DGPS unit and the Allegro field computer were coupled to marry EM-31 and EM-61 measurements to their corresponding geographic coordinates and to record survey data for the site map.

3.0 METHODS AND FIELD PROCEDURES

Prior to data acquisition, colored flagging ribbons were placed on the chain-link construction fences on the along the north and south sides of the soil covered northern lot and in the soil or soil piles at the southern end of the property. Each row of flagging ribbons was color coordinated with the flagging ribbons spaced 10 feet apart. A five color sequence was used to distinguish south-north survey lines (red=0E, blue =10E, yellow =20E, pink=30E, green = 40E, red=50E, etc.). Navigation with the EM-31 and EM-61 was accomplished with the operator walking between flagging ribbons of the same color on south-to-north traverses (from red at 0E on south side to red at 0E on north side) and in between the flagging ribbons on north-to-south traverses (between the red at 0E and blue at 10E for the survey line on 5E). Using this procedure the EM-31 and EM-61 data were acquired on roughly parallel north-south survey lines spaced 5 feet apart on average.

Before EM-31 data were acquired, a base station was established in an area with no surface metal within 4 meters of the instrument. The EM-31 was assembled, the battery level was checked and verified per the manufacturer instructions. Once an acceptable battery reading was verified, the in-phase component of the EM-31 was nulled with the instrument at normal operating height and the instrument boom oriented in the primary direction of EM-31 data acquisition. Finally, the instrument phase was checked and tuned if necessary. A file with roughly 50 measurements was recorded at the base station prior to acquiring the data to verify consistency of readings.

Before EM-61 data were collected, the battery level was checked and found to be greater than 12.5 volts. After the EM-61 had a few minutes to warm up, the instrument was nulled at a base station with more than four meters of separation between the coils and any known metallic objects. A static test was run in which the instrument response to the soil and a metal bolt was monitored for amplitude and consistency of the readings. A cable-shake test was then performed to assure the cables were in good working condition and the connectors were fastened properly. The EM-61 used in this survey was found to be working as expected.

The NavCom DGPS unit was allowed to warm up until submeter accuracy was achieved before any EM-31, EM-61 or survey data were acquired.

3.1 EM-31 Terrain Conductivity Meter

The EM-31 terrain conductivity meter was used in an effort to locate buried metallic objects, building foundations or footings. During this investigation EM-31 readings were collected at a rate of five readings per second along parallel south-north lines spaced roughly 5 feet apart within the area of the investigation. DGPS positions were streamed to the Allegro field computer at one second intervals, and EM-31 measurements were interpolated between DGPS positions. This resulted in a 1-foot station spacing on average. The acquisition software displayed the DGPS accuracy in real time and gave a visual warning if submeter accuracy was lost. The DGPS accuracy during data acquisition at this site was consistently submeter. A brief description of how the EM-31 works follows.

EM-31 Data Acquisition

The EM-31 (an electromagnetic induction instrument) consists of two coils (transmitter and receiver) mounted on the ends of a 4-meter-long plastic boom (the EM-31 coil separation is 3.66 meters). An alternating current is applied to the transmitter coil, which sends a primary electromagnetic (EM) field into the ground. This primary field induces eddy currents in buried conductive material that is encountered, and these eddy currents generate a secondary magnetic field. This secondary magnetic field is measured at the receiver and compared to the primary field [as a ratio of the secondary field to primary field in parts per thousand (ppt)] and recorded as the in-phase component. The EM-31 also measures the component 90 degrees out of phase with the primary EM field (the quadrature component). The quadrature component is converted to read apparent conductivity in millimhos per meter (mmhos/m). The in-phase component is set to read 0 in background materials, and is sensitive to metal. The primary field generated by the EM-31 can travel 1.5 times the coil spacing in

the vertical plane (5.5 meters or 18 feet) and 0.5 times the coil spacing in the horizontal plane (1.8 meters or 6 feet).

The EM-31 instrument has a long history of demonstrated use for the delineation of undocumented disposal, chemical waste and large buried metallic objects. Conductivity values from the EM-31 measurements can be used to delineate lateral contrasts in subsurface materials. With the aid of a regularly spaced grid, the EM-31 can be used to distinguish the boundaries between materials exhibiting contrasts in conductivity such as coarse-grained sediments vs. finer-grained soils, metallic material vs. non-metallic material, and chemical contrasts in soils.

3.2 EM-61 Digital Metal Detector

The EM-61 high-sensitivity metal detector was used in an effort to delineate areas where metallic objects may be buried. The EM-61 transmitter generates short pulses of a primary magnetic field that induces electromagnetic currents in nearby metallic objects. Between pulses, the two receiver coils measure the decay of these electromagnetic currents in millivolts (mV). The measured values are proportional to the metal content (ferrous and non-ferrous) of the nearby objects.

During this investigation, EM-61 readings were recorded and stored in the Allegro at a rate of 5 readings per second along north-south survey lines spaced approximately 5 feet apart. DGPS positions were streamed to the Allegro at 1-second intervals and EM-61 measurements were interpolated between DGPS positions. This resulted in a 1-foot station spacing on average. These data were processed in the field and used to generate contour maps to assist in identifying anomalous areas that may be caused by buried metallic features.

EM-61 Data acquisition

Top coil, bottom coil and differential (top coil data minus the bottom coil data) EM-61 data were recorded. Data from the bottom coil and differential channels were processed but only the differential data are presented. Some surficial metal was filtered out of the differential data while the buried features were not.

3.3 Ground Penetrating Radar

GPR was used to investigate anomalies detected with the EM-61. A GPR grid was established parallel and perpendicular to the construction fences in the northern half of the soil covered lot. North-south GPR traverses spaced 5 feet apart were acquired within the 60-foot by 65-foot grid. During the GPR survey, an antenna containing both a transmitter and a receiver was pushed along the ground surface on south-north survey lines. The transmitter radiated short pulses of high-frequency electromagnetic energy (with a center frequency of 500 MHz for this survey) into the ground. As the radio waves propagated into the ground, these signals were

reflected at boundaries with contrasting electrical conductivity. These reflected signals were then received at the antenna and displayed as vertical profiles on the GPR unit.

GPR data collected during this investigation were processed using GPR-Slice™ V7.0. GPR-Slice™ allows the user to combine 2D radargrams to generate a series of map view time slices or 3D volume. A series of 9 nanosecond time slices were generated and contoured based on GPR signal strength (absolute amplitude of reflected GPR scans). Each 9 nanosecond time slice represents approximately 1.2 vertical feet. The contour maps were used to identify GPR anomalies with lateral extents expected for footings, pipes or buried debris. GPR profiles were reviewed in order to distinguish between horizontal GPR reflectors which may be the result of a conductive soil layer, dipping GPR reflectors which may be the result of a sloped edge of a backfilled excavation or parabolic reflectors that may be the result of a buried pipe. All GPR profiles and time slices were reviewed, and Figure 5 is presented with a representative time slice.

3.4 Electromagnetic Utility Location

During this investigation, active electromagnetic (EM) utility-locating methods were used to relocate linear EM-61 anomalies and to delineate the surface trace of detectable underground utilities.

Active locating was initiated by conducting an EM signal at a known frequency (8 kHz for this site) on an exposed conductor found within the survey area. A receiver, tuned to 8 kHz, was then used to locate the signal maxima (or surface trace) of the applied signal.

The Fisher M-Scope metal detector was used to relocate shallow buried metallic features identified in the EM-61 data. The M-Scope has a transmitter and a receiver at the ends of a short boom. The transmitter emits a radio-frequency source signal that induces a secondary magnetic field in metallic material in its immediate vicinity. The receiver measures the signal strength of this secondary magnetic field and emits an audible response, the volume and pitch of which increase in the presence of metallic material. The sensitivity of the M-Scope allows the operator to locate the lateral boundaries of a metallic object.

Detected utilities were marked on the ground with surveyor's paint. Lines that could not be traced to a pipe stick up are labelled with an "L" and marked in pink on the Figures. Unknown lines that were not detected in the field but were interpreted from the EM-61 data are also labeled with an "L" and are marked with dashed pink lines in the Figures.

4.0 RESULTS

A geophysical interpretation map is presented in Figure 1, contour maps of the EM-31 conductivity and in-phase data are presented in Figure 2 and Figure 3, respectively and a contour map of the EM-61 differential data is presented as Figure 4. A contour map of GPR signal intensity of the upper foot of soil is presented in Figure 5.

4.1 EM-31

The colors in the EM-31 contour maps represent the magnitudes of the measured values where yellow to light green colors represent background readings, deep green to blue colors represent measured values below background and orange to pink colors represent increasing values above background. The dimensions of EM-31 anomalies are usually much larger than the dimensions of the corresponding sources, however small objects like scrap metal are usually undetected by the EM-31. It should be noted that the orientation of the EM-31 coils relative to a conductor will influence the magnitude of the measured values. When crossing a linear conductor at a right angle to oblique angle, the EM-31 response is typically negative over the conductor with positive "shoulders" either side of the conductor. When surveying parallel to a linear conductor the EM-31 response is typically positive and well above background readings. A discussion of the anomalies identified within the area of investigation may be found below.

There are several moderate- to high-amplitude linear EM-31 anomalies within the survey area. The construction fences surrounding the area of investigation produced linear conductivity and in-phase highs along the perimeter of the survey area. A linear in-phase low was detected running through the alley and may be the result of an electric line.

Surface metal such as the metal plate and sign located adjacent to pallets in the soil covered lot produced the most significant high-amplitude EM-31 anomalies.

The conductivity is slightly higher in the southern asphalt covered lot compared to the northern soil covered lot. The fill in the southern lot may be finer or may hold more moisture.

4.2 EM-61

The color scale in the contour map of the EM-61 differential data shows the magnitudes of the measured EM-61 values where yellow to light green colors represent background readings, deep green colors represent measured values below background and orange to pink represent increasing values above background. Due to the sensitivity of the EM-61, anomalies are usually exaggerated compared to the actual dimensions of the source metal. It is common for a sheared fence post to produce a 7-foot by 7-foot EM-61 anomaly while a 600-gallon UST buried 4 feet below ground surface can produce an EM-61 anomaly with dimensions of 15 feet by 15 feet. The findings of the survey are discussed below.

There are several moderate-amplitude linear EM-61 anomalies. These anomalies are the result of surface metal such as the fences and buried linear conductors. Many of the linear anomalies were reinvestigated with the M-Scope metal detector to confirm the locations of the anomalies. Linear anomalies not traced to a riser are marked in pink. Some of these lines may be abandoned pipes, but could also be rebar or other features related to the demolished structures that were present on the site. There are also several low-amplitude anomalies that were not detected with the utility locators. These anomalies were dashed in pink on the Figures. The sources of these anomalies could be discarded metallic features from the demolition of the former building. Small EM-61 anomalies are marked with pink diamonds on the maps. The sources of these anomalies are expected to be buried debris.

4.3 GPR

GPR profiles were acquired in the northernmost portion of the site where the majority of EM-61 anomalies were detected. The GPR was effective at imaging some shallow buried features. The anomalies detected with the GPR were all within a foot of the ground surface. The detected GPR reflectors were generally horizontal and very close to the surface which may indicate that the sources of these anomalies are construction debris.

5.0 LIMITATIONS

The detection of subsurface objects and utilities is dependent upon acquiring reliable data with geophysical instruments above ground. These data may be interpreted as representative of subsurface objects. The electromagnetic fields being measured, however, may be attenuated and/or distorted by a number of factors including soil moisture, corrosion and proximity to other surface and subsurface structures. A discussion of the limitations of each method follows.

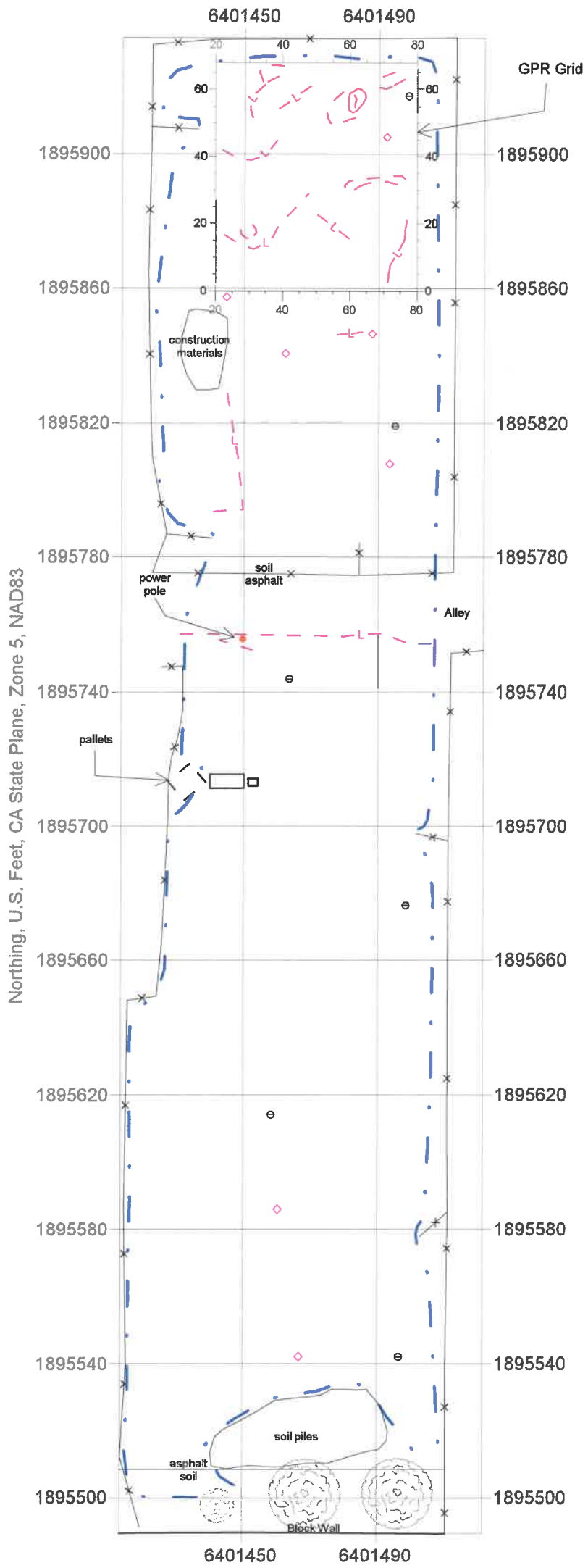
5.1 EM-31 & EM-61

The EM-31 and EM-61 are capable of detecting a 55-gallon drum up to a depth of 3 meters under favorable conditions. We recommended a minimum 10-foot buffer between the survey area and any metal bearing surface cultural features such as fences, reinforced concrete or above ground pipes which could severely compromise the quality of the data. The EM data collected within 8 feet of surface metal at this site such as the fences, metal plates or construction materials influenced the EM-31 and EM-61 responses adversely. As a result, Spectrum cannot guarantee that subsurface features were detectable beneath of adjacent to surface metal.

5.2 GPR

The performance capability of GPR is dependent on the electrical conductivity of the soil at the site. If the soil conductivity is high, attenuation of the radar signal in the soil can severely restrict the maximum penetration depth of the radar signal. Under favorable conditions depth of penetration can be greater than 10 feet; however, average depths of GPR penetration in Southern California tend to range between 2-5 feet. Soil moisture, especially in clay rich soils, only increases the radar signal attenuation, further limiting the radar performance. The penetration depth of the GPR signal was approximately 3 feet at this site.

SPECTRUM GEOPHYSICS, 20434 CORISCO STREET, CHATSWORTH, CALIFORNIA 91311



LEGEND

- Area of Geophysical Investigation
- Linear Conductor (dashed where interpreted from EM Data)
- GPR Anomaly
- Buried Metal
- Fence
- Surface Metal
- Tree
- Proposed Boring Location

0 20 40 (feet)

spectrum geophysics
Revealing the Subsurface
20434 CORISCO STREET
CHATSWORTH, CA 91311
(818) 886-4500
www.spectrum-geophysics.com

MAP: **Site Map with Geophysical Interpretation**

PROJECT: Future Reseda Ice & Roller Rink
18210 Sherman Way
Reseda, California

PREPARED FOR: Converse Consultants
Monrovia, California

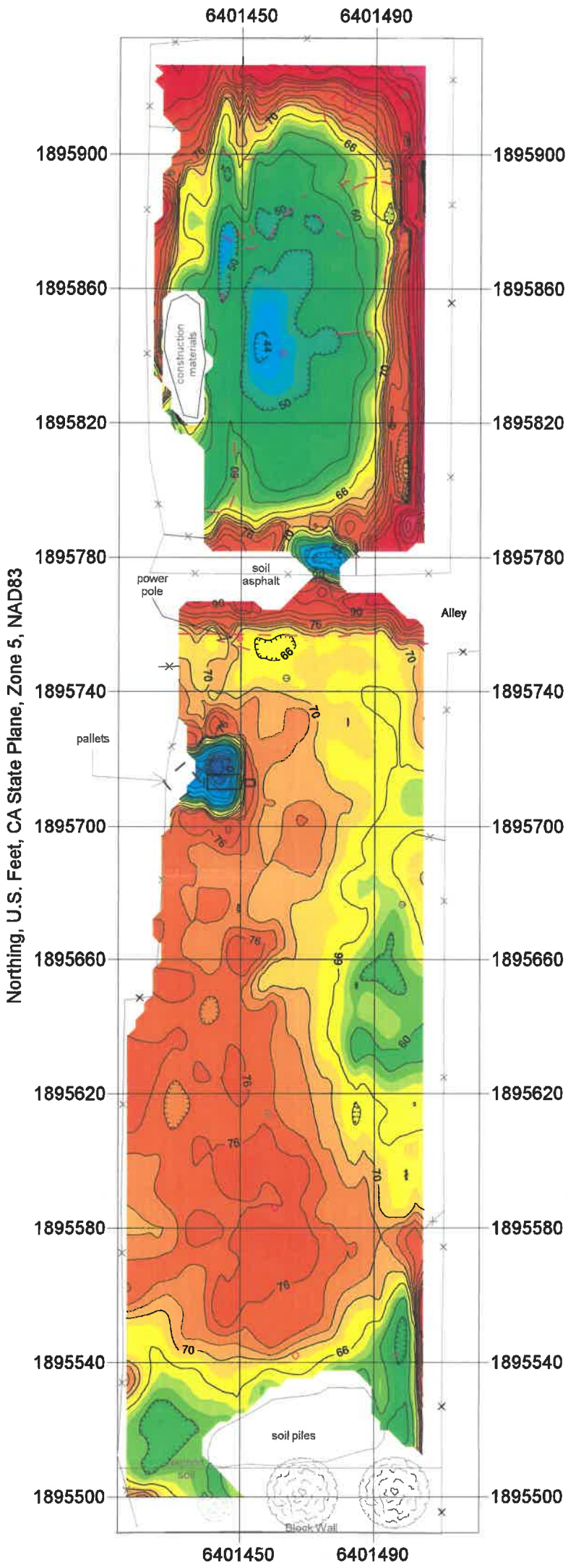
SCALE: 1 inch = 40 feet

FIGURE BY: C. Carter

FIGURE NO.: 1

PROJECT NO.: 1244

DATE: 08/12/19



LEGEND

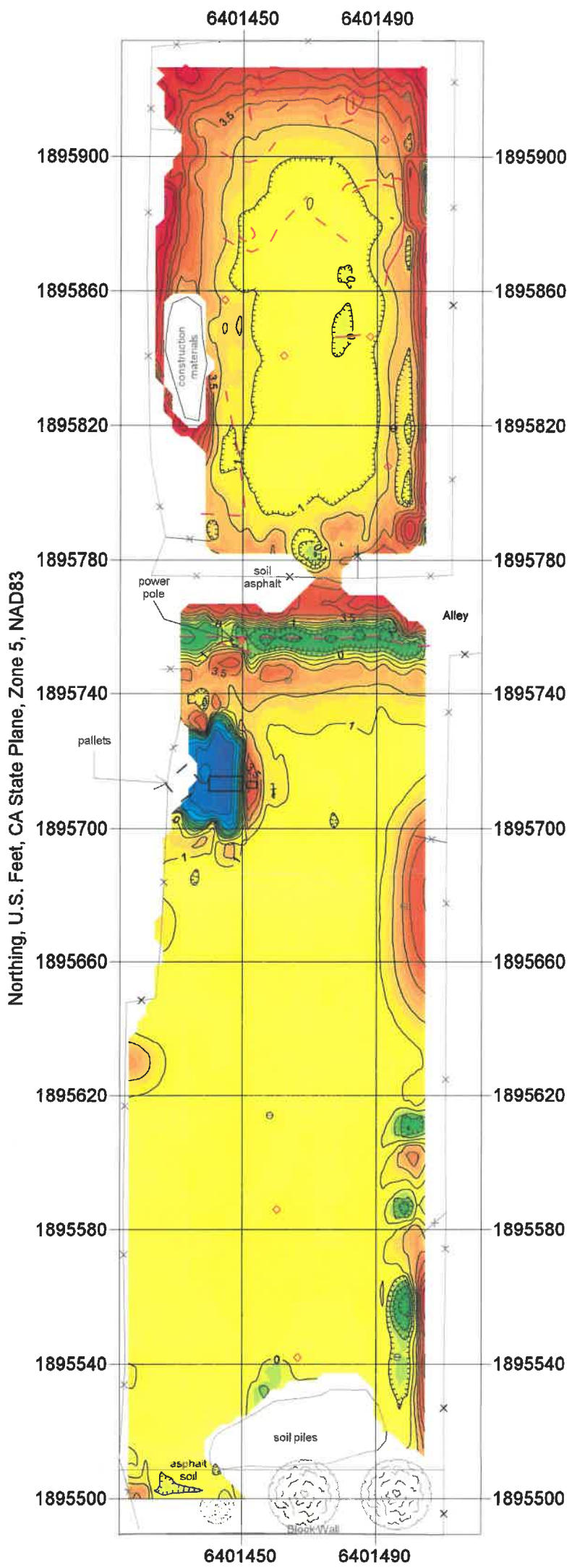
- Linear Conductor (dashed where interpreted from EM Data)
- GPR Anomaly
- Buried Metal
- Fence
- Surface Metal
- Tree
- Proposed Boring Location

0 20 40 (feet)

spectrum geophysics
REVEALING THE SUBSURFACE

20434 CORISCO STREET
CHATSWORTH, CA 91311
(818) 886-4500
www.spectrum-geophysics.com

MAP: **Contour Map of EM-31 Conductivity Data**		FIGURE NO. **2**
PROJECT: Future Reseda Ice & Roller Rink 18210 Sherman Way Reseda, California		
PREPARED FOR: Converse Consultants Monrovia, California		PROJECT NO. 1244
SCALE: 1 inch = 40 feet	FIGURE BY: C. Carter	DATE: 08/12/19



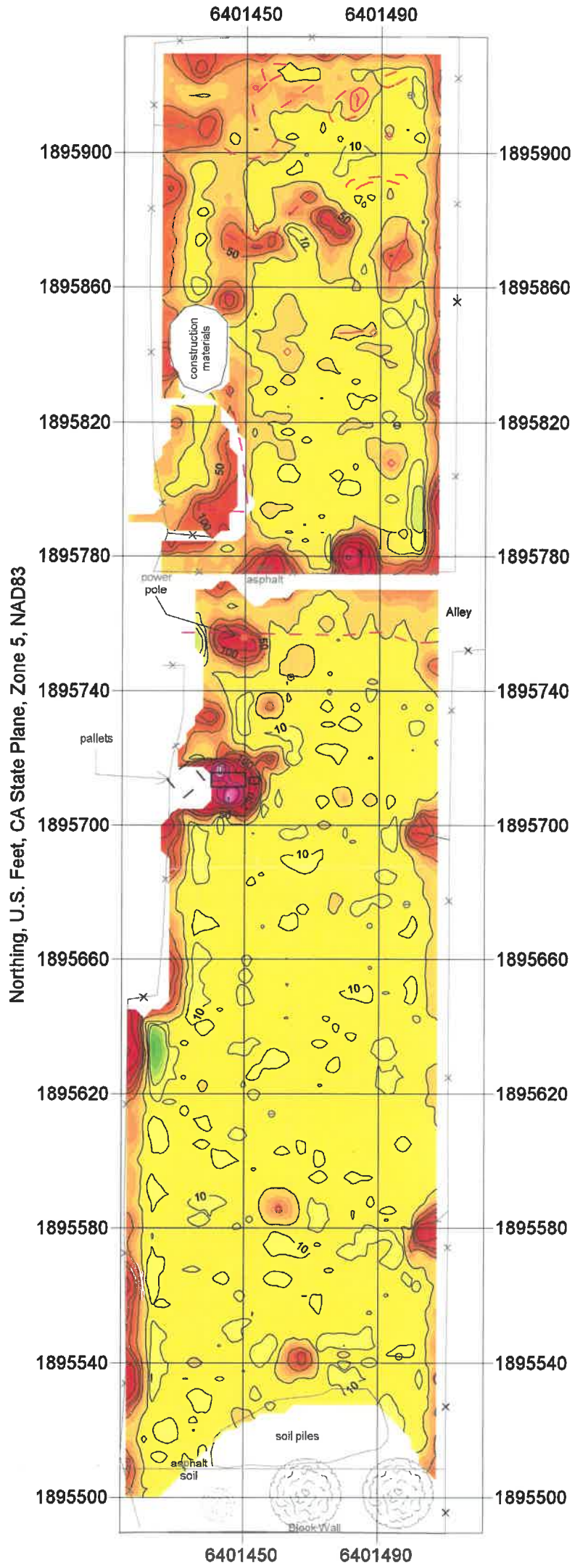
LEGEND

- Linear Conductor (dashed where interpreted from EM Data)
- GPR Anomaly
- Buried Metal
- Fence
- Surface Metal
- Tree
- Proposed Boring Location

0 20 40
(feet)

spectrum geophysics
REVEALING THE SUBSURFACE
20434 CORISCO STREET
CHATSWORTH, CA 91311
(818) 886-4500
www.spectrum-geophysics.com

MAP: **Contour Map of EM-31 In-Phase Data**		FIGURE NO. **3**
PROJECT: Future Reseda Ice & Roller Rink 18210 Sherman Way Reseda, California		
PREPARED FOR: Converse Consultants Monrovia, California		PROJECT NO. 1244
SCALE: 1 inch = 40 feet	FIGURE BY: C. Carter	DATE: 08/12/19



LEGEND

- Linear Conductor (dashed where interpreted from EM Data)
- GPR Anomaly
- Buried Metal
- Fence
- Surface Metal
- Tree
- Proposed Boring Location

0 20 40
(feet)

spectrum geophysics
Revealing the Subsurface
20434 CORISCO STREET
CHATSWORTH, CA 91311
(818) 886-4500
www.spectrum-geophysics.com

MAP: **Contour Map of EM-61 Differential Data**

FIGURE NO.: **4**

PROJECT: Future Reseda Ice & Roller Rink
18210 Sherman Way
Reseda, California

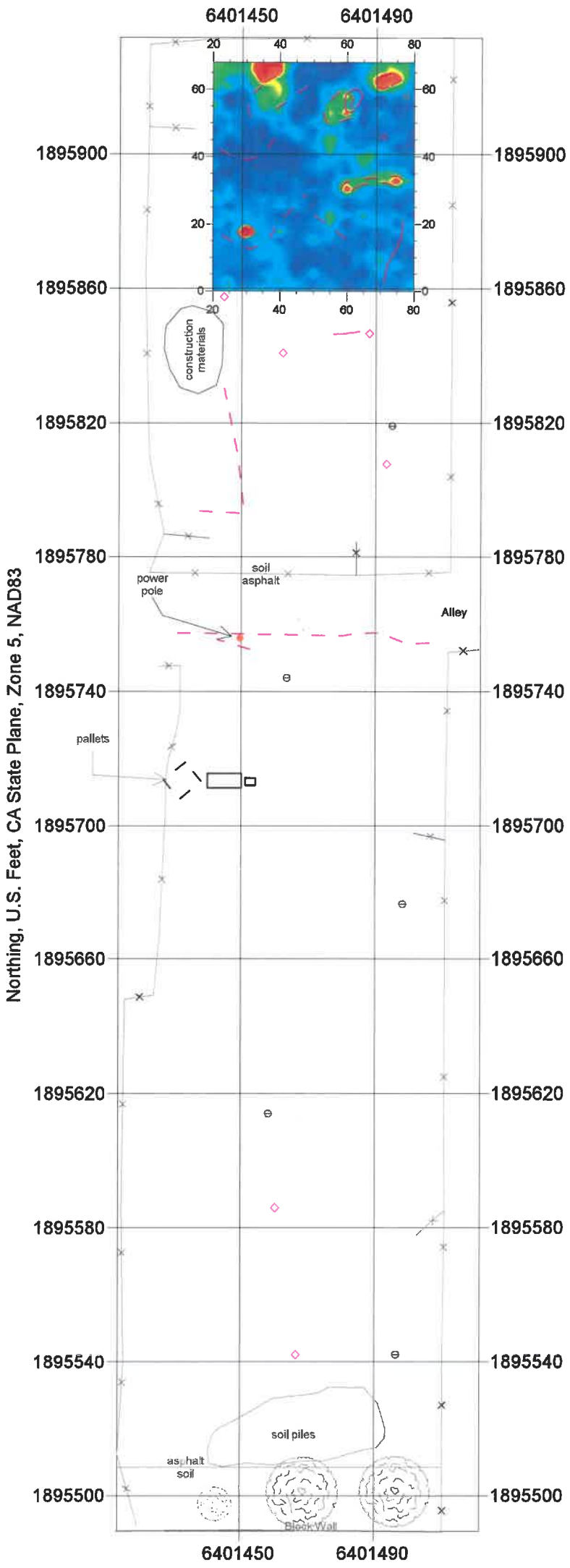
PREPARED FOR: Converse Consultants
Monrovia, California

PROJECT NO.: 1244

SCALE: 1 inch = 40 feet

FIGURE BY: C. Carter

DATE: 08/12/19



LEGEND

- Linear Conductor (dashed where interpreted from EM Data)
- GPR Anomaly
- Buried Metal
- Fence
- Surface Metal
- Tree
- Proposed Boring Location

0 20 40 (feet)

spectrum geophysics
Revealing the Subsurface
20434 CORISCO STREET
CHATSWORTH, CA 91311
(818) 886-4500
www.spectrum-geophysics.com

MAP: **Contour Map of GPR Signal Intensity (0 - 9ns)**

FIGURE NO.: **5**

PROJECT: Future Reseda Ice & Roller Rink
18210 Sherman Way
Reseda, California

PREPARED FOR: Converse Consultants
Monrovia, California

PROJECT NO.: 1244

SCALE: 1 inch = 40 feet

FIGURE BY: C. Carter

DATE: 08/12/19

CITY OF LOS ANGELES
CALIFORNIA

BOARD OF
BUILDING AND SAFETY
COMMISSIONERS

VAN AMBATIELOS
PRESIDENT

JAVIER NUNEZ
VICE PRESIDENT

JOSELYN GEAGA-ROSENTHAL
GEORGE HOVAGUIMIAN
ELVIN W. MOON

ERIC GARCETTI
MAYOR

DEPARTMENT OF
BUILDING AND SAFETY
201 NORTH FIGUEROA STREET
LOS ANGELES, CA 90012

OSAMA YOUNAN, P.E.
GENERAL MANAGER
SUPERINTENDENT OF BUILDING

JOHN WEIGHT
EXECUTIVE OFFICER

SOILS REPORT APPROVAL LETTER

March 25, 2021

LOG # 116702
SOILS/GEOLOGY FILE - 2

City of Los Angeles
221 N. Figueroa St., # 350
Los Angeles, CA 90012

TRACT: 21799
LOT(S): 5 (arb 1 and 2)
LOCATION: 18128 - 18138 W. Sherman Way

CURRENT REFERENCE REPORT/LETTER(S)	REPORT No.	DATE OF DOCUMENT	PREPARED BY
Addendum Report	19-080	12/21/2020	City of LA – GED

PREVIOUS REFERENCE REPORT/LETTER(S)	REPORT No.	DATE OF DOCUMENT	PREPARED BY
Dept. Approval Letter	110593	11/08/2019	LADBS
Soils Report	19-080	08/28/2019	City of LA – GED

The Grading Division of the Department of Building and Safety has reviewed the referenced addendum report that provides supplemental recommendations for the proposed Peseda Skate Facility Project. The project scope is described on page one of the 12/21/2020 report.

The Department reviewed and conditionally approved the previous referenced report for the proposed roller rink, indoor ice-skating rink, and surface parking. The earth materials at the subsurface exploration locations consist of up to 5 feet of uncertified fill underlain by lean clay. The consultants recommend to support the proposed structures on conventional foundations bearing on native undisturbed soils and/or compacted fill.

The referenced addendum report provides an alternative deep foundation option for the Shade Structure.

The referenced report is acceptable, provided the following conditions are complied with during site development:

(Note: Numbers in parenthesis ( ) refer to applicable sections of the 2017 City of LA Building Code. P/BC numbers refer the applicable Information Bulletin. Information Bulletins can be accessed on the internet at LADBS.ORG.)

1. All conditions of the previous Department approval letter dated 11/08/2019 (Log # 110593), except as specifically modified herein, shall be complied with.

2. All latest recommendations of the 12/21/2020 report that are in addition to or more restrictive than the conditions contained herein shall be incorporated into the plans.

3. CIDH piles shall be designed as recommended on pages 2 and 3 of the 12/21/2020 report.

4. Onsite storm water infiltration shall not be used at the subject site.

YING LIU
Geotechnical Engineer II

Log No. 116702
213-482-0480

cc: City of LA - GED, Project Consultant
VN District Office

CITY OF LOS ANGELES
DEPARTMENT OF PUBLIC WORKS
Bureau of Engineering
GEOTECHNICAL ENGINEERING DIVISION

December 21, 2020

SUPPLEMENTAL GEOTECHNICAL REPORT – RESEDA SKATE FACILITY PROJECT
18128 – 18138 WEST SHERMAN WAY
LOS ANGELES, CALIFORNIA
W.O.# E170121B **GED FILE NO. 19-080**

INTRODUCTION

The Los Angeles Department of Public Works, Bureau of Engineering, Geotechnical Engineering Division (GED) has prepared this report to provide supplemental recommendations for the project. The GED' original geotechnical engineering report dated August 28, 2019 was approved by the Los Angeles Department of Building and Safety (LADBS), Grading Division on November 8, 2019 under Log Number 110593. The recommendations in this report supercede those in the previous report. All previous recommendations remain applicable, except those specifically modified herein.

PROJECT DESCRIPTION

The project scope has changed slightly since the time our original geotechnical report was prepared. The most recent site plan, Sheet A1.00, is attached to this report. As shown on Sheet A1.00, the project includes construction of a roller rink in the northwest portion (18210 West Sherman Way) and an ice skating rink in the southwest portion (no current address). This site plan does not show the proposed parking area to the east.

Roller Rink: We understand the roller rink will consist of an outdoor area paved with asphalt concrete (AC). Habitable structures and/or shade structures are not proposed at this time. The southeastern portion will include handicap parking, a trash enclosure, a transformer pad, and a switchgear pad. The west side of the site will be occupied by a 28-foot wide fire lane. The proposed construction also includes a security fence surrounding the north, east, and south sides of the roller rink. The roller rink site may also include construction of a shade structure.

Ice Skating Rink: We understand the ice skating rink will be supported on competent ground. A conceptual cross-section of the ice skating rink floor is presented on Figure 1 in this report. Based on discussions with the ice skating rink designer, the potential for ground freezing to occur is very low.

The ice skating rink will be covered by a "Sprung" tent-like structure that consists of a tensioned membrane-covered frame supported on isolated footings. Several structures (rooms) are proposed on the north and east sides of the ice skating rink. These rooms will consist of concrete masonry unit (CMU) block construction with concrete SOG floors. The CMU block structures will be supported on continuous footings, except in areas near property boundaries, where they will be supported on isolated footings. The CMU block structures will be structurally connected to the "Sprung" structure such that the entire system behaves as a single unit.

Also, a 6- to 8-foot high CMU site wall is proposed along the west and south sides of the ice skating rink. This site wall will not retain soil and will be supported on continuous footings.

Feasibility of Onsite Storm Water Infiltration:

To comply with the City's Low Impact Development Best Management Practices (LID BMP), the feasibility of onsite storm water infiltration was evaluated. As part of the feasibility evaluation, three borehole infiltration tests were performed by Converse Consultants (Converse). The feasibility recommendations in this report are based on the information contained in Converse's data report dated April 21, 2020. A copy of their report is attached to this report. The GED has reviewed Converse's data report, concurs with the findings, and accepts responsibility for the use of its contents.

RECOMMENDATIONS

Supplemental recommendations for seismic design parameters, the roller rink, ice skating rink, pavement design, exterior concrete flatwork, and feasibility of onsite stormwater infiltration are provided in the following sections.

2020 Los Angeles Building Code Seismic Design Parameters

The seismic design parameters presented in the original (2019) report were developed in accordance with the ASCE 7-16 procedures. The seismic design parameters in the original report are consistent with the 2020 Los Angeles Building Code and remain applicable.

Roller Rink

As discussed, the roller rink is expected to consist of an AC paved surface. The existing soil (uncertified fill) beneath the roller rink shall be removed to a depth of 24 inches below existing grade. The excavation shall extend laterally at least 2 feet beyond the edges of the AC or the property boundary, whichever is less. Recommendations for Subgrade Preparation and Stabilization in Section 6.2.3 of the original report remain applicable. The existing clayey soil may be reused as backfill to within 12 inches below the AC. The AC shall be underlain by at least 12 inches of imported granular fill compacted to at least 95 percent RC. Crushed miscellaneous base (CMB) and/or crushed aggregate base (CAB) are acceptable.

Shade Structure – Shallow Foundations

The shade structure may be supported on footings in accordance with the recommendations in this report. Refer to ice skating rink section in this report for earthwork, bearing capacity, and settlement recommendations. Recommendations for lateral load resistance were provided in the original geotechnical report and remain applicable.

Shade Structure – Deep Foundations

As an alternative to footings, the shade structure may be supported on CIDH piles. The CIDH pile recommendations in this report are based on an assumed uncertified fill thickness of 5 feet (see Borings BH-1 through BH-3). The minimum pile diameter and pile spacing shall be 24 inches and 3 diameters on center.

The axial compression capacity shall be determined based on skin friction only and using an allowable adhesion value of 300 psf. This value may be increased by 1/3 for temporary loading conditions such as wind and seismic forces. All capacity (i.e. adhesion) in the upper 5 feet shall be neglected. The minimum pile embedment depth shall be 8 feet below the lowest adjacent grade, and at least 3 feet into native soil, whichever is greater. The actual depths may be deeper and will likely depend on the required lateral and tensile loads. The total settlement for each pile is not expected to exceed ½-inch provided the piles are properly constructed.

The allowable axial tensile capacity may be assumed to be ½ the axial capacity in compression. The weight of the concrete shaft embedded below the ground surface may be added to the tensile capacity.

The lateral load behavior of the CIDH piles was evaluated using the LPILE (Ensoft, 2013) software program. LPILE (2013) uses load deflection (p-y) curves to approximate the relationship between soil resistance and pile deflection. The lateral load behavior was evaluated for a free head deflection of ½-inch assuming a 24-inch diameter CIDH pile. Also, we assumed a perfectly elastic pile and a cracked section. The modulus of elasticity for the cracked section was estimated to be 1802500 pounds per square inch (i.e. FS = 2). The main inputs in the LPILE software for each soil layer are the unit weight and soil shear strength. We realize the existing uncertified fill mostly consists of lean with sand; however, for the selection of p-y curves, the fill was assumed to behave as “sand” with a total unit weight of 98 pcf, effective friction angle of 20 degrees, and no cohesion. A request for modification of building ordinances for deriving lateral support from the existing undocumented fill will be submitted concurrently with this report. The existing native soil below 5 feet was assumed to behave as “stiff clay without free water.” An undrained shear strength value of 1,000 psf was used for the soil shear strength. The results of the LPILE analyses are attached to this report.

Ice Skating Rink

Based on information from the four previous borings, which were drilled in the proposed ice skating rink area (BH-4 through BH-7), the uncertified fill thickness in the ice skating rink area is expected to be no greater than 4 feet.

Earthwork

The earthwork for the ice skating rink floor shall result in at least 12 inches of non-expansive compacted fill beneath the warm floor tubing pipe as shown on Figure 1. The non-expansive fill shall be compacted to at least 95 percent RC.

Over-excavation is not required for structural footings embedded at least 6 inches into native soil. The existing uncertified fill shall be removed beneath all structural footings not embedded into native soil. The existing uncertified fill beneath interior SOG floors shall also be removed and replaced with compacted fill. Recommendations for Subgrade Preparation and Stabilization in Section 6.2.3 of the original report remain applicable. We anticipate the vertical over-excavation will result in approximately 18 to 24 inches of compacted fill beneath footings, excluding those that are embedded into native soil. The lateral over-excavation for footings shall be equal to the vertical over-excavation unless footings are embedded into native soil.

Bearing Capacity and Settlement

Footings may be designed using an allowable (net) bearing capacity of 2,000 psf. This allowable bearing capacity value may be increased by ⅓ when considering transient live loads, including wind and seismic forces. Based on the allowable bearing value recommended above, total static settlement of the shallow footings is anticipated to be less than 1-inch. Differential settlement between footings is expected to be less than ½-inch.

Subdrain

The ice skating rink shall be constructed with a subdrain. The subdrain pipe shall consist of rigid 4-inch diameter PVC pipe with the perforations facing down. The pipe shall be encased in ¾-inch clear crushed rock that is entirely wrapped in filter cloth. It is imperative that subsurface water not accumulate near foundations. Non-perforated rigid PVC pipe shall be used to convey subsurface water near footings. Subsurface water shall be discharged at an approved location away from any structures.

CMU Site Wall

The existing soil beneath the proposed 6- to 8-foot high CMU site wall shall be removed to a depth of 12 inches below the bottom of footing. Lateral over-excavation is not required. Recommendations for Subgrade Preparation and Stabilization in Section 6.2.3 of the original report remain applicable. The existing soil is suitable for reuse as compacted fill beneath the footings.

Continuous footings shall be a minimum of 18 inches wide and embedded at least 18 inches below the lowest adjacent grade. Footings may be designed using an allowable (net) bearing capacity of 1,200 psf. This allowable bearing capacity value may be increased by ⅓ when considering transient live loads, including wind and seismic forces. Based on the allowable bearing value recommended above, total static settlement of the footings is anticipated to be less than 1½ inches. Differential settlement is expected to be less than ¾-inch.

<u>Pavement Design</u>

AC pavement recommendations were previously provided in Section 6.6 of the original report; however, we understand a traffic index is not available for the proposed fire lane and individual parking stalls. The recommendations for a traffic index of 8, as presented in Table 2 of the original report, may be used for the fire lane design. The recommendations for a traffic index of 5 may be used for the parking stall design.

<u>Exterior Concrete Flatwork</u>

The existing fill beneath exterior concrete flatwork (i.e. pedestrian walkways) shall be removed to a depth of 12 inches below existing grade and at least 6 inches below the slab, whichever is greater. The onsite soil may be reused as backfill, except for the upper 4 inches. The upper 4 inches shall consist of imported granular fill compacted to at least 90 percent RC. The slab thickness and reinforcement shall be determined by the structural engineer.

Feasibility of Onsite Storm Water Infiltration

The infiltration test rates were estimated using the general guidelines in the County of Los Angeles Department of Public Works, Geotechnical and Materials Engineering Division Administrative Manual (2017). The infiltration measurements were averaged over a period where a steady-state flow condition was achieved. As presented in Converse's data report (attached), the unadjusted infiltration rates were between approximately 0.03 and 0.3-inch per hour. The soil in the infiltration zone(s) mostly consists of lean clay. Based on our estimation of the infiltration rates at the site and the guidelines presented in the City's LID BMP requirements, the site would typically be classified as Category 3 or "Infeasible."

CLOSURE

If you have any questions about this report, please contact Easton Forcier at (213) 847-0476.

REGISTERED PROFESSIONAL ENGINEER
EASTON RENE FORCIER
No. GE 2948
Exp. 9-30-22
GEOTECHNICAL
STATE OF CALIFORNIA

12-21-20

Easton Forcier, GE
Geotechnical Engineer II

Attachments: Sheet A1.00 – Proposed Ice and Roller Rink Site Plan
Figure 1 – Conceptual Cross-Section of Ice Skating Rink Floor
Converse Consultants Data Report dated April 21, 2020
LPILE Results for a 24-inch diameter CIDH Pile

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

METAL DECK AND CONCRETE AT ROOF

METAL DECK AND CONCRETE AT ROOF

ELECTRICAL ROOM 135 SF

IT 135 SF

GIRL'S ROOM 145SF

TYP.SIZE= 235 SF W/ 38' OF LINEAR BENCH

TYP. SHARED LOCKER RESTROOM= 190 SF

End Bearing Caissons at East Property Line founded into native soil

8" CMU WALLS Full Height Reinforced Fully Grouted TYP.

SITE WALL PER CIVIL

2" Separation gap from PL

JANITOR 78 SF

ICE ROOM

16'-4"

7'-7"

MECH. ROOM

LOCKER ROOM 1

LOCKER ROOM 2

LOCKER ROOM 3

LOCKER ROOM 4

CMU LINTEL. TYP. AT DOORS

CMU LINTEL. TYP. AT DOORS

SPRUNG STRUCTURE ALONG EAST SIDE LANDS ON TOP OF CMU WALL

18" W x 18" thick Concrete Footing. Typ. at CMU walls except East Wall

CONCRETE FOOTING @ SPRUNG STRUCTRE COLUMNS. FOUNDED INTO COMPACTED FILL TOP OF FOOTING 12" BELOW TOP OF SLAB TYP.

NOTES:

1. FOR EXTENT OF OVER EXCAVATION AND REMOVAL AND RECOMPACTION SEE CIVIL DRAWINGS AND SOILS REPORT

2. FOR SLAB ON GRADE SUBGRADE PREPARATION SEE SOILS REPORT

3. FOR ICE RINK SURFACE SUBGRADE PREPARATION SEE SOILS REPORT AND ICE RINK CONSULTANT SPECIFICATIONS

4. LIGHT GREY LINE WORK INDICATES ARCHITECTURAL BACKGROUND AND IT IS SHOWN FOR REFERENCE ONLY. REFER TO ARCHITECTURAL DRAWINGS FOR ARCHITECTURAL INFORMATION

85' x 200' ICE SURFACE

SKATE RENTAL

Concrete Curb. Height per Architectural. Width to match sprung structure width.

CONCRETE FOOTING @ SPRUNG STRUCTRE COLUMNS. FOUNDED INTO COMPACTED FILL TOP OF FOOTING 12" BELOW TOP OF SLAB TYP.

ICE RINK SURFACE PER ICE RINK CONSULTANT

NON LOAD BEARING CMU WALL ENCLOSURE ZAMBONI ROOM. INSTALL ON THICKENED SLAB

SHOP+ ENTRY 720 SF

Concrete Curb. Height per Architectural. Width to match sprung structure width.

ZAMBONI ROOM 630 SF

Sprung Structure column typ.

BENCHES

BENCHES

6' CMU WALL ENCLOSURE @ ZAMBONI ROOM

Concrete Curb. Height per Architectural. Width to match sprung structure width.

5" Concrete slab on grade with #4 @ 16" o.c. each way. Subgrade per soils report Thick edge 18" deep from top of slab

CONCRETE FOOTING @ SPRUNG STRUCTRE COLUMNS. FOUNDED INTO COMPACTED FILL TOP OF FOOTING 12" BELOW TOP OF SLAB TYP.

SITE WALL PER CIVIL

N

S3.1

FLOOR PLAN

Schematic design 11.05.2020

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Design

LFA Labib Funk + Associates Structural | Civil Engineers
Burnett + Young Shoring Engineers

THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED

BUREAU OF ENGINEERING
VERTICAL CONTROL:
HORIZONTAL CONTROL:
SHEET TITLE:
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

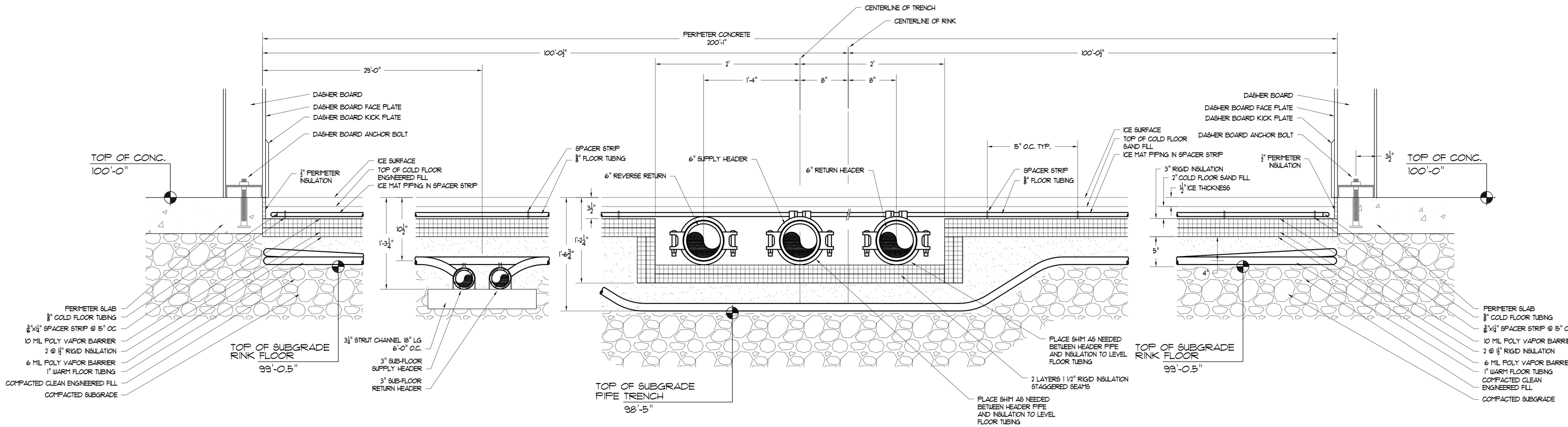
DEPARTMENT OF PUBLIC WORKS
CITY OF LOS ANGELES
GARY LEE MOORE, P.E., ENV SP
CITY ENGINEER
DESIGN GROUP
ENGINEER:
DESIGNED BY:
DRAWN BY:
CHECKED BY:
APPROVED BY:
DATE:
REVISIONS: NO: BY: DATE:
CIP NO.
INDEX NO.

WORK ORDER NO. E170121B

SHEET NAME S2.1
SHEET 1 of 2 SHEETS

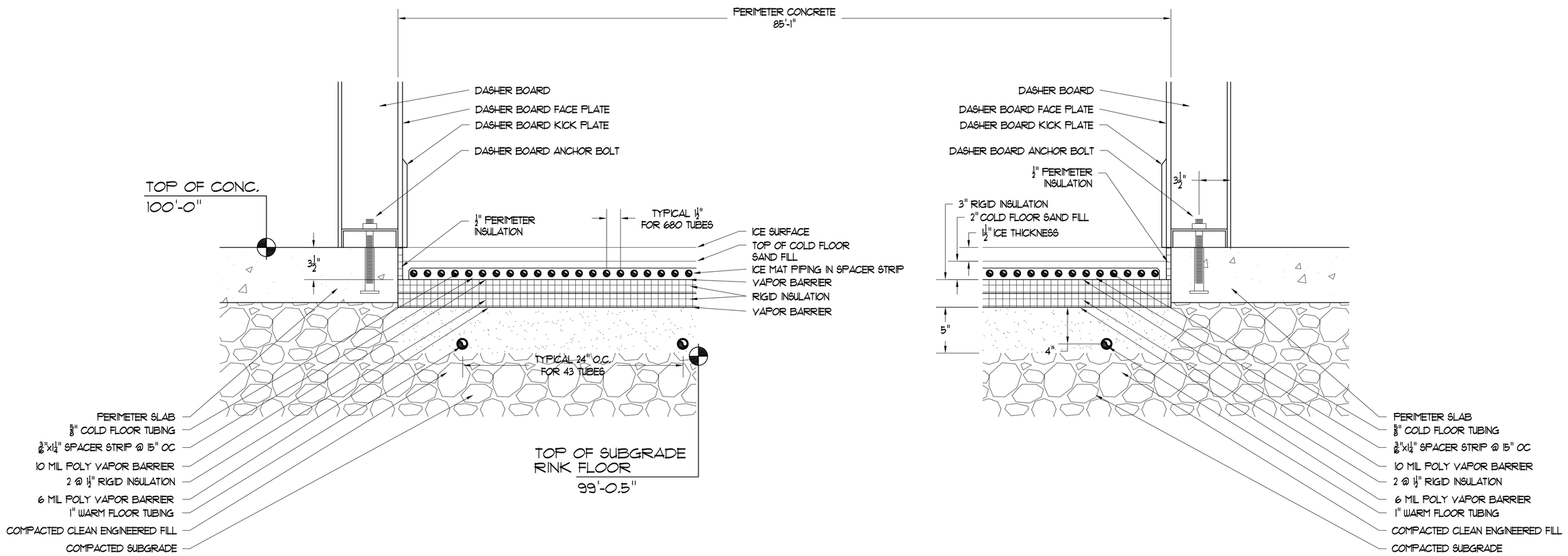
REVISION DATES (DESIGN STAGE ONLY)

Sheet Version 4.0



6 COLD FLOOR SECTION RINK LENGTH TRENCH DETAIL

SCALE: 1 1/2" = 1'



7 COLD FLOOR SECTION RINK WIDTH

SCALE: 1 1/2" = 1'

Figure 1 - Conceptual Cross-Section of Ice Skating Rink Floor

SERV-ICE REFRIGERATION, INC.
143 Cady Centre, #207 Northville, MI 48167
Phone (248) 735-6000 Fax (248) 735-6001

NO. DESCRIPTION DATE

Converse Consultants
Geotechnical Engineering, Environmental & Groundwater Science, Inspection & Testing Services

April 21, 2020

Mr. Patrick J. Schmidt, PE, GE
Geotechnical Engineering Division
1149 South Broadway, Suite 120
Los Angeles, California 90015-2213

Subject: **SUMMARY OF INFILTRATION TEST RESULTS**
The Reseda Ice and Roller Rink Project
18210 Sherman Way
Reseda, California 91335
Converse Project No. 16-31-260-16

Dear Mr. Schmidt:

Converse Consultants (Converse) has prepared this letter to summarize the results of the infiltration tests performed to assist in dry well design for the subject project as per our proposal dated March 18, 2020. The testing was performed in general accordance with Los Angeles County Low Impact Development Stormwater Infiltration, Best Management Practices Guidelines, 2017.

Converse conducted the infiltration test on April 13, 2020 at an empty lot located at 18210 Sherman Way in Reseda, California as shown on Figure No. 1, *Site and Infiltration Location Map*. Three (3) exploratory borings (IT-1, IT-2 and IT-3) were drilled within the project site using a truck-mounted drill rig equipped with an 8-inch diameter hollow-stem auger. Borings were drilled to a depth of 6.5, 11.5 and 36.5 feet below ground surface (bgs). The infiltration tests were performed on IT-1 through IT-3 to meet the County of Los Angeles requirement. Detailed descriptions of the field exploration and sampling program are presented in Appendix A, *Field Exploration*. For a description of the laboratory test methods and test results, see Appendix B, *Laboratory Testing Program*.

Upon completion of drilling, a 1-inch-thick gravel layer was placed at the bottom of the bore hole and a 2-inch diameter perforated pipe was installed above the gravel to the ground surface. The boring annulus around the pipe was filled with gravel. The purpose of the pipe and gravel was to reduce the potential for erosion and caving due to the addition of water to the holes.

The results of the infiltration test and requirements are presented in Appendix C, *Infiltration Testing*. The well designer should determine whether additional design-related safety factors are appropriate and whether infiltration rates are appropriate for use in the well design.

The field data of the most conservative test interval and infiltration rates are presented in the following table:

Depth of Test Below Ground Level (Feet)

Boring No.	Depth of Test (feet)	Topsoil Types (USCS)	Ground Water Encountered (feet)	Average Infiltration Rate (inches/hour)	Design Infiltration Rate (inches/hour)
IT-1*	0-6.5	Sandy Silt (ML) with trace clay	N/A	0.29	0.28
IT-2*	0-11.5	Lean Clay (CL) with trace silt and sand	N/A	0.03	0.03
IT-3*	0-36.5	Silt (ML) and Lean Clay (CL), trace sand	N/A	0.22	0.22

*Infiltration rate was obtained from an 8-inch diameter bore hole to a depth which shows in the next column (Depth of Test). The infiltration rate may change with different well dimensions. The adjustment to the provided infiltration rate to a well with different dimensions should be determined by the well designer.

We appreciate the opportunity to be of continued service to City of Los Angeles. If you have any questions or require additional information, please feel free to contact the undersigned at (626) 930-1275.

Sincerely,

CONVERSE CONSULTANTS

Siva K. Sivathasan, PhD, PE, GE, DGE, QSD, F. ASCE
Senior Vice President / Principal Engineer

REGISTERED PROFESSIONAL ENGINEER
KATHIRAVETPILLAI SIVATHASAN
No. 2708
Exp. 6-30-20
GEOTECHNICAL
STATE OF CALIFORNIA

Encl: References
Figure
Appendix A
Appendix B
Appendix C

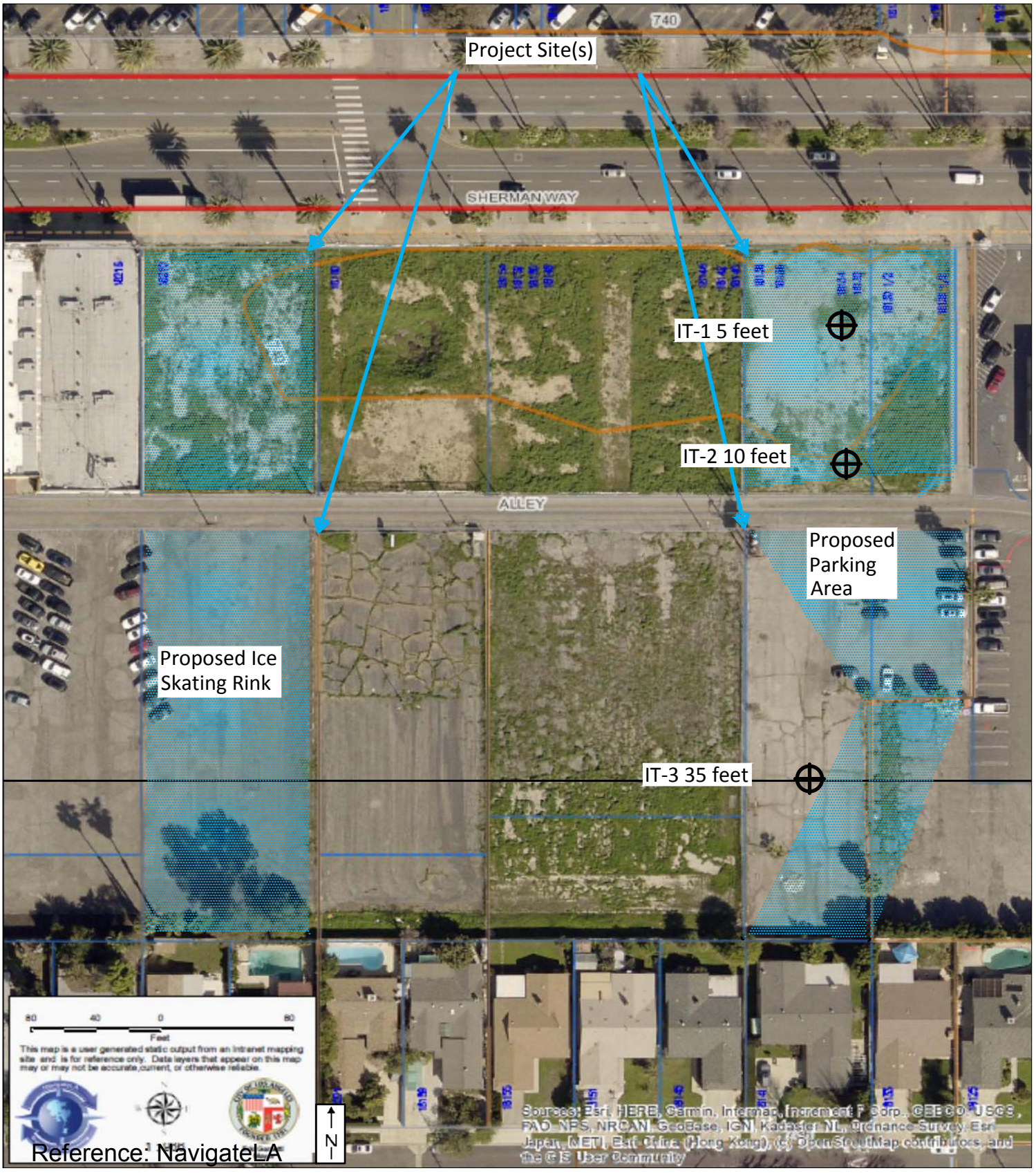
SKS/PA:jjl

Reference

REFERENCE

COUNTY OF LOS ANGELES, Department of Public Works, *Administrative Manual - Guidelines for Geotechnical Investigation and Reporting, Low Impact Development Storm Water Infiltration*, 2017.

Figure



SITE LOCATION MAP

Converse Consultants

Reseda Ice and Roller Rink
West Sherman Way
Los Angeles, CA

Project No.
16-31-260-16

Figure No.
1

Appendix A

Field Exploration

APPENDIX A: FIELD EXPLORATION

Field exploration included a site reconnaissance and subsurface exploration program. During the site reconnaissance, the surface conditions were noted, and the approximate location of the boring was determined. The exploratory boring was approximately located using existing boundaries and other features as a guide and should be considered accurate only to the degree implied by the method used. The various field study methods performed are discussed below.

Exploratory Borings

Three (3) exploratory borings (IT-1, IT-2 and IT-3) were drilled within the project site on April 13, 2020. The borings were advanced using a truck-mounted 8-inch-diameter hollow stem auger drill rig to a maximum depth of 36.5 feet below the existing ground surface (bgs). The borings were visually logged by a Converse engineer in accordance with the Unified Soil Classification System and sampled at regular intervals and at changes in subsurface soils. The field descriptions have been modified where appropriate to reflect laboratory test results.

Samples of the subsurface materials were obtained at frequent intervals in the exploratory boring using a California Modified Sampler (2.4 inches inside diameter and 3.0 inches outside diameter) lined with sample rings. The steel ring sampler was driven into the bottom of the borehole with successive drops of a 140-pound driving weight falling 30 inches, using an automatic hammer. Samples were retained in brass rings (2.4 inches inside diameter and 1.0 inch in height). The central portion of the sample was retained and carefully sealed in waterproof plastic containers for shipment to the Converse laboratory. Blow counts for each sample interval are presented on the logs of borings. Bulk samples of typical soil types were also obtained. The boring location is shown on Figure No. 1, *Site and Infiltration Location Map*. Infiltration tests were conducted in borings (IT-1 to IT-3) and the results are presented in Appendix C.

It should be noted that the exact depths at which material changes occur cannot always be established accurately. Changes in material conditions that occur between driven samples are indicated in the logs at the top of the next drive sample. A key to soil symbols and terms is presented as Drawing No. A-1, *Soil Classification Chart*. The log of the exploratory borings is presented in Drawing No. A-2 through A-4, *Logs of Boring*.

SOIL CLASSIFICATION CHART

MAJOR DIVISIONS			SYMBOLS GRAPH	SYMBOLS LETTER	TYPICAL DESCRIPTIONS
COARSE GRAINED SOILS — MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	GRAVEL AND GRAVELLY SOILS — MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	CLEAN GRAVELS (LITTLE OR NO FINES)		GW	WELL-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
				GP	POORLY-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
		GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES)		GM	SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES
				GC	CLAYEY GRAVELS, GRAVEL - SAND - CLAY MIXTURES
	SAND AND SANDY SOILS — MORE THAN 50% OF COARSE FRACTION PASSING ON NO. 4 SIEVE	CLEAN SANDS (LITTLE OR NO FINES)		SW	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
				SP	POORLY-GRADED SANDS, GRAVELLY SAND, LITTLE OR NO FINES
		SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)		SM	SILTY SANDS, SAND - SILT MIXTURES
				SC	CLAYEY SANDS, SAND - CLAY MIXTURES
FINE GRAINED SOILS — MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILTS AND CLAYS	LIQUID LIMIT LESS THAN 50		ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY
				CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
				OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS	LIQUID LIMIT GREATER THAN 50		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS
				CH	INORGANIC CLAYS OF HIGH PLASTICITY
				OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
HIGHLY ORGANIC SOILS				PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS

SAMPLE TYPE

STANDARD PENETRATION TEST
Split barrel sampler in accordance with ASTM D-1586-84 Standard Test Method

DRIVE SAMPLE 2.42" I.D. sampler.

DRIVE SAMPLE No recovery

BULK SAMPLE

GRAB SAMPLE

GROUNDWATER WHILE DRILLING

GROUNDWATER AFTER DRILLING

BORING LOG SYMBOLS

LABORATORY TESTING ABBREVIATIONS

TEST TYPE
(Results shown in Appendix B)

CLASSIFICATION

Plasticity	pi
Grain Size Analysis	ma
Passing No. 200 Sieve	wa
Sand Equivalent	se
Expansion Index	ei
Compaction Curve	max
Hydrometer	h

STRENGTH

Pocket Penetrometer	p
Direct Shear	ds
Direct Shear (single point)	ds*
Unconfined Compression	uc
Triaxial Compression	tx
Vane Shear	vs
Consolidation	c
Collapse Test	col
Resistance (R) Value	r
Chemical Analysis	ca
Electrical Resistivity	er

UNIFIED SOIL CLASSIFICATION AND KEY TO BORING LOG SYMBOLS

Converse Consultants

Project Name
Reseda Ice and Roller Rink
West Sherman Way
Los Angeles, CA

Project No. **16-31-260-16**

Figure No. **A-1**

Log of Boring No. IT-1

Dates Drilled: 4/13/2020 Logged by: PP Checked By: RAM

Equipment: HSA 8" diameter Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 734' Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	SAMPLES: DRIVE	SAMPLES: BULK	BLOWS/6"	MOISTURE (%)	DRY UNIT WT. (pcf)	PID and Lab Tests
		FILL (Af): **SANDY SILT (ML):** clay, moist, light brown.	X		1/1/1			
5		**ALLUVIUM (Qal):** **SANDY CLAY (CL):** with silt and sand, fine to coarse-grained, moist, light brown.	X		2/3/3			wa (fc=56%)
		End of boring at 6.5 feet. No groundwater encountered. Percolation test was performed between 0-6.5 feet beolw ground level. Backfilled with soil cutting and gravel on 4/13/2020. Coordinates: 34.2009, -118.5286						

Converse Consultants

Project Name
Reseda Ice and Roller Rink
West Sherman Way
Los Angeles, CA

Project No. **16-31-260-16**

Figure No. **A-2**

Log of Boring No. IT-2

Dates Drilled: 4/13/2020 Logged by: PP Checked By: RAM

Equipment: HSA 8" diameter Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 734' Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	SAMPLES DRIVE	SAMPLES BULK	BLOWS/6"	MOISTURE (%)	DRY UNIT WT. (pcf)	PID and Lab Tests
		FILL (Af): **LEAN CLAY (CL)** with trace silt and sand, moist, brown	X		1/3/2			
5		**ALLUVIUM (Qal):** **LEAN CLAY (CL)** with trace silt and sand, moist, dark brown	■		6/7/8	10	95	wa (fc=76%)
10		few silt, light brown	X		1/4/6			
		End of boring at 11.5 feet. No groundwater encountered. Percolation test was performed between 0 -11.5 feet below ground level. Backfilled with soil cutting and gravel on 4/13/2020. Coordinates: 34.2006, -118.5286						

Converse Consultants

Project Name
Reseda Ice and Roller Rink
West Sherman Way
Los Angeles, CA

Project No. **16-31-260-16**

Figure No. **A-3**

Log of Boring No. IT-3

Dates Drilled: 4/13/2020 Logged by: PP Checked By: RAM

Equipment: HSA 8" diameter Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 734' Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	SAMPLES DRIVE	SAMPLES BULK	BLOWS/6"	MOISTURE (%)	DRY UNIT WT. (pcf)	PID and Lab Tests
		2" ASPHALT CONCRETE WITH NO BASE						
		FILL (Af):						
		SILT (ML): with sand, fine to coarse-grained, light brown.						
		ALLUVIUM (Qal):						
5		**SILT (ML):** with sand, fine to coarse-grained, moist, light brown.	■		2/5/7	11	98	
10			⊠		1/1/1			wa (fc=75%)
15		**LEAN CLAY (CL)** with silt and trace sand, fine to medium-grained, moist, brown	■		4/7/9	13	107	
20		with trace silt and sand, miost, brown	⊠		3/3/3			wa (fc=60%)
25		**LEAN CLAY (CL)** with some silt and trace sand, fine to medium-grained, moist, brown with black streaks	■		2/4/6	17	97	
30			⊠		2/4/5			wa (fc=83%)

Converse Consultants

Project Name
Reseda Ice and Roller Rink
West Sherman Way
Los Angeles, CA

Project No. **16-31-260-16**

Figure No. **A-4a**

Log of Boring No. IT-3

Dates Drilled: 4/13/2020 Logged by: PP Checked By: RAM

Equipment: HSA 8" diameter Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 734' Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	SAMPLES DRIVE	SAMPLES BULK	BLOWS/6"	MOISTURE (%)	DRY UNIT WT. (pcf)	PID and Lab Tests
		ALLUVIUM (Qal): **LEAN CLAY (CL)** moist, brown with black streaks	X		3/4/8			
		End of boring at 36.5 feet. No groundwater encountered. Percolation test was performed between 0 -36.5 feet below ground level. Borehole was backfilled with gravel and cement grout and capped with cold patch asphalt on 4/13/2020. Coordinates: 34.1999, -118.5287						

Converse Consultants

Project Name
Reseda Ice and Roller Rink
West Sherman Way
Los Angeles, CA

Project No. **16-31-260-16**

Figure No. **A-4b**

Appendix B

Laboratory Testing Program

APPENDIX B: LABORATORY TESTING PROGRAM

Tests were conducted in the Converse laboratory on representative soil samples for the purpose of classification and evaluation of their relevant physical characteristics and engineering properties. Test results are presented herein and on the boring logs in Appendix A, *Field Exploration*. The following is a summary of the laboratory tests conducted for this project.

Moisture Content and Dry Density

Results of moisture content and dry density tests performed on relatively undisturbed ring samples were used to aid in the classification of the soils and to provide quantitative measure of the *in situ* dry density. Data obtained from this tests provides qualitative information on strength and compressibility characteristics of site soils. For test results, see the boring logs in Appendix A, *Field Exploration*.

Percent Passing Sieve No. 200

The Percent Passing Sieve No. 200 tests were performed on five (5) selected soil samples to aid in the classification of the on-site soils and to estimate other engineering parameters. Testing was performed in general accordance with the ASTM Standard D1140 test method. The test results are presented in the boring logs and in the following table:

Table No. B-1, Summary of Percent Passing Sieve No. 200 Test Results

Boring No.	Depth (feet)	Soil Classification	Percent Passing Sieve No. 200
IT-1	5	Sandy Clay (CL)	56
IT-2	5	Lean Clay (CL)	76
IT-3	10	Silt (ML) with sand	75
IT-3	20	Lean Clay (CL)	60
IT-3	30	Lean Clay (CL)	83

Appendix C

Infiltration Testing

APPENDIX C: INFILTRATION TESTING

Infiltration testing was performed utilizing exploratory borings IT-1, IT-2 and IT-3 on April 13, 2020. The continuous pre-soak falling-head test method was utilized to evaluate soil infiltration rates of the native soils encountered between depths of 0 to 36.5 feet below the ground surface at the respective boring locations in accordance with Los Angeles County (2017), Administrative Manual--Guidelines for Design, Investigation, and Reporting Low Impact Development Storm Water Infiltration. The test locations were prepared by placing a perforated 2-inch diameter PVC pipe surrounded by pea gravel and sand after drilling and sampling.

The borings were encased using a two-inch diameter perforated casing. Water was added to the bore hole until the water level was as near the ground surface as could be achieved and allowed to pre-soak at least one hour to ensure the pea gravel and sand around the annulus of the perforated pipe was fully saturated.

Time interval for recording the water drop between readings was determined by the following procedure: Filled the excavation 12 inches above the bottom; Observed the drop in the water during the next 30 minutes; and compared with the condition that applies below:

- If water drains in less than 10 minutes, a constant head or high flowrate test procedure must be used to justify high recommended infiltration rates.
- If water remains in the hole after 10 minutes but drains before 30 minutes, the time interval between readings shall be 10 minutes.
- If water remains in the hole after 30 minutes, the time interval between readings shall be 30 minutes.

Based on the conditions, readings were taken for every 10 minutes for IT-1 and every 30 minutes for IT-2 and IT-3.

The boring was filled back to the initial water depth and the time recorded of filling for each successive infiltration test reading. A sounder was used to determine the water level for test sections at depth. Measurements of all water levels were taken to the nearest 1/8-inch increment. infiltration test readings were repeated a minimum of eight times or until stabilized. A stabilized rate is when the highest and lowest readings are within 10 percent of each other from three consecutive readings. The soil boring infiltration test results are shown in the following table:

Table No. C-1, Soil Boring Infiltration Test Results

Boring No.	Depth of Test (feet)	Topsoil Types (USCS)	Ground Water Encountered (feet)	Average Infiltration Rate (inches/hour)	Design Infiltration Rate (inches/hour)
IT-1*	6.5	Sandy Silt (ML) with trace clay	N/A	0.29	0.28
IT-2*	11.5	Lean Clay (CL) with trace silt and sand	N/A	0.03	0.03
IT-3*	36.5	Silt (ML) and Lean Clay (CL), trace sand	N/A	0.22	0.22

*Infiltration rate was obtained from an 8-inch diameter bore hole to a depth which shows in the next column (Depth of Test). The infiltration rate may change with different well dimensions. The adjustment to the provided infiltration rate to a well with different dimensions should be determined by the well designer.

In accordance with County of Los Angeles requirements, the minimum infiltration rate for design of infiltration systems for storm water management is 0.3 inches per hour. It should be noted that per Los Angeles County Low Impact Development, Best Management Practices Guidelines, any planned infiltration systems should be at least 10 feet above historically highest groundwater levels. The project Civil Engineer shall review the infiltration rates presented for design of the proposed infiltration system. Additional details regarding drywell design and requirements can be found in the Low Impact Development Manual, County of Los Angeles Department of Public Works, latest edition. The infiltration system should be properly maintained periodically to minimize sedimentation in the infiltration system.

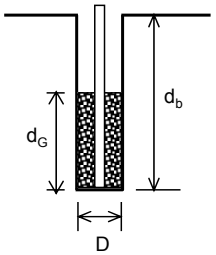
Table No. C-2, Infiltration Facility Setback Requirements per Los Angeles County

Setback From	Distance
Any Foundation	5 feet
Face of any slope	15 feet or within 1:1 plane drawn up from the bottom of foundation, whichever greater
Water wells used for drinking water	H/2, 5 feet minimum (H is height of slope)
Historically high groundwater table	10 feet above

Percolation Testing

Job Name: Reseda Ice and Roller Rink
Job No.: 16-31-260-16
Location: IT-1
Test Date: April 13, 2020

Test Boring No **IT-1**
Depth of Boring (d_b): 6.5 feet
Diameter of Boring (D): 0.67 feet
Test Performer: PAT



Time of Testing				Water Level Measurement		Water Level Calculations				Percolation Rate Calculations		
Initial Time	Final Time	Time Interval	Percolation Test Depth Below Ground Surface	Initial depth to water	Final depth to water	Drop in Height	Surface Area of Percolation	Surface Area of Percolation	Volume of discharged water	Pre-adjusted Percolation Rate	Reduction Factor	Adjusted Percolation Rate
T_i	T_f	ΔT	d	d_1	d_2	$\Delta d = d_i - d_f$	SA	SA	L_{ave}	$k_i = \Delta d / \Delta T$	R_f	$k = k_i / R_f$
		(hr)	(feet)	(feet)	(feet)	(feet)	(feet^2)	(inch^2)	(feet^3)	(inch/hr)		(inch/hr)
Percolation Test												
9:55:00 AM	10:05:00 AM	0.17	0 - 6.5	0.00	0.18	0.18	13.96	2010.62	0.06	0.32	1.0	0.32
10:05:00 AM	10:15:00 AM	0.17	0 - 6.5	0.00	0.16	0.16	13.96	2010.62	0.05	0.28	1.0	0.28
10:15:00 AM	10:25:00 AM	0.17	0 - 6.5	0.00	0.16	0.16	13.96	2010.62	0.05	0.28	1.0	0.28
10:25:00 AM	10:35:00 AM	0.17	0 - 6.5	0.00	0.16	0.16	13.96	2010.62	0.06	0.29	1.0	0.29
10:35:00 AM	10:45:00 AM	0.17	0 - 6.5	0.00	0.16	0.16	13.96	2010.62	0.05	0.28	1.0	0.28

Note: Reduction Factor, (R_f = (2*d_i - Δd)/D +1) was not applied for this calculation

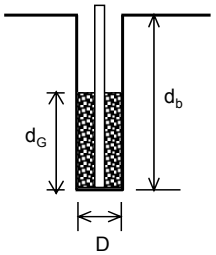
Lowest Percolaton Rate = 0.28 inch/hr
Average Percolation Rate = 0.29 inch/hr
Design Percolation Rate = 0.28 inch/hr

Reference: Los Angeles County (2017). Adminstrative Manual - Low Impact Development Best Management Practice Guideline for Design, Investigation, and Reporting, 12/31/17.

Percolation Testing

Job Name: Reseda Ice and Skate Rink
Job No.: 16-31-260-31
Location: IT-2
Test Date: April 13,2020

Test Boring No **IT-2**
Depth of Boring (d_b): 11.5 feet
Diameter of Boring (D): 0.67 feet
Test Performer: PAT



Time of Testing				Water Level Measurement		Water Level Calculations				Percolation Rate Calculations		
Initial Time	Final Time	Time Interval	Percolation Test Depth Below Ground Surface	Initial depth to water	Final depth to water	Drop in Height	Surface Area of Percolation	Surface Area of Percolation	Volume of discharged water	Pre-adjusted Percolation Rate	Reduction Factor	Adjusted Percolation Rate
T_i	T_f	ΔT	d	d_1	d_2	$\Delta d = d_i - d_f$	SA	SA	L_{ave}	$k_i = \Delta d / \Delta T$	R_f	$k = k_i / R_f$
		(hr)	(feet)	(feet)	(feet)	(feet)	(feet^2)	(inch^2)	(feet^3)	(inch/hr)		(inch/hr)
Percolation Test												
9:53:00 AM	10:23:00 AM	0.50	0 - 11.5	0.00	0.06	0.06	24.56	3536.43	0.02	0.02	1.0	0.02
10:27:00 AM	10:57:00 AM	0.50	0 - 11.5	0.00	0.09	0.09	24.56	3536.43	0.03	0.03	1.0	0.03
10:57:00 AM	11:27:00 AM	0.50	0 - 11.5	0.00	0.08	0.08	24.56	3536.43	0.03	0.03	1.0	0.03
11:28:00 AM	11:58:00 AM	0.50	0 - 11.5	0.00	0.09	0.09	24.56	3536.43	0.03	0.03	1.0	0.03

Note: Reduction Factor, (R_f = (2*d_i - Δd)/D +1) was not applied to this calculation

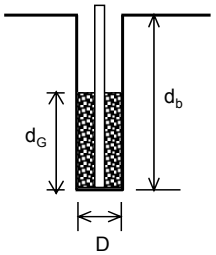
Lowest Percolaton Rate = 0.02 inch/hr
Average Percolation Rate = 0.03 inch/hr
Design Percolation Rate = 0.03 inch/hr

Reference: Los Angeles County (2017). Adminstrative Manual - Low Impact Development Best Management Practice Guideline for Design, Investigation, and Reporting, 12/31/17.

Percolation Testing

Job Name: Reseda Ice and Roller Rink
Job No.: 16-31-260-16
Location: IT-3
Test Date: April 13, 2020

Test Boring No **IT-3**
Depth of Boring (d_b): 36.5 feet
Diameter of Boring (D): 0.67 feet
Test Performer: PAT

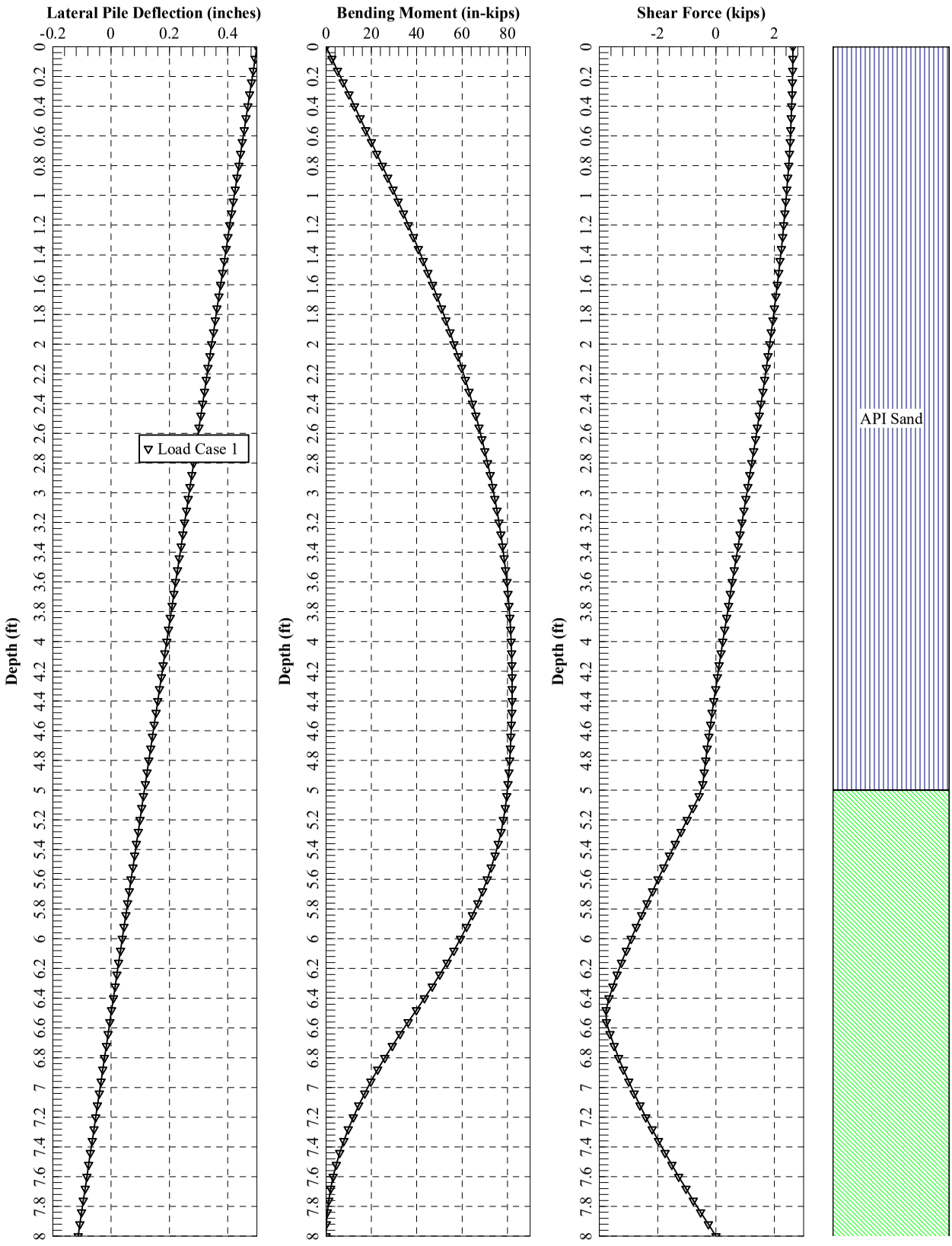


Time of Testing				Water Level Measurement		Water Level Calculations				Percolation Rate Calculations		
Initial Time	Final Time	Time Interval	Percolation Test Depth Below Ground Surface	Initial depth to water	Final depth to water	Drop in Height	Surface Area of Percolation	Surface Area of Percolation	Volume of discharged water	Pre-adjusted Percolation Rate	Reduction Factor	Adjusted Percolation Rate
T_i	T_f	ΔT	d	d_1	d_2	$\Delta d = d_i - d_f$	SA	SA	L_{ave}	$k_i = \Delta d / \Delta T$	R_f	$k = k_i / R_f$
		(hr)	(feet)	(feet)	(feet)	(feet)	(feet^2)	(inch^2)	(feet^3)	(inch/hr)		(inch/hr)
Percolation Test												
11:13:00 AM	11:43:00 AM	0.50	0 - 36.5	0.000	2.01	2.01	77.18	11113.95	0.71	0.22	1.0	0.22
11:45:00 AM	12:15:00 PM	0.50	0 - 36.5	0.000	2.01	2.01	77.18	11113.95	0.71	0.22	1.0	0.22
12:15:00 PM	12:45:00 PM	0.50	0 - 36.5	0.000	2.00	2.00	77.18	11113.95	0.71	0.22	1.0	0.22
12:45:00 PM	1:15:00 PM	0.50	0 - 36.5	0.000	1.91	1.91	77.18	11113.95	0.67	0.21	1.0	0.21

Note: Reduction Factor, (R_f = (2*d_i - Δd)/D +1) was not applied to this calculation

Lowest Percolaton Rate = 0.21 inch/hr
Average Percolation Rate = 0.22 inch/hr
Design Percolation Rate = 0.22 inch/hr

Reference: Los Angeles County (2017). Adminstrative Manual - Low Impact Development Best Management Practice Guideline for Design, Investigation, and Reporting, 12/31/17.



24-Inch Free Head

BUREAU OF ENGINEERING
DEPARTMENT OF PUBLIC WORKS
CITY OF LOS ANGELES

RESEDA SKATING FACILITY

100% PERMIT SET

VICINITY MAP

NOT TO SCALE

PROJECT TEAM

GENERAL MANAGER:	DEPARTMENT OF RECREATION AND PARKS	MICHAEL SHULL, PROJECT MANAGER
PROJECT MANAGEMENT:	BUREAU OF ENGINEERING, ARCHITECTURE DIVISION	STEVEN FIERCE, PRINCIPAL ARCHITECT REZA BAGHERZADEH, PE DAVID WANG, RA RAY ARAUJO, PE PROJECT MANAGERS
SOIL ENGINEERING:	BUREAU OF ENGINEERING, SOIL ENGINEERING GROUP	PATRICK SCHMIDT, PE, GE, PRINCIPAL ENGINEER EASTON FORCIER, PE, GE PRINCIPAL MANAGER
ARCHITECT:	BROOKS+SCARPA ARCHITECTS	LAWRENCE SCARPA, F.A.I.A., PRINCIPAL IN CHARGE ELEF STAVRIDI PROJECT MANAGER
STRUCTURAL ENGINEER:	LABIB FUNK & ASSOCIATES	FABIO ZANGOLI PRINCIPAL IN CHARGE
MEP ENGINEER:	PROJECTLINE TECNICAL SERVICES	ROBERT GETTER, P.E. PROJECT MANAGER
LANDSCAPE ARCHITECT:	HONGJOO KIM LANDSCAPE ARCHITECTS	HONGJOO KIM PRINCIPAL
ICE RINK CONSULTANT:	STANTEC	JIM MALAND PROJECT MANAGER
CIVIL ENGINEER:	VCA ENGINEERING	AUTUMN WAGGONER PROJECT MANAGER
SPECIFICATIONS WRITER:	C2S CONSTRUCTIONS SPECIFICATIONS	YOUNG JOHNSON PRINCIPAL
COST ETIMATOR:	LELAND SAYLOR ASSOCIATES	JEFF SAYLOR PRINCIPAL
LEED/ COMMISSIONING:	ARGENTO/ GRAHAM	ANNIE ARGENTO PRINCIPAL
CONTRACTIBILITY REVIEW:	MARRS SERVICES, INC	

BROOKS + SCARPA

BROOKS+SCARPA ARCHITECTS INC.
3929 W. 139TH STREET
HAWTHORNE, CA 90250
T: 323 596 4700

BUREAU OF ENGINEERING
ENGINEERING
CITY OF LOS ANGELES

DATE: | BY:
NO. | REVISIONS:
WORK ACCEPTED
SERIAL NO.

STRUCTURE NO.

INDEX NO.

DEPARTMENT OF PUBLIC WORKS
CITY OF LOS ANGELES

GARY LEE MOORE, P.E. ENV. SP. CITY ENGINEER
ACCEPTED BY:
DEPUTY CITY ENGINEER / PROGRAM MANAGER — DATE
CITY ENGINEER — DATE

VERTICAL CONTROL: (SAMPLE) 24-03875,18-05830, NGVD29, 1985 ADJ.
HORIZONTAL CONTROL: (SAMPLE) NAD83, EPOCH 1991.5

SHEET TITLE: COVER SHEET
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY RESEDA, CA 91335

WORK ORDER NO.
E170121B
DRAWING NO.
A0.00
SHEET - OF - SHEETS

REVISION DATES (DESIGN STAGE ONLY)

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

Sheet Version 4.00

PROJECT DESCRIPTION & DATA

THE PROJECT WILL CONSIST OF AN ICE HOCKEY/ ICE SKATING BUILDING AND A ROLLER SKATE PARK, LOCATED AT 18210 SHERMAN WAY (APN: 2125036902, APN: 2125036903) RESEDA, CA 91335. THE TWO LOTS AT 18210 SHERMAN WAY ARE UNCONNECTED AND SEPARATED BY A 20' WIDE PUBLIC ALLEY.

THE ICE RINK BUILDING, LOCATED AT THE SOUTH LOT, INCLUDES AN 85'X200' REGULATION SIZE ICE SURFACE, WITH ICE ROOM, DASHER BOARDS AND GLASS PLACED ON TOP OF THE DASHER BOARDS, MECHANICAL & ELECTRICAL ROOM, ICE RESURFACER ROOM, 4 LOCKER ROOMS, ADA COMPLIANT RESTROOMS, OFFICE SPACE, SKATE RENTAL AREA, PRO SHOP AND SKATE SHOP. THE ICE RINK PROGRAM WILL BE DEVELOPED UNDER A SINGLE STORY MEMBRANE STRUCTURE AND A CMU STRUCTURE.

THE NORTH LOT WILL INCLUDE AN OUTDOOR SKATE PARK, LANDSCAPE AREA, FIRE LANE, 2 PARKING SPACES AND A ZONE FOR ELECTRICAL EQUIPMENT TO SERVE THE ICE RINK BUILDING. THIS LOT WILL BE FENCED ALL AROUND WITH GATES ON THE NORTH AND SOUTH SIDE TO ALLOW ACCESS TO FIRE DEPT. VISITORS AND USERS OF THE ICE RINK BUILDING WILL BE COMING IN FROM SHERMAN WAY VIA THE NORTH LOT.

THE TWO LOTS AT 18210 SHERMAN WAY, ARE DESIGNATED AS :Q:C2-1L-CDO AND :Q:P-1L-CDO. HOWEVER THEY HAVE BEEN ACQUIRED BY THE DEPARTMENT OF RECREATION AND PARKS, CITY OF LA AND WILL BE RE-ZONED AND RE-DESIGNATED TO OPEN SPACE (SEE A0.31)

THE PROJECT IS LOCATED IN COUNCIL DISTRICT 3, BOB BLUMENFIELD

THE PROJECT IS FUNDED BY PROPOSITION K- L.A. FOR KIDS PROGRAM BALLOT MEASURE AND OTHER SOURCES.

THE ICE RINK BUILDING IS APPROXIMATELY 28,235 GROSS SF AND WILL BE 'NFPA 13' FULLY AUTOMATIC SPRINKLERED.

SUSTAINABILITY: THE PROJECT SHALL OBTAIN LEED SILVER RATING MINIMUM FROM THE USGBC.

SEE SHEET **A0.30 FOR CODE ANALYSIS** AND MORE INFORMATION.

SITE IS NOT IN A 'METHANE ZONE.'

NOTES:

- DEFERRED SUBMITTALS ARE LISTED ON SHT. A0.30. CONTRACTOR IS RESPONSIBLE FOR THE DESIGN, ENGINEERING AND PERMITTING OF ALL DEFERRED SUBMITTALS. PROVIDE ARCHITECT WITH A MIN. 3 WEEKS REVIEW TIME PRIOR TO SUBMITTING FOR PLAN CHECK.
- THE CITY OF LA IS IN THE PROCESS OF ACQUIRING A 25'-0" X 265'-0" PIECE OF LAND TO EXPAND THE SOUTH LOT ON THE WEST. THE LAND ACQUISITION IS NOT YET COMPLETED AND NOT REFLECTED ON SURVEY HEREIN, BUT IT IS TAKEN INTO CONSIDERATION FOR THE PROPOSED ICE RINK DESIGN.
- THE ICE RINK SITE IS VERY TIGHT THEREFORE CONTRACTOR'S MAXIMUM TOLERANCE AT CMU WALL ALONG GRID LINE 'A' SHALL BE NO GREATER THAN 1/2". CONTRACTOR SHALL MAINTAIN A STRAIGHT AND TRUE VERTICAL PLUMB. WALL AT GRID LINE I.1 SEE A1.10.
- THE WORK DESCRIBED IN THESE DRAWINGS AND SPECIFICATIONS, IS TO BE PERFORMED BY TWO PRIME CONTRACTORS AS DESCRIBED BELOW:

  i. SHELL & CORE (S&C) SCOPE TO INCLUDE BUILDING AND LIFE SAFETY, MEP, HEATING AND VENTILATION SYSTEMS AND INFRASTRUCTURE AS WELL AS DISABLED ACCESS COMPLIANCE. S&C SCOPE ALSO INCLUDES SITE WORK, GRADING AND EXCAVATION, UTILITIES, LANDSCAPE AND HARDSCAPE, STRUCTURAL WORK, ALL PLUMBING FIXTURES, BATHROOM ACCESSORIES AND LIGHTING AS NOTED.

  ii. FACILITY FURNISHING AND EQUIPMENT (FF&E) SCOPE SHALL INCLUDE ALL RELATED ICE EQUIPMENT, ICE RINK FLOOR AND RELATED SUB FLOOR ICE RINK PIPING, DEHUMIDIFIER EQUIPMENT, SCOREBOARD AND SOUND SYSTEMS, SPECIALTY LIGHTING, NETTING, ALL BUILDING FURNISHING INCLUDING: BENCHES, BLEACHERS, SCOREBOARD, SKATE RACKS, DESKS, SKATE SHARPENER, VENDING MACHINES.
- S&C ARCH'AL DRAWINGS INCLUDE BOTH S&C AND FF&E ITEMS FOR PURPOSES OF COORDINATION. S&C CONTRACTOR SHALL ENSURE PROPER COORDINATION OF THE INFRASTRUCTURE NECESSARY TO COMPLETE ALL FF&E WORK.
- FF&E ITEMS ARE NOTED AS ' NIC' ON THE ARCH'AL DRAWINGS. FF&E (NIC) SCOPE OF WORK WILL BE UNDER A SEPARATE CONTRACT AND WILL BE PERFORMED BY A SEPARATE (FF&E) CONTRACTOR.
- S&C AND FF&E CONTRACTORS SHALL COORDINATE WITH EACH OTHER AS REQUIRED FOR COMPLETION OF TURNKEY BUILDING SYSTEMS AND FURNISHING.
- S&C AND FF&E CONTRACTORS SHALL PREPARE AND SUBMIT COORDINATION PLANS TO THE CITY & ARCHITECT PRIOR TO PERFORMING ANY WORK.
- FF&E CONTRACTOR SHALL PROVIDE EQUIPMENT SPECIFIED OR EQUIVALENT.
- SEE EACH DISCIPLINE'S DRAWINGS FOR FURTHER NOTES AND CLARIFICATION ON THE SCOPE OF WORK.
- PER TOS No 57, THE PROJECT ORIGINALLY INCLUDED TWO MORE LOTS AT 18132 SHERMAN WAY RESEDA CA 91335, TO BE USED AS ON-GRADE PARKING LOTS. DUE TO LIMITED BUDGET THE CITY OF LA HAS DECIDED TO MINIMIZE THE WORK ONLY ON THE (E) SOUTH LOT TO INCLUDE THE FOLLOWING : REMOVAL OF ALL WEEDS, PATCH, SLURRY AND RE-STRIPING OF THE (E) ASPHALT LOT. THIS WORK SHALL BE PERFORMED BY THE S&C CONTRACTOR.

One prime GC

Typo

Work for the south lot

ABBREVIATIONS

ABV	ABOVE
ABS	ABSOLUTE
ACC	ACCESSIBLE
ADJ	ADJACENT
AFF	ABOVE FINISH FLOOR
ALUM	ALUMINUM
@	AT
BLDG	BUILDING
BLKG	BLOCKING
BM	BEAM
B.O.	BOTTOM OF
BTWN	BETWEEN
BUR	BUILT UP ROOF
CEM	CEMENT
CFCI	CONTRACTOR FURNISHED / INSTALLED
CJ	CONTROL JOINT
CL	CENTER LINE
CLNG	CEILING
CLR	CLEAR
CMU	CONCRETE MASONRY UNIT
COL	COLUMN
CONC	CONCRETE
CONST	CONSTRUCTION
CONT'S	CONTINUOUS
CT	CERAMIC TILE
D/B	DESIGN BUILD
DBL	DOUBLE
D.G.	DECOMPOSED GRANITE
DIA	DIAMETER
DIM	DIMENSION
DN	DOWN
DR	DOOR
DS	DOWNSPOUT
DETL	DETAIL
DWGS	DRAWINGS
DHW	DOMESTIC HOT WATER
(E)	EXISTING
EA	EACH
EJ	EXPANSION JOINT
EL (ELEV.)	ELEVATION
ELEC	ELECTRICAL
ENL	
EQ	EQUAL / EQUAL TO
EQMT	EQUIPMENT
EVCS	ELECTRIC VEHICLE CHARGING STATION
EXP	EXPANSION
EXT	EXTERIOR
F	FIXED
FE	FIRE EXTINGUISHER
FF	FINISHED FLOOR
FF&E	FACILITY FURNISHING & EQUIPMENT
FH	FIRE HYDRANT
FIN	FINISH
FLR	FLOOR
FLRG	FLOORING
FLUOR	FLUORESCENT
F.O.PLY	FACE OF PLYWOOD
F.O.C.	FACE OF CONCRETE
F.O.F.	FACE OF FINISH
F.O.S.	FACE OF STUD
FRMG	FRAMING
FSR	FLAME SPREAD RATING
FURR	FURRING
GA	GAUGE
GALV	GALVANIZED
GEO	GEOTECHNICAL
GI	GALVANIZED IRON
GLAZ	GLAZING
GYP BD	GYPSUM BOARD
HB	HOSE BIBB
HC	HOLLOW CORE
HM	HOLLOW METAL
HR	HOUR
HT	HEIGHT
HW	HOT WATER
INSUL	INSULATION / INSULATED
INT	INTERIOR
JAN	JANITOR
JT	JOINT
KIT	KITCHEN
LAV	LAVATORY
LDSC	LANDSCAPE
LV	LOW VOLTAGE
LOC	LOCATION
MAX	MAXIMUM
MECH	MECHANICAL
MEMB	MEMBRANE
MDF	MEDIUM DENSITY FIBERBOARD
MANUF	MANUFACTURER
MIN	MINIMUM
MOD	MODULE
MTD	MOUNTED
MTL	METAL
N/A	NOT APPLICABLE
NIC	NOT IN (SHELL & CORE) CONTRACT
NO	NUMBER
N	NORTH
(N)	NEW
NR	NON RATED
OAE	OR APPROVED EQUAL
OC	ON CENTER
OFCI	OWNER FURNISHED/CONTRACTOR INSTALL
OPP	OPPOSITE
OPER	OPERABLE
PIC	POURED-IN-PLACE CONCRETE
PL	PROPERTY LINE
PLAS	PLASTER
PLAS LAM	PLASTIC LAMINATE
PLY	PLYWOOD
PN	PLAN NORTH
PNL	PANEL
POT	PATH OF TRAVEL
PP	POWER POLE
PR	PAIR
PT	POINT
PTD	PAINTED
RAD	RADIUS
REF	REFER TO
REFR	REFRIGERATOR
RES	RESISTANT
RESIL	RESILIENT
REQ'D	REQUIRED
RF	ROOF
RFNG	ROOFING
RM	ROOM
RO	ROUGH OPENING
S&C	SHELL & CORE
SCHED	SCHEDULE
SCRN	SCREEN
SCW	SOLID CORE WOOD
SD	STORM DRAIN
SECT	SECTION
SHT	SHEET
SHWR	SHOWER
SIM	SIMILAR
SP	STAND PIPE
SPECS	SPECIFICATIONS
S.S.	STAINLESS STEEL
STL	STEEL
STOR	STORAGE
STRUCT	STRUCTURE
STRUC'TL	STRUCTURAL
SUSP	SUSPENDED
TEMP	TEMPERED
THK	THICK
THRU	THROUGH
T.O.	TOP OF
T.O.S	TOP OF SLAB
TYP	TYPICAL
UFAS	UNIFORM ACCESSIBILITY STANDARDS
UNO	UNLESS NOTED OTHERWISE
URNL	URINAL
VER	VERIFY
VIF	VERIFY IN FIELD
VNR	VENEER
W/	WITH
W/D	WASHER / DRYER
W/O	WITHOUT
WD	WOOD
WNDW	WINDOW
WM	WATER METER
WP	WATERPROOFING
WR	WATER RESISTANT

SYMBOLS

A	GRID
1 / A4.00	ELEVATION MARKER
	ELEVATION BULLET
1 / A5.00	SECTION MARKER
A1	WALL TYPE
A / D / B / C / 1 / A7.00	INTERIOR ELEVATION MARKER
1 / A9.10	DETAIL MARKER
N	NORTH ARROW (PLAN NORTH)
1	REVISION DELTA
#	DEMOLITION NOTE MARKER
12.01	KEYNOTE MARKER
	TUB/SHOWER
	FLOOR CLEARANCES SHOWN DOTTED

X / X / 100	ROOM NAME & NUMBER
000.0	DOOR NUMBER
000.A	WINDOW NUMBER
S	SMOKE DETECTOR
FE	FIRE EXTINGUISHER
	CEILING MOUNTED EXIT SIGNAGE
	WALL MOUNTED EXIT SIGNAGE
	WALL MOUNTED MOTION SENSOR
	CEILING MOUNTED MOTION SENSOR
	SECURITY CAMERA
	SECURITY GATED INTERCOM
	SECURITY GATE ALARM KEYPAD
AL	ALARMED DOOR/ SECURITY GATE
FD	FLOOR DRAIN (FD)
AD	AREA DRAIN
PD	PLANTER DRAIN
	EGRESS ROUTE SEE SHT. A0.41
	ACCESSIBLE PATH OF TRAVEL SEE SHT. A0.50
A1	BATH ACCESSORY SCHEDULE MARKER
	MECHANICAL CEILING GRILLE, SEE MECH. DWGS.
	ROLL-IN SHOWER
HB	HOSE BIBB

PLAN LEGEND

- 1-HR RATED CMU WALL
- CMU WALL. FIN. PER SPECS. SEE PLANS AND DETAILS FOR MORE INFO.
- MEMBRANE STRUCTURE
- NON-RATED STUD WALL. PAINT PER SPECS. SEE PLANS AND DETAILS FOR MORE INFO.
- 1-HR RATED STUD WALL. PAINT PER SPECS. SEE PLANS AND DETAILS FOR MORE INFO.
- PLANTED AREA

SHEET INDEX

ARCHITECTURAL	
Sheet Number	Sheet Title
A0.00	COVER SHEET
A0.01A	SHEET INDEX, PROJECT DESCR. & SYMBOLS
A0.01B	SHEET INDEX
A0.02	3D VIEWS
SRVI	SURVEY
SRVII	SURVEY
SRVIII	SURVEY
A0.09	LOT LINE ADJUSTMENT
A0.10	GENERAL NOTES
A0.11	GENERAL NOTES
A0.12	GREEN BUILDING FORMS
A0.13	GREEN BUILDING FORMS
A0.14	GREEN BUILDING FORMS
A0.15	GREEN BUILDING NOTES
A0.16	GREEN BUILDING NOTES
A0.17	GREEN BUILDING NOTES
A0.20	ACCESSIBILITY NOTES
A0.21	ACCESSIBILITY NOTES
A0.22	ACCESSIBILITY NOTES
A0.23	ACCESSIBILITY DETAILS
A0.24	ACCESSIBILITY DETAILS
A0.25	ACCESSIBILITY DETAILS
A0.26	ACCESSIBILITY DETAILS
A0.27	ACCESSIBILITY DETAILS
A0.28	PLAN CHECK NOTES
A0.30	CODE ANALYSIS & PLOT PLAN
A0.31	LETTER FROM PLANNING & RAP
A0.32	CEQA_NOE
A0.33	CEQA_NOE
A0.34	ENVIRONM. DESIGN RECOMMENDATION
A0.35	SOILS REPORT APPROVAL LETTER
A0.36	MODIFICATON
A0.40	OCCUPANCY DIAGRAM
A0.41	EGRESS EXITING DIAGRAM & FIRE LANE
A0.42	FIRE RATED WALL & EXIT ACCESS TRAVEL
A0.43	ALLOWABLE OPENINGS
A0.50	ACCESSIBLE PATH OF TRAVEL
A0.90	(E) SITE PHOTOS
A1.00	SITE PLAN
A1.01	SITE LIGHTING PLAN
A1.10	FLOOR PLAN
A1.10A	SLAB PLAN
A1.11	FINISH FLOOR PLAN
A1.12	REFLECTED CEILING PLAN
A1.13	SPECIALTY LIGHTING & EQUIPMENT RCP (FF&E)
A1.20	ROOF PLAN
A2.00	ELEVATIONS
A2.01	ELEVATIONS
A3.00	SECTIONS
A3.01	SECTIONS
A3.02	SECTIONS
A3.10	ENLARGED SECTIONS
A3.11	ENLARGED SECTIONS
A3.12	ENLARGED SECTIONS
A3.13	ENLARGED SECTIONS
A4.00	ENLARGED PLAN
A4.01	ENLARGED RCP
A4.10	ENLARGED PLAN
A4.11	ENLARGED RCP
A4.20	ENLARGED PLAN
A4.21	ENLARGED RCP
A4.30	ENLARGED PLAN
A4.31	ENLARGED RCP
A4.40	ENLARGED PLANS
A4.41	ENLARGED RCP
A4.50	ENLARGED PLAN
A5.00	METAL STUD DETAILS
A5.01	METAL STUD DETAILS
A6.00	DOOR & WINDOW SCHEDULE
A6.01	DOOR TYPES
A6.02	WINDOW TYPES
A6.10	GATEWAY DETAILS
A6.11	GATEWAY DETAILS
A6.12	GATEWAY DETAILS
A6.13	GATEWAY DETAILS
A6.14	GATEWAY DETAILS
A6.20	DOOR DETAILS
A7.00	SCHEDULES (SHELL & CORE)
A7.00A	SCHEDULES (FF&E)
A7.01	FINISH DETAILS
A7.10	INTERIOR ELEVATIONS
A7.11	INTERIOR ELEVATIONS
A7.12	INTERIOR ELEVATIONS
A7.13	INTERIOR ELEVATIONS
A7.14	INTERIOR ELEVATIONS

ARCHITECTURAL	
A8.00	WALL TYPES
A8.01	WALL DETAILS
A8.02	CEILING DETAILS
A8.10	FLOOR DETAILS
A8.20	ROOF DETAILS
A8.21	ROOF DETAILS
A8.30	SITE DETAILS
A8.31	SITE DETAILS
A8.32	SITE DETAILS
A8.33	SITE DETAILS
A8.34	SITE DETAILS
A8.35	SITE DETAILS
A8.40	SITE DETAILS

CIVIL	
SHEET No.	SHEET TITLE
C100	GENERAL NOTES
C101	GENERAL NOTES
CD100	DEMOLITION PLAN
C200	SITE CONTROL PLAN
C300	GRADING PLAN
C301	GRADING SECTION
C302	GRADING SECTION
C303	OVER EXCAVATION PLAN
C400	UTILITY PLAN
C401	STORMDRAIN PROFILES
C402	LID PLAN
C500	MISC. DETAILS
C501	MISC. DETAILS
C502	MISC. DETAILS
C503	SUMP PUMP DETAIL & SOILS APPROVAL LETTER
C504	SUMP PUMP 2 DETAIL
C600	EROSION CONTROL PLAN
C601	EROSION CONTROL DETAILS

STRUCTURAL	
SHEET No.	SHEET TITLE
S0.01	GENERAL NOTES
S0.02	GENERAL NOTES
S1.01	TYPICAL DETAILS
S1.02	TYPICAL DETAILS
S1.03	TYPICAL DETAILS
S1.11	TYPICAL DETAILS
S1.12	TYPICAL DETAILS
S1.21	TYPICAL DETAILS
S1.22	TYPICAL DETAILS
S1.31	TYPICAL DETAILS
S1.32	TYPICAL DETAILS
S1.41	TYPICAL DETAILS
S1.51	STANDARD QUALITY ASSURANCE PLAN
S1.52	STANDARD QUALITY ASSURANCE PLAN
S1.53	STANDARD QUALITY ASSURANCE PLAN
S2.01	FIRST FLOOR FOUNDATION PLAN
S2.02	MEMBRANE ROOF FRAMING PLAN
S3.01	MEMBRANE FRAMING ELEVATIONS
S4.01	SECTION & DETAILS
S4.02	SECTION & DETAILS
S4.03	SECTION & DETAILS
S4.04	SECTION & DETAILS
S4.05	SECTION & DETAILS

LANDSCAPE	
L0.00	COVER SHEET
L0.01	CONSTRUCTION SCHEDULE AND NOTES
L1.00	LANDSCAPE OVERALL PLAN
L1.01	LANDSCAPE ENLARGEMENT PLAN
L1.02	LANDSCAPE DIMENSION PLAN
L1.10	LANDSCAPE SECTIONS & ELEVATIONS
L1.20	LANDSCAPE DETAILS
L1.21	LANDSCAPE DETAILS
L2.01	LANDSCAPE HYDROZONE PLAN
L3.00	IRRIGATION NOTES
L3.01	IRRIGATION PLAN
L3.10	IRRIGATION DETAILS
L3.11	IRRIGATION DETAILS
L4.00	PLANTING SCHEDULE & NOTES
L4.01	LANDSCAPE PLANTING PLAN
L4.20	LANDSCAPE PLANTING DETAILS

SHEET INDEX CONTINUES ON A0.01.B

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

LICENSED ARCHITECT
LAWRENCE SCARPA
C 21812
REN 10/31/2023
STATE OF CALIFORNIA

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED

BUREAU OF ENGINEERING
VERTICAL CONTROL:
HORIZONTAL CONTROL:
SHEET TITLE: SHEET INDEX, PROJECT DESCR. & SYMBOLS
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

CITY OF LOS ANGELES
DEPARTMENT OF PUBLIC WORKS
GARY LEE MOORE, P.E., ENV SP
DESIGN GROUP:
CITY ENGINEER
DATE:
ENGINEER:
DESIGNED BY:
DRAWN BY:
CHECKED BY:
APPROVED BY:

NO. | REVISIONS: | DATE: | BY:

CIP NO.
INDEX NO.

WORK ORDER NO.
E170121B

SHEET NAME
A0.01A
SHEET X OF X SHEETS

REVISION DATES (DESIGN STAGE ONLY)

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

SHEET INDEX CON'T

ELECTRICAL	
E-01	ABBREVIATIONS & GENERAL NOTES
E-02	LEGEND
E-03	ELECTRICAL SITE PLAN
E-04	FIRST FLOOR POWER PLAN
E-05	FIRE ALARM/ LOW VOLTAGE
E- 05.1	SPECIALTY LIGHTING & EQUIPMENT (FF&E)
E-06	ELECTRICAL ROOF PLAN
E-07	ELECTRICAL SINGLE LINE DIAGRAM
E-08	ELECTRICAL SINGLE LINE DIAGRAM
E-09	ELECTRICAL SINGLE LINE DIAGRAM
E-10	ELECTRICAL PANEL SCHEDULES
E-11	ELECTRICAL PANEL SCHEDULES
E-12	ELECTRICAL PANEL SCHEDULES
E-13	ELECTRICAL PANEL SCHEDULES
E-14	MAIN SWITCHBOARD
DWP	LADWP PLAN FOR REFERENCE
EL-01	INDOOR LIGHTING PLAN
EL-02	INDOOR FOOT CANDLE CALCS.
EL-03	INDOOR EGRESS FOOT CANDLE CALCS.
EL-04	OUTDOOR LIGHTING PLAN
EL-05	OUTDOOR PHOTOMETRIC PLAN
EL-06	OUTDOOR PHOTOMETRIC PLAN
EL-07	ROOF MOUNTING DETAILS
EL-08	TITLE 24 FORMS
EL-09	TITLE 24 FORMS
EL-10	TITLE 24 FORMS
EL-11	LIGHTING CATALOGUE CUTS
EL-12	LIGHTING CATALOGUE CUTS
EL-13	LIGHTING CATALOGUE CUTS
EL-14	LIGHTING CATALOGUE CUTS
EL-15	LIGHTING CATALOGUE CUTS
EL-16	LIGHTING CATALOGUE CUTS
MECHANICAL	
M-01	NOTES & LEGEND
M-02	HVAC LAYOUT PLAN
M-03	HVAC ROOF PLAN & DETAILS
M-04	HVAC SECTIONS
M-05	HANGER DETAILS
M-06	MECHANICAL SYSTEM FORMS
M-07	MECHANICAL SYSTEM FORMS
M-08	MECHANICAL SYSTEM FORMS
M-09	OUTDOOR HEAT PUMP & FAN CUT SHEET
M-10	ROOFTOP SYSTEM CUT SHEET
M-11	ROOF EQUIPMENT
M-12	BACKDRAFT DAMPER CUT SHEET
M-13	HEAT PUMP WATER HEATER CUT SHEET
M-14	CUT SHEETS
M-15	CUT SHEETS
PLUMBING	
P-01	GENERAL NOTES & ABBREVIATION
P-02	FIRST FLOOR PLUMBING PLAN
P-03	FIRST FLOOR PLUMBING PLAN
P-04	PLUMBING ROOF PLAN
P-05	PLUMBING FIXTURE SCHEDULE
P-06	PIPE SUPPORT DETAILS
P-07	PIPING DETAIL
P-08	WATER SUPPLY DIAGRAM
P-09	WASTE & VENT DIAGRAM
P-10	WATER SUPPLY FIXTURE COUNT
P-11	WASTE & VENT FIXTURE COUNT
REFRIGERANT	
R0.01	RINK COVER SHEET
R1.01	RINK LAYOUT
R1.02	RINK EQUIPMENT ROOM
R1.03	RINK ROOF-TOP CONDENSOR
R1.04	RINK SUBSOIL DRAINAGE PLAN
R1.05	RINK SUBSOIL & SNOWMELT HEATING PLAN
R5.01	RINK DETAILS
R5.02	RINK DETAILS
R5.03	RINK DETAILS
R5.04	RINK DETAILS
R6.01	RINK DETAILS
R6.02	RINK DETAILS
R6.03	RINK DETAILS
FIRE PROTECTION	
FP-01	GENERAL NOTES & SINGLE LINE DIAGRAM
FP-02	FIRE PROTECTION ZONE PLAN
FP-03	BUILDING SECTIONS
FP04	FIRE SAFETY & SECURITY PLAN

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

LICENSED ARCHITECT
LAWRENCE SCARPA
C 21812
REN 10/31/2023
STATE OF CALIFORNIA

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED •

BUREAU OF ENGINEERING

VERTICAL CONTROL:
HORIZONTAL CONTROL:

SHEET TITLE: SHEET INDEX

PROJECT: RESEDA SKATE FACILITY

ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

DEPARTMENT OF PUBLIC WORKS

NO.	REVISIONS:	BY:	DATE:

CIP NO.

INDEX NO.

CITY OF LOS ANGELES

CITY ENGINEER
GARY LEE MOORE, P.E., ENV SP
DATE:

DESIGN GROUP:

ENGINEER:
DESIGNED BY:
DRAWN BY:
CHECKED BY:
APPROVED BY:

WORK ORDER NO.
E170121B

SHEET NAME
A0.01B
SHEET X OF X SHEETS

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REVISION DATES
(DESIGN STAGE ONLY)

Sheet Version 4.0

Z:\B□S ARCHITECTURE\019 JOBS\01935.0 CITY OF LA-RESEDA ICE HOCKEY ROLLER RINK\01935.0 1.CURRENT DRAWINGS_24X36\01935.0_A001B_24X36.DWG 12/7/2021 1:32 PM

06

03

05

02

04

01

NOTE: SEE SHT. A1.00 FOR ALL LOCATIONS OF THESE 3D MODEL IMAGES. THESE IMAGES ARE FOR CLARIFYING PURPOSES ONLY, CONTRACTOR SHALL REFER TO A2.00 & A2.01 AND OTHER SHEETS FOR TECHNICAL INFORMATION.

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REVISION DATES (DESIGN STAGE ONLY)

Sheet Version 4.0

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED

LICENSED ARCHITECT
LAWRENCE SWARTZ
C 21812
REN 10/31/2023
STATE OF CALIFORNIA

BUREAU OF ENGINEERING
VERTICAL CONTROL:
HORIZONTAL CONTROL:
SHEET TITLE: 3D VIEWS
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

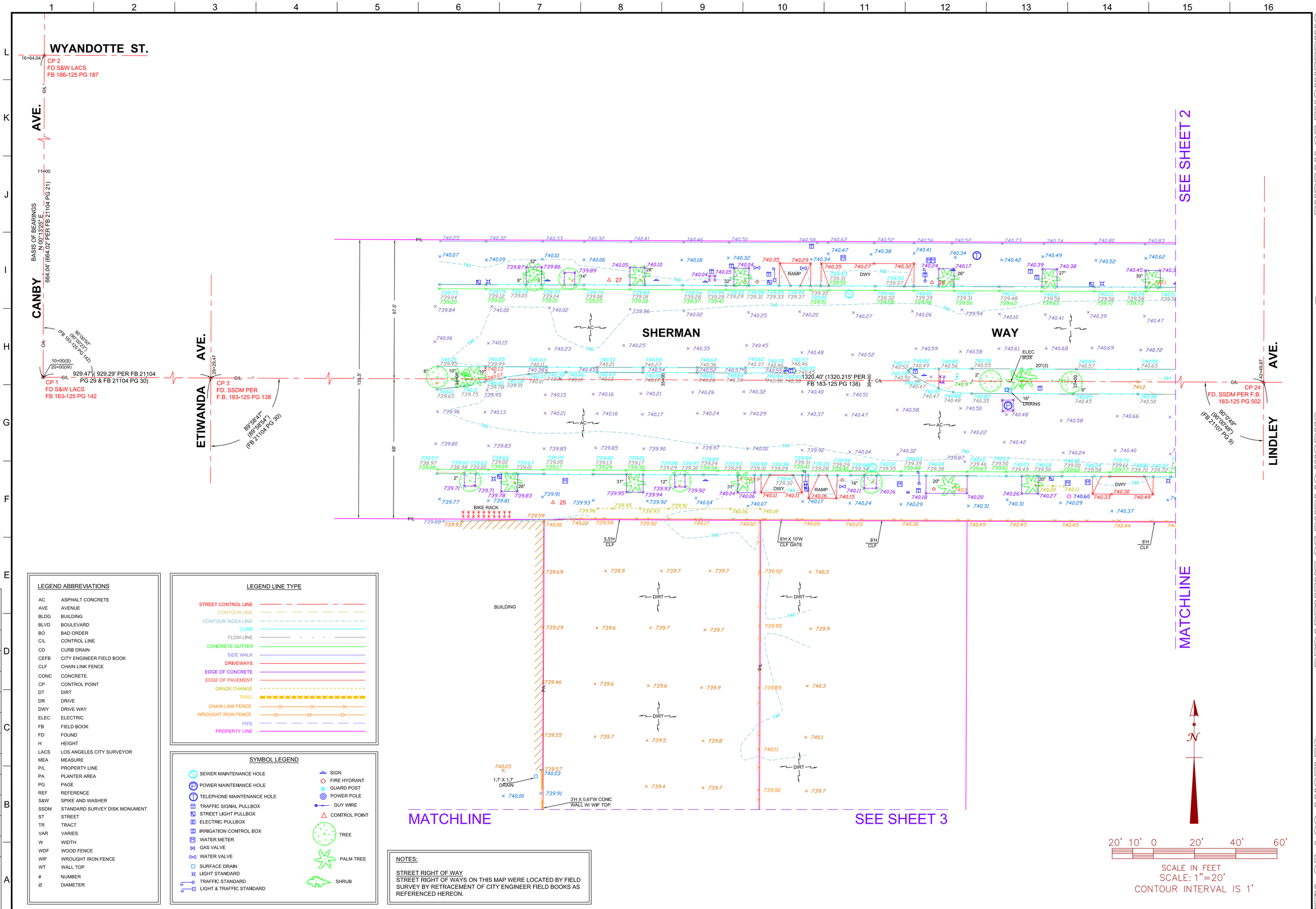
DEPARTMENT OF PUBLIC WORKS
NO. REVISIONS: DATE: BY:
CIP NO.
INDEX NO.

CITY OF LOS ANGELES
CITY ENGINEER
GARY LEE MOORE, P.E., ENV SP
DESIGN GROUP*
DATE:
ENGINEER:
DESIGNED BY:
DRAWN BY:
CHECKED BY:
APPROVED BY:

WORK ORDER NO.
E170121B

SHEET NAME
A0.02
SHEET X OF X SHEETS

Z:\B□S ARCHITECTURE\019 JOBS\01935.0 CITY OF LA-RESEDA ICE HOCKEY ROLLER RINK\01935.0 1.CURRENT DRAWINGS_24X36\01935.0_A002_24X36.DWG 12/3/2021 9:05 AM



LEGEND ABBREVIATIONS

AC	ASPHALT CONCRETE
AVE	AVENUE
BLDG	BUILDING
BLVD	BOULEVARD
BO	BAD ORDER
C/L	CONTROL LINE
CD	CURB DRAIN
CEFB	CITY ENGINEER FIELD BOOK
CLF	CHAIN LINK FENCE
CONC	CONCRETE
CP	CONTROL POINT
DT	DIRT
DR	DRIVE
DWY	DRIVE WAY
ELEC	ELECTRIC
FB	FIELD BOOK
FD	FOUND
H	HEIGHT
LACS	LOS ANGELES CITY SURVEYOR
MEA	MEASURE
P/L	PROPERTY LINE
PA	PLANTER AREA
PG	PAGE
REF	REFERENCE
S&W	SPIKE AND WASHER
SSDM	STANDARD SURVEY DISK MONUMENT
ST	STREET
TR	TRACT
VAR	VARIES
W	WIDTH
WDF	WOOD FENCE
WIF	WROUGHT IRON FENCE
WT	WALL TOP
#	NUMBER
Ø	DIAMETER

LEGEND LINE TYPE

- STREET CONTROL LINE
- CONTOUR LINE
- CONTOUR INDEX LINE
- CURB
- FLOW LINE
- CONCRETE GUTTER
- SIDE WALK
- DRIVEWAYS
- EDGE OF CONCRETE
- EDGE OF PAVEMENT
- GRADE CHANGE
- WALL
- CHAIN LINK FENCE
- WROUGHT IRON FENCE
- PIPE
- PROPERTY LINE

SYMBOL LEGEND

- SEWER MAINTENANCE HOLE
- POWER MAINTENANCE HOLE
- TELEPHONE MAINTENANCE HOLE
- TRAFFIC SIGNAL PULLBOX
- STREET LIGHT PULLBOX
- ELECTRIC PULLBOX
- IRRIGATION CONTROL BOX
- WATER METER
- GAS VALVE
- WATER VALVE
- SURFACE DRAIN
- LIGHT STANDARD
- TRAFFIC STANDARD
- LIGHT & TRAFFIC STANDARD
- SIGN
- FIRE HYDRANT
- GUARD POST
- POWER POLE
- GUY WIRE
- CONTROL POINT
- TREE
- PALM TREE
- SHRUB

NOTES:

STREET RIGHT OF WAY
STREET RIGHT OF WAYS ON THIS MAP WERE LOCATED BY FIELD SURVEY BY RETRACEMENT OF CITY ENGINEER FIELD BOOKS AS REFERENCED HEREON.

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REVISION DATES
(DESIGN STAGE ONLY)

Sheet Version 2.01

BUREAU OF ENGINEERING
ENGINEERING
CITY OF LOS ANGELES

NO.	REVISIONS:	DATE:	BY:

SURVEY NO.
35995

INDEX NO.

WORKS
CITY ENGINEER
DATE:
P.L.S.:

GARY LEE MOORE, P.E.
SURVEY DIVISION

SURVEYOR:	MARK KINDIG
FIELD SURVEYOR:	THOMAS ABRAHAMIAN
DRAWN BY:	VINCENT RADCLIFFE
CHECKED BY:	THOMAS ABRAHAMIAN
APPROVED BY:	

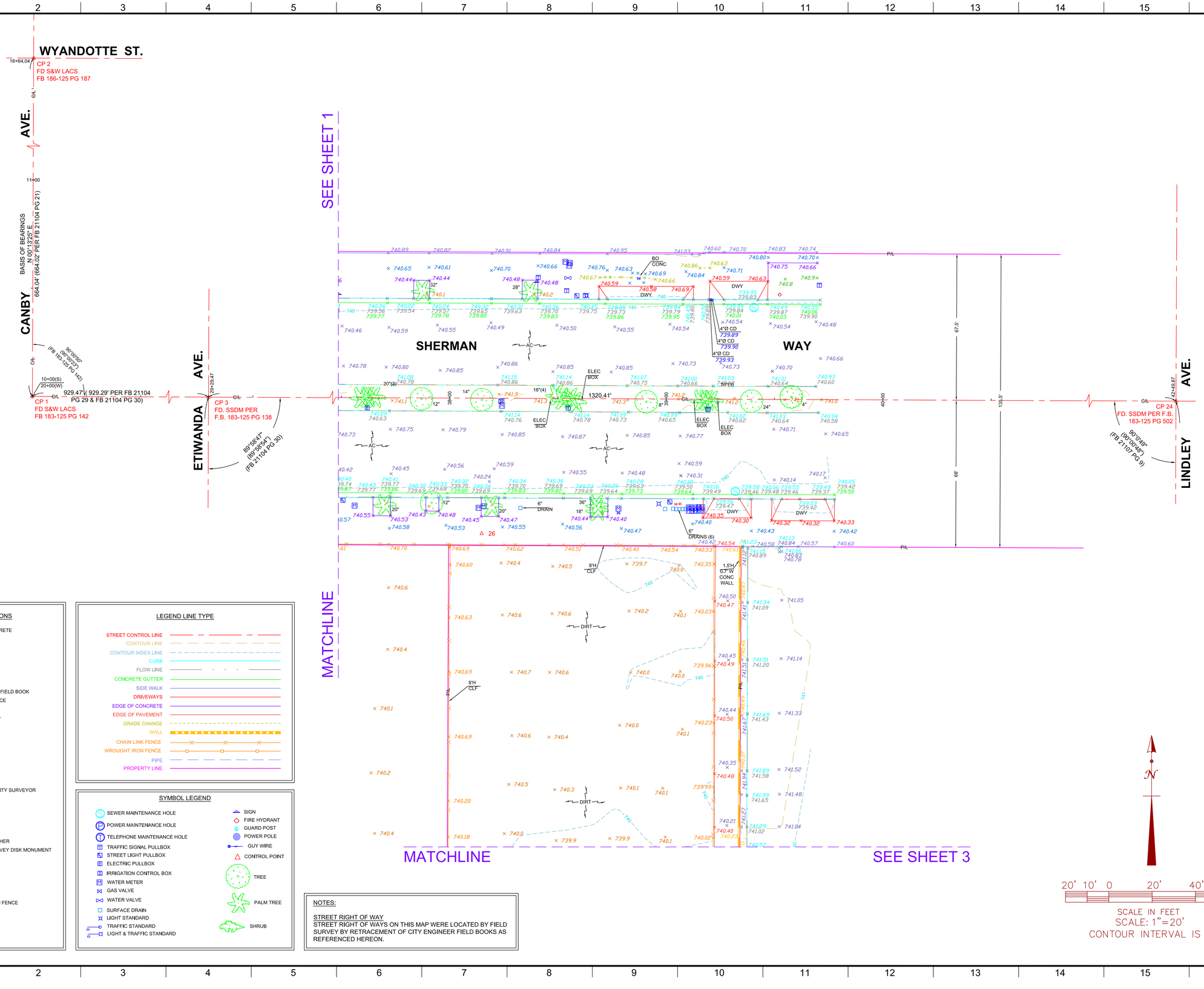
12/02/2019
12/23/2019
12/23/2019

CITY OF LOS ANGELES DEPARTMENT OF PUBLIC WORKS

VERTICAL CONTROL: C.E.F.B. 43060 PGS. 37 - 44
HORIZONTAL CONTROL: C.E.F.B. 43060 PGS. 37 - 44

SHEET TITLE: SITE SURVEY
PROJECT: RESEDA SKATE FACILTIY
ADDRESS: 18160 W SHERMAN WAY

WORK ORDER NO.
E170121B
DRAWING NO.
SRVI
SHEET 1 OF 3 SHEETS



LEGEND ABBREVIATIONS

AC	ASPHALT CONCRETE
AVE	AVENUE
BLDG	BUILDING
BLVD	BOULEVARD
BO	BAD ORDER
C/L	CONTROL LINE
CD	CURB DRAIN
CEFB	CITY ENGINEER FIELD BOOK
CLF	CHAIN LINK FENCE
CONC	CONCRETE
CP	CONTROL POINT
DT	DIRT
DR	DRIVE
DWY	DRIVE WAY
ELEC	ELECTRIC
FB	FIELD BOOK
FD	FOUND
H	HEIGHT
LACS	LOS ANGELES CITY SURVEYOR
MEA	MEASURE
P/L	PROPERTY LINE
PA	PLANTER AREA
PG	PAGE
REF	REFERENCE
S&W	SPIKE AND WASHER
SSDM	STANDARD SURVEY DISK MONUMENT
ST	STREET
TR	TRACT
VAR	VARIES
W	WIDTH
WDF	WOOD FENCE
WIF	WROUGHT IRON FENCE
WT	WALL TOP
#	NUMBER
Ø	DIAMETER

LEGEND LINE TYPE

- STREET CONTROL LINE
- CONTOUR LINE
- CONTOUR INDEX LINE
- CURB
- FLOW LINE
- CONCRETE GUTTER
- SIDE WALK
- DRIVEWAYS
- EDGE OF CONCRETE
- EDGE OF PAVEMENT
- GRADE CHANGE
- WALL
- CHAIN LINK FENCE
- WROUGHT IRON FENCE
- PIPE
- PROPERTY LINE

SYMBOL LEGEND

- SEWER MAINTENANCE HOLE
- POWER MAINTENANCE HOLE
- TELEPHONE MAINTENANCE HOLE
- TRAFFIC SIGNAL PULLBOX
- STREET LIGHT PULLBOX
- ELECTRIC PULLBOX
- IRRIGATION CONTROL BOX
- WATER METER
- GAS VALVE
- WATER VALVE
- SURFACE DRAIN
- LIGHT STANDARD
- TRAFFIC STANDARD
- LIGHT & TRAFFIC STANDARD
- SIGN
- FIRE HYDRANT
- GUARD POST
- POWER POLE
- GUY WIRE
- CONTROL POINT
- TREE
- PALM TREE
- SHRUB

NOTES:

STREET RIGHT OF WAY
STREET RIGHT OF WAYS ON THIS MAP WERE LOCATED BY FIELD SURVEY BY RETRACEMENT OF CITY ENGINEER FIELD BOOKS AS REFERENCED HEREON.

N

20' 10' 0 20' 40' 60'

SCALE IN FEET
SCALE: 1"=20'
CONTOUR INTERVAL IS 1'

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REVISION DATES (DESIGN STAGE ONLY)

Sheet Version 2.01

CITY OF LOS ANGELES
DEPARTMENT OF PUBLIC WORKS
BUREAU OF ENGINEERING
ENGINEERING
CITY OF LOS ANGELES

NO.	REVISIONS:	DATE:	BY:

SURVEY NO. 35995

INDEX NO.

CITY ENGINEER: DATE:

GARY LEE MOORE, P.E.

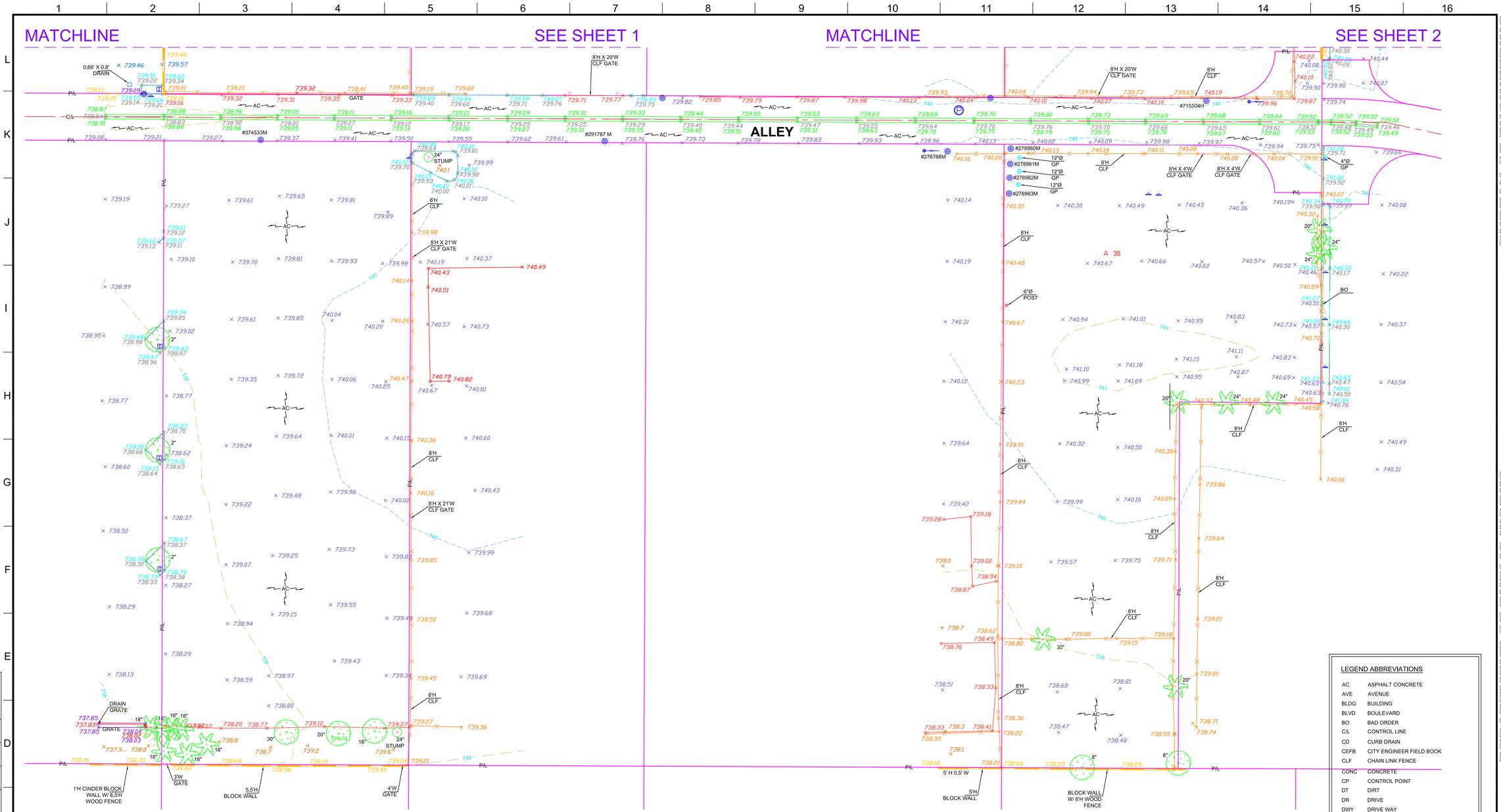
SURVEY DIVISION P.L.S.:

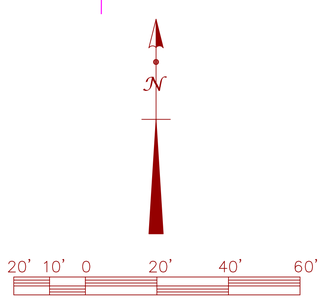
SURVEYOR: MARK KINDIG 12/02/2019
FIELD SURVEYOR: THOMAS ABRAHAMIAN 11/23/2019
DRAWN BY: VINCENT RADCLIFFE 12/23/2019
CHECKED BY: THOMAS ABRAHAMIAN
APPROVED BY:

VERTICAL CONTROL: C.E.F.B. 43060 PGS. 37 - 44
HORIZONTAL CONTROL: C.E.F.B. 43060 PGS. 37 - 44

SHEET TITLE: SITE SURVEY
PROJECT: RESEDA SKATE FACILTIY
ADDRESS: 18160 W SHERMAN WAY

WORK ORDER NO.
E170121B
DRAWING NO.
SRVII
SHEET 2 OF 3 SHEETS





SCALE IN FEET
SCALE: 1"=20'
CONTOUR INTERVAL IS 1'

NOTES:

STREET RIGHT OF WAY
STREET RIGHT OF WAYS ON THIS MAP WERE LOCATED BY FIELD SURVEY BY RETRACEMENT OF CITY ENGINEER FIELD BOOKS AS REFERENCED HEREON.

SYMBOL LEGEND

- SEWER MAINTENANCE HOLE
- POWER MAINTENANCE HOLE
- TELEPHONE MAINTENANCE HOLE
- TRAFFIC SIGNAL PULLBOX
- STREET LIGHT PULLBOX
- ELECTRIC PULLBOX
- IRRIGATION CONTROL BOX
- WATER METER
- GAS VALVE
- WATER VALVE
- SURFACE DRAIN
- LIGHT STANDARD
- TRAFFIC STANDARD
- LIGHT & TRAFFIC STANDARD
- SIGN
- FIRE HYDRANT
- GUARD POST
- POWER POLE
- GUY WIRE
- CONTROL POINT
- TREE
- PALM TREE
- SHRUB

LEGEND LINE TYPE

- STREET CONTROL LINE
- CONTOUR LINE
- CONTOUR INDEX LINE
- CURB
- FLOW LINE
- CONCRETE GUTTER
- SIDE WALK
- DRIVEWAYS
- EDGE OF CONCRETE
- EDGE OF PAVEMENT
- GRADE CHANGE
- WALL
- CHAIN LINK FENCE
- WROUGHT IRON FENCE
- PIPE
- PROPERTY LINE

LEGEND ABBREVIATIONS

AC	ASPHALT CONCRETE
AVE	AVENUE
BLDG	BUILDING
BLVD	BOULEVARD
BO	BAD ORDER
C/L	CONTROL LINE
CD	CURB DRAIN
CEFB	CITY ENGINEER FIELD BOOK
CLF	CHAIN LINK FENCE
CONC	CONCRETE
CP	CONTROL POINT
DT	DIRT
DR	DRIVE
DWY	DRIVE WAY
ELEC	ELECTRIC
FB	FIELD BOOK
FD	FOUND
H	HEIGHT
LACS	LOS ANGELES CITY SURVEYOR
MEA	MEASURE
P/L	PROPERTY LINE
PA	PLANTER AREA
PG	PAGE
REF	REFERENCE
S&W	SPIKE AND WASHER
SSDM	STANDARD SURVEY DISK MONUMENT
ST	STREET
TR	TRACT
VAR	VARIES
W	WIDTH
WDF	WOOD FENCE
WIF	WROUGHT IRON FENCE
WT	WALL TOP
#	NUMBER
Ø	DIAMETER

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REVISION DATES (DESIGN STAGE ONLY)

Sheet Version 2.01

CITY OF LOS ANGELES DEPARTMENT OF PUBLIC WORKS

BUREAU OF ENGINEERING

ENGINEERING
CITY OF LOS ANGELES

NO.	REVISIONS:	DATE:	BY:

SURVEY NO. 35995

INDEX NO.

GARY LEE MOORE, P.E. CITY ENGINEER
SURVEY DIVISION

		DATE:
SURVEYOR:	MARK KINDIG	
FIELD SURVEYOR:	THOMAS ABRAHAMIAN	12/02/2019
DRAWN BY:	VINCENT RADCLIFFE	12/23/2019
CHECKED BY:	THOMAS ABRAHAMIAN	12/23/2019
APPROVED BY:		

P.L.S:

VERTICAL CONTROL: C.E.F.B. 43060 PGS. 37 - 44
HORIZONTAL CONTROL: C.E.F.B. 43060 PGS. 37 - 44

SHEET TITLE: SITE SURVEY

PROJECT: RESEDA SKATE FACILTIY

ADDRESS: 18160 W SHERMAN WAY

WORK ORDER NO. E170121B

DRAWING NO. SRVIII

SHEET 3 OF 3 SHEETS

LOT LINE ADJUSTMENT
PROPOSED LEGAL DESCRIPTIONS

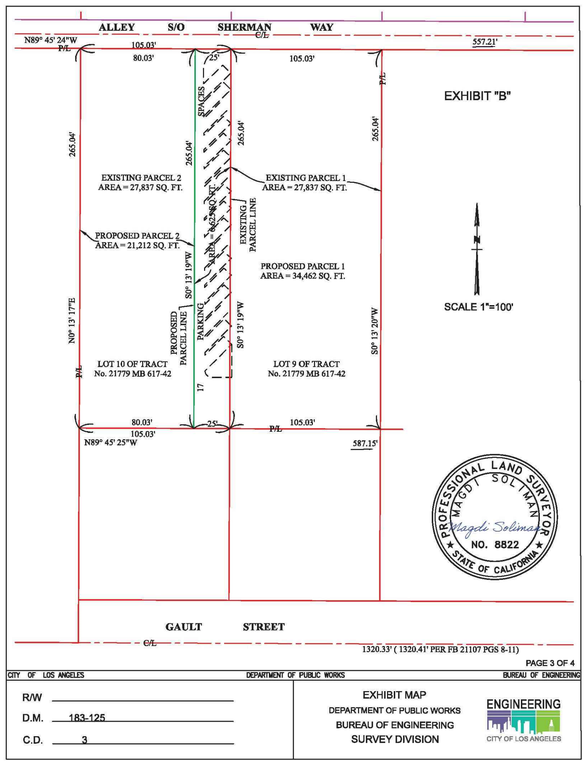
PARCEL 1:

LOT 9 AND EASTERLY 25.00 FEET OF LOT 10 OF TRACT No. 21779, IN THE CITY OF LOS ANGELES, COUNTY OF LOS ANGELES, STATE OF CALIFORNIA, AS PER MAP RECORDED IN BOOK 617, PAGES 42 TO 44 INCLUSIVE OF MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF SAID COUNTY.

PARCEL 2:

LOT 10 OF TRACT No. 21779, IN THE CITY OF LOS ANGELES, COUNTY OF LOS ANGELES, STATE OF CALIFORNIA, AS PER MAP RECORDED IN BOOK 617, PAGES 42 TO 44 INCLUSIVE OF MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF SAID COUNTY.

EXCEPTING THEREFROM THE EASTERLY 25.00 FEET OF SAID LOT 10.



CITY OF LOS ANGELES | DEPARTMENT OF PUBLIC WORKS | BUREAU OF ENGINEERING

R/W
D.M. 183-125
C.D. 3

EXHIBIT MAP
DEPARTMENT OF PUBLIC WORKS
BUREAU OF ENGINEERING
SURVEY DIVISION

ENGINEERING
CITY OF LOS ANGELES

BASIS OF BEARINGS:
THE BEARINGS SHOWN HEREON ARE BASED ON BEARING N 00°13'25" E ALONG THE CENTERLINE OF CANBY AVENUE BETWEEN WYANDOTTE AVENUE AND SHERMAN WAY

THIS DOCUMENT WAS PREPARED BY ME OR UNDER M DIRECTION.

MAGDI SOLIMAN
PLS NO. 8822
REG. EXP. DEC. 31, 2021
Magdi Soliman

PROFESSIONAL LAND SURVEYOR
MAGDI SOLIMAN
NO. 8822
STATE OF CALIFORNIA

November 19, 2020

PARCEL 1 OWNER:
LA CITY C/O GENERAL MANAGER
221 N FIGUEROA ST. SUIT 350
LOS ANGELES, CA 90012
PC: MICHAEL SHULL
C/O: CID MACARAEG
TEL:(213)202-2608

PARCEL 2 OWNER:
MPM SHERMAN WAY, LLC
A CALIFORNIA NON-PROFIT ORGANIZATION
250 E 1ST STREET
LOS ANGELES, CA 90012
TEL:( ) -

PARCEL 1:
NO RECORD ADDRESS
APN # 2125-036-903
EXISTING ZONINING: {Q}P-1L-CDO
EXISTING AREA: 27,837 SQ. FT.
PROPOSED AREA: 34,462 SQ. FT.

PARCEL 2:
NO RECORD ADDRESS
APN # 2125-036-106
EXISTING ZONINING: (T)[Q]C2-1L-CDO
EXISTING AREA: 27,837 SQ. FT.
PROPOSED AREA: 21,212 SQ. FT.

CITY OF LOS ANGELES | DEPARTMENT OF PUBLIC WORKS | BUREAU OF ENGINEERING

R/W
D.M. 183-125
C.D. 3

EXHIBIT MAP
DEPARTMENT OF PUBLIC WORKS
BUREAU OF ENGINEERING
SURVEY DIVISION

ENGINEERING
CITY OF LOS ANGELES

Remove EED logo. Typ.

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

LICENSED ARCHITECT
LAWRENCE SUARD
C 21812
REN 10/31/2023
STATE OF CALIFORNIA

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED •

BUREAU OF ENGINEERING
VERTICAL CONTROL:
HORIZONTAL CONTROL:
SHEET TITLE: LOT LINE ADJUSTMENT
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

DEPARTMENT OF PUBLIC WORKS
NO. | REVISIONS: | BY: | DATE:

CIP NO.

INDEX NO.

CITY ENGINEER
DATE:

CITY OF LOS ANGELES
GARY LEE MOORE, P.E., ENV SP
DESIGN GROUP:
ENGINEER:
DESIGNED BY:
DRAWN BY:
CHECKED BY:
APPROVED BY:

WORK ORDER NO.
E170121B

SHEET NAME
A0.09
SHEET X OF X SHEETS

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REVISION DATES (DESIGN STAGE ONLY)

Sheet Version 4.0

Z:\B□S ARCHITECTURE\019 JOBS\01935.0 CITY OF LA-RESEDA ICE HOCKEY ROLLER RINK\01935.0 1.CURRENT DRAWINGS_24X36\01935.0_A009_24X36.DWG 12/3/2021 9:06 AM

GENERAL NOTES: COMMERCIAL

1. THESE DRAWINGS AND SPECIFICATIONS AND COPIES ARE LEGAL INSTRUMENTS OF SERVICE FOR USE BY THE OWNER AND AUTHORIZED REPRESENTATIVES ON THE DESIGNATED PROPERTY ONLY.

2. THE CONTRACTOR SHALL CAREFULLY INSTRUCT EACH OF THE SUBCONTRACTORS TO BECOME THOROUGHLY FAMILIAR WITH ALL OF THE DRAWINGS AND SPECIFICATIONS AND WHEREVER EXISTING CONDITIONS MAY HAVE A BEARING ON THE EXPEDITIOUS PERFORMANCE OF HIS WORK. THE SUBCONTRACTOR SHALL VISIT THE JOBSITE AND PERSONALLY INSPECT AND VERIFY THE SITE FOR COMPARISON WITH PERTINENT SECTIONS OF SPECIFICATIONS AND DRAWINGS. NO ALLOWANCE CAN BE SUBSEQUENTLY MADE ON BEHALF OF THE SUBCONTRACTOR FOR ERRORS DUE TO THIS NEGLIGENCE OF FAILING TO ACQUAINT HIMSELF WITH THE EXISTING SITE CONDITIONS.

3. CONTRACTOR SHALL VERIFY THE DIMENSIONS OF ALL EXISTING CONDITIONS AT THE SITE, AND SHALL REPORT TO THE ARCHITECT IN WRITING ANY DISCREPANCIES BETWEEN ACTUAL EXISTING CONDITIONS AND THE DRAWINGS FOR THE ARCHITECT'S DECISIONS AND INSTRUCTIONS BEFORE PROCEEDING WITH THE WORK AFFECTED BY SUCH DISCREPANCIES. IF ANY DISCREPANCY OR CONFLICT APPEARS BETWEEN THE DRAWINGS OR SPECIFICATIONS REGARDING MATERIALS THE SITUATION SHALL BE REPORTED TO THE ARCHITECT IN WRITING AND THE ARCHITECT WILL ISSUE A CLARIFICATION.

4. CONTRACTOR SHALL STUDY AND COMPARE THE CONTRACT DOCUMENTS AND SHALL AT ONCE REPORT TO THE ARCHITECT IN WRITING ALL ERRORS, INCONSISTENCIES, OR OMISSIONS DISCOVERED. CONTRACTOR SHALL NOT BE LIABLE TO OWNER OR ARCHITECT FOR DAMAGE RESULTING FROM ANY SUCH ERRORS, INCONSISTENCIES OR OMISSIONS IN THE CONTRACT DOCUMENTS, BUT, IF THE CONTRACTOR PROCEEDS WITH ANY WORK SO AFFECTED WITHOUT THE WRITTEN INSTRUCTIONS FROM THE ARCHITECT, THE CONTRACTOR SHALL MAKE GOOD ANY RESULTING DAMAGE OR DEFECTS. THE CONTRACTOR SHALL PERFORM NO PORTION OF THE WORK AT ANY TIME WITHOUT CONTRACT DOCUMENTS OR WHERE REQUIRED APPROVED SHOP DRAWINGS, PRODUCT DATA, OR SAMPLES FOR PORTIONS OF THE WORK.

5. REQUIREMENTS FOR REGULATORY AGENCIES: ALL PERTAINING STATUTES, ORDINANCES, LAWS, RULES, CODE REGULATIONS, STANDARDS, AND THE LAWFUL ORDERS OF ALL PUBLIC AUTHORITIES HAVING JURISDICTION OF THE WORK, ARE HEREBY INCORPORATED INTO THESE CONTRACT DOCUMENTS THE SAME AS IF REPEATED IN FULL HEREIN AND SUCH ARE INTENDED WHERE ANY REFERENCE IS MADE IN EITHER THE SINGULAR OR PLURAL TO CODE OR BUILDING CODE UNLESS OTHERWISE SPECIFIED INCLUDING WITHOUT LIMITATION, THOSE IN THE SITE LIST BELOW. CONTRACTOR SHALL MAKE AVAILABLE AT THE SITE COPIES OF THE LISTED DOCUMENTS APPLICABLE TO THE WORK AS THE ARCHITECT OR OWNER MAY REQUEST.

A) CALIFORNIA BUILDING CODE, CURRENT EDITION APPROVED BY THE CITY OF LOS ANGELES::WITH LOS ANGELES AMENDMENTS.

PART 1 2019 CALIFORNIA ADMINISTRATIVE CODE, CA CODE OF REGULATIONS TITLE 24 C.C.R, PART 1

PART 2 2019 CALIFORNIA BUILDING CODE, CALIFORNIA CODE OF REGULATIONS TITLE 24 C.C.R, VOLUMES 1 AND 2 (BASED ON THE 2012 INTERNATIONAL BUILDING CODE, WITH CALIFORNIA AMENDMENTS, ALSO REFERRED TO AS "CBC").

PART 3 2019 CALIFORNIA ELECTRICAL CODE, CALIFORNIA CODE OF REGULATIONS TITLE 24 C.C.R, PART 3 (BASED ON THE 2011 NATIONAL ELECTRICAL CODE, ALSO REFERRED TO AS "CEC").

PART 4 2019 CALIFORNIA MECHANICAL CODE, CALIFORNIA CODE OF REGULATIONS TITLE 24 C.C.R, PART 4 (BASED ON THE 2012 UNIFORM MECHANICAL CODE, ALSO REFERRED TO AS "CMC").

PART 5 2019 CALIFORNIA PLUMBING CODE, CALIFORNIA CODE OF REGULATIONS TITLE 24 C.C.R, PART 5 (BASED ON THE 2012 UNIFORM PLUMBING CODE, ALSO REFERRED TO AS "CPC").

PART 6 2019 CALIFORNIA ENERGY CODE, CA CODE OF REGULATIONS TITLE 24 C.C.R, PART 6.

PART 7 2019 CALIFORNIA ELEVATOR SAFETY CONSTRUCTION CODE, CA CODE OF REGULATIONS, TITLE 24 C.C.R., PART 7.

PART 8 2019 CALIFORNIA HISTORICAL BUILDING CODE, CA CODE OF REGULATIONS TITLE 24 C.C.R, PART 8.

PART 9 2019 CALIFORNIA FIRE CODE, CALIFORNIA CODE OF REGULATIONS TITLE 24 C.C.R, (BASED ON THE 2012 UNIFORM FIRE CODE, ALSO REFERRED TO AS "CFC").

PART 11 2019 CALIFORNIA GREEN BUILDING STANDARDS CODE, CODE OF REGS, TITLE 24, PART 11. (CALGREEN CODE).

PART 12 2019 CALIFORNIA REFERENCE STANDARDS CODE, CA CODE OF REGULATIONS TITLE 24 C.C.R, PART 12.

B) TITLE 24 CAC, BUILDING STANDARDS, INCLUDING ARCHITECTURAL BARRIER LAWS AND REGULATIONS REGARDING ACCESSIBILITY, CURRENT EDITION.

C) 2019 CALIFORNIA BUILDING CODE REFERENCED STANDARDS CHAPTER 35 (PARTIAL LIST OF APPLICABLE STANDARDS):

NFPA 13 AUTOMATIC SPRINKLER SYSTEMS (2019 EDITION)

NFPA 14 STANDPIPE SYSTEMS (2019 EDITION)

NFPA 72 NATIONAL FIRE ALARM CODE (2019 EDITION)

D) 2019 CITY OF LA FIRE CODE

E) CITY OF LOS ANGELES MUNICIPAL CODE (LAMC)

F) OTHER STATUTES, ORDINANCES, LAWS, REGULATIONS, RULES, ORDER, AND CODES AS SPECIFIED IN OTHER SECTIONS OF THE SPECIFICATIONS OR BEARING ON THE WORK.

6. CONTRACTOR SHALL PROVIDE SAFEGUARDS DURING CONSTRUCTION AS PER CH.33 OF 2017 CBC.

7. CONTRACTOR SHALL PROVIDE TEMPORARY CHEMICAL TOILETS AND OTHER FACILITIES AS REQUIRED. UTILITIES WILL NOT BE PROVIDED BY THE OWNER. ANY CHEMICAL TOILET SHALL BE CLEANED A MINIMUM ONCE PER WEEK.

8. CONTRACTOR SHALL PROVIDE SAFEGUARDS DURING CONSTRUCTION AS PER CH.33 OF 2017 CBC. PROVIDE PEDESTRIAN AND PROPERTY PROTECTION BARRICADES AND/OR CANOPIES AS REQUIRED BY THE LOCAL AUTHORITIES, OR AS NECESSARY FOR PEDESTRIAN SAFETY. A PERMIT FROM THE DEPT. OF PUBLIC WORKS AND/OR BUILDING & SAFETY IS REQUIRED FOR A PROTECTION FENCE OR CANOPY OVER OR ON ANY STREET, SETBACK OR PUBLIC WAY. THE ERECTION AND PLACEMENT OF ANY CONSTRUCTION OFFICE SHALL BE SUBJECT TO APPROVAL OF THE BUILDING & SAFETY DIRECTOR CONCERNING LOCATION AND DURATION.

9. ALL OPENINGS IN EXTERIOR WALLS OR ROOFS WHICH ARE LESS THAN 16' (SIXTEEN FEET) ABOVE ADJACENT AREAS ACCESSIBLE TO THE PUBLIC SHALL BE CONSIDERED SECURITY OPENINGS AND SHALL COMPLY TO THE PROVISIONS FOR SECURITY IN THE CALIFORNIA BUILDING CODE.

10. IMPROVEMENTS ON THE SITE, WORK IN PROGRESS, STORED MATERIALS, AND PUBLIC AND PRIVATE IMPROVEMENTS ON PROPERTY ADJACENT TO THE SITE SHALL BE PROTECTED BY THE CONTRACTOR FROM DAMAGE ARISING FROM THE WORK. ALL DAMAGE SO OCCURRING SHALL BE REPAIRED OR DAMAGED ITEM SHALL BE REPLACED BY THE CONTRACTOR AT NO COST TO THE OWNER.

11. PRIOR TO START OF WORK, THE CONTRACTOR SHALL INSPECT THE SITE AND PREMISES AND REPORT IN WRITING TO ARCHITECT AND OWNER ALL DAMAGE AND UNSATISFACTORY CONDITIONS EXISTING AT THE START OF WORK. NATURE AND EXTENT OF THESE CONDITIONS WILL BE VERIFIED BY THE ARCHITECT AND CONTRACTOR WILL NOT BE HELD RESPONSIBLE FOR CORRECTION OF SUCH DAMAGE UPON COMPLETION OF WORK, UNLESS INCLUDED IN THE CONTRACT BY MUTUAL CONSENT.

12. PROVIDE SUPPORTS, SHORING AND BRACING AS REQUIRED. ALL PITS, HOLES, TRENCHES OR EXCAVATIONS 5' OR MORE IN DEPTH MUST BE PROPERLY SHORED AND SUPPORTED.

13. OVERLOADING: DO NOT OVERLOAD ANY PART OF THE STRUCTURES BEYOND THE SAFE CARRYING CAPACITY BY PLACING OF MATERIALS, EQUIPMENT, TOOLS, MACHINERY OR ANY OTHER ITEM THEREON. LOAD LIMIT AT SLABS-ON-GRADE IS 1,000 LB/SF MAX. LOAD LIMITS AT STRUCTURAL SLABS SHALL BE ACCORDING TO USAGE PER CHAPTER 16 OF THE 2017 CALIFORNIA BUILDING CODE.

14. PROTECTION OF FLOORS. USE CARE TO PROTECT FLOOR SURFACES FROM DAMAGE AND EQUIPMENT, INCLUDING MOBILE EQUIPMENT WITH PNEUMATIC TIRES.

15. CONVENTIONAL DETAILS SHALL APPLY WHERE NO SPECIAL DETAILS OR SECTIONS ARE SHOWN. THE ARCHITECT WILL FURNISH ANY CLARIFICATION DETAILS AT THE REQUEST OF THE JOB SUPERINTENDENT.

16. ALL SHOP DRAWINGS SHALL BE PREPARED AS REQUIRED AND SUBMITTED TO THE ARCHITECT FOR CHECKING. ALL SHOP DRAWINGS REQUIRE 15 WORKING DAYS FOR REVIEW UPON RECEIPT BY ARCHITECT. SHOP DRAWINGS FOR ALL LOW VOLTAGE WORK, WHETHER UNDER THIS CONTRACT OR NOT, SHALL BE SUBMITTED FOR THE ARCHITECT'S REVIEW.

17. SPECIFICATIONS, BOUND SEPARATELY, ARE PART OF THESE DOCUMENTS. ALL ADDENDA, CHANGE ORDER, BULLETINS AND NOTICES, IF ISSUED LATER, SHALL BE CONSIDERED AS PART OF THE WORK. THE SPECIFICATIONS, GENERAL CONDITIONS AND ALL ISSUED ADDENDA AND CHANGE ORDERS ARE PART OF ARCHITECTURAL DRAWINGS.

18. THE ARCHITECT SHALL BE NOTIFIED 48 HRS. PRIOR TO ANY FINISH WORK APPLICATION.

19. DO NOT SCALE DRAWINGS::DIMENSIONS GOVERN. LARGE SCALE DETAILS GOVERN OVER SMALL SCALE DETAILS. DIMENSIONS ARE TO FACE OF ROUGH FRAMING UNLESS OBVIOUSLY SHOWN, MARKED TO CENTERLINE OF WALL OR COLUMN, OR NOTED OTHERWISE.

20. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONTINUOUS CLEAN-UP OF THE SITE AND OF ALL DEBRIS, WHETHER CREATED BY HIS WORK, OR BY THE FAILURE OF HIS SUBCONTRACTORS TO CLEAN UP AFTER THEIR WORK.

21. THESE GENERAL NOTES SHALL APPLY EQUALLY TO THE GENERAL CONTRACTOR AND ALL PRIME SUBCONTRACTORS ENGAGED UPON THIS PROJECT. THE WORD "CONTRACTOR" AS USED HEREINAFTER SHALL APPLY EQUALLY TO THE WORK OF ALL TRADES.

22. THESE DRAWINGS ARE INTENDED TO BE READ IN CONJUNCTION WITH SCHEDULES, DETAILS AND SPECIFICATIONS EMBODIED IN THE PROJECT MANUAL(S). NO ONE DRAWING OR SPECIFICATION SCHEDULE SHALL "GOVERN". CONTRACTOR SHALL CORRELATE WORK BETWEEN ARCHITECTURAL DRAWINGS AND SPECIFICATIONS AND CONSULTANT DRAWINGS AND SPECIFICATIONS. IT IS THE EXPLICIT AND SPECIFIC RESPONSIBILITY OF THE CONTRACTOR TO EXAMINE THE CONTRACT DOCUMENTS IN THEIR ENTIRETY, REPORT ALL WITH ANY WORK AFFECTED BY SUCH DISCREPANCIES.

23. GENERAL NOTES ARE AN AID TO THE CONTRACTOR IN UNDERSTANDING THE WORK AND SHOULD NOT BE CONSTRUED AS BEING COMPLETE IN EVERY DETAIL. IT IS THE EXPLICIT AND SPECIFIC RESPONSIBILITY OF THE CONTRACTOR TO VISIT THE SITE, VERIFY THE EXISTING CONDITIONS, FAMILIARIZE HIMSELF THOROUGHLY WITH SCOPE OF THE WORK, AND REPORT ALL DISCREPANCIES BETWEEN THE DRAWINGS AND THE ASSUMED OR ACTUAL CONDITIONS TO THE ATTENTION OF THE ARCHITECT.

24. ALL LINES, SYMBOLS, NOTES, POCHE AND OTHER GRAPHIC DEVICES CONTAINED IN THE CONTRACT DOCUMENTS CARRY SPECIFIC OR INFERENTIAL MEANING. ITEMS INDICATED IN THESE WAYS ARE PART OF THE SCOPE OF WORK AND WILL BE REQUIRED BY THE OWNER AND ARCHITECT TO BE INCLUDED IN THE CONTRACTOR'S ORIGINAL BID. ANY ITEMS WHICH REQUIRE FURTHER CLARIFICATION BY THE ARCHITECT FOR THE SPECIFIC BENEFIT OF THE CONTRACTOR SHALL BE BROUGHT TO THE ATTENTION OF THE ARCHITECT FOR SUCH CLARIFICATION BEFORE COMMENCEMENT OF ANY WORK AND SUBMITTAL OF FINAL BID.

25. THE CONTRACTOR SHALL PAY SPECIFIC ATTENTION TO ALL DIMENSIONED OR INFERENTIAL PLAN AND SECTIONAL SPATIAL RELATIONSHIPS, AND SHALL VERIFY ALL AXES AND SYMMETRIES BEFORE COMMENCING WORK.

26. ANY DIMENSIONS MARKED "VERIFY" ARE TO CHECKED FOR ACCURACY BY THE CONTRACTOR AS WORK PROGRESSES, AND ALL DISCREPANCIES ARE TO BE BROUGHT TO THE ARCHITECT BEFORE PROCEEDING.

27. THE DIMENSIONS MARKED "CLEAR" ARE NOT ADJUSTABLE WITHOUT THE WRITTEN AUTHORIZATION OF THE ARCHITECT.

28. NOT USED

29. NO CERTIFICATE OF OCCUPANCY FOR NEW BUILDINGS SHALL BE ISSUED UNLESS OR UNTIL ALL EXISTING & PROPOSED ELECTRICAL LINES AND OVERHEAD SERVICE DROP CONDUCTORS, AND ALL GAS, TELEPHONE, TELEVISION CABLE SERVICE WIRES OR LINES, WHICH ARE ON-SITE, ABUTTING, AND/OR TRANSECTING, ARE COMPLETE, AND SERVICE REQUIREMENTS PUBLISHED BY THE UTILITIES.

30. DESIGN WORK IS THE RESPONSIBILITY OF THE ARCHITECT. ANY DESIGN CHANGES MADE BY THE CONTRACTOR SHALL BE THE FULL RESPONSIBILITY AND LIABILITY OF THE CONTRACTOR.

31. WORKMANSHIP SHALL BE THE HIGHEST QUALITY NORMALLY OBTAINABLE IN THE RESPECTIVE TRADES AND EXECUTED BY SKILLED JOURNEYMEN. WORK WHICH IN THE OPINION OF THE ARCHITECT IS INFERIOR OR IMPROPERLY PERFORMED, SHALL BE REMOVED AND REPLACED AT THE CONTRACTOR'S EXPENSE.

32. UNSPECIFIED MATERIALS SHALL BE NEW, FIRST LINE PRODUCTS OF A RECOGNIZED MANUFACTURER. NO SUBSTITUTIONS FROM SPECIFICATIONS SHALL BE USED UNLESS APPROVED BY THE ARCHITECT. UNDER NO CIRCUMSTANCES WILL SUBSTITUTIONS BE ALLOWED DUE TO CONTRACTOR'S FAILURE TO ORDER PRODUCTS IN A TIMELY MANNER TO MEET CONSTRUCTION SCHEDULES. WHERE AVAILABLE OR REQUIRED, MANUFACTURER'S GUARANTEE SHALL BE PROVIDED IN WRITING.

33. ALL CONSTRUCTIONS AND INSTALLATIONS SHALL CONFORM TO MANUFACTURER'S PUBLISHED SPECIFICATIONS AS WELL AS THE LATEST EDITION OF THE CALIFORNIA BUILDING CODE WITH ALL STATE AND LOCAL ADOPTED ORDINANCES AND A COPY OF THESE STIPULATIONS SHALL BE AVAILABLE AT THE CONSTRUCTION OFFICE.

34. THE METHODS AND SAFETY OF CONSTRUCTION ARE THE RESPONSIBILITY OF CONTRACTOR AND HIS ASSIGNEES.

35. THE CONTRACTOR SHALL COORDINATE THE WORK OF ALL SUBCONTRACTORS, INCLUDING THOSE UNDER SEPARATE CONTRACT WITH THE OWNER.

36. EACH CONTRACTOR SHALL BE RESPONSIBLE FOR THE WORK IN HIS TRADE REQUIRED BY ALL OTHER TRADES, I.E. OPENINGS, HOLES, BLOCKING, BRACING, ETC.

37. WHERE CONSTRUCTION MATERIALS ARE TEMPORARILY STORED ON ROOF OR FLOOR FRAMING, THEY SHALL BE DISTRIBUTED SO THAT LOAD DOES NOT EXCEED DESIGN LIVE LOAD. ADEQUATE STORING AND/OR BRACING SHALL BE PROVIDED WHERE STRUCTURAL MEMBERS HAVE NOT ATTAINED DESIGN STRENGTH.

38. ANY WASTE CAUSED BY THIS WORK SHALL BE REMOVED FROM THE PREMISES AND DISPOSED OF BY THE CONTRACTOR, INCLUDING EXCESS SOIL REMOVAL AND CLEAN TOP SOIL PROVIDED IN PLANTED AREAS. DEMOLITION IS NOT SHOWN IN ITS ENTIRETY- REMOVE ALL (E) CONSTRUCTION REQUIRED TO COMPLETE THE WORK.

39. LICENSES AND PERMITS NECESSARY TO THE PERFORMANCE, COMPLETION AND APPROVAL OF THE WORK, AND ALL INSPECTION AND OTHER APPLICABLE FEES (EXCLUDING BUILDING PERMIT FILING FEE) SHALL BE SECURED AND PAID FOR BY THE CONTRACTOR.

40. ANY GEOLOGY AND SOILS REPORTS AND ATTENDANT APPROVAL BY THE GOVERNING AGENCY ARE A PART OF THESE PLANS. ANY REQUIREMENTS CALLED FOR IN THEM SHALL BE PART OF THE CONTRACT AND PERFORMED AS CALLED FOR, WHETHER INDICATED ON THE DRAWINGS OR NOT.

41. THE CONTRACTOR IS RESPONSIBLE FOR ALL WORK REQUIRED BY ONE TRADE TO ANOTHER AND TO INSURE THAT ALL COSTS ARE INCLUDED IN THE CONTRACT PRICE.

42. ALL CHANGE ORDERS SHALL BE APPROVED IN WRITING BY THE ARCHITECT PRIOR TO COMMENCEMENT OF SUCH WORK, OTHERWISE CONTRACTOR WILL BE FULLY RESPONSIBLE FOR ALL ASSOCIATED COSTS.

43. THE CONTRACTOR SHALL PROVIDE A □500.00 ALLOWANCE FOR A JOBSITE SIGN. SIZE AND LAYOUT SHALL BE DETERMINED BY THE ARCHITECT.

BUILDING

1. THERE SHALL BE NO EXPOSED PIPE CONDUITS, DUCTS, VENTS, ETC. ON EXTERIOR OF THE BUILDING OR IN DESIGNATED FINISH SPACES, UNLESS NOTED AS EXPOSED CONSTRUCTION ON FINISH SCHEDULE.

2. WHERE FACTORY PRIMED ITEMS OCCUR, SUCH AS GRILLES, DIFFUSERS, METAL TRIM AND ACCESSORIES, ETC. PAINT TO MATCH THE ADJACENT SURFACE OR AS DIRECTED BY THE ARCHITECT. REFER TO SPECIFICATIONS FOR ALL OTHER ITEMS NOT INCLUDED ON FINISH SCHEDULE. THE NOTE 'GSM' REFERS TO GALVANIZED OR BONDERIZED METAL, SEE FINISH SCHEDULE AND ELEVATIONS FOR PAINT COLORS. ALL PARAPET AND WALL COPING AND METAL WINDOW SILLS SHALL MATCH ADJACENT WALL COLOR UNLESS NOTED OTHERWISE.

3. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO OBTAIN APPROVAL BY THE APPROVED BUILDING INSPECTOR FOR ALL CONCEALED WORK BEFORE CLOSING UP.

4. ALL BATHROOMS AND TOILET ROOMS SHALL BE MECHANICALLY VENTILATED PER MECHANICAL CODE (MIN. 5 AIR CHANGES PER HOUR), AND CONNECTED DIRECTLY TO THE OUTSIDE.

5. NOT USED

6. PROVIDE BACKING AND BLOCKING FOR ALL CABINETS, LOCKERS, TOWEL BARS, GRAB BARS, DOOR STOPS, HARDWARE, ETC. TYP. EVEN IF NOT SHOWN ON DETAIL. PROVIDE BACKING AND BLOCKING FOR OTHER ACCESSORIES/ ITEMS SHOWN AS FUTURE OR OPTIONAL ON ALL FRAME WALLS.

7. ALL LUMBER IN CONTACT WITH MASONRY OR CONCRETE LESS THAN 6" ABOVE THE GROUND SHALL BE PRESSURE-TREATED WOOD.

8. FIRE- BLOCKING IS REQUIRED AT MID- HEIGHT OF WALLS OVER 8'-0" HIGH.

9. ALL EXTERIOR OPENINGS EXPOSED TO THE WEATHER SHALL BE FLASHED IN SUCH A MANNER AS TO MAKE THEM WEATHERPROOF. ALL FLASHING, COUNTER-FLASHING AND COPING WHEN OF METAL, SHALL BE MINIMUM 24 GA. GALVANIZED OR BONDERIZED IF PAINTED. AT ALL ROUGH OPENINGS IN EXT. WALL OF BUILDING, CONTRACTOR SHALL PROVIDE, AT A MINIMUM, SELF-HEALING FLASHING WATERPROOFING, LAPPED A MIN. OF 6" BEYOND OPENING. SEE DETAILS AND SPECIFICATIONS.

10. NOT USED.

11. ALL OUTSWINGING EXTERIOR DOORS SHALL HAVE DRIPS AT THE HEAD OF THE DOOR, TYPICALLY, IF NOT COVERED WITH A CANOPY OR OVERHANG.

12. CONTRACTOR SHALL PROVIDE A GYP. BOARD ACCESS PANEL AT ALL DAMPER LOCATIONS AND AT ALL MECHANICAL EQUIPMENT LOCATIONS AT GYP. BOARD SOFFITS. SIZE OF PANEL SHALL BE AS NECESSARY TO ACCESS THE EQUIPMENT.

13. CONTRACTOR SHALL PROVIDE AN ACCESS PANEL AT ALL PLUMBING EQUIPMENT/PIPING REQUIRED TO BE ACCESSED.

14. AT ALL WOOD STUD WALL SILL PLATES, PROVIDE SILL SEAL BY DOW (OR EQUAL) BETWEEN WOOD STUD AND CONCRETE TO FULLY SEAL THE CONNECTION BETWEEN FOUNDATION AND SILL PLATE.

15. NOT USED

SECURITY

1. GLAZED OPENINGS WITHIN 40" OF THE DOOR LOCK WHEN THE DOOR IS IN THE CLOSED POSITION, SHALL BE FULLY TEMPERED GLASS OR APPROVED BURGLARY RESISTANT MATERIAL OR SHALL BE PROTECTED BY METAL BARS, SCREENS OR GRILLS HAVING A MAXIMUM OPENING OF 2". THE PROVISIONS OF THIS SECTION SHALL NOT APPLY TO VIEW PORTS OR WINDOWS WHICH DO NOT EXCEED 2" IN THEIR GREATEST DIMENSIONS.

2. DOOR STOPS OF IN-SWINGING DOORS SHALL BE OF ONE-PIECE CONSTRUCTION WITH THE JAMB OR JOINED BY RABBET TO THE JAMB.

3. ALL PIN-TYPE HINGES WHICH ARE ACCESSIBLE FROM OUTSIDE THE SECURED AREA WHEN THE DOOR IS CLOSED SHALL HAVE NON-REMOVABLE HINGE PINS. IN ADDITION, THEY SHALL HAVE MINIMUM 1/4" DIAMETER STEEL JAMB STUD WITH 1/4" MINIMUM PROTECTION UNLESS THE HINGES ARE SHAPED TO PREVENT REMOVAL OF THE DOOR IF THE HINGE PINS ARE REMOVED.

4. THE STRIKE PLATE FOR LATCHES AND THE HOLDING DEVICE FOR PROTECTING DEADBOLTS IN WOOD CONSTRUCTION SHALL BE SECURED TO THE JAMB AND THE WALL FRAMING WITH SCREWS NOT LESS THAN 2-1/2" IN LENGTH. STRIKE PLATES SHALL BE A MINIMUM OF 31/2" IN LENGTH.

5. DEADBOLTS SHALL HAVE HARDENED INSERTS: DEADLOCKING LATCH, KEY-OPERATED LOCKS ON EXTERIOR□LOCKS OPENABLE WITHOUT KEY, SPECIAL KNOWLEDGE OR SPECIAL EFFORT ON INTERIOR AND TYPE-THROW, AND EMBEDMENT OF DEADBOLTS FOR SINGLE SWINGING DOOR, ACTIVE LEAF OR PAIRS OF DOORS, OR BOTTOM LEAF OF DUTCH DOOR.

6. STRAIGHT DEADBOLTS SHALL HAVE A MINIMUM THROW OF 1" AND AN EMBEDMENT OF NOT LESS THAN 5/8".

7. A HOOK-SHAPED OR AN EXPANDING LUG DEADBOLT SHALL HAVE MIN. 3/4" THROW.

8. CYLINDER GUARDS SHALL BE INSTALLED ON ALL CYLINDER LOCKS WHENEVER THE CYLINDER PROJECTS BEYOND THE FACE OF THE DOOR OR IS OTHERWISE ACCESSIBLE TO GRIPPING TOOLS.

9. IN B OCCUPANCIES, PANES OF GLAZING WITH A DIMENSION GREATER THAN 6" BUT LESS THAN 48" SHALL BE FULLY TEMPERED GLASS OR APPROVAL BURGLAR-RESISTANT MATERIAL OR SHALL BE PROTECTED BY METAL BARS OR GRILLS WITH OPENINGS THAT HAVE AT LEAST ONE DIMENSION OF 6" OR LESS

10. SCREENS, BARRICADES, OR FENCES MADE OF MATERIAL WHICH PRECLUDE HUMAN CLIMBING SHALL BE PROVIDED AT EVERY PORTION OF ROOF, BALCONY, OR SIMILAR OR SIMILAR SURFACE WHICH IS WITHIN 8' OF THE OF A UTILITY POLE OR SIMILAR STRUCTURE.

11. ALL GLASS DOORS SHALL HAVE FULLY TEMPERED GLASS.

12. GLAZING ADJACENT TO A DOOR AND WITHIN THE SAME WALL PLANE AS THE DOOR WHOSE NEAREST VERTICAL EDGE IS WITHIN 12" OF THE DOOR IN A CLOSED POSITION AND WHOSE BOTTOM EDGE IS LESS THAN 60" ABOVE THE FLOOR OR WALKING SURFACE SHALL BE TEMPERED.

13. GLAZING IN FIXED PANELS WHICH HAVE A GLAZED AREA IN EXCESS OF 9 SQUARE FEET AND THE LOWEST EDGE IS LESS THAN 18" ABOVE THE FINISHED FLOOR LEVEL OR WALKING SURFACE WITHIN 36" OF SUCH GLAZING SHALL BE TEMPERED.

14. NOT USED

15. THE INACTIVE LEAF OF DOUBLE DOORS SHALL BE EQUIPPED WITH FLUSH BOLTS HAVING A MINIMUM EMBEDMENT OF FIVE-EIGHTS INCH INTO THE HEAD AND THRESHOLD OF THE DOOR FRAME.

16. NOT USED

17. WHERE PANIC HARDWARE IS REQUIRED BY THE UNIFORM BUILDING CODE OR TITLE 19, CALIFORNIA ADMINISTRATIVE CODE, IT SHALL BE EQUIPPED AND INSTALLED AS FOLLOWS:

A) PANIC HARDWARE SHALL CONTAIN MIN. OF (2) LOCKING POINTS ON EACH DOOR::OR

B) ON SINGLE DOORS, PANIC HARDWARE MAY HAVE ONE LOCKING POINT WHICH IS NOT TO BE LOCATED AT EITHER THE TOP OR BOTTOM RAILS OF THE DOOR FRAME. THE DOOR SHALL HAVE AN ASTRAGAL CONSTRUCTED OF STEEL .125 INCHES THICK WHICH SHALL BE ATTACHED WITH NON-REMOVABLE BOLTS OR WELDED TO THE OUTSIDE OF THE DOOR. THE ASTRAGAL SHALL EXTEND A MIN. OF SIX INCHES VERTICALLY ABOVE AND BELOW THE LATCH OF THE PANIC HARDWARE. THE ASTRAGAL SHALL BE A MIN. OF TWO INCHES WIDE AND EXTEND A MIN. OF ONE INCH BEYOND THE EDGE OF THE DOOR.

C) DOUBLE DOORS CONTAINING PANIC HARDWARE SHALL HAVE AN ASTRAGAL ATTACHED TO THE DOORS AS THEIR MEETING POINT WHICH WILL CLOSE THE OPENING BETWEEN THEM BUT NOT INTERFERE WITH THE OPERATION OF EITHER DOOR.

19. ALL EXTERIOR DOORS SHALL BE EQUIPPED WITH A LIGHTING DEVICE CAPABLE OF PROVIDING AT LEAST ONE FOOTCANDLE OF LIGHT AT THE GROUND LEVEL DURING HOURS OF DARKNESS. LIGHTING DEVICES SHALL BE PROTECTED BY VANDAL-RESISTANT COVERS.

ENVIRONMENTAL IMPACT REPORT

1. CONTRACTOR SHALL REVIEW AND FOLLOW ALL MITIGATION MEASURES AND PROJECT CONDITIONS.

FIRE PROTECTION

1. PROVIDE A PORTABLE FIRE EXTINGUISHER WITH A RATING AS REQ'D BY CODE FOR SPECIFIC USE AT EVERY 75' MAX AND AS REQUIRED BY CALIFORNIA FIRE CODE. SEE PLANS FOR LOCATION AT 'FINISHED AREAS', FOR 'UN-FINISHED AREAS' SUCH AS PARKING GARAGES, PROVIDE PLAN FOR ARCHITECT'S REVIEW.

2. PROVIDE AND MAINTAIN FIRE EXTINGUISHERS AS REQUIRED BY THE LOCAL FIRE DEPARTMENT FIELD INSPECTOR DURING CONSTRUCTION.

3. FIRE EXTINGUISHERS SHALL BE REQUIRED AND DETERMINED BY FIRE DEPARTMENT FIELD INSPECTOR.

4. THE CONTRACTOR SHALL BE RESPONSIBLE TO CONSTRUCT ALL FIRE RATED SPACES TO THE REQUIREMENTS OF THE APPLICABLE CODES AND STANDARDS. PROVIDE APPROPRIATE FIRE RATED ENCLOSURES BEHIND RECESSED LIGHT FIXTURES WHERE REQUIRED.

5. OMIT.

6. WIDTH AND HEIGHT OF REQUIRED EXIT DOORWAYS SHALL COMPLY WITH APPLICABLE BUILDING CODE.

7. COMMERCIAL DUMPSTERS OR CONTAINERS WITH AN INDIVIDUAL CAPACITY OF 1.5 CUBIC YARDS OR GREATER SHALL NOT BE STORED OR PLACED WITHIN 5' OF COMBUSTIBLE WALLS, OPENINGS OR COMBUSTIBLE ROOF EAVE LINES UNLESS AREAS CONTAINING DUMPSTERS ARE PROTECTED BY AN APPROVED SPRINKLER SYSTEM.

8. PROVIDE FIRE RESISTIVE CONSTRUCTION AS NOTED ON PLANS.

9. FIRE RESISTIVE ASSEMBLIES FOR PROTECTION OF OPENINGS SHALL COMPLY WITH BUILDING CODE:2017 CBC SECTION 715.

10. EGRESS DOORS SHALL BE READILY OPERABLE FROM THE EGRESS SIDE WITHOUT THE USE OF A KEY OR ANY SPECIAL KNOWLEDGE OR EFFORT.

11. SHAFTS SHALL BE ENCLOSED IN COMPLIANCE WITH 2017 CBC, SECTION 708. EXT. WALLS SHALL MEET FIRE RESISTANCE RATING OF SECT. 705 AND STRUCT. MEMBERS SHALL BE PROTECTED AS REQUIRED BY SECT. 704.

12. WALLS AND SOFFITS OF ENCLOSED USABLE SPACE UNDER ENCLOSED AND UNENCLOSED STAIRWAYS SHALL BE PROTECTED BY ONE-HR FIRE RESISTANCE-RATED CONSTRUCTION OR THE FIRE RESISTANCE-RATING OF THE STAIR ENCLOSURE, WHICHEVER IS GREATER. SPACES UNDER STAIRWAYS WITHIN A SINGLE RESIDENTIAL DWELLING UNIT IN R1 OR R2 OCCUPANCIES, SHALL BE PROTECTED ON THE ENCLOSED SIDE WITH MIN HALF-INCH GYP BRD. THE OPEN SPACE UNDER EXTERIOR STAIRWAYS SHALL NOT BE USED FOR ANY PURPOSE.

13. ALL PENETRATIONS AND/OR GAPS IN RATED WALLS, FLOORS, CEILINGS ROOFS, ETC. INCLUDING, BUT NOT LIMITED TO, PLUMBING PIPES, SHAFTS, VENT PIPES, DUCTS AND OR ANY PENETRATION, SHALL BE SEALED AND/OR CAULKED WITH AN APPROVED MATERIAL TO MEET THAT CONSTRUCTION RATING OF THE SURFACEAND/OR ASSEMBLY WHICH IT PENETRATES.

14. RECESSED LIGHTS SHALL BE ENCLOSED IN A MANNER TO ACHIEVE AN APPROVED ONE-HOUR FIRE RESISTIVE CONSTRUCTION, IF LOCATED IN A ONE-HOUR ASSEMBLY.

15. PROVIDE SMOKE DETECTORS TO COMPLY WITH BUILDING CODE REGARDING FIRE WARNING SYSTEMS. SMOKE DETECTORS SHALL BE HARD WIRED W/ BATTERY BACKUP.

16. INTERIOR WALL AND CEILING FINISHES SHALL BE AS REQ'D BY 2017 CBC, TABLE 803.9. FOR FULLY SPRINKLERED BUILDING: B&E OCCUPANCY, FLAME SPREAD INDEX SHALL BE "C" MIN. AT CORRIDORS/ROOMS AND "B" MIN AT EXIT PASSAGEWAYS. FOR A-OCCUPANCIES FLAME SPREAD INDEX SHALL BE "B" MIN.

17. ANY DECORATIONS USED SHALL BE NON-COMBUSTIBLE OR FLAME- RETARDANT TREATED IN AN APPROVED MANNER, INCLUDING CURTAINS, DRAPES, SHADES, HANGINGS, ET

30. MAINTENANCE OF FIRE-RESISTANCE-RATED CONSTRUCTION (CFC 703.1): THE REQUIRED FIRE-RESISTANCE RATING OF FIRE-RESISTANCE-RATED CONSTRUCTION (INCLUDING WALLS, FIRESTOPS, SHAFT ENCLOSURES, PARTITIONS, SMOKE BARRIERS, FLOORS, FIRE-RESISTIVE COATINGS AND SPRAYED FIRE-RESISTANT MATERIALS APPLIED TO STRUCTURAL MEMBERS AND FIRE-RESISTANT JOINT SYSTEMS) SHALL BE MAINTAINED. SUCH ELEMENTS SHALL BE PROPERLY REPAIRED, RESTORED OR REPLACED WHEN DAMAGED, ALTERED, BREACHED OR PENETRATED. OPENINGS MADE THEREIN FOR THE PASSAGE OF PIPES, ELECTRICAL CONDUIT, WIRES, DUCTS, AIR TRANSFER OPENINGS AND HOLES MADE FOR ANY REASON SHALL BE PROTECTED WITH APPROVED METHODS CAPABLE OF RESISTING THE PASSAGE OF SMOKE AND FIRE.OPENINGS THROUGH FIRE-RESISTANCE-RATED ASSEMBLIES SHALL BE PROTECTED BY SELF- OR AUTOMATIC-CLOSING DOORS OF APPROVED CONSTRUCTION MEETING THE FIRE PROTECTION REQUIREMENTS FOR THE ASSEMBLY.

31. KEY BOX REQUIRED TO BE INSTALLED (CFC 506.1)- WHERE ACCESS TO OR WITHIN A STRUCTURE OR AN AREA IS RESTRICTED BECAUSE OF SECURED OPENINGS OR WHERE IMMEDIATE ACCESS IS NECESSARY FOR LIFE-SAVING OR FIRE-FIGHTING PURPOSES, THE FIRE CODE OFFICIAL IS AUTHORIZED TO REQUIRE A KEY BOX TO BE INSTALLED IN AN APPROVED LOCATION. CONTACT THE FIRE DEPARTMENT FOR A KNOX APPLICATION FORM. THE KNOX KEY BOX SHALL CONTAIN KEYS TO ALL AREAS OF INGRESS/EGRESS, ALARM ROOMS, FIRE SPRINKLER RISER/EQUIPMENT ROOMS, MECHANICAL ROOMS, ELEVATOR ROOMS, ELEVATOR CONTROLS, PLUS A CARD CONTAINING THE EMERGENCY CONTACT PEOPLE AND PHONE NUMBERS FOR THE BUILDING/COMPLEX.

32. PLOT PLAN: PRIOR TO COMPLETION OF THE PROJECT, A 8.5" X 11" PLOT PLAN AND AN ELECTRONIC CAD VERSION SHALL BE PROVIDED BY THE CONTRACTOR TO THE FIRE DEPARTMENT. THIS SHALL CLEARLY SHOW ALL ACCESS POINTS, FIRE HYDRANTS, KNOX BOX LOCATIONS, FIRE DEPARTMENT CONNECTIONS, UNIT IDENTIFIERS, MAIN ELECTRICAL PANEL LOCATIONS, SPRINKLER RISER AND FIRE ALARM LOCATIONS. LARGE PROJECTS MAY REQUIRE MORE THAN ONE PAGE.

33. THE POWER SUPPLY FOR MEANS OF EGRESS ILLUMINATION SHALL BE PROVIDED BY THE PREMISES' ELECTRICAL SUPPLY. IN THE EVENT OF POWER SUPPLY FAILURE, AN EMERGENCY ELECTRICAL SYSTEM SHALL AUTOMATICALLY ILLUMINATE THE FOLLOWING AREAS□: A) AISLES AND UNENCLOSED EGRESS STAIRWAYS IN ROOMS AND SPACES THAT REQUIRE TWO OR MORE MEANS OF EGRESS, B) CORRIDORS, EXIT ENCLOSURES AND EXIT PASSAGEWAYS IN BUILDINGS REQUIRED TO HAVE TWO OR MORE EXITS, C) EXTERIOR EGRESS COMPONENTS AT OTHER THAN THE LEVEL OF EXIT DISCHARGE UNTIL EXIT DISCHARGE IS ACCOMPLISHED FOR BUILDINGS REQUIRED TO HAVE TWO OR MORE EXITS, D) INTERIOR EXIT DISCHARGE, AS PERMITTED IN SECTION 1024, IN BUILDINGS REQUIRED TO HAVE TWO OR MORE EXITS, E) EXTERIOR LANDINGS, AS REQUIRED BY SECTION 1008.1.5, FOR EXIT DISCHARGE DOORWAYS IN BUILDINGS REQUIRED TO HAVE TWO OR MORE EXITS.

34. THE EMERGENCY POWER SHALL PROVIDE POWER FOR DURATION OF NOT LESS THAN 90 MINUTES AND SHALL CONSIST OF STORAGE BATTERIES, UNIT EQUIPMENT OR AN ON-SITE GENERATOR. THE INSTALLATION OF THE EMERGENCY POWER SYSTEM SHALL BE IN ACCORDANCE WITH 2016 CBC SECTION 2702.

35. EMERGENCY LIGHTING FACILITIES SHALL BE ARRANGED TO PROVIDE INITIAL ILLUMINATION THAT IS AT LEAST AN AVERAGE OF 1 FOOT-CANDLE AND A MINIMUM AT ANY POINT OF 0.1 FOOT-CANDLE MEASURED ALONG THE PATH OF EGRESS AT FLOOR LEVEL. ILLUMINATION LEVELS SHALL BE PERMITTED TO DECLINE TO 0.6 FOOT-CANDLE AVERAGE AND A MINIMUM AT ANY POINT OF 0.06 FOOT-CANDLE AT THE END OF THE EMERGENCY LIGHTING TIME DURATION. A MAXIMUM-TO-MINIMUM ILLUMINATION UNIFORMITY RATIO OF 40 TO 1 SHALL NOT BE EXCEEDED PER CBC SECT 1006.4.

36. EMERGENCY RESPONDER SAFETY FEATURES PER 2019 CBC SECT 914 AND 915: EXTERIOR AND INTERIOR ACCESS TO VERTICAL SHAFTS OR HOISTWAYS SHALL BE IDENTIFIED WITH THE WORD 'SHAFTWAY' IN RED LETTERS, 6 INCHES HIGH, ON A WHITE BACKGROUND, PLACED SO AS TO BE READILY DISCERNIBLE, UNLESS THE OPENING IS READILY DISCERNIBLE BY THE CONSTRUCTION OR ARRANGEMENT OF THE OPENING. FIRE EQUIPMENT ROOMS SHALL BE IDENTIFIED FOR THE USE OF THE FIRE DEPARTMENT (CONTROL, SPRINKLER RISER, VALVE ROOMS, ETC) APPROVED SIGNS SHALL BE CONSTRUCTED OF DURABLE MATERIALS, PERMANENTLY INSTALLED AND READILY VISIBLE. ENERGENCY RESPONDER RADIO COVERAGE SHALL BE PROVIDED IN ALL NEW BUILDINGS IN ACCORDANCE WITH SECT 510 OF THE 2017 CFC.

ENERGY

1. THE BUILDING SHALL MEET THE REQUIREMENTS OF 2019 CALIFORNIA ENERGY CODE: TITLE 24, CEC, PART 6, SUBCH. 1 THROUGH 6 FOR COMMERCIAL OCCUPANCIES.
2. INSULATION INSTALLER SHALL POST IN A CONSPICUOUS LOCATION IN THE BUILDING A CERTIFICATE SIGNED BY THE BUILDER AND INSTALLER STATING THAT THE INSTALLATION CONFORMS WITH THE REQUIREMENTS OF TITLE 24, PART 6, SUBCH.2. SECT. 118 AND THAT THE MATERIALS INSTALLED CONFORM WITH THE REQUIREMENTS OF TITLE 20, CHAPTER 2, SUBCHAPTER 4, ARTICLE 3.
3. ALL INSULATION MATERIALS SHALL BE INSTALLED AND CERTIFIED AS PER 2017 CEC SECT 118. INSULATION SHALL BE FREE OF UREA-FORMALDEHYDE. CONCRETE SLAB FLOORS SHALL BE INSULATED PER SECT 118, (G) AND OTHER APPLICABLE SECTIONS.
4. DOORS AND WINDOWS BETWEEN CONDITIONED AND OUTSIDE OF CONDITIONED SPACES SHALL BE FULLY WEATHER-STRIPPED.
5. MANUFACTURED DOORS AND WINDOWS SHALL BE CERTIFIED AND LABELED IN COMPLIANCE WITH THE APPROPRIATE INFILTRATION STANDARDS.
6. CAULK, GASKET, WEATHER-STRIP OR OTHERWISE SEAL PLUMBING AND ELECTRICAL PENETRATIONS, ALL WINDOW AND DOOR FRAMES, BETWEEN WALL SOLEPLATES AND FLOOR AND ALL OTHER OPENINGS IN THE BUILDING ENVELOPE THAT ARE POTENTIAL SOURCES OF AIR LEAKAGE.
7. DUCTS SHALL BE CONSTRUCTED, INSTALLED AND INSULATED PER UMC LATEST EDITION. ALL DUCTS SHALL BE WRAPPED TO PREVENT DUST FROM GETTING INSIDE PRIOR TO CLOSE UP.
8. ALL OPENINGS (DOORS AND WINDOWS) SHALL BE PROPERLY CERTIFIED, AND LABELED.
9. BACKDRAFT DAMPERS FOR ALL EXHAUST AND FAN SYSTEMS SHALL BE PROVIDED.
10. ALL STEAM AND STEAM CONDENSATE RETURN PIPING SHALL BE INSULATED AS REQUIRED BY THE PLUMBING DIVISION.
11. ROOFING PRODUCTS THERMAL EMITTANCE AND 3-YEAR AGED SOLAR REFLECTANCE SHALL BE CERTIFIED AND LABELED OR SHALL MEET DEFAULT VALUES AS SPECIFIED IN TITLE 24, CEC, PART 6, SUBCH. 2, SECT. 118, (h) (i) 1.
12. FOLLOW MANDATORY REQUIREMENTS FOR LIGHITNG CONTROL DEVICES, BALLASTS AND LUMINAIRES PER 2017 CEC SECT 119.

MISCELLANEOUS

1. PROVIDE ULTRA LOW FLOW WATER CLOSETS THROUGHOUT.
2. GLASS THICKNESS SHALL BE NOT LESS THAN THAT DETERMINED BY TABLE 2403.2.1 2017 CBC. ALL GLASS AND GLAZING SHALL MEET THE GUIDELINES AS OUTLINED IN CHAPTER 24 2017 CBC. GREATER REQUIREMENTS MAY BE APPLICABLE PER THESE CONSTRUCTION DOCUMENTS.
3. ALL GLASS DOORS SHALL HAVE FULLY TEMPERED GLASS AND ALL GLAZING WITHIN 18" OF A FLOOR SHALL BE TEMPERED.
4. GLAZING ADJACENT TO A DOOR AND WITHIN THE SAME WALL PLANE AS THE DOOR WHOSE NEAREST VERTICAL EDGE IS WITHIN 12 INCHES OF THE DOOR IN A CLOSED POSITION AND WHOSE BOTTOM EDGE IS LESS THAN 60" ABOVE THE FLOOR OR WALKING SURFACE SHALL BE TEMPERED. GLAZING IN FIXED PANELS WHICH HAVE A GLAZED AREA IN EXCESS OF 9 SQUARE FEET AND THE LOWEST EDGE IS LESS THAN 18" ABOVE THE FINISHED FLOOR LEVEL OR WALKING SURFACE WITHIN 36" OF SUCH GLAZING SHALL BE TEMPERED.
5. ACOUSTIC INSULATION SHALL BE CONTINUOUS AT ALL TOILET ROOMS AND PLUMBING WALLS.
6. THERMAL INSUL. SHALL MATCH THE VALUES STATED IN THE DRAWINGS & ENERGY CALCULATION REPORT & SHALL BE CONTINUOUS AT ALL EXTERIOR CAVITY WALLS & SOFFITS. ALL REQUIREMENTS OF TITLE 24 SHALL BE COMPLIED WITH.
7. PHONE OUTLETS SHALL BE PROVIDED PER DRAWINGS.
8. PROVIDE OUTLETS AS REQUIRED BY CODE WHETHER SHOWN ON THE PLANS OR NOT.
9. NEW EXTERIOR PLASTER WALLS: ALL TERMINAL EDGES OF PLASTER SHALL HAVE A PLASTER SCREED APPROPRIATE FOR THE GIVEN CONDITION, WHETHER INDICATED ON PLANS OR NOT.
10. ALL DOOR STRIKES WHETHER HEREIN SPECIFIED OR NOT SHALL HAVE TONGUES TO CLEAR ALL ADJACENT SURFACES SO THAT THE DOOR LATCH TOUCHES ONLY THE STRIKE WHEN OPENING AND CLOSING.
11. CONCRETE WATERPROOFING. ALL COLD JOINTS BETWEEN CONCRETE SLABS, WALLS AND/OR FOUNDATIONS AND OTHER CONDITIONS WITHIN 2" ABOVE FINISH GRADE AND BELOW THAT LEVEL SHALL HAVE A CONTINUOUS 2" WIDE STRIP (MINIMUM) OF SELF SEALING BENTONITE BY PARAMOUNT TECHNICAL PRODUCTS, INC. (PRODUCT NAME "PARASTOP").
12. ALL FLAT ROOFS, DECKS AND ANY SURFACES THAT THE SOLE METHOD OF WATER DRAINAGE IS VIA INTEGRAL DRAINS SHALL HAVE A MIN. 3" DIAMETER OVERFLOW SCUPPER LOCATED SUCH AND IN QUANTITY TO PREVENT PONDING AND/OR BUILD-UP COLLECTION OF WATER IN CASE OF CLOGGING AND/OR FAILURE OF INTEGRAL DRAINS. ALL AREAS THAT RELY ON SUCH SAID DRAINAGE SHALL BE FLASHED AND WATERPROOFED ABOVE THE HEIGHT OF THE OVERFLOW SCUPPER SO THAT THE SCUPPER MAY DRAIN EXCESS WATER WITHOUT WATER PENETRATION INTO THE INTERIOR OF THE STRUCTURE FORM THE AREAS THAT RELY ON THIS SYSTEM OF DRAINAGE. CONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLATION OF SCUPPERS WHETHER OR NOT THEY ARE SHOWN ON THESE PLANS.

GENERAL MATERIAL NOTES

CONCRETE

1. CONTRACTOR SHALL ASSUME THAT ALL CONCRETE STEPS OR STAIRS HAVE REINFORCEMENT OF: #4 NOSING & BOTTOM EACH RISER AND BOTTOM #6 BARS AT 12" O.C., MINIMUM. MORE STRINGENT REQUIREMENTS MAY OCCUR ELSEWHERE.
2. ALL CONC. SLABS SHALL HAVE 6"X6" MESH REINFORCING AT A MINIMUM. MORE STRINGENT REQUIREMENTS MAY OCCUR ELSEWHERE.
3. ALL CONC. SLABS SHALL HAVE CONTROL JT. & EXPANSION JT. SEE STRUCT. PLANS AND SPECS. PATTERN OF ALL JOINTS SHALL BE APPROVED BY ARCH.
4. CONCRETE FINISHES: SHOTCRETE (WHERE OCCURS): REBOUND MATERIAL SHALL BE CAREFULLY SWEPT OFF THE FINISHED SHOTCRETE SURFACE AND DISCARDED BEFORE IT BECOMES TOO HARD FOR REMOVAL. AFTER THE SHOTCRETE HAS BEEN PLACED TO THE DEPTH REQUIRED, THE SURFACE SHALL BE CHECKED WITH A STRAIGHTEDGE OR TEMPLATE AND ANY LOW SPOTS SHALL BE BROUGHT UP TO GRADE BY PLACING ADDITIONAL SHOTCRETE. SCREED AND FURTHER FINISH AS FOLLOWS: PLACE SHOTCRETE A FRACTION BEYOND THE GUIDE STRIPS, GROUND WIRES OR FORMS. ALLOW THE SURFACE OF THE SHOTCRETE TO STIFFEN TO THE POINT IT WILL NOT PULL OR CRACK UNDER SCREEDING OR TROWELING. TRIM, SLICE, OR SCRAPE EXCESS MATERIAL TO TRUE LINE AND GRADE AND REMOVE THE PLACING GUIDES. A NATURAL ROD FINISH SHALL CONSIST OF THE REMOVAL, BY FLOATING, OF THE IMPRESSIONS LEFT AFTER THE GUIDE STRIPS OR GROUND WIRES HAVE BEEN REMOVED. PROVIDE A FLOAT FINISH RESULTING FROM FLOATING THE NATURAL ROD FINISH WITH A WOOD OR RUBBER FLOAT. POURED-IN-PLACE EXPOSED CONCRETE WALLS (WHERE OCCURS): PROVIDE FORM-FACING PANELS THAT WILL PROVIDE CONTINUOUS, TRUE, AND SMOOTH CONCRETE SURFACES. FURNISH FORMS IN LARGEST PRACTICABLE SIZES TO MINIMIZE NUMBER OF JOINTS. FORMS SHALL BE EXTERIOR-GRADE PLYWOOD PANELS SUITABLE FOR CONCRETE FORMS, HIGH-DENSITY OVERLAY, CLASS I OR BETTER. FORMS FOR CYLINDRICAL COLUMNS SHALL BE METAL, GLASS-FIBER-REINFORCED PLASTIC, PAPER OR FIBER TUBES THAT WILL PRODUCE SURFACES NOT EXCEEDING SPECIFIED FORMWARK CLASS. PROVIDE UNITS WITH SUFFICIENT WALL THICKNESS TO RESIST PLASTIC CONCRETE LOADS WITHOUT DETRIMENTAL DEFORMATION. CHAMFER STRIPS SHALL BE WOOD, METAL OR RUBBER STRIPS, KERFED FOR EASE OF REMOVAL, THREE-QUARTER INCH X THREE-QUARTER INCH. THE FORM-RELEASE AGENT SHALL NOT BOND WITH OR STAIN OR ADVERSELY AFFECT CONCRETE SURFACES AND WILL NOT IMPAIR SUBSEQUENT TREATMENTS OF CONCRETE SURFACES. FORM TIES SHALL BE FACTORY-FABRICATED, REMOVABLE OR SNAP-OFF METAL OR GLASS-FIBER-REINFORCED PLASTIC FORM TIES DESIGNED TO RESIST LATERAL PRESSURE OF FRESH CONCRETE ON FORMS AND TO PREVENT SPALLING OF CONCRETE ON REMOVAL. FURNISH UNITS THAT WILL LEAVE NO CORRODIBLE METAL CLOSER THAN 1.5 INCHES TO THE PLANE OF EXPOSED CONCRETE SURFACE. TIES SHALL LEAVE HOLES NO LARGER THAN 1 INCH I DIAMETER. CONCRETE SLABS (EXPOSED, WHERE OCCURS): SHALL BE STABLE, FIRM AND SLIP RESISTANT. CONCRETE SHALL HAVE A HEAVY BROOM FINISH ON VEHICULAR DRIVES SLOPED OVER 10%. CONCRETE SHALL BE SLIP RESISTANT AT SLOPES EQUAL TO OR GREATER THAN 6% AND HAVE A MEDIUM SALTED FINISH WHERE SLOPE IS LESS THAN 6%.

INSULATION/ SEALANT/ THERMAL REQUIREMENTS

1. BATT INSULATION OF R-VALUE R-21 MIN. SHALL BE PROVIDED IN ALL EXTERIOR FRAME WALLS□:R-VALUE R-30 AT THE UNDERSIDE OF ROOF PLYWOOD SHEATHING, IF WOOD TRUSSES ARE UTILIZED FOR FLOOR OR ROOF STRUCTURE, PROVIDE BLOWN-IN INSULATION TO PROPERLY FILL ALL AIR GAPS.
2. INSULATION SHALL BE INSTALLED SO THAT BATTS ARE NOT COMPRESSED (CUT BATTS TO FIT AROUND ELECTRICAL AND PLUMBING IN WALL CAVITY). THERE SHALL BE NO GAPS OR VOIDS IN WALL CAVITY. EXTERIOR SHEATHING SHALL NOT BE VISIBLE THROUGH INSULATION MATERIAL.
3. PROVIDE ATTIC EAVE BAFFLES (WHEREVER SOFFIT VENTS ARE LOCATED) THAT EXTEND OVER THE TOP OF ATTIC INSULATION TO SERVE AS AN AIR BARRIER TO PREVENT WIND FROM MOVING INSULATION.
4. OMIT.
5. SKYLIGHT SHAFTS PROTRUDING THROUGH CEILING AND AN UNCONDITIONED SPACE SHALL BE INSULATED AND SHALL HAVE AN AIR BARRIER ON EXT. SIDE OF SHAFT WALL. THIS INSULATION SHALL BE CONTINUOUS WITH CLG/ROOF INSULATION.
6. PROVIDE WOOD BLOCKING OR SOLID AIR BARRIER AT THE INTERSECTION BETWEEN CONDITIONED SPACE AND AN EXTERIOR ROOF/SOFFIT SO THAT AIR CANNOT EASILY PASS THROUGH INSULATION FROM OUTSIDE TO INSIDE.
7. OMIT.
8. ALL DUCT SHAFTS, PIPING SHAFTS, FLUE SHAFTS & PENETRATIONS SHALL BE FULLY SEALED BETWEEN CONDITIONED & UNCONDITIONED SPACES. USE SOLID BLOCKING OR FLASHING & SEAL ANY REMAINING GAPS WITH CAULK OR FOAM.
9. ATTIC ACCESS PANELS (OR CEILING PANELS) SHALL BE FULLY GASKETED AND INSULATED (MIN R-5).
10. WHERE DROPPED CEILINGS OR SOFFITS OCCUR AT EXTERIOR WALLS, PROVIDE AN AIR BARRIER ALIGNED WITH FLR./ CLG. INSULATION AND EXT. WALL INSULATION.

WOOD FRAMING REQUIREMENTS/WHERE OCCURS

1. ALL NEW EXTERIOR WALL, FLOOR, AND ROOF FRAMING SHALL BE FSC CERTIFIED.
2. PROVIDE SILL SEAL (BY DOW OR EQUAL) BELOW BOTTOM PLATE OF ALL EXT. WALLS.
3. PRESERVATIVE-TREATED WOOD DUE TO HIGH PROBABILITY OF TERMITE INFESTATION.
4. STUD WALLS SHALL BEAR ON A 2" THICK OR LARGER BOTTOM PLATE (ACTUAL 1 1/2" THICK) OF A WIDTH AT LEAST EQUAL TO THE WIDTH OF THE STUDS. STUDS SHALL BE MIN. 16" O.C.
5. PROVIDE DRAFTSTOPPING AND FIREBLOCKING AS REQUIRED BY 2017 CBC SECTION 717 FOR CONCEALED SPACES.
6. NON-BEARING WALLS AND PARTITIONS SHALL HAVE NO LESS THAN A SINGLE TOP PLATE INSTALLED TO PROVIDE OVERLAPPING AT CORNERS AND AT INTERSECTIONS W/ OTHER WALLS AND PARTITIONS.
7. STUD WALLS SHALL BE BRACED PER 2017 CBC 2308.9.3.
8. ALL OPENINGS IN INTERIOR PARTITIONS SHALL HAVE HEADERS PER 2017 CBC SECT 2308.9.6 AND 2308.9.7.
9. PIPES IN WALL SHALL MEET 2017 CBC, 2308.9.8.

WOOD SHEATHING REQUIREMENTS / WHERE OCCURS

1. ALL WALL SHEATHING SHALL EITHER HAVE FSC CERTIFICATION OR A RECYCLED CONTENT (AT LEAST 25% POST-CONSUMER OR 50% E-CONSUMER/ POST-INDUSTRIAL).

METAL STUD FRAMING/WHERE OCCURS

1. ALL PARTITION FRAMING SHALL REFER TO THE WALL TYPES ON THE ARCHITECTURAL DRAWINGS.
2. ALL TOP & BOTTOM TRACK DETAILS AT NON-LOAD BEARING PARTITIONS SHALL REFER TO ARCH. DWGS.
3. WEB STIFFENER IS REQUIRED AT ALL SUPPORTS, UNLESS OTHERWISE NOTED.
4. USE DOUBLE JOISTS UNDER WALLS OR PARTITIONS PARALLEL TO JOISTS. USE SOLID BLOCKING UNDER PARTITIONS PERPENDICULAR TO JOISTS PER PLANS.
5. ALL TRACKS AND RUNNERS TO BE 18 GA DEEP LEG TRACK BY 'CEMCO'. SEE NOTE 3.
6. WALL TRACKS SHALL NOT BE USED TO SUPPORT ANY LOADS.
7. PROVIDE SOLID BLOCKING OR BRIDGING AT WALLS PER MANUFACTURERS RECOMMENDATIONS.
8. APPLY BRIDGING AT FLOOR JOISTS PER MANUFACTURER RECOMMENDATIONS.
9. ALL STUDS AND JOISTS ARE TO BE GALVANIZED.
10. AXIALLY LOADED STUD WALLS SHALL BE INSTALLED SEATED SQUARELY AGAINST THE WEB PORTION OF THE TOP AND BOTTOM TRACKS.
11. ALL DOOR JAMBS TO HAVE TRACK STIFFENER PER AND MANUFACTURER RECOMMENDATIONS.
12. END BLOCKING SHALL BE PROVIDED WHERE JOIST ENDS ARE NOT OTHERWISE RESTRAINED FROM ROTATION.
13. SCREW SPACING AND EDGE DISTANCE SHALL NOT BE LESS THAN 1.5 X DIAMETER OF THE SCREW.
14. THE CONTRACTOR IS TO PROVIDE ALL ACCESSORIES INCLUDING BUT NOT NECESSARILY LIMITED TO TRACKS, CLIPS, WEB STIFFENERS, ANCHORS, FASTENING DEVICES, RESILIENT CLIPS, AND OTHER ACCESSORIES REQUIRED FOR A COMPLETE AND PROPER INSTALLATION AS RECOMMENDED BY THE MANUFACTURER.
15. FASTENING OF COMPONENTS SHALL BE WITH SELF DRILLING SCREWS OR WELDING PER STRUCTURAL OR ARCHITECTURAL DETAILS UNLESS OTHERWISE APPROVED BY THE ENGINEER OF RECORD.
16. ALL NAILS ARE TO BE 'COMMON' UNLESS OTHERWISE NOTED.

WELDING

1. SHALL BE PERFORMED BY CERTIFIED OPERATORS UNDER CONTINUOUS INSPECTION OF A DEPUTY REGISTERED INSPECTOR.

SHEET METAL

1. AT FASCIAS AND WALL PANELS SHEET METAL SHALL BE GALVANIZED, BONDERIZED, OR PAINTED, AND 20 GA. MIN. UNLESS OTHERWISE NOTED. 'GSM', WHERE CALLED OUT ON PLANS/ELEVATIONS, SHALL MEAN GALVANIZED SHEET METAL THAT IS CONCEALED OR EXPOSED PAINTED BONDERIZED SHEET METAL. (AT ALL LOCATIONS WHERE GSM IS EXPOSED OR PAINTED THE GSM SHALL BE BONDERIZED META LOR ZINC ALLOY) SEE ELEVATIONS.

INTERIOR GYPSUM BOARD

1. SHALL BE "TYPE "X" 5/8" THICKNESS IN ALL AREAS. U.N.O., TAPED AND FINISHED SMOOTH FOR WALL PAINT. ALL GYPSUM BOARD SHALL BE INSTALLED USING FLATHEAD DRYWALL SCREWS ONLY.
2. WHERE A FIRE DAMPER OR MECHANICAL OR PLUMBING EQUIPMENT REQUIRING ACCESS OCCURS, CONTRACTOR SHALL PROVIDE A GYP. BRD. ACCESS PANEL THAT IS 2'-0" X 2'-0".

METAL SUSPENSION SYSTEMS FOR LAY IN PANEL CEILINGS

1. 12 GA. (MIN.) HANGER WIRES MAY BE USED FOR UP TO AND INCLUDING 4'-0" X 4'-0" GRID SPACING AND SHALL BE ATTACHED TO MAIN RUNNERS.
2. PROVIDE 12 GA. HANGER WIRES AT ENDS OF ALL MAIN AND CROSS RUNNERS WITHIN EIGHT INCHES (8") OF THE SUPPORT OR WITHIN ONE-FOURTH (1/4) OF THE END TEE, WHICHEVER IS LEAST, FOR THE PERIMETER OF THE CEILING AREA.
3. PROVIDE TRAPEZE OR OTHER SUPPLEMENTARY SUPPORT MEMBERS AT OBSTRUCTIONS TO TYPICAL HANGER SPACING. PROVIDE ADDITIONAL HANGERS, STRUTS OR BRACES AS REQUIRED AT ALL CEILING BREAKS, SOFFITS OR DISCONTINUOUS AREAS. HANGER WIRES THAT ARE MORE THAN 1 IN 6 OUT OF PLUMB ARE TO HAVE COUNTER-SLOPING WIRES.
4. CEILING GRID MEMBERS MAY BE ATTACHED TO NOT MORE THAN TWO (2) ADJACENT WALLS. CEILING GRID MEMBERS SHALL BE AT LEAST 1/2" FREE OF OTHER WALLS. IF WALLS RUN DIAGONALLY TO CEILING GRID SYSTEM RUNNERS, ONE END OF MAIN AND CROSS RUNNERS SHOULD BE FREE, AND A MINIMUM OF 1/2" CLEAR OF WALL.
5. AT THE PERIMETER OF THE CEILING AREA WHERE MAIN OR CROSS RUNNERS ARE NOT CONNECTED TO THE ADJACENT WALL, PROVIDE INTERCONNECTION BETWEEN THE RUNNERS AT THE FREE END TO PREVENT LATERAL SPREADING. A METAL STRUT OR A 16 GA. WIRE WITH A POSITIVE MECHANICAL CONNECTION TO THE RUNNER MAY BE USED. WHERE THE PERPENDICULAR DISTANCE FROM THE WALL TO THE FIRST PARALLEL RUNNER IS 12" OR LESS, THIS INTERLOCK IS NOT REQUIRED.
6. PROVIDE BRACING ASSEMBLIES CONSISTING OF A COMPRESSION STRUT AND FOUR (4) 12 GA. SPLAYED BRACING WIRES ORIENTED 90 DEGREES FROM EACH OTHER AT THE FOLLOWING SPACING:
   A) FOR SCHOOL BUILDINGS, PLACE BRACING ASSEMBLIES AT A SPACING NOT MORE THAN 12' BY 12' ON CENTER.
   B) FOR ESSENTIAL SERVICES BUILDINGS, PLACE BRACING ASSEMBLIES NOT MORE THAN 8' BY 12' ON CENTER.
   C) PROVIDE BRACING ASSEMBLIES AT LOCATIONS NOT MORE THAN HALF (1/2) THE SPACINGS GIVEN ABOVE, FROM EACH PERIMETER WALL AND AT THE EDGE OF VERTICAL CEILING OFFSETS. THE SLOPE OF THESE WIRES SHALL NOT EXCEED 45 DEGREES FROM THE PLANE OF THE CEILING AND SHALL BE TAUT. SPLICES IN BRACING WIRES ARE NOT TO BE PERMITTED WITHOUT SPECIAL DSA APPROVAL.
   D) SUSPENDED ACOUSTICAL CEILING SYSTEMS WITH A CEILING AREA OF 144 SQUARE FEET OR LESS, AND FIRE RATED SUSPENDED ACOUSTICAL CEILING SYSTEMS WITH A CEILING AREA OF 96 SQUARE FEET OR LESS, SURROUNDED BY WALLS WHICH CONNECT DIRECTLY TO THE STRUCTURE ABOVE, DO NOT REQUIRE BRACING ASSEMBLIES WHEN ATTACHED TO TWO ADJACENT WALLS.
7. FASTEN HANGER WIRES WITH NOT LESS THAN THREE (3) TIGHT TURNS. FASTEN BRACING WIRES WITH FOUR (4) TIGHT TURNS. MAKE ALL TIGHT TURNS WITHIN A DISTANCE OF 1 1/2" INCHES. HANGER OR BRACING WIRE ANCHORS TO THE STRUCTURE SHOULD BE INSTALLED IN SUCH A MANNER THAT THE DIRECTION OF THE WIRE ALIGNS AS CLOSELY AS POSSIBLE WITH THE DIRECTION OF THE FORCES ACTING ON THE WIRE.
   □ NOTE: WIRE TURNS MADE BY MACHINE WHERE BOTH STRANDS HAVE BEEN DEFORMED OR BENT IN WRAPPING CAN WAIVE THE 1 1/2" REQUIREMENT,BUT THE NUMBER OF TURNS SHOULD BE MAINTAINED, AND BE AS TIGHT AS POSSIBLE.
8. SEPERATE ALL CEILING HANGING AND BRACING WIRES AT LEAST SIX INCHES (6") FROM ALL UNBRACED DUCTS, PIPES, CONDUIT, ETC. IT IS ACCEPTABLE TO ATTACH LIGHTWEIGHT ITEMS, SUCH AS SINGLE ELECTRICAL CONDUIT NOT EXCEEDING 3/4" NOMINAL DIAMETER.
9. WHEN DRILLED-IN CONCRETE ANCHORS OR SHOT-IN ANCHORS ARE USED IN REINFORCED CONCRETE FOR HANGER WIRES, 1 OUT OF 10 MUST BE FIELD TESTED FOR 200LBS IN TENSION. WHEN DRILLED-IN CONCRETE ANCHORS ARE USED FOR BRACING WIRES, 1 OUT OF 2 MUST BE FIELD TESTED FOR 440 LBS. IN TENSION. SHOT -IN ANCHORS IN CONCRETE ARE NOT PERMITTED FOR BRACING WIRES.
10. ATTACH ALL LIGHT FIXTURES AND CEILING MOUNTED AIR TERMINALS OR SERVICES, TO THE CEILING GRID RUNNERS TO RESIST A HORIZONTAL FORCE EQUAL TO THE WEIGHT OF THE FIXTURES. SCREWS OR APPROVED FASTENERS ARE REQUIRED.
11. FLUSH OR RECESSED LIGHT FIXTURES AND AIR TERMINALS OR SERVICES, WEIGHING LESS THAN 56 LBS., MAY BE SUPPORTED DIRECTLY ON THE RUNNERS OF A HEAVY DUTY GRID SYSTEM BUT, IN ADDITION, THEY MUST HAVE A MINIMUM OF TWO 12 GA. SLACK SAFETY WIRES ATTACHED TO THE FIXTURE AT DIAGONAL CORNERS AND ANCHORED TO THE STRUCTURE ABOVE. ALL 4" X 4' LIGHT FIXTURES MUST HAVE SLACK SAFETY WIRES AT EACH CORNER. ALL FLUSH OR RECESSED LIGHT FIXTURES AND AIR TERMINALS OR SERVICES WEIGHING 56 LBS. OR MORE MUST BE INDEPENDENTLY SUPPORTED BY NOT LESS THAN FOUR (4) TAUT 12 GA. WIRES EACH ATTACHED TO THE FIXTURE AND TO THE STRUCTURE ABOVE REGARDLESS OF THE TYPE OF CEILING GRID SYSTEM USED.
    □ THE FOUR (4) TAUT 12 GA. WIRES INCLUDING THEIR ATTACHMENT TO THE STRUCTURE ABOVE MUST BE CAPABLE OF SUPPORTING FOUR (4) TIMES THE WEIGHT OF THE UNIT.
12. ALL FIXTURES AND AIR TERMINALS OR SERVICES SUPPORTED ON INTERMEDIATE DUTY GRID SYSTEMS MUST BE INDEPENDENTLY SUPPORTED BY NOT LESS THAN FOUR (4) TAUT 12 GA. WIRES EACH ATTACHED TO THE FIXTURE OR TERMINAL, AND TO THE STRUCTURE ABOVE.
13. SUPPORT SURFACE MOUNTED LIGHT FIXTURES BY AT LEAST TWO POSITIVE DEVICES WHICH SURROUND THE CEILING RUNNER AND WHICH ARE EACH SUPPORTED FROM THE STRUCTURE ABOVE BY A 12 GA. WIRE. SPRING CLIPS OR CLAMPS THAT CONNECT ONLY TO THE RUNNER ARE NOT ACCEPTABLE.
14. SUPPORT PENDANT MOUNTED LIGHT FIXTURES DIRECTLY FROM THE STRUCTURE ABOVE WITH HANGER WIRES OR CABLES PASSING THROUGH EACH PENDANT HANGER AND CAPABLE OF SUPPORTING FOUR (4) TIMES THE WEIGHT OF THE FIXTURE.

ADDITIONAL GENERAL REQUIREMENTS

1. THE CONSTRUCTION SHALL NOT RESTRICT A FIVE-FOOT CLEAR AND UNOBSTRUCTED ACCESS TO ANY WATER OR POWER DISTRIBUTION FACILITIES (POWER POLES, PULL-BOXES, TRANSFORMERS, VAULTS, PUMPS, VALVES, METERS, APPURTENANCES, ETC) OR TO THE LOCATION OF THE HOOK-UP. THE CONSTRUCTION SHALL NOT BE WITHIN TEN FEET OF ANY POWER LINES WHETHER OR NOT THE LINES ARE LOCATED ON THE PROPERTY. FAILURE TO COMPLY MAY CAUSE CONSTRUCTION DELAYS AND/OR ADDITIONAL EXPENSES.
2. OMIT.

3-4. OMIT.

5. FIRE RATED ASSEMBLIES SHALL BE PER TABLE 721.1(1), GENERIC ASSEMBLIES OF GYPSUM HANDBOOK, OR HAVE LARR APPROVAL OR ICC APPROVAL.
6. EXIT SIGNS SHALL BE INTERNALLY OR EXTERNALLY ILLUMINATED.
7. EXIT SIGNS ILLUMINATED BY AN EXTERNAL SOURCE SHALL HAVE AN INTENSITY OF NOT LESS THAN 5 FOOT CANDLES (54 LUX).
8. INTERNALLY ILLUMINATED SIGNS SHALL BE LISTED AND LABELED AND SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS AND SECTION 2702.
9. EXIT SIGNS SHALL BE ILLUMINATED AT ALL TIMES. (1011

STORM WATER POLLUTION CONTROL
(2020 Los Angeles Green Building Code)

FORM GRN 1

Storm Water Pollution Control Requirements for Construction Activities
Minimum Water Quality Protection Requirements for All Construction Projects

The following notes shall be incorporated in the approved set of construction/grading plans and represents the minimum standards of good housekeeping which must be implemented on all construction projects.

Construction means constructing, clearing, grading or excavation that result in soil disturbance. Construction includes structure teardown (demolition). It does not include routine maintenance to maintain original line and grade, hydraulic capacity, or original purpose of facility; emergency construction activities required to immediately protect public health and safety; interior remodeling with no outside exposure of construction material or construction waste to storm water; mechanical permit work; or sign permit work. (Order No. 01-182, NPDES Permit No. CAS004001 – Part 5: Definitions)

1. Eroded sediments and pollutants shall be retained on site and shall not be transported from the site via sheet flow, swales, area drains, natural drainage or wind.
2. Stockpiles of earth and other construction-related materials shall be covered and/or protected from being transported from the site by wind or water.
3. Fuels, oils, solvents and other toxic materials must be stored in accordance with their listing and shall not contaminate the soil nor the surface waters. All approved toxic storage containers are to be protected from the weather. Spills must be cleaned up immediately and disposed of properly and shall not be washed into the drainage system.
4. Non-storm water runoff from equipment and vehicle washing and any other activity shall be contained on the project site.
5. Excess or waste concrete may not be washed into the public way or any drainage system. Provisions shall be made to retain concrete waste on-site until it can be appropriately disposed of or recycled.
6. Trash and construction –related solid wastes must be deposited into a covered receptacle to prevent contamination of storm water and dispersal by wind.
7. Sediments and other materials shall not be tracked from the site by vehicle traffic. The construction entrance roadways must be stabilized so as to inhibit sediments from being deposited into the street/public ways. Accidental depositions must be swept up immediately and may not be washed down by rain or by any other means.
8. Retention basins of sufficient size shall be provided to retain storm water runoff on-site and shall be properly located to collect all tributary site runoff.
9. Where retention of storm water runoff on-site is not feasible due to site constraints, runoff may be conveyed to the street and the storm drain system provided that an approved filtering system is installed and maintained on-site during the construction duration.

As a covered entity under Title II of the Americans with Disabilities Act, the City of Los Angeles does not discriminate on the basis of disability and, upon request, will provide reasonable accommodation to ensure equal access to its programs, services and activities.

2020 Los Angeles Green Building Code

FORM GRN 18N

WATER CONSERVATION ORDINANCE NOTES
NON-RESIDENTIAL BUILDINGS

1. For new buildings or additions exceeding 50,000 ft^2, install a separate water meter or sub-meter for the following areas:
   A. For each individual leased, rented, or other tenant space within the building projected to consume more than 100 gpd (380 L/day).
   B. Where potable water is used for industrial/process uses, for water supplied to the following subsystems:
      a. Makeup water for cooling towers where flow through is greater than 500 gpm (30 L/s).
      b. Makeup water for evaporative coolers greater than 6 gpm (0.04 L/s).
      c. Steam and hot-water boilers with energy input more than 500,000 Btu/h (147 kW).
   C. For each building that uses more than 100 gpd on a parcel containing multiple buildings. (5.303.1.1)
2. Provide a 20% reduction in the overall potable water use for each building. The reduction shall be based on the maximum allowable water use per plumbing fixture and fittings as required by the Los Angeles Plumbing Code. New projects having a water supply of 2"or less and additions and alterations projects may use the prescriptive method outlined in this section. (5.303.2)
3. A water budget for landscape irrigation use that conforms to the California Department of Water Resources' Model Water Efficient Landscape Ordinance (MWELO) is required for new landscape areas of 500 sqft or more. The following methods to reduce potable water use in landscape areas include, but are not limited to, use of captured rainwater, recycled water, graywater, or water treated for irrigation purposes and conveyed by a water district or public entity. (5.304.1, 5.304.2)
4. New buildings on a site with 1,000 square feet or more of cumulative landscape area shall have separate meters or submeters for outdoor water use. (5.304.4)
5. Additions and alterations on a site with 1,000 square feet of cumulative landscape area which require water service upgrade shall have separate meters or submeters for outdoor water use. (5.304.4)
6. Locks shall be installed on all publicly accessible exterior faucets and hose bibs. (5.304.5)
7. Except as provided in this section, for sites with over 500 square feet of landscape area, alternate waste piping shall be installed to permit discharge from the clothes washer, bathtub, showers, and bathroom/restrooms wash basins to be used for a future graywater irrigation system. (5.305.1)
8. Except as provided in this section, where City-recycled water is available within 200 feet of the property line, water closets, urinals, floor drains, and process cooling and heating in the building shall be supplied from recycled water and shall be installed in accordance with the Los Angeles Plumbing Code. (5.305.2)
9. Cooling towers shall comply with one of the following:
   A. Shall have a minimum of 6 cycles of concentration (blowdown)
   B. A minimum of 50% of the makeup water supply to the cooling towers shall come from non-potable water sources, including treated backwash. (5.305.3)
10. Develop and construct a system for onsite reuse of the groundwater where groundwater is being extracted and discharged. Alternatively, the groundwater may be discharged to the sewer. (5.305.4)
11. Provide a hot water system complying with one of the following:
    A. The hot water system shall not allow more than 0.6 gallons of water to be delivered to any fixture before hot water arrives.
    B. Where a hot water recirculation or electric resistance heat trace wire system is installed, the branch from the recirculating loop or electric resistance heat trace wire to the fixture shall contain a maximum of 0.6 gallons. (Los Angeles Plumbing Code Section 610.4.1)

As a covered entity under Title II of the Americans with Disabilities Act, the City of Los Angeles does not discriminate on the basis of disability and, upon request, will provide reasonable accommodation to ensure equal access to its programs, services and activities.

Basis of Design (BOD) Compliance Form
2020 Los Angeles Green Building Code
and 2019 California Energy Code

FORM GRN 21

COMPLETE AND INCORPORATE THIS FORM INTO THE PLANS

Project Address: 18210 Sherman Way Permit Number: _____ - _____ - _____

ITEM #	BOD ITEMS	PAGE NUMBER IN BOD DOCUMENT
	HVAC SYSTEMS AND CONTROLS	
1	Narrative description of system (i.e. system type(s), location, control type, efficiency features, outdoor air ventilation strategy, indoor air quality features, noise reduction features, environmental benefits, other features)	1
2	Description of how the system meets requirements in OPR	1-2
3	Reasons for system selection, as opposed to alternatives (e.g. comfort performance, efficiency, reliability, cost, acoustics, etc.)	2
4	Load calculations (i.e. method/software, summer outdoor conditions, winter outdoor conditions, indoor design conditions, assumptions, other)	2
5	Sequence of Operations (i.e. operating schedules, setpoints, other)	2
	INDOOR LIGHTING SYSTEM	
6	Narrative Description of system (e.g. fixture type(s), lamp & ballast type, control type, etc.)	2-3
7	Description of how the system meets requirements in OPR	3-5
8	Reasons for system selection, as opposed to alternatives (e.g. visual comfort performance, efficiency, reliability, flexibility, simplicity, cost, etc.)	3
9	Lighting Design Criteria (i.e. space ID, space type, illumination design target, source of target, light calculation assumptions, other)	3-4
10	Lighting Power Design Target (i.e. space type, Title 24-Energy Code lighting power allowance, lighting power design target, other)	4-5
	WATER HEATING SYSTEM	
11	Narrative description of system (i.e. system type, location, control type, efficiency features, environmental benefits, other)	5
12	Description of how the system meets requirements in OPR	5
13	Reasons for system selection, as opposed to alternatives (e.g. performance, efficiency, reliability, space constraints, cost, ease of maintenance, other)	5
14	Water heating load calculations: sizing calculation method, assumptions, and results	5-6
	LANDSCAPE IRRIGATION SYSTEMS	
15	Narrative description of system (i.e. system type(s), location, control type, performance, efficiency, water savings, other)	7
16	Description of how the system meets requirements in OPR	7
17	Reasons for system selection, as opposed to alternatives (e.g. performance, efficiency, reliability, flexibility, cost, utility company incentives, other)	7
18	Landscape irrigation system calculations: sizing calculation method, assumptions, and results	7
	COVERED PROCESSES	
19	Narrative description of system (i.e. system type(s), location, control type, performance, efficiency, savings, other)	10-11
20	Description of how the system meets requirements in OPR	10
21	Reasons for system selection, as opposed to alternatives (e.g. performance, efficiency, reliability, flexibility, simplicity, expandability, cost, payback period, utility company incentives, owner preference, etc.)	10
22	Sequence of Operation (e.g. operating schedules, setpoints, storage capacity, etc...)	10
	RENEWABLE ENERGY SYSTEMS (IF ANY)	
23	Narrative description of system (i.e. system type(s), location, inverter type, control type, performance, efficiency, energy savings, payback period, other)	N/A
24	Description of how the system meets requirements listed in OPR	N/A
25	Reasons for system selection, as opposed to alternatives (e.g. performance, efficiency, reliability, flexibility, simplicity, expandability, cost, payback period, etc.)	N/A
26	Renewable energy system generation calculations: sizing calculation method, assumptions, and results	N/A
	WATER REUSE SYSTEM (IF ANY)	
27	Narrative description of system (i.e. system type(s), location, space requirements, equipment requirements, control type, performance, efficiency, potable water savings, payback period, other)	N/A
28	Description of how the system meets requirements in OPR	N/A
29	Reasons for system selection, as opposed to alternatives (e.g. performance, efficiency, reliability, flexibility, simplicity, cost, payback period, etc.)	N/A
30	Water reuse system calculations: sizing calculation method, assumptions, and results	N/A

Architect/Engineer/Designer Acknowledgement

I hereby acknowledge the Basis of Design (BOD) document has been completed and meets the Owner's Project Requirements (OPR).

	Name	License Number	Signature	Date
Architect of Record	Lawrence Scarpa	C21812		06/17/2021
Mechanical Designer	Robert Getter	M30752		6/18/21
Electrical Designer	Robert Getter	E21884		6/18/21
Plumbing Designer	Robert Getter	M30752		6/18/21
Landscape Architect	Hongjoo Kim	LA5087		06/21/2021
Renewable Energy System Designer				
Others (specify): Refrigeration System Designer of Record	Damin Estes	M27249		06/25/2021

As a covered entity under Title II of the Americans with Disabilities Act, the City of Los Angeles does not discriminate on the basis of disability and, upon request, will provide reasonable accommodation to ensure equal access to its programs, services and activities.

Basis of Design (BOD) Compliance Form
2020 Los Angeles Green Building Code
and 2019 California Energy Code

FORM GRN 21

Commissioning Agent Acknowledgement

I have reviewed the Basis of Design (BOD) and verified that it meets the Owner's Project Requirements (OPR):

Name: Bobby Almeida

Company Name (if applicable): Argento/Graham

Agent's Signature: _____ Date: 6/17/21

As a covered entity under Title II of the Americans with Disabilities Act, the City of Los Angeles does not discriminate on the basis of disability and, upon request, will provide reasonable accommodation to ensure equal access to its programs, services and activities.

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED

LICENSED ARCHITECT
LAWRENCE SCARPA
C 21812
REN 10/31/2023
STATE OF CALIFORNIA

BUREAU OF ENGINEERING
VERTICAL CONTROL:
HORIZONTAL CONTROL:
SHEET TITLE: GREEN BUILDING FORMS
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

DEPARTMENT OF PUBLIC WORKS
NO. | REVISIONS: | DATE: | BY:

CIP NO.

INDEX NO.

CITY OF LOS ANGELES
GARY LEE MOORE, P.E., ENV SP
DESIGN GROUP:
ENGINEER:
DESIGNED BY:
DRAWN BY:
CHECKED BY:
APPROVED BY:
CITY ENGINEER
DATE:

WORK ORDER NO.
E170121B

SHEET NAME
A0.12
SHEET X OF X SHEETS

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REVISION DATES (DESIGN STAGE ONLY)

Sheet Version 4.0

Z:\B□S ARCHITECTURE\019 JOBS\01935.0 CITY OF LA-RESEDA ICE HOCKEY ROLLER RINK\01935.0 1.CURRENT DRAWINGS_24X36\01935.0_A012_24X36.DWG 12/3/2021 9:06 AM

CITY OF LA DBS DEPARTMENT OF BUILDING AND SAFETY

2020 Los Angeles Green Building Code

FORM GRN 5

MANDATORY REQUIREMENTS CHECKLIST

NEWLY CONSTRUCTED NON-RESIDENTIAL BUILDINGS

(COMPLETE AND INCORPORATE THIS FORM INTO THE PLANS)

Permit # _____ - _____ - _____ Date: _____

ITEM #	CODE SECTION	REQUIREMENT	REFERENCE SHEET (Sheet # or N/A)	COMMENTS (e.g. note #, detail # or reason for N/A)
		PLANNING AND DESIGN		
1	5.106.1	**Storm water pollution prevention**	A0.12	GRN 1
2	5.106.4.1.1	**Short-term bicycle parking**	A1.00, A8.34	7 SPACES
3	5.106.4.1.2	**Long-term bicycle parking**	N/A	2 PARKING SPACES PROVIDED
4	5.106.5.2	**Designated parking**	A1.00	2 SPACES
5	5.106.5.3	**Electric vehicle charging**	A1.00, A8.34	1 SPACE
6	5.106.8	**Light pollution reduction**	A0.15	SEE NOTE
7	5.106.10	**Grading and paving**	A1.00	SITE PLAN
8	5.106.11	**Hardscape alternatives**	L0.00	HARDSCAPE CALCS.
		ENERGY EFFICIENCY		
9	5.211.1	**Solar ready buildings**	A1.20	MEMBRANE ROOF EXCLUDED FROM CALCS.
		WATER EFFICIENCY & CONSERVATION		
10	5.303.1.1	**New buildings in excess of 50,000 sq. ft.**	N/A	□50,000 SF
11	5.303.1.2	**Excess consumption**	A0.13	GRN 15 #2
12	5.303.2	**Water reduction**	A0.12	GRN 18N #2
13	5.303.3	**Water conserving plumbing fixtures and fittings**	A0.13	GRN 15 #3
14	5.303.3.3	**Showerheads**	A0.13	GRN 15 #4
15	5.304.1	**Outdoor water use in landscape areas**	L3.00	LANDSCAPE PLANS
16	5.304.3	**Irrigation controller and sensor application**	A0.13	GRN 15 #8
17	5.304.4	**Outdoor water use meters**	A0.12	GRN 18N #4
18	5.304.5	**Exterior faucets**	A0.12	GRN 18N #6
19	5.305.1	**Graywater ready**	A0.12	GRN 18N #7
20	5.305.2	**Recycled water supply to fixtures**	A0.12	GRN 18N #8
21	5.305.3	**Cooling towers**	A0.12	GRN 18N #9
22	5.305.4	**Groundwater discharge**	A0.12	GRN 18N #10
		MATERIAL CONSERVATION & RESOURCE EFFICIENCY		
23	5.407.1	**Weather protection**	A0.13	GRN 15 #7
24	5.407.2.1	**Sprinklers**	A0.13	GRN 15 #8
25	5.407.2.2.1	**Nonabsorbent floor and wall finishes**	A0.13	GRN 15 #10
26		**Exterior door protection**	A1.10, A4.00	4'-0" MIN.
27	5.407.2.2.2	**Flashing**	A0.13	GRN 15 #11
28	5.408.1	**Construction waste reduction**	A0.13	GRN 15 #12
29	5.408.3	**Excavated soil and land clearing debris**	A0.13	GRN 15 #13

As a covered entity under Title II of the Americans with Disabilities Act, the City of Los Angeles does not discriminate on the basis of disability and, upon request, will provide reasonable accommodation to ensure equal access to its programs, services and activities.

CITY OF LA DBS DEPARTMENT OF BUILDING AND SAFETY

2020 Los Angeles Green Building Code

FORM GRN 5

ITEM #	CODE SECTION	REQUIREMENT	REFERENCE SHEET (Sheet # or N/A)	COMMENTS (e.g. note #, detail # or reason for N/A)
30	5.410.1	**Recycling by occupants**	A1.00, A8.34	TRASH ENCLOSURE
31	5.410.2	**Commissioning (> 10,000 sq. ft.)**		
32	5.410.2.1	– **Owner's Project Requirements (OPR)**	A0.14	GRN 20
33	5.410.2.2	– **Basis of Design (BOD)**	A0.12	GRN 21
34	5.410.2.3	– **Commissioning plan**	A0.14	GRN 23
35	5.410.2.4	– **Functional performance testing**	A0.14	NOTE
36	5.410.2.5.1	– **Systems manual**	A0.14	NOTE
37	5.410.2.5.2	– **Systems operations training**	A0.14	NOTE
38	5.410.2.6	– **Commissioning report**	A0.14	NOTE
39	5.410.4	**Testing and adjusting (< 10,000 sq. ft.)**	N/A	□10,000 SF
40	5.410.4.2	– **Systems**		
41	5.410.4.3	– **Procedures**		
42	5.410.4.4	– **Reporting**		
43	5.410.4.5	– **Operation and maintenance manual**		
44	5.410.4.5.1	– **Inspections and reports**		
		ENVIRONMENTAL QUALITY		
45	5.503.1	**Fireplace and Woodstoves**	N/A	NO FP
46	5.504.1.3	**Temporary ventilation**	A0.13	GRN 15 #17
47	5.504.3	**Covering of duct openings and protection of mechanical equipment during construction**	A0.13	GRN 15 #18
48	5.504.4	**Finish material pollutant control**	A0.13	GRN 15 #19
49	5.504.4.1	– **Adhesives, sealants, and caulks**		
50	5.504.4.3	– **Paints and coatings**		
51	5.504.4.3.1	– **Aerosol paints and coatings**		
52	5.504.4.3.2	– **Verification**		GRN 15 #20
53	5.504.4.4	**Carpet systems**	N/A	GRN 15 #21
54	5.504.4.4.1	**Carpet cushion**	N/A	GRN 15 #22
55	5.504.4.5	**Composite wood products**	A0.13	GRN 15 #23
56	5.504.4.6	**Resilient flooring systems**	A0.13	GRN 15 #25
57	5.504.5.3	**Filters**	A0.13	GRN 15 #26
58	5.504.7	**Environmental tobacco smoke (ETS) control**	A0.13	GRN 15 #27
59	5.505.1	**Indoor moisture control**	A0.13	GRN 15 #28
60	5.506.2	**Carbon dioxide (CO_2) monitoring**	A0.13	GRN 15 #29
61	5.507.4.1	**Exterior noise transmission prescriptive method**	N/A	PROJECT EXEMPT,
62		– **Exterior noise transmission for roof**		SPORTS ARENA
63		– **Exterior noise transmission for walls**		
64		– **Exterior noise transmission for windows**		
65	5.507.4.2	**Exterior noise transmission performance method**	N/A	PROJECT EXEMPT,
66	5.507.4.3	**Interior sound transmission**	N/A	SPORTS ARENA

As a covered entity under Title II of the Americans with Disabilities Act, the City of Los Angeles does not discriminate on the basis of disability and, upon request, will provide reasonable accommodation to ensure equal access to its programs, services and activities.

CITY OF LA DBS DEPARTMENT OF BUILDING AND SAFETY

2020 Los Angeles Green Building Code

FORM GRN 5

ITEM #	CODE SECTION	REQUIREMENT	REFERENCE SHEET (Sheet # or N/A)	COMMENTS (e.g. note #, detail # or reason for N/A)
67	5.508.1	**Ozone depletion and greenhouse gas reductions**	A0.13	GRN 15 #30
68	5.508.2	**Supermarket refrigerant leak reduction**	A0.13	GRN 15 #31

As a covered entity under Title II of the Americans with Disabilities Act, the City of Los Angeles does not discriminate on the basis of disability and, upon request, will provide reasonable accommodation to ensure equal access to its programs, services and activities.

CITY OF LA DBS DEPARTMENT OF BUILDING AND SAFETY

2020 Los Angeles Green Building Code

FORM GRN 15

GREEN BUILDING CODE PLAN CHECK NOTES

NON-RESIDENTIAL BUILDINGS

1. State on plans that the outdoor lighting systems shall be designed and installed to comply with all of the following:
   a. The minimum requirements in California Energy Code for Lighting Zones 1-4
   b. Backlight, Uplight and Glare (BUG) ratings as defined in IESNA TM-15-11
   c. Allowable BUG ratings not exceeding those shown in on Table 5.106.8 (5.106.8)
2. Separate submeters shall be installed in any building or new space within a building that is projected to consume more than 1,000 gal/day. (5.303.1.2)
3. New plumbing fixtures and fittings shall not exceed the maximum allowable flow rate specified in Section 5.303.3. (5.303.3)
4. When a shower is served by more than one showerhead, the combined flow rate of all the showerheads and/or other shower outlets controlled by a single valve shall not exceed 2.0 gallons per minute at 80psi, or the shower shall be designed to only allow one showerhead to be in operation at a time. (5.303.3.3)
5. For projects that include landscape work, the *Landscape Certification*, Form GRN 12, shall be completed prior to final inspection approval. (State Assembly Bill No. 1881)
6. Installed automatic irrigation system controllers are weather- or soil-based controllers. (WMELO, § 492.7)
7. Weather-resistant exterior wall and foundation envelope shall be detailed in conformance with Los Angeles Building Code Section 1403.2 and California Energy Code Section 150. (5.407.1)
8. Automatic landscape irrigators shall be installed such that it doesn't spray on the structure. (5.407.2.1)
9. New exterior entries and openings subject to foot traffic shall be protected against water intrusion using features such as overhangs, awnings and/or recesses for a combined depth over the entry of at least 4 feet. (5.407.2.2.1)
10. Nonabsorbent interior floor and wall finishes shall be used within at least two feet around and perpendicular to new exterior entries and/or opening subject to foot traffic. (5.407.2.2.1)
11. Exterior entries shall have flashing integrated with the drainage plane. (5.407.2.2.2)
12. Only a City of Los Angeles certified hauler will be used for hauling of construction waste. (5.408.1)
13. 100% of excavated soil and vegetation resulting from land clearing shall be reused or recycled. (5.408.3)
14. A final report for the testing and adjusting of all new systems shall be completed and provided to the field inspector prior to final approval. This report shall be signed by the individual responsible for performing these services. (5.410.4.4)
15. For all new equipment, an *Operation & Systems Manual* shall be provided to the owner and the field inspector at the time of final inspection. (5.410.4.5)
16. All new gas fireplaces must be direct-vent, sealed combustion type. Wood burning fireplaces are prohibited per AQMD Rule 445. (5.503.1, AQMD Rule 445)
17. If the new HVAC system is used during construction, use return air filters with a MERV of 8. Replace all filters immediately prior to occupancy. (5.504.1.3)
18. All new ducts and other new related air distribution components openings shall be covered with tape, plastic, or sheet metal until the final startup of the heating, cooling and ventilating equipment. (5.504.3)
19. Architectural paints and coatings, adhesives, caulks and sealants shall comply with the Volatile Organic Compound (VOC) limits listed in Tables 5.504.4.1-5.504.4.3. (5.504.4.1- 5.504.4.3)
20. The *VOC Content Verification Checklist*, Form GRN 2, shall be completed and verified prior to final inspection approval. The manufacturer's specifications showing VOC content for all applicable products shall be readily available at the job site and be provided to the field inspector for verification. (5.504.4.3.2)
21. All new carpet installed in the building interior meets the testing and product requirements of one of the following:
    a. Carpet and Rug Institute's Green Label Plus Program
    b. California Department of Public Health's Specification 01350
    c. NSF/ANSI 140 at the Gold level
    d. Scientific Certifications Systems Indoor Advantage™ Gold (5.504.4.4)
22. All new carpet cushion installed in the building interior shall meet the requirements of the Carpet and Rug Institute Green Label program. (5.504.4.4.1)
23. New hardwood plywood, particle board, and medium density fiberboard composite wood products used in the interior or exterior of the building shall meet the formaldehyde limits. (5.504.4.5, 10.504.4.5)
24. The *Formaldehyde Emissions Verification Checklist*, Form GRN 3, shall be completed prior to final inspection approval. The manufacturer's specifications showing formaldehyde content for all applicable wood products shall be readily available at the job site and be provided to the field inspector for verification. (5.504.4.5)
25. 80% of the total area receiving new resilient flooring shall comply with one or more of the following:
    a. VOC emission limits defined in the CHPS High Performance Products Database
    b. Certified under UL GREENGUARD Gold
    c. Certification under the Resilient Floor Covering Institute (RFCI) FloorScore program
    d. Meet the California Department of Public Health's Specification 01350 (5.504.4.6)
26. Mechanically ventilated buildings shall have air filter with a Minimum Efficiency Reporting Value (MERV) of 13 or higher. Filters shall be installed prior to occupancy and recommendations for maintenance with filters of the same value shall be included in the operation and maintenance manual. (5.504.5.3)
27. Designated outdoor smoking area shall be at least 25 feet from an outdoor air intake or operable windows. (5.504.7)
28. Buildings shall meet or exceed the provisions of California Building Code, CCR, Title 24, Part 2 Sections 1202 (Ventilation) and Chapter 14 (Exterior Walls). For additional measures, see Section 5.407.2. (5.505.1)
29. Buildings that use Demand Control Ventilation shall have CO_2 sensors and ventilation controls installed in accordance with the requirements of the current edition of the California Energy Code, CCR, Title 24, Part 6, Section 121(c). (5.506.2)
30. The HVAC, refrigeration, and fire suppression equipment shall not contain CFC or Halons. (5.508.1.)
31. Retail food stores of 8,000 sq. ft. or more of conditioned area that hire a commercial refrigeration system with a global warming potential (GWP) of 150 or greater shall have leak reduction measures in accordance with LAGBC Section 5.508.2. Separate mechanical plan check is required. (5.508.2)

As a covered entity under Title II of the Americans with Disabilities Act, the City of Los Angeles does not discriminate on the basis of disability and, upon request, will provide reasonable accommodation to ensure equal access to its programs, services and activities.

CITY OF LA DBS DEPARTMENT OF BUILDING AND SAFETY

VOC AND FORMALDEHYDE LIMITS

2020 Los Angeles Green Building Code

(Incorporate this form into the plans)

FORM GRN 11

2020 Los Angeles Green Building Code Tables 4.504.1, 4.504.2, 4.504.3, 4.504.5, 5.504.4.1, 5.504.4.2, 5.504.4.3, 5.504.4.5

VOC CONTENT LIMITS FOR ARCHITECTURAL COATINGS [2,3]
Grams of VOC per Liter of Coating, Less Water and Less Exempt Compounds

COATING CATEGORY [2,3]	CURRENT LIMIT
Flat coatings	50
Nonflat coatings	50
Nonflat-high gloss coatings	50
Specialty Coatings	
Aluminum roof coatings	100
Basement specialty coatings	400
Bituminous roof coatings	50
Bituminous roof primers	350
Bond breakers	350
Concrete curing compounds	100
Concrete curing compounds, Roadways & Bridges	350
Concrete/masonry sealers	100
Driveway sealers	50
Dry fog coatings	50
Faux finishing coatings	
Clear Top Coat	100
Decorative Coatings	350
Glazes	350
Japan	350
Trowel Applied Coatings	50
Fire resistive coatings	150
Floor coatings	50
Form-release compounds	100
Graphic arts coatings (sign paints)	200
High temperature coatings	420
Industrial maintenance coatings	100
Low-solids coatings[1]	120
Magnesite cement coatings	450
Mastic texture coatings	100
Metallic pigmented coatings	150
Multicolor coatings	250
Pretreatment wash primers	420
Primers, sealers, and undercoaters	100
Reactive penetrating sealers	350
Recycled coatings	250
Roof coatings	50
Roof coatings, aluminum	100
Rust preventative coatings	100
Shellacs	
Clear	730
Opaque	550
Specialty primers, sealers and undercoaters	100
Stains	100
Stains, Interior	250
Stone consolidants	450
Swimming pool coatings	340
Traffic marking coatings	100
Tub and tile refinish coatings	420
Waterproofing membranes	100
Wood coatings	275
Wood preservatives	350
Zinc-rich primers	100

[1] Grams of VOC per liter of coating, including emitted and excluding exempt compounds.
[2] The specified limits remain in effect unless lower limits are listed in subsequent columns in the table.
[3] Some values in this table are derived from those specified by the California Air Resources Board, Architectural Coatings Suggested Control Measure, February 5, 2016. More information is available from the Air Resources Board.

FORMALDEHYDE LIMITS[1]:
Maximum Formaldehyde Emissions in Parts per Million

PRODUCT	CURRENT LIMIT
Hardwood plywood veneer core	0.05
Hardwood plywood composite core	0.05
Particleboard	0.09
Medium density fiberboard	0.11
Thin medium density fiberboard[2]	0.13

[1] Values in this table are derived from those specified by the California Air Resources Board, Air Toxic Control Measure for Composite Wood as last amended by the Board on July 19, 2007. For additional information, see California Code of Regulations, Title 17, Sections 93120 through 93120.12.
[2] Thin medium density fiberboard has a maximum thickness of 5/32 inches (4 mm).

SEALANT VOC LIMIT
Less Water and Less Exempt Compounds in Grams per Liter

SEALANTS	CURRENT VOC LIMIT
Architectural	50
Marine deck	760
Nonmembrane roof	300
Roadway	250
Single-ply roof membrane	450
Other	420
SEALANT PRIMERS	
Architectural	
Nonporous	250
Porous	775
Modified bituminous 500	500
Marine deck	760
Other	750

Note: For additional information regarding methods to measure the VOC content specified in this table, see South Coast Air Quality Management District Rule 1168.

ADHESIVE VOC LIMIT [1,2]
Less Water and Less Exempt Compounds in Grams per Liter

ARCHITECTURAL APPLICATIONS	CURRENT VOC LIMIT
Indoor carpet adhesives	50
Carpet pad adhesives	50
Outdoor carpet adhesives	150
Wood flooring adhesive	100
Rubber floor adhesives	60
Subfloor adhesives	50
Ceramic tile adhesives	65
VCT and asphalt tile adhesives	50
Drywall and panel adhesives	50
Cove base adhesives	50
Multipurpose construction adhesives	70
Structural glazing adhesives	100
Single-ply roof membrane adhesives	250
Other adhesives not specifically listed	50
SPECIALTY APPLICATIONS	
PVC welding	510
CPVC welding	490
ABS welding	325
Plastic cement welding	100
Adhesive primer for plastic	550
Contact adhesive	80
Special purpose contact adhesive	250
Structural wood member adhesive	140
Top and trim adhesive	250
SUBSTRATE SPECIFIC APPLICATIONS	
Metal to metal	30
Plastic foams	50
Porous material (except wood)	50
Wood	30
Fiberglass	80

[1] If this adhesive is used to bond dissimilar substrates together, the adhesive with the highest VOC content is allowed.
[2] For additional information regarding methods to measure the VOC content specified in this table, see South Coast Air Quality Management District Rule 1168, http://www.arb.ca.gov/DRDB/SC/CURHTML/R1168.PDF.

As a covered entity under Title II of the Americans with Disabilities Act, the City of Los Angeles does not discriminate on the basis of disability and, upon request, will provide reasonable accommodation to ensure equal access to its programs, services and activities.

CITY OF LA DBS DEPARTMENT OF BUILDING AND SAFETY

PLUMBING FIXTURE FLOW RATES

Non-Residential Occupancies

2020 Los Angeles Green Building Code

(Incorporate this form into the plans)

FORM GRN 17

SECTION 5.303.2
WATER REDUCTION FIXTURE FLOW RATES

FIXTURE TYPE	MAXIMUM ALLOWABLE FLOW RATE
Showerheads	1.8 gpm @ 80 psi
Lavatory faucets, residential	1.2 gpm @ 60 psi[1,3]
Lavatory Faucets, nonresidential	0.4 gpm @ 60 psi[1,3]
Kitchen faucets	1.5 gpm @ 60 psi[2,4,5]
Wash fountains	1.8 gpm for every 20 in. of rim space @60 psi
Metering faucets	0.2 gallons/cycle
Metering faucets for wash fountains	0.2 gpm for every 20 in. of rim space @ 60 psi
Gravity tank type water closets	1.28 gallons/flush[6]
Flushometer tank water closets	1.28 gallons/flush[6]
Flushometer valve water closets	1.28 gallons/flush[6]
Urinals	0.125 gallons/flush
Clothes Washers	ENERGY-STAR certified
Dishwashers	ENERGY-STAR certified

[1] Lavatory faucets shall not have a flow rate less than 0.8 gpm at 20 psi.
[2] Kitchen faucets may temporarily increase flow above the maximum rate, but not above 2.2gpm @ 60psi and must default to a maximum flow rate of 1.8 gpm @ 60psi.
[3] Where complying faucets are unavailable, aerators or other means may be used to achieve reduction.
[4] Kitchen faucets with a maximum 1.8 gpm flow rate may be installed in buildings that have water closets with a maximum flush rate of 1.06 gallons/flush installed throughout.
[5] This requirement does not apply to faucets in commercial kitchens.
[6] Includes single and dual flush water closets with an effective flush of 1.28 gallons or less.
Single Flush Toilets - The effective flush volume shall not exceed 1.28 gallons (4.8 liters). The effective flush volume is the average flush volume when tested in accordance with ASME A112.19.233.2.
Dual Flush Toilets - The effective flush volume shall not exceed 1.28 gallons (4.8 liters). The effective flush volume is defined as the composite, average flush volume of two reduced flushes and one full flush. Flush volumes will be tested in accordance with ASME A112.19.2 and ASME A112.19.14.

As a covered entity under Title II of the Americans with Disabilities Act, the City of Los Angeles does not discriminate on the basis of disability and, upon request, will provide reasonable accommodation to ensure equal access to its programs, services and activities.

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

LICENSED ARCHITECT
LAWRENCE SCARPA
C 21812
REN 10/31/2023
STATE OF CALIFORNIA

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED

BUREAU OF ENGINEERING
VERTICAL CONTROL:
HORIZONTAL CONTROL:
SHEET TITLE: GREEN BUILDING FORMS
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

DEPARTMENT OF PUBLIC WORKS
BY: DATE:
NO. REVISIONS:
CIP NO.
INDEX NO.

CITY OF LOS ANGELES
GARY LEE MOORE, P.E. ENV SP
DESIGN GROUP
CITY ENGINEER DATE:
ENGINEER:
DESIGNED BY:
DRAWN BY:
CHECKED BY:
APPROVED BY:

WORK ORDER NO.
E170121B

SHEET NAME
A0.13
SHEET X OF X SHEETS

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REVISION DATES (DESIGN STAGE ONLY)

Sheet Version 4.0

Z:\B□S ARCHITECTURE\019 JOBS\01935.0 CITY OF LA-RESEDA ICE HOCKEY ROLLER RINK\01935.0 1.CURRENT DRAWINGS_24X36\01935.0_A013_24X36.DWG 12/3/2021 9:06 AM

Commissioning Plan Compliance Form

FORM GRN 23

2020 Los Angeles Green Building Code
and 2019 California Energy Code

COMPLETE AND INCORPORATE THIS FORM INTO THE PLANS

Project Address: 18210 Sherman Way Permit Number: _____ - _____ - _____

ITEM #	COMMISSIONING PLAN ITEMS	PAGE NUMBER IN COMMISSIONING PLAN DOCUMENT
	GENERAL PROJECT INFORMATION	
1	Project name, owner, location, building type and building area	3
2	Definitions	3-5
3	Overall project commissioning schedule	16
4	Contact information for individual/company providing commissioning services	1
	COMMISSIONING GOALS	
5	Meeting the Los Angeles Green Building code and California Energy Code requirements for commissioning	6
6	Meeting OPR and BOD requirements	6
7	Carrying out requirements for commissioning activities as specified in plans and specifications	6
	SYSTEMS TO BE COMMISSIONED	
8	Explanation of the original design intent (refer to OPR and BOD documents)	7
9	Requirements for execution and documentation of installation, checkout and start up, including controls point-to-point checks and calibrations	7, 17-22
10	Equipment and systems to be tested*, functions and modes to be tested, conditions under which the test shall be performed, measurable criteria for acceptable performance, and example test forms	7, 17-22
	COMMISIONING TEAM INFORMATION	
11	List of all team members and contact information (i.e. owner, owner's representative, architect, engineers, designated commissioning representative, and (if available): general contractor, sub-contractors, vendors, and construction manager)	8
	COMMISSIONING PROCESS ACTIVITIES, SCHEDULES, AND RESPONSIBILITIES	
12	Prescribed commissioning process steps and activities to be accomplished by the Cx team throughout the design to occupancy	9-14
13	Roles and responsibilities for each member of the Cx team for each phase of the work (including who writes checklists and tests, who reviews and approves test forms, who directs tests, who executes tests, who documents tests results and who approves completed tests)	9-14
14	Required Cx deliverables, reports, forms, and verifications expected at each stage of the commissioning effort	9-14
15	Confirmation, development and approval process for the O&M manual, systems manual and the facility operator and maintenance staff training	12-14

At a minimum, the following systems shall be tested: HVAC & controls, indoor lighting system & controls, water heating system, landscape irrigation systems, covered processes, renewable energy systems, and water reuse systems.

Owner/Owner Representative Acknowledgement

The commissioning plan includes the items listed above and have been approved by the Owner or Owner Representative:

Name: David Wang ☐ Owner X Owner Representative

Company Name (if applicable): _____

Signature: _____ Date: 7/20/2021

As a covered entity under Title II of the Americans with Disabilities Act, the City of Los Angeles does not discriminate on the basis of disability and, upon request, will provide reasonable accommodation to ensure equal access to its programs, services and activities.

Owner's Project Requirements (OPR) Compliance Form

FORM GRN 20

2020 Los Angeles Green Building Code
and 2019 California Energy Code

COMPLETE AND INCORPORATE THIS FORM INTO THE PLANS

Project Address: 18210 Sherman Way Permit Number: _____ - _____ - _____

ITEM #	OPR ITEMS	PAGE NUMBER IN OPR DOCUMENT
	PROJECT PROGRAM	
1	General building information (size, stories, construction type, occupancy type and number)	1
2	Intended uses and schedules	1
3	Future expandability and flexibility of spaces	1
4	Quality and/or durability of materials and desired building lifespan	1
5	Budget or operation constraints	1
	ENVIRONMENTAL AND SUSTAINABILITY GOALS	
6	Level of compliance with the Los Angeles Green Building Code: Mandatory, Tier 1, or Tier 2	1
7	Specific environmental or sustainability goals (e.g. water efficiency, water reuse, CO_2 monitoring, xeriscaping, etc.)	1-2
	ENERGY EFFICIENCY GOALS	
8	Overall efficiency of building: meet California Energy Code or exceed by (%)	2
9	Lighting system efficiency: meet California Energy Code or exceed by (%)	2
10	HVAC equipment efficiency and characteristics	3
11	Other measures affecting energy efficiency desired by owner (e.g. building orientation, shading, envelope and fenestration, roof, renewable power, net-zero energy use, etc.)	3
	INDOOR ENVIRONMENTAL QUALITY REQUIREMENTS	
12	Lighting	3
13	Temperature and Humidity	3
14	Acoustics	3
15	Air quality, ventilation, and filtration	3-4
16	Desired adjustability of system controls	4
17	Accommodations for after-hours use	4
18	Other owner requirements (e.g. natural ventilation, daylight, views, etc.)	4
	EQUIPMENT AND SYSTEMS EXPECTATIONS	
19	Level of quality, reliability, equipment type, flexibility, maintenance, and complexity desired	4
20	Specific efficiency targets, desired technologies, or preferred manufacturers for building systems, acoustics and vibration	4
21	Degree of system integration, automation, and functionality for controls (i.e. load shedding, demand response, energy management)	4
	BUILDING OCCUPANT AND O&M PERSONNEL EXPECTATIONS	
22	Description of how the building will be operated and by whom	4
23	Level of training and orientation required to understand, operate and use the building systems for building operation and maintenance staff, as well as occupants	4
24	Building operation and maintenance staff location and capabilities	4
	COMMISSIONING AGENT INFORMATION	
25	Name of Commissioning Agency: Argento/Graham	
26	Address of Agency: 500 S Grand Suite 1180 Los Angeles, CA 90071	
27	Contact person(s) Name(s): Bobby Almeida	

Owner/Owner Representative Acknowledgement

Owner's Project Requirements (OPR). The expectations and requirements of the building appropriate to its phase shall be documented before the design phase of the project begins. The OPR includes the elements listed above and have been approved by the Owner or Owner Representative.

Name: David Wang ☐ Owner x Owner Representative

Company Name (if applicable): _____

Signature: _____ Date: 7/20/2021

As a covered entity under Title II of the Americans with Disabilities Act, the City of Los Angeles does not discriminate on the basis of disability and, upon request, will provide reasonable accommodation to ensure equal access to its programs, services and activities.

Commissioning Measures In Construction Documents

FORM GRN 22

2020 Los Angeles Green Building Code
and 2019 California Energy Code

COMPLETE AND INCORPORATE THIS FORM INTO THE PLANS

Project Address: 18210 Sherman Way Permit Number: _____ - _____ - _____

ITEM #	Commissioning Measures Items
1	Measures shown in the specifications and cross referenced
2	List of commissioned equipment and systems
3	Cx roles and responsibilities of all parties
4	Meeting requirements
5	Commissioning schedule management procedures
6	Procedures for addressing outstanding issues or non-compliance
7	Requirements for execution and documentation of installation and equipment start up
8	Specific testing requirements for each system type
9	Submittal review and approval requirements
10	Contents and approval process of the commissioning plan
11	Cx documentation and reporting requirements
12	Facility staff training requirements and verification procedures
13	O & M manual review and approval procedures
14	Systems manual development and approval procedures
15	Definitions

Commissioning Agent Acknowledgment

I have reviewed the applicable construction documents listed above and verified their compliance with the owner's project requirements, basis of design, and commissioning plan.

Name: Bobby Almeida

Company Name (if applicable): Argento/Graham

Agent's signature: _____ Date: 4/7/2021

As a covered entity under Title II of the Americans with Disabilities Act, the City of Los Angeles does not discriminate on the basis of disability and, upon request, will provide reasonable accommodation to ensure equal access to its programs, services and activities.

ADD'AL GRN PLAN CHECK COMMISSIONING NOTES:

AFTER FUNCTIONAL PERFORMANCE TESTS ARE CONCLUDED, FORM GRN 24 SHALL BE COMPLETED AND READILY AVAILABLE TO THE FIELD INSPECTOR PRIOR TO FINAL APPROVAL. (5.410.2.4)

ALL OPERATIONAL ASPECTS OF THE BUILDING SHALL BE DOCUMENTED WITHIN A SYSTEMS MANUAL. THIS SYSTEMS MANUAL SHALL BE DELIVERED TO THE OWNER OR REPRESENTATIVE. (5.410.2.5.1)

THE TRAINING FOR THE APPROPRIATE MAINTENANCE STAFF FOR EACH EQUIPMENT TYPE AND/OR SYSTEM SHALL BE DOCUMENTED IN THE COMMISSIONING REPORT. (5.410.2.5.2)

FORM GRN 25 SHALL BE COMPLETED AND READILY AVAILABLE TO THE FIELD INSPECTOR PRIOR TO FINAL APPROVAL.

A COMPLETE COMMISSIONING REPORT AND FORM GRN 26 (COMPLETED) SHALL BE PROVIDED TO THE OWNER OR REPRESENTATIVE AND WILL BE READILY AVAILABLE TO THE FIELD INSPECTOR PRIOR TO THE FINAL APPROVAL. (5.410.2.6. 5.410.4.4)

THE THIRD PARTY COMMISSIONING AGENT'S INFORMATION IS ON THE COVER SHEET AND HAS BEEN HIRED BY THE OWNER.

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REVISION DATES (DESIGN STAGE ONLY)

Sheet Version 4.0

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED

LICENSED ARCHITECT
LAWRENCE SCARPA
C 21812
REN 10/31/2023
STATE OF CALIFORNIA

BUREAU OF ENGINEERING
VERTICAL CONTROL:
HORIZONTAL CONTROL:
SHEET TITLE: GREEN BUILDING FORMS
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

DEPARTMENT OF PUBLIC WORKS
NO. REVISIONS: DATE: BY:
INDEX NO.

CITY OF LOS ANGELES
CITY ENGINEER
GARY LEE MOORE, P.E., ENV SP
DESIGN GROUP: DATE:
ENGINEER:
DESIGNED BY:
DRAWN BY:
CHECKED BY:
APPROVED BY:

CIP NO.

WORK ORDER NO.
E170121B

SHEET NAME
A0.14
SHEET X OF X SHEETS

Z:\B□S ARCHITECTURE\019 JOBS\01935.0 CITY OF LA-RESEDA ICE HOCKEY ROLLER RINK\01935.0 1.CURRENT DRAWINGS_24X36\01935.0_A014_24X36.DWG 12/3/2021 9:06 AM

2019 CALIFORNIA GREEN BUILDING STANDARDS CODE, CHAPTER 3 GREEN BUILDING MANDATORY REQUIREMENTS

SECTION 301 GENERAL

301.1 301.1 THIS BUILDING SHALL FOLLOW ALL NON - RESIDENTIAL GREEN BUILDING MANADTORY MEASURES AND ADDITIONAL CITY OF LOS ANGELES REQUIREMENTS. SEE SHEETS A0.12 - A0.17 FOR MORE INFORMATION. CITY OF LOS ANGELES REQUIREMENTS MAY BE MORE RESTRICTIVE.

SECTION 302 MIXED OCCUPANCY BUILDINGS

302.1 MIXED OCCUPANCY BUILDINGS: IN MIXED OCCUPANCY BUILDINGS, EACH PORTION OF A BUILDING SHALL COMPLY WITH THE SPECIFIC GREEN BUILDING MEASURES APPLICABLE TO EACH SPECIFIC OCCUPANCY.

NON-RESIDENTIAL MANDATORY MEASURES, CHAPTER 5

DIVISION 5.1 PLANNING AND DESIGN

5.101.1 SCOPE. THE PROVISIONS OF THIS CHAPTER OUTLINE PLANNING, DESIGN AND DEVELOPMENT METHODS THAT INCLUDE ENVIRONMENTALLY RESPONSIBLE SITE SELECTION, BUILDING DESIGN, BUILDING SITING AND DEVELOPMENT TO PROTECT, RESTORE AND ENHANCE THE ENVIRONMENTAL QUALITY OF THE SITE AND RESPECT THE INTEGRITY OF ADJACENT PROPERTIES.

SECTION 5.102 DEFINITIONS

5.102.1 DEFINITIONS. THE FOLLOWING TERMS ARE DEFINED IN CHAPTER 2.

CUTOFF LUMINAIRES

LOW-EMITTING AND FUEL-EFFICIENT VEHICLES

NEIGHBORHOOD ELECTRIC VEHICLE (NEV)

TENANT-OCCUPANTS

VANPOOL VEHICLE

ZEV

5.103 SITE SELECTION (RESERVED)

5.104 SITE PRESERVATION (RESERVED)

5.105 DECONSTRUCTION AND REUSE OF EXISTING STRUCTURES (RESERVED)

5.106 SITE DEVELOPMENT

5.106.1 STORM WATER POLLUTION PREVENTION FOR PROJECTS THAT DISTURB LESS THAN ONE ACRE OF LAND. NEWLY CONSTRUCTED PROJECTS AND ADDITIONS WHICH DISTURB LESS THAN ONE ACRE OF LAND, AND ARE NOT PART OF A LARGER COMMON PLAN OF DEVELOPMENT OR SALE, SHALL PREVENT THE POLLUTION OF STORMWATER RUNOFF FROM THE CONSTRUCTION ACTIVITIES THROUGH ONE OR MORE OF THE FOLLOWING MEASURES:

5.106.1.1 LOCAL ORDINANCE. COMPLY WITH A LAWFULLY ENACTED STORM WATER MANAGEMENT AND/OR EROSION CONTROL ORDINANCE.

5.106.1.2 BEST MANAGEMENT PRACTICES (BMP'S). PREVENT THE LOSS OF SOIL THROUGH WIND OR WATER EROSION BY IMPLEMENTING AN EFFECTIVE COMBINATION OF EROSION AND SEDIMENT CONTROL AND GOOD HOUSEKEEPING BMP'S.

1. SOIL LOSS BMP'S THAT SHOULD BE CONSIDERED FOR IMPLEMENTATION AS APPROPRIATE FOR EACH PROJECT INCLUDE, BUT ARE NOT LIMITED TO, THE FOLLOWING:
   - A. SCHEDULING CONSTRUCTION ACTIVITY DURING DRY WEATHER, WHEN POSSIBLE.
   - B. PRESERVATION OF NATURAL FEATURES, VEGETATION, SOIL, AND BUFFERS AROUND SURFACE WATERS.
   - C. DRAINAGE SWALES OR LINED DITCHES TO CONTROL STORM WATER FLOW.
   - D. MULCHING OR HYDROSEEDING TO STABILIZE DIS-TURBED SOILS.
   - E. EROSION CONTROL TO PROTECT SLOPES.
   - F. PROTECTION OF STORM DRAIN INLETS (GRAVEL BAGS OR CATCH BASIN INSERTS).
   - G. PERIMETER SEDIMENT CONTROL (PERIMETER SILT FENCE, FIBER ROLLS).
   - H. SEDIMENT TRAP OR SEDIMENT BASIN TO RETAIN SEDIMENT ON SITE.
   - I. STABILIZED CONSTRUCTION EXITS.
   - J. WIND EROSION CONTROL.
   - K. OTHER SOIL LOSS BMP'S ACCEPTABLE TO THE ENFORCING AGENCY.
2. GOOD HOUSEKEEPING BMP'S TO MANAGE CONSTRUCTION EQUIPMENT, MATERIALS, NON-STORMWATER DISCHARGES, AND WASTES THAT SHOULD BE CONSIDERED FOR IMPLEMENTATION AS APPROPRIATE FOR EACH PROJECT INCLUDE, BUT ARE NOT LIMITED TO, THE FOLLOWING:
   - A. DEWATERING ACTIVITIES.
   - B. MATERIAL HANDLING AND WASTE MANAGEMENT.
   - C. BUILDING MATERIALS STOCKPILE MANAGEMENT.
   - D. MANAGEMENT OF WASHOUT AREAS (CONCRETE, PAINTS, STUCCO, ETC.).
   - E. CONTROL OF VEHICLE/EQUIPMENT FUELING TO CONTRACTOR'S STAGING AREA.
   - F. VEHICLE AND EQUIPMENT CLEANING PERFORMED OFF SITE.
   - G. SPILL PREVENTION AND CONTROL.
   - H. OTHER HOUSEKEEPING BMP'S ACCEPTABLE TO THE ENFORCING AGENCY.

5.106.2 STORM WATER POLLUTION PREVENTION FOR PROJECTS THAT DISTURB ONE OR MORE ACRES OF LAND. COMPLY WITH ALL LAWFULLY ENACTED STORM WATER DISCHARGE REGULATIONS FOR PROJECTS THAT (1) DISTURB ONE ACRE OR MORE OF LAND, OR (2) DISTURB LESS THAN ONE ACRE OF LAND BUT ARC PART OF A LARGER COMMON PLAN OF DEVELOPMENT OR SALE. NOTE: PROJECTS THAT (1) DISTURB ONE ACRE OR MORE OF LAND, OR (2) DISTURB LESS THAN ONE ACRE OF LAND, BUT ARE PART OF A LARGER COMMON PLAN OF DEVELOPMENT OR SALE MUST COMPLY WITH THE POSTCONSTRUCTION REQUIREMENTS DETAILED IN THE APPLICABLE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) GENERAL PERMIT FOR STORMWATER DISCHARGES ASSOCIATED WITH CONSTRUCTION AND LAND DISTURBANCE ACTIVITIES ISSUED BY THE STATE WATER RESOURCES CONTROL BOARD OR THE LAHONTAN REGIONAL WATER QUALITY CONTROL BOARD (FOR PROJECTS IN THE LAKE TAHOE HYDROLOGIC UNIT).
THE NPDES PERMITS REQUIRE POSTCONSTRUCTION RUNOFF (POST-PROJECT HYDROLOGY) TO MATCH THE PRECONSTRUCTION RUNOFF (PRE-PROJECT HYDROLOGY) WITH THE INSTALLATION OF POSTCONSTRUCTION STORM WATER MANAGEMENT MEASURES. THE NPDES PERMITS EMPHASIZE RUNOFF REDUCTION THROUGH ON-SITE STORMWATER USE, INTERCEPTION, EVAPOTRANSPIRATION, AND INFILTRATION THROUGH NONSTRUCTURAL CONTROLS, SUCH AS LOW IMPACT DEVELOPMENT (LID) PRACTICES, AND CONSERVATION DESIGN MEASURES. STORMWATER VOLUME THAT CANNOT BE ADDRESSED USING NONSTRUCTURAL PRACTICES IS REQUIRED TO BE CAPTURED IN STRUCTURAL PRACTICES AND BE APPROVED BY THE ENFORCING AGENCY.
REFER TO THE CURRENT APPLICABLE PERMITS ON THE STATE WATER RESOURCES CONTROL BOARD WEBSITE AT: WWW.WATERBOARDS.CA.GOV/CONSTRUCTION STORMWATER. CONSIDERATION TO THE STORMWATER RUNOFF MANAGEMENT MEASURES SHOULD BE GIVEN DURING THE INITIAL DESIGN PROCESS FOR APPROPRIATE INTEGRATION INTO SITE DEVELOPMENT.

5.106.4 BICYCLE PARKING. FOR BUILDINGS WITHIN THE AUTHORITY OF CALIFORNIA BUILDING STANDARDS COMMISSION AS SPECIFIED IN SECTION L 03, COMPLY WITH SECTION 5.106.4.1. FOR BUILDINGS WITHIN THE AUTHORITY OF THE DIVISION OF THE STATE ARCHITECT PURSUANT TO SECTION 105, COMPLY WITH SECTION 5.106.4.2.

5.106.4.1 BICYCLE PARKING. ∃SC-CG□COMPLY WITH SECTIONS 5.106.4.1.1 AND 5.106.4.1.2□OR MEET THE APPLICABLE LOCAL ORDINANCE, WHICHEVER IS STRICTER.

5.106.4.1.1 SHORT-TERM BICYCLE PARKING. IF THE NEW PROJECT OR AN ADDITION OR ALTERATION IS ANTICIPATED TO GENERATE VISITOR TRAFFIC, PROVIDE PERMANENTLY ANCHORED BICYCLE RACKS WITHIN 200 FEET OF THE VISITORS' ENTRANCE, READILY VISIBLE TO PASSERS-BY, FOR 5 PERCENT OF NEW VISITOR MOTORIZED VEHICLE PARKING SPACES BEING ADDED, WITH A MINIMUM OF ONE TWO-BIKE CAPACITY RACK.

EXCEPTION: ADDITIONS OR ALTERATIONS WHICH ADD NINE OR LESS VISITOR VEHICULAR PARKING SPACES.

5.106.4.1.2 LONG-TERM BICYCLE PARKING. FOR NEW BUILDINGS WITH TENANT SPACES THAT HAVE 10 OR MORE TENANT-OCCUPANTS, PROVIDE SECURE BICYCLE PARKING FOR 5 PERCENT OF THE TENANT-OCCUPANT VEHICULAR PARKING SPACES WITH A MINIMUM OF ONE BICYCLE PARKING FACILITY.

5.106.4.1.3. FOR ADDITIONS OR ALTERATIONS THAT ADD 10 OR MORE TENANT-OCCUPANT VEHICULAR PARKING SPACES, PROVIDE SECURE BICYCLE PARKING FOR 5 PERCENT OF THE TENANT VEHICULAR PARKING SPACES BEING ADDED, WITH A MINIMUM OF ONE BICYCLE PARKING FACILITY.

5.106.4.1.4. FOR NEW SHELL BUILDINGS IN PHASED PROJECTS PROVIDE SECURE BICYCLE PARKING FOR 5 PERCENT OF THE ANTICIPATED TENANT-OCCUPANT VEHICULAR PARKING SPACES WITH A MINIMUM OF ONE BICYCLE PARKING FACILITY.

5.106.4.1.5. ACCEPTABLE BICYCLE PARKING FACILITY FOR SECTIONS 5.106.4.1.2, 5.106.4.1.3, AND 5.106.4.1.4 SHALL BE CONVENIENT FROM THE STREET AND SHALL MEET ONE OF THE FOLLOWING:

1. COVERED, LOCKABLE ENCLOSURES WITH PERMANENTLY ANCHORED RACKS FOR BICYCLES□
2. LOCKABLE BICYCLE ROOMS WITH PERMANENTLY ANCHORED RACKS□OR
3. LOCKABLE, PERMANENTLY ANCHORED BICYCLE LOCKERS.

NOTE: ADDITIONAL INFORMATION ON RECOMMENDED BICYCLE ACCOMMODATIONS MAY BE OBTAINED FROM SACRAMENTO AREA BICYCLE ADVOCATES.

5.106.4.2 BICYCLE PARKING. ∃SA-SS□FOR PUBLIC SCHOOLS AND COMMUNITY COLLEGES: NOT APPLICABLE FOR THIS PROJECT.

5.106.5.2 DESIGNATED PARKING FOR CLEAN AIR VEHICLES. IN NEW PROJECTS OR ADDITIONS OR ALTERATIONS THAT ADD 10 OR MORE VEHICULAR PARKING SPACES, PROVIDE DESIGNATED PARKING FOR ANY COMBINATION OF LOW-EMITTING, FUEL-EFFICIENT AND CARPOOL/VAN POOL VEHICLES AS FOLLOWS:

PARKING SPACES

TABLE 5.106.5.2

TABLE 5.106.5.2

TOTAL NUMBER OF PARKING SPACES	NUMBER OF REQUIRED SPACES
0–9	0
10–25	3
26–50	6
51–75	9
76–100	12
101–150	18
151–200	21
201 and over	At least 12 percent of total[1]

1. Calculation for spaces shall be rounded up to the nearest whole number.

NOTE: DESIGNATED PARKING FOR CLEAN AIR VEHICLES SHALL COUNT TOWARD THE TOTAL PARKING SPACES REQUIRED BY THE LOCAL ENFORCING AGENCIES.

5.106.5.2.1 PARKING STALL MARKING. PAINT, IN THE PAINT USED FOR STALL STRIPING, THE FOLLOWING CHARACTERS SUCH THAT THE LOWER EDGE OF THE LAST WORD ALIGNS WITH THE END OF THE STALL STRIPING AND IS VISIBLE BENEATH A PARKED VEHICLE:

CLEAN AIR/ VANPOOL/EV

NOTE: VEHICLES BEARING CLEAN AIR VEHICLE STICKERS FROM EXPIRED HOV LANE PROGRAMS MAY BE CONSIDERED ELIGIBLE FOR DESIGNATED PARKING SPACES.

5.106.5.3 ELECTRIC VEHICLE (EV) CHARGING. .N□CONSTRUCTION SHALL COMPLY WITH SECTION 5.106.5.3.1 OR SECTION 5 .106.5.3 .2 TO FACILITATE FUTURE INSTALLATION OF ELECTRIC VEHICLE SUPPLY EQUIPMENT (EVSE). WHEN EVSE(S) IS/ARE INSTALLED, IT SHALL BE IN ACCORDANCE WITH THE CALIFORNIA BUILDING CODE, THE CALIFORNIA ELECTRICAL CODE AND AS FOLLOWS:

5.106.5.3.1 SINGLE CHARGING SPACE REQUIREMENTS. .N□WHEN ONLY A SINGLE CHARGING SPACE IS REQUIRED PER TABLE 5.106.5.3.3, A RACEWAY IS REQUIRED TO BE INSTALLED AT THE TIME OF CONSTRUCTION AND SHALL BE INSTALLED IN ACCORDANCE WITH THE CALIFORNIA ELECTRICAL CODE. CON-STRUCTION PLANS AND SPECIFICATIONS SHALL INCLUDE, BUT ARE NOT LIMITED TO, THE FOLLOWING:

1. THE TYPE AND LOCATION OF THE EVSE.
2. A LISTED RACEWAY CAPABLE OF ACCOMMODATING A 208/240-VOLT DEDICATED BRANCH CIRCUIT.
3. THE RACEWAY SHALL NOT BE LESS THAN TRADE SIZE 1."
4. THE RACEWAY SHALL ORIGINATE AT A SERVICE PANEL OR A SUBPANEL SERVING THE AREA, AND SHALL TERMINATE IN CLOSE PROXIMITY TO THE PROPOSED LOCATION OF THE CHARGING EQUIPMENT AND INTO A LISTED SUITABLE CAB-INET, BOX, ENCLOSURE OR EQUIVALENT.
5. THE SERVICE PANEL OR SUBPANEL SHALL HAVE SUFFI-CIENT CAPACITY TO ACCOMMODATE A MINIMUM 40- AMPERE DEDICATED BRANCH CIRCUIT FOR THE FUTURE INSTALLATION OF THE EVSE.

5.106.5.3.2 MULTIPLE CHARGING SPACE REQUIREMENTS. .N□WHEN MULTIPLE CHARGING SPACES ARE REQUIRED PER TABLE 5.106.5.3.3 RACEWAY(S) IS/ARE REQUIRED TO BE INSTALLED AT THE TIME OF CONSTRUCTION AND SHALL BE INSTALLED IN ACCORDANCE WITH THE CALIFORNIA ELECTRICAL CODE. CONSTRUCTION PLANS AND SPECIFICATIONS SHALL INCLUDE, BUT ARE NOT LIMITED TO, THE FOLLOWING:

1. THE TYPE AND LOCATION OF THE EVSE.
2. THE RACEWAY(S) SHALL ORIGINATE AT A SERVICE PANEL OR A SUBPANEL(S) SERVING THE AREA, AND SHALL TERMINATE IN CLOSE PROXIMITY TO THE PROPOSED LOCATION OF THE CHARGING EQUIPMENT AND INTO LISTED SUITABLE CABINET(S), BOX(ES), ENCLOSURE(S) OR EQUIVALENT.
3. PLAN DESIGN SHALL BE BASED UPON 40-AMPERE MINI-MUM BRANCH CIRCUITS.
4. ELECTRICAL CALCULATIONS SHALL SUBSTANTIATE THE DESIGN OF THE ELECTRICAL SYSTEM, TO INCLUDE THE RATING OF EQUIPMENT AND ANY ON-SITE DISTRIBUTION TRANSFORM-ERS AND HAVE SUFFICIENT CAPACITY TO SIMULTANEOUSLY CHARGE ALL REQUIRED EVS AT ITS FULL RATED AMPERAGE.
5. THE SERVICE PANEL OR SUBPANEL(S) SHALL HAVE SUFFI-CIENT CAPACITY TO ACCOMMODATE THE REQUIRED NUM-BER OF DEDICATED BRANCH CIRCUIT(S) FOR THE FUTURE INSTALLATION OF THE EVSE.

5.106.5.3.3 EV CHARGING SPACE CALCULATION. .N□TABLE 5.106.5.3.3 SHALL BE USED TO DETERMINE IF SINGLE OR MULTIPLE CHARGING SPACE REQUIREMENTS APPLY FOR THE FUTURE INSTALLATION OF EVSE.

EXCEPTIONS: ON A CASE-BY-CASE BASIS WHERE THE LOCAL ENFORCING AGENCY HAS DETERMINED EV CHARGING AND INFRASTRUCTURE IS NOT FEASIBLE BASED UPON ONE OR MORE OF THE FOLLOWING CONDITIONS:

1. WHERE THERE IS INSUFFICIENT ELECTRICAL SUPPLY.
2. WHERE THERE IS EVIDENCE SUITABLE TO THE LOCAL ENFORCING AGENCY SUBSTANTIATING THAT ADDITIONAL LOCAL UTILITY INFRASTRUCTURE DESIGN REQUIREMENTS, DIRECTLY RELATED TO THE IMPLEMENTATION OF SECTION 5.106.5.3, MAY ADVERSELY IMPACT THE CONSTRUCTION COST OF THE PROJECT.

TABLE 5.106.5.3.3

TABLE 5.106.5.3.3

TOTAL NUMBER OF ACTUAL PARKING SPACES	NUMBER OF REQUIRED EV CHARGING SPACES
0-9	0
10-25	2
26-50	4
51-75	7
76-100	9
101-150	13
151-200	18
201 and over	10 percent of total[1]

1. Calculation for spaces shall be rounded up to the nearest whole number.

5.106.3.4..N□ IDENTIFICATION. THE SERVICE PANEL OR SUBPANEL(S) CIRCUIT DIRECTORY SHALL IDENTIFY THE RESERVED OVERCURRENT PROTECTIVE DEVICE SPACE(S) FOR FUTURE EV CHARGING AS "EV CAPABLE". THE RACEWAY TERMINATION LOCATION SHALL BE PERMANENTLY AND VISIBLY MARKED AS "EV CAPABLE."

5.106.5.3.5 .N□ FUTURE CHARGING SPACES. FUTURE CHARGING SPACES QUALIFY AS DESIGNATED PARKING AS DESCRIBED IN SECTION 5.106.5 .2 DESIGNATED PARKING FOR CLEAN AIR VEHICLES. NOTE: FUTURE ELECTRIC VEHICLE CHARGING SPACES SHALL COUNT TOWARD THE TOTAL PARKING SPACES REQUIRED BY THE LOCAL ENFORCING AGENCIES.

5.106.8 LIGHT POLLUTION REDUCTION. .N□OUTDOOR LIGHTING SYSTEMS SHALL BE DESIGNED AND INSTALLED TO COMPLY WITH THE FOLLOWING:

1. THE MINIMUM REQUIREMENTS IN THE CALIFORNIA ENERGY CODE FOR LIGHTING ZONES 0-4 AS DEFINED IN CHAPTER 10, SECTION 10-114 OF THE CALIFORNIA ADMINISTRATIVE CODE□AND
2. BACKLIGHT (B) RATINGS AS DEFINED IN IES TM-15-11 (SHOWN IN TABLE A-1 IN CHAPTER 8)□UPLIGHT AND GLARE RATINGS AS DEFINED IN CALIFORNIA ENERGY CODE (SHOWN IN TABLES 130.2-A AND 130.2-B IN CHAPTER 8) AND
3. ALLOWABLE BUG RATINGS NOT EXCEEDING THOSE SHOWN IN TABLE 5.106.8 .N□OR COMPLY WITH A LOCAL ORDINANCE LAWFULLY ENACTED PURSUANT TO SECTION 101.7, WHICHEVER IS MORE STRINGENT.

EXCEPTIONS:

1. LUMINAIRES THAT QUALIFY AS EXCEPTIONS IN SECTIONS 130.2(B) AND 140.7 OF THE CALIFORNIA ENERGY CODE.
2. EMERGENCY LIGHTING.
3. BUILDING FACADE MEETING THE REQUIREMENTS IN TABLE 140.7-B OF THE CALIFORNIA ENERGY CODE, PART 6.
4. CUSTOM LIGHTING FEATURES AS ALLOWED BY THE LOCAL ENFORCING AGENCY, AS PERMITTED BY SECTION 101.8 ALTERNATE MATERIALS, DESIGNS AND METHODS OF CONSTRUCTION.
5. LUMINAIRES WITH LESS THAN 6,200 INITIAL LUMINAIRE LUMENS.

5.106.8.1 FACING - BACKLIGHT. LUMINAIRES WITHIN 2MH OF A PROPERTY LINE SHALL BE ORIENTED SO THAT THE NEAREST PROPERTY LINE IS BEHIND THE FIXTURE, AND SHALL COMPLY WITH THE BACKLIGHT RATING SPECIFIED IN TABLE 5.106.8 BASED ON THE LIGHTING ZONE AND DISTANCE TO THE NEAREST POINT OF THAT PROPERTY LINE.

EXCEPTION: CORNERS. IF TWO PROPERTY LINES (OR TWO SEGMENTS OF THE SAME PROPERTY LINE) HAVE EQUIDISTANT POINTS TO THE LUMINAIRE, THEN THE LUMINAIRE MAY BE ORIENTED SO THAT THE INTERSECTION OF THE TWO LINES (THE CORNER) IS DIRECTLY BEHIND THE LUMINAIRE. THE LUMINAIRE SHALL STILL USE THE DISTANCE TO THE NEAREST POINT(S) ON THE PROPERTY LINES TO DETERMINE THE REQUIRED BACKLIGHT RATING.

5.106.8.2 FACING - GLARE. FOR LUMINAIRES COVERED BY 5.106.8.1, IF A PROPERTY LINE ALSO EXISTS WITHIN OR EXTENDS INTO THE FRONT HEMISPHERE WITHIN 2MH OF THE LUMINAIRE THEN THE LUMINAIRE SHALL COMPLY WITH THE MORE STRINGENT GLARE RATING SPECIFIED IN TABLE 5.106.8 BASED ON THE LIGHTING ZONE AND DISTANCE TO THE NEAREST POINT ON THE NEAREST PROPERTY LINE WITHIN THE FRONT HEMISPHERE.

NOTES:

1. SEE ALSO CALIFORNIA BUILDING CODE, CHAPTER 12, SECTION 1205.7 FOR COLLEGE CAMPUS LIGHTING REQUIREMENTS FOR PARKING FACILITIES AND WALKWAYS.
2. REFER TO CHAPTER 8 (COMPLIANCE FORMS, WORKSHEETS AND REFERENCE MATERIAL) FOR IES TM-15-11 TABLE A-1, CALIFORNIA ENERGY CODE TABLES 130.2-A AND 130.2-B.
3. REFER TO THE CALIFORNIA ENERGY CODE FOR REQUIREMENTS FOR ADDITIONS AND ALTERATIONS.

5.106.10 GRADING AND PAVING. CONSTRUCTION PLANS SHALL INDICATE HOW SITE GRADING OR A DRAINAGE SYSTEM WILL MANAGE ALL SURFACE WATER FLOWS TO KEEP WATER FROM ENTERING BUILDINGS. EXAMPLES OF METHODS TO MANAGE SURFACE WATER INCLUDE, BUT ARE NOT LIMITED TO, THE FOLLOWING:

i SWALES

ii WATER COLLECTION AND DISPOSAL SYSTEMS.

iii FRENCH DRAINS.

iv WATER RETENTION GARDENS.

v OTHER WATER MEASURES WHICH KEEP SURFACE WATER AWAY FROM BUILDINGS AND AID IN FEOUNDWATER RECHARGE.

EXCEPTION: ADDITIONS AND ALTERATIONS NOT ALTERING THE DRAINAGE PATH.

5.106.12 SHADE TREES. ∃SA-SS□NOT APPLICABLE TO THIS PROJECT.

5.106.12.2 LANDSCAPE AREAS. SHADE TREE PLANTINGS, MINI-MUM NO. 10 CONTAINER SIZE OR EQUAL SHALL BE INSTALLED TO PROVIDE SHADE OF 20 PERCENT OF THE LANDSCAPE AREA WITHIN 15 YEARS.

EXCEPTION: PLAYFIELDS FOR ORGANIZED SPORT ACTIVITY ARE NOT INCLUDED IN THE TOTAL AREA CALCULATION.

5.106.12.3 HARDSCAPE AREAS. SHADE TREE PLANTINGS, MINIMUM NO. 10 CONTAINER SIZE OR EQUAL SHALL BE INSTALLED TO PROVIDE SHADE OVER 20 PERCENT OF THE HARDSCAPE AREA WITHIN 15 YEARS.

EXCEPTION: WALKS, HARDSCAPE AREAS COVERED BY SOLAR PHOTOVOLTAIC SHADE STRUCTURES, AND HARDSCAPE AREAS COVERED BY SHADE STRUCTURES WITH ROOFING MATERIALS THAT COMPLY WITH TABLE A5.106.11.2.2 IN APPENDIX A5, ARE NOT INCLUDED IN THE TOTAL AREA CALCULATION.

TABLE 5.106.8[N]

TABLE 5.106.8 [N]
MAXIMUM ALLOWABLE BACKLIGHT, UPLIGHT AND GLARE (BUG) RATINGS[1,2,3]

ALLOWABLE RATING	LIGHTING ZONE LZ0	LIGHTING ZONE LZ1	LIGHTING ZONE LZ2	LIGHTING ZONE LZ3	LIGHTING ZONE LZ4
Maximum Allowable Backlight Rating (B)					
Luminaire greater than 2 mounting heights (MH) from property line	N/A	No Limit	No Limit	No Limit	No Limit
Luminaire back hemisphere is 1 – 2 MH from property line	N/A	B2	B3	B4	B4
Luminaire back hemisphere is 0.5 – 1 MH from property line	N/A	B1	B2	B3	B3
Luminaire back hemisphere is less than 0.5 MH from property line	N/A	B0	B0	B1	B2
Maximum Allowable Uplight Rating (U)					
For area lighting[3]	N/A	U0	U0	U0	U0
For all other outdoor lighting, including decorative luminaires	N/A	U1	U2	U3	U4
Maximum Allowable Glare Rating (G)					
Luminaire greater than 2 MH from property line	N/A	G1	G2	G3	G4
Luminaire front hemisphere is 1 – 2 MH from property line	N/A	G0	G1	G1	G2
Luminaire front hemisphere is 0.5 – 1 MH from property line	N/A	G0	G0	G1	G1
Luminaire front hemisphere is less than 0.5 MH from property line	N/A	G0	G0	G0	G1

1. IESNA Lighting Zones 0 are not applicable; refer to Lighting Zones as defined in the *California Energy Code* and Chapter 10 of the *California Administrative Code*.
2. For property lines that abut public walkways, bikeways, plazas and parking lots, the property line may be considered to be 5 feet beyond the actual property line for purpose of determining compliance with this section. For property lines that abut public roadways and public transit corridors, the property line may be considered to be the centerline of the public roadway or public transit corridor for the purpose of determining compliance with this section.
3. General lighting luminaires in areas such as outdoor parking, sales or storage lots shall meet these reduced ratings. Decorative luminaires located in these areas shall meet *U*-value limits for "all other outdoor lighting."

DIVISION 5.2 - ENERGY EFFICIENCY

SECTION 5.301 GENERAL

5.201.1 SCOPE. CALIFORNIA ENERGY CODE. FOR THE PURPOSES OF MANDATORY ENERGY EFFICIENCY STANDARDS IN THIS CODE, THE CALIFORNIA ENERGY COMMISSION WILL CONTINUE TO ADOPT MANDATORY BUILDING STANDARDS.

DIVISION 5.3- WATER EFFICIENCY AND CONSERVATION

SECTION 5.301 GENERAL

5.301.1 SCOPE. THE PROVISIONS OF THIS CHAPTER SHALL ESTABLISH THE MEANS OF CONSERVING WATER USED INDOORS, OUTDOORS AND IN WASTEWATER CONVEYANCE

SECTION 5.302 DEFINITIONS

5.302.1 DEFINITIONS. THE FOLLOWING TERMS ARE DEFINED M CHAPTER 2.

EV APOTRANSPIRA TION ADJUSTMENT FACTOR (ET AF). (DSA-SS)

FOOTPRINT AREA (DSA-SS)

GRAYWATER.

METERING FAUCET.

MODEL WATER EFFICIENT LANDSCAPE

ORDINANCE (MWELO).

POTABLE WATER.

RECLAIMED (RECYCLED) WATER.

RECYCLED WATER.

SPECIAL LANDSCAPE AREA (SLA). (DSA-SS)

SUB METER.

SECTION 5.303

INDOOR WATER USE

5.303.1 METERS. SEPARATE SUBMETERS OR METERING DEVICES SHALL BE INSTALLED FOR THE USES DESCRIBED IN SECTIONS 5 .303.1.1 AND 5.303.1.2.

5.303.1.1 NEW BUILDINGS OR ADDITIONS IN EXCESS OF 50,000 SQUARE FEET. SEPARATE SUBMETERS SHALL BE INSTALLED AS FOLLOWS:

1. FOR EACH INDIVIDUAL LEASED, RENTED, OR OTHER TENANT SPACE WITHIN THE BUILDING PROJECTED TO CONSUME MORE THAN 100 GAL/DAY (380 L/DAY), INCLUDING, BUT NOT LIMITED TO, SPACES USED FOR LAUNDRY OR CLEANERS, RESTAURANT OR FOOD SERVICE, MEDICAL OR DENTAL OFFICE, LABORATORY, OR BEAUTY SALON OR BARBER SHOP.
2. WHERE SEPARATE SUBMETERS FOR INDIVIDUAL BUILDING TENANTS ARE UNFEASIBLE, FOR WATER SUPPLIED TO THE FOLLOWING SUBSYSTEMS:
   - A. MAKEUP WATER FOR COOLING TOWERS WHERE FLOW THROUGH IS GREATER THAN 500 GPM (30 L/S).
   - B. MAKEUP WATER FOR EVAPORATIVE COOLERS GREATER THAN 6 GPM (0.04 L/S).
   - C. STEAM AND HOT-WATER BOILERS WITH ENERGY INPUT MORE THAN 500,000 BTU/H (147 KW).

5.303.1.2 EXCESS CONSUMPTION. A SEPARATE SUBMETER OR METERING DEVICE SHALL BE PROVIDED FOR ANY TENANT WITHIN A NEW BUILDING OR WITHIN AN ADDITION THAT IS PROJECTED TO CON-SUME MORE THAN 1,000 GAL/DAY.

5.303.2 RESERVED

5.303.3 WATER CONSERVING PLUMBING FIXTURES AND FITTINGS. PLUMBING FIXTURES (WATER CLOSETS AND URINALS) AND FITTINGS (FAUCETS AND SHOWERHEADS) SHALL COMPLY WITH THE FOLLOWING:

5.303.1 WATER CLOSETS. THE EFFECTIVE FLUSH VOLUME OF ALL WATER CLOSETS SHALL NOT EXCEED 1.28 GALLONS PER FLUSH. TANK-TYPE WATER CLOSETS SHALL BE CERTIFIED TO THE PERFORMANCE CRITERIA OF THE U.S. EPA WATERSENSE SPECIFICATION FOR TANK-TYPE TOILETS.

NOTE: THE EFFECTIVE FLUSH VOLUME OF DUAL FLUSH TOILETS IS DEFINED AS THE COMPOSITE, AVERAGE FLUSH VOLUME OF TWO REDUCED FLUSHES AND ONE FULL FLUSH.

5.303.3.2 URINALS

5.303.3.2.1. WALL-MOUNTED URINALS. THE EFFECTIVE FLUSH VOLUME OF WALL-MOUNTED URINALS SHALL NOT EXCEED 0.125 GALLONS PER FLUSH.

5.303.3.3.2 FLOOR-MOUNTED URINALS. THE EFFECTIVE FLUSH VOLUME OF FLOOR-MOUNTED OR OTHER URINALS SHALL NOT EXCEED 0.5 GALLONS PER FLUSH.

5.303.3.3 SHOWERHEADS.

5.303.3.3.1 SINGLE SHOWERHEAD. SHOWERHEADS SHALL HAVE A MAXIMUM FLOW RATE OF NOT MORE THAN 1.8 GALLONS PER MINUTE AT 80 PSI. SHOWERHEADS SHALL BE CERTIFIED TO THE PERFORMANCE CRITERIA OF THE U.S. EPA WATERSENSE SPECIFICATION FOR SHOWERHEADS.

5.303.3.3.2 MULTIPLE SHOWERHEADS SERVING ONE SHOWER. WHEN A SHOWER IS SERVED BY MORE THAN ONE SHOWERHEAD, THE COMBINED FLOW RATE OF ALL SHOWERHEADS AND/OR OTHER SHOWER OUTLETS CONTROLLED BY A SINGLE VALVE SHALL NOT EXCEED 1.8 GALLONS PER MINUTE AT 80 PSI, OR THE SHOWER SHALL BE DESIGNED TO ALLOW ONLY ONE SHOWER OUT-LET TO BE IN OPERATION AT A TIME.

NOTE: A HAND-HELD SHOWER SHALL BE CONSIDERED A SHOWERHEAD.

5.303.3.4. FAUCETS AND FOUNTAINS.

5.303.3.4.1 NONRESIDENTIAL LAVATORY FAUCETS. LAVATORY FAUCETS SHALL HAVE A MAXIMUM FLOW RATE OF NOT MORE THAN 0.5 GALLONS PER MINUTE AT 60 PSI.

5.303.3.4.2 KITCHEN FAUCETS. KITCHEN FAUCETS SHALL HAVE A MAXIMUM FLOW RATE OF NOT MORE THAN 1.8 GALLONS PER MINUTE AT 60 PSI. KITCHEN FAUCETS MAY TEMPORARILY INCREASE THE FLOW ABOVE THE MAXIMUM RATE, BUT NOT TO EXCEED 2.2 GALLONS PER MINUTE AT 60 PSI, AND MUST DEFAULT TO A MAXIMUM FLOW RATE OF 1.8 GALLONS PER MIN-UTE AT 60 PSI.

5.303.3.4.3 WASH FOUNTAINS. WASH FOUNTAINS SHALL HAVE A MAXIMUM FLOW RATE OF NOT MORE THAN 1.8 GALLONS PER MINUTE/20 .RIM SPACE (INCHES) AT 60 PSI□

5.303.3.4.4 METERING FAUCETS. METERING FAUCETS SHALL NOT DELIVER MORE THAN 0.20 GALLONS PER CYCLE.

5.303.3.4.5 METERING FAUCETS FOR WASH FOUNTAINS. METERING FAUCETS FOR WASH FOUNTAINS SHALL HAVE A MAXIMUM FLOW RATE OF NOT MORE THAN 0.20 GALLONS PER CYCLE/ 20 .RIM SPACE (INCHES) AT 60 PSI□

NOTE: WHERE COMPLYING FAUCETS ARE UNAVAILABLE, AERATORS OR OTHER MEANS MAY BE USED TO ACHIEVE REDUCTION.

5.303.3.4.6 PRE-RINSE SPRAY VALVE. WHEN INSTALLED, SHALL MEET THE REQUIREMENTS IN THE CALIFORNIA CODE OF REGULATIONS, TITLE 20 (APPLIANCE EFFICIENCY REGULATIONS), SECTION 1605.1(H)(4) TABLE H-2, SECTION 1605.3(H)(4)(A), AND SECTION 1607(D)(7), AND SHALL BE EQUIPPED WITH AN INTEGRAL AUTOMATIC SHUTOFF.
FOR REFERENCE ONLY: THE FOLLOWING TABLE AND CODE SECTION HAVE BEEN REPRINTED FROM THE CALIFORNIA CODE OF REGULATIONS, TITLE 20 (APPLIANCE EFFICIENCY REGULATIONS), SECTION 1605.1(H)(4) AND SECTION 1605.3(H)(4)(A).

TABLE H-2
STANDARDS FOR COMMERCIAL PRE-RINSE SPRAY VALVES MANUFACTURED ON OR AFTER JANUARY 28, 2019

| PRODUCT CLASS [spray force in ounce force (ozf

5.304.1 OUTDOOR POTABLE WATER USE IN LANDSCAPE AREAS. NONRESIDENTIAL DEVELOPMENTS SHALL COMPLY WITH A LOCAL WATER EFFICIENT LANDSCAPE ORDINANCE OR THE CURRENT 'CALIFORNIA DEPARTMENT OF WATER RESOURCES' MODEL WATER EFFICIENT LANDSCAPE ORDINANCE (MWELO), WHICHEVER IS MORE STRINGENT.

NOTES:

1. THE MODEL WATER EFFICIENT LANDSCAPE ORDINANCE (MWELO) IS LOCATED IN THE CALIFORNIA CODE OF REGULATIONS, TITLE 23, CHAPTER 2.7, DIVISION 2.
2. MWELO AND SUPPORTING DOCUMENTS, INCLUDING A WATER BUDGET CALCULATOR, ARE AVAILABLE AT: HTTPS:// WWW.WATER.CA.GOV/.

5.304.6 OUTDOOR POTABLE WATER USE IN LANDSCAPE AREAS. FOR PUBLIC SCHOOLS AND COMMUNITY COLLEGES, LANDSCAPE PROJECTS AS DESCRIBED IN SECTIONS 5.304.6.1 AND 5.304.6.2 SHALL COMPLY WITH THE CALIFORNIA DEPARTMENT OF WATER RESOURCES MODEL WATER EFFICIENT LANDSCAPE ORDINANCE (MWELO) COMMENCING WITH SECTION 490 OF CHAPTER 2.7, DIVISION 2, TITLE 23, CALIFORNIA CODE OF REGULATIONS, EXCEPT THAT THE EVAPOTRANSPIRATION ADJUSTMENT FACTOR (ETAF) SHALL BE 0.65 WITH AN ADDITIONAL WATER ALLOWANCE FOR SPECIAL LANDSCAPE AREAS (SLA) OF 0.35.

EXCEPTION: ANY PROJECT WITH AN AGGREGATE LANDSCAPE AREA OF 2,500 SQUARE FEET OR LESS MAY COMPLY WITH THE PRESCRIPTIVE MEASURES CONTAINED IN APPENDIX D OF THE MWELO.

5.304.6.1 NEWLY CONSTRUCTED LANDSCAPES. NEW CONSTRUC-TION PROJECTS WITH AN AGGREGATE LANDSCAPE AREA EQUAL TO OR GREATER THAN 500 SQUARE FEET.

5.304.6.2 REHABILITATED LANDSCAPES. REHABILITATED LAND-SCAPE PROJECTS WITH AN AGGREGATE LANDSCAPE AREA EQUAL TO OR GREATER THAN 1,200 SQUARE FEET.

SECTION 5.305 WATER REUSE SYSTEMS (RESERVED)

DIVISION 5.4 MATERIAL CONSERVATION AND RESOURCE EFFICIENCY

SECTION 5.401 GENERAL

5.401.1 SCOPE. THE PROVISIONS OF THIS CHAPTER SHALL OUTLINE MEANS OF ACHIEVING MATERIAL CONSERVATION AND RESOURCE EFFI-CIENCY THROUGH PROTECTION OF BUILDINGS FROM EXTERIOR MOIS-TURE, CONSTRUCTION WASTE DIVERSION, EMPLOYMENT OF TECHNIQUES TO REDUCE POLLUTION THROUGH RECYCLING OF MATERIALS, AND BUILD-ING COMMISSIONING OR TESTING AND ADJUSTING.

SECTION 5.402 DEFINITIONS

5.402.1 DEFINITIONS. THE FOLLOWING TERMS ARE DEFINED M CHAPTER 2.

ADJUST.

BALANCE.

BUILDING COMMISSIONING.

ORGANIC WASTE.

TEST.

SECTION 5.403 FOUNDATION SYSTEMS (RESERVED)

SECTION 5.404 EFFICIENT FRAMING TECHNIQUES (RESERVED)

SECTION 5.405 MATERIAL SOURCES (RESERVED)

SECTION 5.406 ENHANCED DURABILITY AND REDUCED MAINTENANCE (RESERVED)

SECTION 5.407 WATER RESISTANCE AND MOISTURE MANAGEMENT

5.407.1 WEATHER PROTECTION. PROVIDE A WEATHER-RESISTANT EXTERIOR WALL AND FOUNDATION ENVELOPE AS REQUIRED BY CALIFORNIA BUILDING CODE SECTION 1402.2 (WEATHER PROTECTION), MANUFACTURER'S INSTALLATION INSTRUCTIONS OR LOCAL ORDINANCE, WHICHEVER IS MORE STRINGENT.

5.407.2 MOISTURE CONTROL. EMPLOY MOISTURE CONTROL MEA-SURES BY THE FOLLOWING METHODS.

5.407.2.1 SPRINKLERS. DESIGN AND MAINTAIN LANDSCAPE IRRI-GATION SYSTEMS TO PREVENT SPRAY ON STRUCTURES.

5.407.2.2 ENTRIES AND OPENINGS. DESIGN EXTERIOR ENTRIES AND/OR OPENINGS SUBJECT TO FOOT TRAFFIC OR WIND-DRIVEN RAIN TO PREVENT WATER INTRUSION INTO BUILDINGS AS FOLLOWS:

5.407.2.2.1 EXTERIOR DOOR PROTECTION. PRIMARY EXTERIOR ENTRIES SHALL BE COVERED TO PREVENT WATER INTRUSION BY USING NONABSORBENT FLOOR AND WALL FINISHES WITHIN AT LEAST 2 FEET AROUND AND PERPENDICULAR TO SUCH OPENINGS PLUS AT LEAST ONE OF THE FOLLOWING:

1. AN INSTALLED AWNING AT LEAST 4 FEET IN DEPTH.
2. THE DOOR IS PROTECTED BY A ROOF OVERHANG AT LEAST 4 FEET IN DEPTH.
3. THE DOOR IS RECESSED AT LEAST 4 FEET.
4. OTHER METHODS WHICH PROVIDE EQUIVALENT PROTECTION.

5.407.2.2.2 FLASHING. INSTALL FLASHINGS INTEGRATED WITH A DRAINAGE PLANE.

SECTION 5.408 CONSTRUCTION WASTE REDUCTION, DISPOSAL AND RECYCLING

5.408.1 CONSTRUCTION WASTE MANAGEMENT. RECYCLE AND/OR SALVAGE FOR REUSE A MINIMUM OF 65 PERCENT OF THE NONHAZARD-OUS CONSTRUCTION AND DEMOLITION WASTE IN ACCORDANCE WITH SECTION 5.408.1.L, 5.408.1.2 OR 5.408.1.3:□OR MEET A LOCAL CONSTRUCTION AND DEMOLITION WASTE MANAGEMENT ORDINANCE, WHICHEVER IS MORE STRINGENT.

5.408.1.1 CONSTRUCTION WASTE MANAGEMENT PLAN. WHERE A LOCAL JURISDICTION DOES NOT HAVE A CONSTRUCTION AND DEMOLITION WASTE MANAGEMENT ORDINANCE THAT IS MORE STRINGENT, SUBMIT A CONSTRUCTION WASTE MANAGEMENT PLAN THAT

1. IDENTIFIES THE CONSTRUCTION AND DEMOLITION WASTE MATERIALS TO BE DIVERTED FROM DISPOSAL BY EFFICIENT USAGE, RECYCLING, REUSE ON THE PROJECT OR SALVAGE FOR FUTURE USE OR SALE.
2. DETERMINES IF CONSTRUCTION AND DEMOLITION WASTE MATERIALS WILL BE SORTED ON-SITE (SOURCE-SEPARATED) OR BULK MIXED (SINGLE STREAM).
3. IDENTIFIES DIVERSION FACILITIES WHERE CONSTRUCTION AND DEMOLITION WASTE MATERIAL COLLECTED WILL BE TAKEN.
4. SPECIFIES THAT THE AMOUNT OF CONSTRUCTION AND DEMO-LITION WASTE MATERIALS DIVERTED SHALL BE CALCULATED BY WEIGHT OR VOLUME, BUT NOT BY BOTH.

5.408.1.2. WASTE MANAGEMENT COMPANY. UTILIZE A WASTE MANAGEMENT COMPANY THAT CAN PROVIDE VERIFIABLE DOCUMENTATION THAT THE PERCENTAGE OF CONSTRUCTION AND DEMOLI-TION WASTE MATERIAL DIVERTED FROM THE LANDFILL COMPLIES WITH THIS SECTION.
NOTE: THE OWNER OR CONTRACTOR SHALL MAKE THE DETERMI-NATION IF THE CONSTRUCTION AND DEMOLITION WASTE MATERIAL WILL BE DIVERTED BY A WASTE MANAGEMENT COMPANY.
EXCEPTIONS TO SECTIONS 5.408.1.1 AND 5.408.1.2:

1. EXCAVATED SOIL AND LAND-CLEARING DEBRIS.
2. ALTERNATE WASTE REDUCTION METHODS DEVELOPED BY WORKING WITH LOCAL AGENCIES IF DIVERSION OR RECYCLE FACILITIES CAPABLE OF COMPLIANCE WITH THIS ITEM DO NOT EXIST.
3. DEMOLITION WASTE MEETING LOCAL ORDINANCE OR CAL-CULATED IN CONSIDERATION OF LOCAL RECYCLING FACILI-TIES AND MARKETS.

5.408.1.3 WASTE STREAM REDUCTION ALTERNATIVE. THE COMBINED WEIGHT OF NEW CONSTRUCTION DISPOSAL THAT DOES NOT EXCEED TWO POUNDS PER SQUARE FOOT OF BUILDING AREA MAY BE DEEMED TO MEET THE 65 PERCENT MINIMUM REQUIREMENT AS APPROVED BY THE ENFORCING AGENCY.

5.408.1.4 DOCUMENTATION. DOCUMENTATION SHALL BE PRO-VIDED TO THE ENFORCING AGENCY WHICH DEMONSTRATES COMPLIANCE WITH SECTIONS 5.408.1.1 THROUGH 5.408.1.3. THE WASTE MANAGEMENT PLAN SHALL BE UPDATED AS NECESSARY AND SHALL BE ACCESSIBLE DURING CONSTRUCTION FOR EXAMINATION BY THE ENFORCING AGENCY.
NOTES:

1. SAMPLE FORMS FOUND IN "A GUIDE TO THE CALIFORNIA GREEN BUILDING STANDARDS CODE (NONRESIDENTIAL)" LOCATED AT HTTPS://WWW .DGS.CA.GOV/BSC/RESOURCES/PAGE-CONTENT/BUILDING-STANDA RDS-COMMISSION-RESOURCES-LIST-FOLDER/CALGREEN MAY BE USED TO ASSIST IN DOCUMENTING COMPLIANCE WITH THE WASTE MANAGEMENT PLAN.
2. MIXED CONSTRUCTION AND DEMOLITION DEBRIS (C&D) PROCESSORS CAN BE LOCATED AT THE CALIFORNIA DEPARTMENT OF RESOURCES RECYCLING AND RECOV-ERY (CALRECYCLE).

5.408.2 UNIVERSAL WASTE. .A□ADDITIONS AND ALTERATIONS TO A BUILDING OR TENANT SPACE THAT MEET THE SCOPING PROVISIONS IN SECTION 301.3 FOR NONRESIDENTIAL ADDITIONS AND ALTERATIONS, SHALL REQUIRE VERIFICATION THAT UNIVERSAL WASTE ITEMS SUCH AS FLUORESCENT LAMPS AND BALLAST AND MERCURY CONTAINING THER-MOSTATS AS WELL AS OTHER CALIFORNIA PROHIBITED UNIVERSAL WASTE MATERIALS ARE DISPOSED OF PROPERLY AND ARE DIVERTED FROM LANDFILLS. A LIST OF PROHIBITED UNIVERSAL WASTE MATERIALS SHALL BE INCLUDED IN THE CONSTRUCTION DOCUMENTS.

NOTE: REFER TO THE UNIVERSAL WASTE RULE LINK AT: HTTPS:// DTSC.CA.GOV/UNIVERSALWASTE/

5.408.3 EXCAVATED SOIL AND LAND CLEARING DEBRIS. 100 PER-CENT OF TREES, STUMPS, ROCKS AND ASSOCIATED VEGETATION AND SOILS RESULTING PRIMARILY FROM LAND CLEARING SHALL BE REUSED OR RECYCLED. FOR A PHASED PROJECT, SUCH MATERIAL MAY BE STOCK-PILED ON SITE UNTIL THE STORAGE SITE IS DEVELOPED.

EXCEPTION: REUSE, EITHER ON-OR OFF-SITE, OF VEGETATION OR SOIL CONTAMINATED BY DISEASE OR PEST INFESTATION.

NOTES:

1. IF CONTAMINATION BY DISEASE OR PEST INFESTATION IS SUSPECTED, CONTACT THE COUNTY AGRICULTURAL COMMIS-SIONER AND FOLLOW ITS DIRECTION FOR RECYCLING OR DIS-POSAL OF THE MATERIAL. (WWW.CDFA.CA.GOV/EXEC/COUNTY/COUNTY _CONTACTS.HTML)
2. FOR A MAP OF KNOWN PEST AND/OR DISEASE QUARANTINE ZONES, CONSULT WITH THE CALIFORNIA DEPARTMENT OF FOOD AND AGRICULTURE. (WWW.CDFA.CA.GOV)

SECTION 5.409 LIFE CYCLE ASSESSMENT (RESERVED)

SECTION 5.410 BUILDING MAINTENANCE AND OPERATION

5.410.1 RECYCLING BY OCCUPANTS. PROVIDE READILY ACCESSIBLE AREAS THAT SERVE THE ENTIRE BUILDING AND ARE IDENTIFIED FOR THE DEPOSITING, STORAGE AND COLLECTION OF NON-HAZARDOUS MATERIALS FOR RECYCLING, INCLUDING (AT A MINIMUM) PAPER, CORRUGATED CARDBOARD□GLASS, PLASTICS, ORGANIC WASTE, AND METALS OR MEET A LAWFULLY ENACTED LOCAL RECYCLING ORDINANCE, IF MORE RESTRICTIVE.

EXCEPTION: RURAL JURISDICTIONS THAT MEET AND APPLY FOR THE EXEMPTION IN PUBLIC RESOURCES CODE 42649.82 (A)(2)(A) ET SEQ. SHALL ALSO BE EXEMPT FROM THE ORGANIC WASTE PORTION OF THIS SECTION.

5.410.1.1 ADDITIONS. ALL ADDITIONS CONDUCTED WITHIN A 12- MONTH PERIOD UNDER SINGLE OR MULTIPLE PERMITS, RESULTING IN AN INCREASE OF 30 PERCENT OR MORE IN FLOOR AREA, SHALL PRO-VIDE RECYCLING AREAS ON SITE.

EXCEPTION: ADDITIONS WITHIN A TENANT SPACE RESULTING IN LESS THAN A 30-PERCENT INCREASE IN THE TENANT SPACE FLOOR AREA.

5.410.1.2 SPACE ALLOCATION FOR RECYCLING AREAS SHALL COMPLY WITH CHAPTER 18, PART 3, DIVISION 30 OF THE PUBLIC RESOURCES CODE. CHAPTER 18 IS KNOWN AS THE CALIFORNIA SOLID WASTE REUSE AND RECYCLING ACCESS ACT OF 1991 (ACT).

NOTE: A SAMPLE ORDINANCE FOR USE BY LOCAL AGENCIES MAY BE FOUND IN APPENDIX A OF THE DOCUMENT AT THE CALRECYCLE'S WEB SITE.

5.410.2 COMMISSIONING. .N□NEW BUILDINGS 10,000 SQUARE FEET AND OVER. FOR NEW BUILDINGS 10,000 SQUARE FEET AND OVER, BUILDING COMMISSIONING SHALL BE INCLUDED IN THE DESIGN AND CONSTRUCTION PROCESSES OF THE BUILDING PROJECT TO VERIFY THAT THE BUILDING SYSTEMS AND COMPONENTS MEET THE OWNER'S OR OWNER REPRESENTATIVE'S PROJECT REQUIREMENTS. COMMISSIONING SHALL BE PERFORMED IN ACCORDANCE WITH THIS SECTION BY TRAINED PERSONNEL WITH EXPERIENCE ON PROJECTS OF COMPARABLE SIZE AND COMPLEXITY. NOT APPLICABLE AS COMMERCIAL AREA IS NOT OVER 10,000 SF.

SECTION 5.407 WATER RESISTANCE AND MOISTURE MANAGEMENT

SECTION 5.501 GENERAL

5.501.1 SCOPE. THE PROVISIONS OF THIS CHAPTER SHALL OUTLINE MEANS OF REDUCING THE QUANTITY OF AIR CONTAMINANTS THAT ARE ODOROUS, IRRITATING, AND/OR HARMFUL TO THE COMFORT AND WELL-BEING OF A BUILDING'S INSTALLERS, OCCUPANTS AND NEIGHBORS.

SECTION 5.502 DEFINITIONS

5.502.1 DEFINITIONS. THE FOLLOWING TERMS ARE DEFINED IN CHAPTER 2.

ARTERIAL HIGHWAY.

A-WEIGHTED SOUND LEVEL (DBA).

1 BTU/HOUR.

COMMUNITY NOISE EQUIVALENT LEVEL (CNEL).

COMPOSITE WOOD PRODUCTS.

DAY-NIGHT AVERAGE SOUND LEVEL (LDN).

DECIBEL (DB).

ENERGY EQUIVALENT (NOISE) LEVEL (LEQ).

EXPRESSWAY.

FREEWAY.

GLOBAL WARMING POTENTIAL (GWP).

GLOBAL WARMING POTENTIAL VALUE (GWP VALUE).

HIGH-GWP REFRIGERANT.

NONRESIDENTIAL MANDATORY MEASURES

LONG RADIUS ELBOW.

LOW-GWP REFRIGERANT.

MERV.

MAXIMUM INCREMENTAL REACTIVITY (MIR). PRODUCT-WEIGHTED MIR (PWMIR).

PSIG.

REACTIVE ORGANIC COMPOUND (ROC). SCHRADER ACCESS VALVES.

SHORT RADIUS ELBOW.

SUPERMARKET.

VOC.

SECTION 5.503 FIREPLACES. NOT APPLICABLE FOR THIS PROJECT.

SECTION 5.504 POLLUTANT CONTROL

5.504.1 TEMPORARY VENTILATION. THE PERMANENT HV AC SYS-TEM SHALL ONLY BE USED DURING CONSTRUCTION IF NECESSARY TO CONDITION THE BUILDING OR AREAS OF ADDITION OR ALTERATION WITHIN THE REQUIRED TEMPERATURE RANGE FOR MATERIAL AND EQUIPMENT INSTALLATION. IF THE HV AC SYSTEM IS USED DURING CONSTRUCTION, USE RETURN AIR FILTERS WITH A MINIMUM EFFICIENCY REPORTING VALUE (MERV) OF 8, BASED ON ASHRAE 52.2-1999, OR AN AVERAGE EFFICIENCY OF 30 PERCENT BASED ON ASHRAE 52.1- 1992. REPLACE ALL FILTERS IMMEDIATELY PRIOR TO OCCUPANCY, OR, IF THE BUILDING IS OCCUPIED DURING ALTERATION, AT THE CONCLUSION OF CONSTRUCTION.

5.504.3 COVERING OF DUCT OPENINGS AND PROTECTION OF MECHANICAL EQUIPMENT DURING CONSTRUCTION. AT THE TIME OF ROUGH INSTALLATION AND DURING STORAGE ON THE CONSTRUCTION SITE UNTIL FINAL STARTUP OF THE HEATING, COOLING AND VENTILATING EQUIP-MENT, ALL DUCT AND OTHER RELATED AIR DISTRIBUTION COMPONENT OPENINGS SHALL BE COVERED WITH TAPE, PLASTIC, SHEETMETAL OR OTHER METHODS ACCEPTABLE TO THE ENFORCING AGENCY TO REDUCE THE AMOUNT OF DUST, WATER AND DEBRIS WHICH MAY ENTER THE SYSTEM.

5.504.4 FINISH MATERIAL POLLUTANT CONTROL. FINISH MATERIALS SHALL COMPLY WITH SECTIONS 5.504.4.1 THROUGH 5.504.4.6.

5.504.4.1 ADHESIVES, SEALANTS AND CAULKS. ADHESIVES, SEALANTS, AND CAULKS USED ON THE PROJECT SHALL MEET THE REQUIREMENTS OF THE FOLLOWING STANDARDS:

1. ADHESIVES, ADHESIVE BONDING PRIMERS, ADHESIVE PRIMERS, SEALANTS, SEALANT PRIMERS AND CAULKS SHALL COMPLY WITH LOCAL OR REGIONAL AIR POLLUTION CONTROL OR AIR QUALITY MANAGEMENT DISTRICT RULES WHERE APPLICA-BLE, OR SCAQMD RULE 1168 VOC LIMITS, AS SHOWN IN TABLES 5.504.4. L AND 5.504.4.2. SUCH PRODUCTS ALSO SHALL COMPLY WITH THE RULE 1168 PROHIBITION ON THE USE OF CERTAIN TOXIC COMPOUNDS (CHLOROFORM, ETH-YLENE DICHLORIDE, METHYLENE CHLORIDE, PERCHLOROETH-YLENE AND TRICHLOROETHYLENE), EXCEPT FOR AEROSOL PRODUCTS AS SPECIFIED IN SUBSECTION 2, BELOW.
2. AEROSOL ADHESIVES, AND SMALLER UNIT SIZES OF ADHE-SIVES, AND SEALANT OR CAULKING COMPOUNDS (IN UNITS OF PRODUCT, LESS PACKAGING, WHICH DO NOT WEIGH MORE THAN ONE POUND AND DO NOT CONSIST OF MORE THAN 16 FLUID OUNCES) SHALL COMPLY WITH STATEWIDE VOC STANDARDS AND OTHER REQUIREMENTS, INCLUDING PROHIBITIONS ON USE OF CERTAIN TOXIC COMPOUNDS, OF CALIFORNIA CODE OF REGULATIONS, TITLE 17, COMMENC-ING WITH SECTION 94507.

TABLE 5.504.4.1

TABLE 5.504.4.1
ADHESIVE VOC LIMIT[1,2]
Less Water and Less Exempt Compounds in Grams Per Liter

ARCHITECTURAL APPLICATIONS	CURRENT VOC LIMIT
Indoor carpet adhesives	50
Carpet pad adhesives	50
Outdoor carpet adhesives	150
Wood flooring adhesive	100
Rubber floor adhesives	60
Subfloor adhesives	50
Ceramic tile adhesives	65
VCT and asphalt tile adhesives	50
Drywall and panel adhesives	50
Cove base adhesives	50
Multipurpose construction adhesives	70
Structural glazing adhesives	100
Single-ply roof membrane adhesives	250
Other adhesive not specifically listed	50
SPECIALTY APPLICATIONS	
PVC welding	510
CPVC welding	490
ABS welding	325
Plastic cement welding	250
Adhesive primer for plastic	550
Contact adhesive	80
Special purpose contact adhesive	250
Structural wood member adhesive	140
Top and trim adhesive	250
SUBSTRATE SPECIFIC APPLICATIONS	
Metal to metal	30
Plastic foams	50
Porous material (except wood)	50
Wood	30
Fiberglass	80

1. If an adhesive is used to bond dissimilar substrates together the adhesive with the highest VOC content shall be allowed.
2. For additional information regarding methods to measure the VOC content specified in this table, see South Coast Air Quality Management District Rule 1168. http://www.arb.ca.gov/DRDB/SC/CURHTML/R1168.PDF.

TABLE 5.504.4.2

TABLE 5.504.4.2
SEALANT VOC LIMIT
Less Water and Less Exempt Compounds in Grams per Liter

SEALANTS	CURRENT VOC LIMIT
Architectural	250
Marine deck	760
Nonmembrane roof	300
Roadway	250
Single-ply roof membrane	450
Other	420
SEALANT PRIMERS	
Architectural Nonporous Porous	 250 775
Modified bituminous	500
Marine deck	760
Other	750

Note: For additional information regarding methods to measure the VOC content specified in these tables, see South Coast Air Quality Management District Rule 1168.

5.504.4.3 PAINTS AND COATINGS. ARCHITECTURAL PAINTS AND COATINGS SHALL COMPLY WITH VOC LIMITS IN TABLE 1 OF THE ARB ARCHITECTURAL COATINGS SUGGESTED CONTROL MEASURE, AS SHOWN IN TABLE 5.504.4.3, UNLESS MORE STRINGENT LOCAL LIMITS APPLY. THE VOC CONTENT LIMIT FOR COATINGS THAT DO NOT MEET THE DEFINITIONS FOR THE SPECIALTY COATINGS CATEGORIES LISTED IN TABLE 5.504.4.3 SHALL BE DETERMINED BY CLASSIFYING THE COATING AS A FLAT, NONFLAT OR NONFLAT-HIGH GLOSS COATING, BASED ON ITS GLOSS, AS DEFINED IN SUBSECTIONS 4.21, 4.36 AND 4.37 OF THE 2007 CALIFORNIA AIR RESOURCES BOARD SUGGESTED CONTROL MEASURE, AND THE CORRESPONDING FLAT, NONFLAT OR NONFLAT-HIGH GLOSS VOC LIMIT IN TABLE 5.504.4.3 SHALL APPLY.

5.504.4.3.1 AEROSOL PAINTS AND COATINGS. AEROSOL PAINTS AND COATINGS SHALL MEET THE PWMIR LIMITS FOR ROC IN SECTION 94522(A)(3) AND OTHER REQUIREMENTS, INCLUDING PROHIBITIONS ON USE OF CERTAIN TOXIC COM-POUNDS AND OZONE DEPLETING SUBSTANCES, IN SECTIONS 94522(C)(2) AND (D)(2) OF CALIFORNIA CODE OF REGULA-TIONS, TITLE 17, COMMENCING WITH SECTION 94520: AND IN AREAS UNDER THE JURISDICTION OF THE BAY AREA AIR QUALITY MANAGEMENT DISTRICT ADDITIONALLY COMPLY WITH THE PERCENT VOC BY WEIGHT OF PRODUCT LIMITS OF REGULATION 8 RULE 49.

5.504.4.3.2 VERIFICATION. VERIFICATION OF COMPLIANCE WITH THIS SECTION SHALL BE PROVIDED AT THE REQUEST OF THE ENFORCING AGENCY. DOCUMENTATION MAY INCLUDE, BUT IS NOT LIMITED TO, THE FOLLOWING:

TABLE 5.504.4.3

TABLE 5.504.4.3
VOC CONTENT LIMITS FOR ARCHITECTURAL COATINGS[2, 3]
Grams of VOC per Liter of Coating,
Less Water and Less Exempt Compounds

COATING CATEGORY	CURRENT LIMIT
Flat coatings	50
Nonflat coatings	100
Nonflat-high gloss coatings	150
SPECIALTY COATINGS	
Aluminum roof coatings	400
Basement specialty coatings	400
Bituminous roof coatings	50
Bituminous roof primers	350
Bond breakers	350
Concrete curing compounds	350
Concrete/masonry sealers	100
Driveway sealers	50
Dry fog coatings	150
Faux finishing coatings	350
Fire resistive coatings	350
Floor coatings	100
Form-release compounds	250
Graphic arts coatings (sign paints)	500
High temperature coatings	420
Industrial maintenance coatings	250
Low solids coatings[1]	120
Magnesite cement coatings	450
Mastic texture coatings	100
Metallic pigmented coatings	500
Multicolor coatings	250
Pretreatment wash primers	420
Primers, sealers, and undercoaters	100
Reactive penetrating sealers	350
Recycled coatings	250
Roof coatings	50
Rust preventative coatings	250
Shellacs Clear Opaque	 730 550
Specialty primers, sealers and undercoaters	100
Stains	250
Stone consolidants	450
Swimming pool coatings	340
Traffic marking coatings	100
Tub and tile refinish coatings	420
Waterproofing membranes	250
Wood coatings	275
Wood preservatives	350
Zinc-rich primers	340

1. Grams of VOC per liter of coating, including water and including exempt compounds.
2. The specified limits remain in effect unless revised limits are listed in subsequent columns in the table.
3. Values in this table are derived from those specified by the California Air Resources Board, Architectural Coatings Suggested Control Measure, February 1, 2008. More information is available from the Air Resources Board.

5.504.4.4 CARPET SYSTEMS. ALL CARPET INSTALLED IN THE BUILDING INTERIOR SHALL MEET THE REQUIREMENTS OF THE CALI-FORNIA DEPARTMENT OF PUBLIC HEALTH, "STANDARD METHOD FOR THE TESTING AND EVALUATION OF VOLATILE ORGANIC CHEMICAL EMISSIONS FROM INDOOR SOURCES USING ENVIRONMENTAL CHAMBERS," VERSION 1.2, JANUARY 2017 (EMISSION TESTING METHOD FOR CALIFORNIA SPECIFICATION 01350).

SEE CALIFORNIA DEPARTMENT OF PUBLIC HEALTH'S WEBSITE FOR CERTIFICATION PROGRAMS AND TESTING LABS. HTTPS://WWW.CDPH.CA.GOV/PROGRAMS/CCDPHP/DEODC/EHLB/IAQ/PAGESNOC.ASPX#MATERIAL

5.504.4.4.1 CARPET CUSHION. ALL CARPET CUSHION INSTALLED IN THE BUILDING INTERIOR SHALL MEET THE REQUIRE-MENTS OF THE CALIFORNIA DEPARTMENT OF PUBLIC HEALTH, "STANDARD METHOD FOR THE TESTING AND EVALUATION OF VOLATILE ORGANIC CHEMICAL EMISSIONS FROM INDOOR SOURCES USING ENVIRONMENTAL CHAMBERS," VERSION 1.2, JANUARY 2017 (EMISSION TESTING METHOD FOR CALIFORNIA SPECIFICATION O 1350).

SEE CALIFORNIA DEPARTMENT OF PUBLIC HEALTH'S WEB-SITE FOR CERTIFICATION PROGRAMS AND TESTING LABS. HTTPS://WWW .CDPH.CA.GOV/PROGRAMS/CCDPHP/ DEODC/EHLB/IAQ/PAGESNOC.ASPX#MATERIAL

5.504.4.4.2 CARPET ADHESIVE. ALL CARPET ADHESIVE SHALL MEET THE REQUIREMENTS OF TABLE 5.504.4.1.

5.504.4.5 COMPOSITE WOOD PRODUCTS. HARDWOOD PLY-WOOD, PARTICLEBOARD AND MEDIUM DENSITY FIBERBOARD COMPOSITE WOOD PRODUCTS USED ON THE INTERIOR OR EXTERIOR OF THE BUILDING SHALL MEET THE REQUIREMENTS FOR FORMALDE-HYDE AS SPECIFIED IN ARB'S AIR TOXICS CONTROL MEASURE (ATCM) FOR COMPOSITE WOOD (17 CCR 93120 ET SEQ.) THOSE MATERIALS NOT EXEMPTED UNDER THE A TCM MUST MEET THE SPECIFIED EMISSION LIMITS, AS SHOWN IN TABLE 5.504.4.5.

TABLE 5.504.4.5

TABLE 5.504.4.5
FORMALDEHYDE LIMITS[1]
Maximum Formaldehyde Emissions in Parts per Million

PRODUCT	CURRENT LIMIT
Hardwood plywood veneer core	0.05
Hardwood plywood composite core	0.05
Particleboard	0.09
Medium density fiberboard	0.11
Thin medium density fiberboard[2]	0.13

1. Values in this table are derived from those specified by the California Air Resources Board, Air Toxics Control Measure for Composite Wood as tested in accordance with ASTM E1333. For additional information, see *California Code of Regulations*, Title 17, Sections 93120 through 93120.12.
2. Thin medium density fiberboard has a maximum thickness of 5/16 inch (8 mm).

5.504.4.5.1 EARLY COMPLIANCE. RESERVED.

5.504.4.5.3 DOCUMENTATION. VERIFICATION OF COMPLI-ANCE WITH THIS SECTION SHALL BE PROVIDED AS REQUESTED BY THE ENFORCING AGENCY. DOCUMENTATION SHALL INCLUDE AT LEAST ONE OF THE FOLLOWING:

1. PRODUCT CERTIFICATIONS AND SPECIFICATIONS.
2. CHAIN OF CUSTODY CERTIFICATIONS.
3. PRODUCT LABELED AND INVOICED AS MEETING THE COMPOSITE WOOD PRODUCTS REGULATION (SEE CCR, TITLE 17, SECTION 93120, ET SEQ.).
4. EXTERIOR GRADE PRODUCTS MARKED AS MEETING THE PS-I OR PS-2 STANDARDS OF THE ENGINEERED WOOD ASSOCIATION, THE AUSTRALIAN AS/NZS 2269 OR EUROPEAN 636 3S STANDARDS.
5. OTHER METHODS ACCEPTABLE TO THE ENFORCING AGENCY

5.504.4.6 RESILIENT FLOORING SYSTEMS. WHERE RESILIENT FLOORING IS INSTALLED, AT LEAST 80 PERCENT OF FLOOR AREA RECEIVING RESILIENT FLOORING SHALL MEET THE REQUIREMENTS OF THE CALIFORNIA DEPARTMENT OF PUBLIC HEALTH, "STANDARD METHOD FOR THE TESTING AND EVALUATION OF VOLATILE ORGANIC CHEMICAL EMISSIONS FROM INDOOR SOURCES USING ENVIRON-MENTAL CHAMBERS," VERSION 1.2, JANUARY 2017 (EMISSION TESTING METHOD FOR CALIFORNIA SPECIFICATION 01350).

SEE CALIFORNIA DEPARTMENT OF PUBLIC HEALTH'S WEBSITE FOR CERTIFICATION PROGRAMS AND TESTING LABS. HTTPS://WWW.CDPH.CA.GOV/PROGRAMS/CCDPHP/DEODC/EHLB/IA Q/PAGESVOC.ASPX#MATERIAL

5.504.4.6.1 VERIFICATION OF COMPLIANCE. DOCUMENTA-TION SHALL BE PROVIDED VERIFYING THAT RESILIENT FLOORING MATERIALS MEET THE POLLUTANT EMISSION LIMITS.

5.504.5.3 FILTERS. IN MECHANICALLY VENTILATED BUILDINGS, PROVIDE REGULARLY OCCUPIED AREAS OF THE BUILDING WITH AIR FILTRATION MEDIA FOR OUTSIDE AND RETURN AIR THAT PROVIDES AT LEAST A MINIMUM EFFICIENCY REPORTING VALUE (MERV) OF 13. MERV 13 FILTERS SHALL BE INSTALLED PRIOR TO OCCUPANCY, AND RECOMMENDATIONS FOR MAINTENANCE WITH FILTERS OF THE SAME VALUE SHALL BE INCLUDED IN THE OPERATION AND MAINTE-NANCE MANUAL.
EXCEPTION: EXISTING MECHANICAL EQUIPMENT.

5.504.5.3.1 LABELING. INSTALLED FILTERS SHALL BE CLEARLY LABELED BY THE MANUFACTURER INDICATING THE MERV RATING.

5.504.7 ENVIRONMENTAL TOBACCO SMOKE (ETS) CONTROL. WHERE OUTDOOR AREAS ARE PROVIDED FOR SMOKING, PROHIBIT SMOKING WITHIN 25 FEET OF BUILDING ENTRIES, OUTDOOR AIR INTAKES AND OPERABLE WINDOWS AND WITHIN THE BUILDING AS ALREADY PRO-HIBITED BY OTHER LAWS OR REGULATIONS; OR AS ENFORCED BY ORDI-NANCES, REGULATIONS OR POLICIES OF ANY CITY, COUNTY, CITY AND COUNTY, CALIFORNIA COMMUNITY COLLEGE, CAMPUS OF THE CALI-FORNIA STATE UNIVERSITY, OR CAMPUS OF THE UNIVERSITY OF CALI-FORNIA, WHICHEVER ARE MORE STRINGENT. WHEN ORDINANCES, REGULATIONS OR POLICIES ARE NOT IN PLACE, POST SIGNAGE TO INFORM BUILDING OCCUPANTS OF THE PROHIBITIONS.

SECTION 5.505 INDOOR MOISTURE CONTROL

5.505.1 INDOOR MOISTURE CONTROL. BUILDINGS SHALL MEET OR EXCEED THE PROVISIONS OF CALIFORNIA BUILDING CODE, CCR, 11 TITLE 24, PART 2, SECTIONS 1202 (VENTILATION) AND CHAPTER 14 (EXTERIOR WALLS). FOR ADDITIONAL MEASURES, SEE SECTION 5.407.2 OF THIS CODE.

SECTION 5.506 INDOOR AIR QUALITY

5.506.1 OUTSIDE AIR DELIVERY. FOR MECHANICALLY OR NATURALLY VENTILATED SPACES IN BUILDINGS, MEET THE MINIMUM REQUIRE-MENTS OF SECTION 120.1 (REQUIREMENTS FOR VENTILATION) OF THE CALIFORNIA ENERGY CODE, OR THE APPLICABLE LOCAL CODE, WHICH-EVER IS MORE STRINGENT, AND DIVISION 1, CHAPTER 4 OF CCR, TITLE 8.

5.506.2 CARBON DIOXIDE (CO2) MONITORING. FOR BUILDINGS OR ADDITIONS EQUIPPED WITH DEMAND CONTROL VENTILATION, CO2 SENSORS AND VENTILATION CONTROLS SHALL BE SPECIFIED AND INSTALLED IN ACCORDANCE WITH THE REQUIREMENTS OF THE CALIFOR-NIA ENERGY CODE, SECTION 120.1(C)(4).

SECTION 5.507 ENVIRONMENTAL COMFORT

NON-

5.507.4 ACOUSTICAL CONTROL. EMPLOY BUILDING ASSEMBLIES AND COMPONENTS WITH SOUND TRANSMISSION CLASS (STC) VALUES DETERMINED IN ACCORDANCE WITH ASTM E90 AND ASTM E413 OR OUTDOOR-INDOOR SOUND TRANSMISSION CLASS (OITC) DETER-MINED IN ACCORDANCE WITH ASTM E1332, USING EITHER THE PRE-SCRIPTIVE OR PERFORMANCE METHOD IN SECTION 5.507.4.1 OR 5.507.4.2.

EXCEPTION: BUILDINGS WITH FEW OR NO OCCUPANTS OR WHERE OCCUPANTS ARE NOT LIKELY TO BE AFFECTED BY EXTERIOR NOISE, AS DETERMINED BY THE ENFORCEMENT AUTHORITY, SUCH AS FACTO-RIES, STADIUMS, STORAGE, ENCLOSED PARKING STRUCTURES AND UTILITY BUILDINGS.

EXCEPTION: □DSA-SS□FOR PUBLIC SCHOOLS AND COMMUNITY COLLEGES, THE REQUIREMENTS OF THIS SECTION AND ALL SUBSEC-TIONS APPLY ONLY TO NEW CONSTRUCTION.

5.507.4.1 EXTERIOR NOISE TRANSMISSION, PRESCRIPTIVE METHOD. WALL AND ROOF-CEILING ASSEMBLIES EXPOSED TO THE NOISE SOURCE MAKING UP THE BUILDING OR ADDITION ENVELOPE OR ALTERED ENVELOPE SHALL MEET A COMPOSITE STC RATING OF AT LEAST 50 OR A COMPOSITE OITC RATING OF NO LESS THAN 40, WITH EXTERIOR WINDOWS OF A MINIMUM STC OF 40 OR OITC OF 30 IN THE FOLLOWING LOCATIONS:

1. WITHIN THE 65 CNEL NOISE CONTOUR OF AN AIRPORT.

EXCEPTIONS:

1. LDN OR CNEL FOR MILITARY AIRPORTS SHALL BE DETERMINED BY THE FACILITY AIR INSTALLATION COMPATIBLE LAND USE ZONE (AICUZ) PLAN.
2. LDN OR CNEL FOR OTHER AIRPORTS AND HELIPORTS FOR WHICH A LAND USE PLAN HAS NOT BEEN DEVELOPED SHALL BE DETERMINED BY THE LOCAL GENERAL PLAN NOISE ELEMENT.

2. WITHIN THE 65 CNEL OR LDN NOISE CONTOUR OF A FREE-WAY OR EXPRESSWAY, RAILROAD, INDUSTRIAL SOURCE OR FIXED-GUIDEWAY SOURCE AS DETERMINED BY THE NOISE ELEMENT OF THE GENERAL PLAN.

5.507.4.1.1 NOISE EXPOSURE WHERE NOISE CONTOURS ARE NOT READILY AVAILABLE. BUILDINGS EXPOSED TO A NOISE LEVEL OF 65 DB LCQ-1-HR DURING ANY HOUR OF OPERATION SHALL HAVE BUILDING, ADDITION OR ALTERATION EXTERIOR WALL AND ROOF-CEILING ASSEMBLIES EXPOSED TO THE NOISE SOURCE MEETING A COMPOSITE STC RATING OF AT LEAST 45 (OR OITC 35), WITH EXTERIOR WINDOWS OF A MINIMUM STC OF 40 (OR OITC 30).

5.507.4.2 PERFORMANCE METHOD. FOR BUILDINGS LOCATED AS DEFINED IN SECTION 5.507.4.1 OR 5.507.4. 1.1, WALL AND ROOF-CEILING ASSEMBLIES EXPOSED TO THE NOISE SOURCE MAKING UP THE BUILDING OR ADDITION ENVELOPE OR ALTERED ENVELOPE SHALL BE CONSTRUCTED TO PROVIDE AN INTERIOR NOISE ENVIRONMENT ATTRIBUTABLE TO EXTERIOR SOURCES THAT DOES NOT EXCEED AN HOURLY EQUIVALENT NOISE LEVEL (LCQ-1 HR) OF 50 DB A IN OCCU-PIED AREAS DURING ANY HOUR OF OPERATION.

5.507.4.2.1 SITE FEATURES. EXTERIOR FEATURES SUCH AS SOUND WALLS OR EARTH BERMS MAY BE UTILIZED AS APPROPRI-ATE TO THE BUILDING, ADDITION OR ALTERATION PROJECT TO MIT-IGATE SOUND MIGRATION TO THE INTERIOR.

5.507.4.2.2 DOCUMENTATION OF COMPLIANCE. AN ACOUS-TICAL ANALYSIS DOCUMENTING COMPLYING INTERIOR SOUND LEVELS SHALL BE PREPARED BY PERSONNEL APPROVED BY THE ARCHITECT OR ENGINEER OF RECORD.

5.507.4.3 INTERIOR SOUND TRANSMISSION. WALL AND FLOOR-CEILING ASSEMBLIES SEPARATING TENANT SPACES AND TENANT SPACES AND PUBLIC PLACES SHALL HAVE AN STC OF AT LEAST 40.
NOTE: EXAMPLES OF ASSEMBLIES AND THEIR VARIOUS STC RATINGS MAY BE FOUND AT THE CALIFORNIA OFFICE OF NOISE CONTROL: HTTP://WWW.TOOLBASE.ORG/PDF/CASESTUDIES/ STC_ICC_RATINGS. PDF.

SECTION 5.508 OUTDOOR AIR QUALITY

5.508.1 OZONE DEPLETION AND GREENHOUSE GAS REDUCTIONS. INSTALLATIONS OF HV AC, REFRIGERATION AND FIRE SUPPRESSION EQUIPMENT SHALL COMPLY WITH SECTIONS 5.508.1.1 AND 5.508.1.2.

5.508.1.1 CHLOROFLUOROCARBONS (CFCS). INSTALL HVAC, REFRIGERATION AND FIRE SUPPRESSION EQUIPMENT THAT DO NOT CONTAIN CFCS.

5.508.1.2 HALONS. INSTALL HV AC, REFRIGERATION AND FIRE SUPPRESSION EQUIPMENT THAT DO NOT CONTAIN HALONS.

5.508.2 SUPERMARKET REFRIGERANT LEAK REDUCTION. NEW COMMERCIAL REFRIGERATION SYSTEMS SHALL COMPLY WITH THE PRO-VISIONS OF THIS SECTION WHEN INSTALLED IN RETAIL FOOD STORES 8,000 SQUARE FEET OR MORE CONDITIONED AREA, AND THAT UTILIZE EITHER REFRIGERATED DISPLAY CASES, OR WALK-IN COOLERS OR FREEZ-ERS CONNECTED TO REMOTE COMPRESSOR UNITS OR CONDENSING UNITS. THE LEAK REDUCTION MEASURES APPLY TO REFRIGERATION SYS-TEMS CONTAINING HIGH-GLOBAL-WARMING POTENTIAL (HIGH-GWP) REFRIGERANTS WITH A GWP OF 150 OR GREATER. NEW REFRIGERATION SYSTEMS INCLUDE BOTH NEW FACILITIES AND THE REPLACEMENT OF EXISTING REFRIGERATION SYSTEMS IN EXISTING FACILITIES.

EXCEPTION: REFRIGERATION SYSTEMS CONTAINING LOW-GLOBAL WARMING POTENTIAL (LOW-GWP) REFRIGERANT WITH A GWP VALUE LESS THAN 150 ARE NOT SUBJECT TO THIS SECTION. LOW-GWP REFRIGERANTS ARE NONOZONE-DEPLETING REFRIGERANTS THAT INCLUDE AMMONIA, CARBON DIOXIDE (CO_2), AND POTENTIALLY OTHER REFRIGERANTS.

5.508.2.1 REFRIGERANT PIPING. PIPING COMPLIANT WITH THE CALIFORNIA MECHANICAL CODE SHALL BE INSTALLED TO BE ACCES-SIBLE FOR LEAK PROTECTION AND REPAIRS. PIPING RUNS USING THREADED PIPE, COPPER TUBING WITH AN OUTSIDE DIAMETER (OD) LESS THAN 1/4 INCH, FLARED TUBING CONNECTIONS AND SHORT RADIUS ELBOWS SHALL NOT BE USED IN REFRIGERANT SYSTEMS EXCEPT AS NOTED BELOW.

5.508.2.1.1 THREADED PIPE. THREADED CONNECTIONS ARE PERMITTED AT THE COMPRESSOR RACK.

5.508.2.1.2 COPPER PIPE. COPPER TUBING WITH AN OD LESS THAN 1/4 INCH MAY BE USED IN SYSTEMS WITH A REFRIG-ERANT CHARGE OF 5 POUNDS OR LESS.

5.508.2.1.2.1 ANCHORAGE. ONE-FOURTH-INCH OD TUB-ING SHALL BE SECURELY CLAMPED TO A RIGID BASE TO KEEP VIBRATION LEVELS BELOW 8 MILS.

5.508.2.1.3 FLARED TUBING CONNECTIONS. DOUBLE-FLARED TUHING CONNECTIONS MAY BE USED FOR PRESSURE CONTROLS, VALVE PILOT LINES AND OIL.
EXCEPTION: SINGLE-FLARED TUBING CONNECTIONS MAY BE USED WITH A MULTIRING SEAL COATED WITH INDUSTRIAL SEALANT SUITABLE FOR USE WITH REFRIGERANT'S AND TIGHT-ENED IN ACCORDANCE WITH MANUFACTURER'S RECOMMEN-DATIONS.

5.508.2.1.4 ELBOWS. SHORT RADIUS ELBOWS ARE ONLY PER-MITTED WHERE SPACE LIMITATIONS PROHIBIT USE OF LONG RADIUS ELBOWS.

5.508.2.2 VALVES. VALVES AND FITTINGS SHALL COMPLY WITH THE CALIFORNIA MECHANICAL CODE AND AS FOLLOWS.

5.508.2.2.1 PRESSURE RELIEF VALVES. FOR VESSELS CONTAIN-ING HIGH-GWP REFRIGERANT, A RUPTURE DISC SHALL BE INSTALLED BETWEEN THE OUTLET OF THE VESSEL AND THE INLET OF THE PRESSURE RELIEF VALVE.

5.508.2.2.1.1 PRESSURE DETECTION. A PRESSURE GAUGE, PRESSURE TRANSDUCER OR OTHER DEVICE SHALL BE INSTALLED IN THE SPACE BETWEEN THE RUPTURE DISC AND THE RELIEF VALVE INLET TO INDICATE A DISC RUPTURE OR DISCHARGE OF THE RELIEF VALVE.

5.508.2.2.2 ACCESS VALVES. ONLY SCHRADER ACCESS VALVES WITH A BRASS OR STEEL BODY ARE PERMITTED FOR USE.

5.508.2.2.2.1 VALVE CAPS. FOR SYSTEMS WITH A REFRIG-ERANT CHARGE OF 5 POUNDS OR MORE, VALVE CAPS SHALL BE BRASS OR STEEL AND NOT PLASTIC.

5.508.2.2.2.2 SEAL CAPS. IF DESIGNED FOR IT, THE CAP SHALL HAVE A NEOPRENE O-RING IN PLACE.

5.508.2.2.2.2.1 CHAIN TETHERS. CHAIN TETHERS TO FIT OVER THE STEM ARE REQUIRED FOR VALVES DESIGNED TO HAVE SEAL CAPS.

EXCEPTION: VALVES WITH SEAL CAPS THAT ARE NOT REMOVED FROM THE VALVE DURING STEM OPERATION.

5.508.2.3 REFRIGERATED SERVICE CASES. REFRIGERATED SER-VICE CASES HOLDING FOOD PRODUCTS CONTAINING VINEGAR AND SALT SHALL HAVE EVAPORATOR COILS OF CORROSION-RESISTANT MATERIAL, SUCH AS STAINLESS STEEL□OR BE COATED TO PREVENT CORROSION FROM THESE SUBSTANCES.

5.508.2.3.1 COIL COATING. CONSIDERATION SHALL BE GIVEN TO THE HEAT TRANSFER EFFICIENCY OF COIL COATING TO MAXI-MIZE ENERGY EFFICIENCY.

5.508.2.4 REFRIGERANT RECEIVERS. REFRIGERANT RECEIVERS WITH CAPACITIES GREATER THAN 200 POUNDS SHALL BE FITTED WITH A DEVICE THAT INDICATES THE LEVEL OF REFRIGERANT IN THE RECEIVER.

5.508.2.5 PRESSURE TESTING. THE SYSTEM SHALL BE PRESSURE TESTED DURING INSTALLATION PRIOR TO EVACUATION AND CHARGING.

5.508.2.5.1 MINIMUM PRESSURE. THE SYSTEM SHALL BE CHARGED WITH REGULATED DRY NITROGEN AND APPROPRIATE TRACER GAS TO BRING SYSTEM PRESSURE UP TO 300 PSIG MINI-MUM

5.508.2.5.2 LEAKS. CHECK THE SYSTEM FOR LEAKS, REPAIR ANY LEAKS, AND RETEST FOR PRESSURE USING THE SAME GAUGE.

5.508.2.5.3 ALLOWABLE PRESSURE CHANGE. THE SYSTEM SHALL STAND, UNALTERED, FOR 24 HOURS WITH NO MORE THAN A □/- ONE POUND PRESSURE CHANGE FROM 300 PSIG, MEA-SURED WITH THE SAME GAUGE.

5.508.2.6 EVACUATION. THE SYSTEM SHALL BE EVACUATED AFTER PRESSURE TESTING AND PRIOR TO CHARGING.

5.508.2.6.1 FIRST VACUUM. PULL A SYSTEM VACUUM DOWN TO AT LEAST 1000 MICRONS(□/- 50 MICRONS), AND HOLD FOR 30 MINUTES.

5.508.2.6.2 SECOND VACUUM. PULL A SECOND SYSTEM VAC-UUM TO A MINIMUM OF 500 MICRONS AND HOLD FOR 30 MINUTES.

5.508.2.6.3 THIRD VACUUM. PULL A THIRD VACUUM DOWN TO A MINIMUM OF 300 MICRONS, AND HOLD FOR 24 HOURS WITH A MAXIMUM DRIFT OF I 00 MICRONS OVER A 24-HOUR PERIOD

END OF NON-RESIDENTIAL GREEN BUILDING GENERAL NOTES.

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

LICENSED ARCHITECT
LAWRENCE SCARPA
C 21812
REN 10/31/2023
STATE OF CALIFORNIA

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED •

DEPARTMENT OF PUBLIC WORKS
BUREAU OF ENGINEERING

NO.	REVISIONS:	DATE:	BY:

VERTICAL CONTROL:
HORIZONTAL CONTROL:

SHEET TITLE: GREEN BUILDING NOTES

PROJECT: RESEDA SKATE FACILITY

ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

CIP NO.

INDEX NO.

CITY OF LOS ANGELES

CITY ENGINEER: GARY LEE MOORE, P.E. ENV. SP — DATE:

DESIGN GROUP

ENGINEER:
DESIGNED BY:
DRAWN BY:
CHECKED BY:
APPROVED BY:

WORK ORDER NO.
E170121B

SHEET NAME
A0.17
SHEET X OF X SHEETS

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REVISION DATES (DESIGN STAGE ONLY)

Sheet Version 4.0

Z:\B□S ARCHITECTURE\019 JOBS\01935.0 CITY OF LA-RESEDA ICE HOCKEY ROLLER RINK\01935.0 1.CURRENT DRAWINGS_24X36\01935.0_A017_24X36.DWG 12/3/2021 9:07 AM

COMMERCIAL ACCESSIBILITY NOTES (Based on the 2019 CALIFORNIA BUILDING CODE (CBC) and Chapter 11B-ACCESSIBILITY TO PUBLIC BUILDINGS, PUBLIC ACCOMODATIONS AND COMMERCIAL BUILDINGS.

APPLICATION AND ADMINISTRATION

THE STATE OF CALIFORNIA DELEGATES TO THE LOCAL JURISDICTION THE AUTHORITY TO ENSURE COMPLIANCE WITH TITLE 24, PART 2 OF THE CALIFORNIA CODE OF REGULATIONS. THE OWNER(S) OF THIS BUILDING IS RESPONSIBLE FOR COMPLIANCE WITH THE MOST CURRENT FEDERAL REGULATIONS CONTAINED IN THE AMERICANS WITH DISABILITIES ACT (ADA) AND FAIR HOUSING ACT (FHA). WHERE THE ADA & FHA REQUIREMENTS EXCEED THOSE CONTAINED IN TITLE 24, PART 2, IT IS THE OWNERS RESPONSIBILITY TO ENSURE COMPLIANCE WITH THE MOST CURRENT ADA & FHA REGULATIONS.

A. APPLICATION AND ADMINISTRATION AND SCOPING REQUIREMENTS

1 PUBLIC ACCOMMODATIONS SHALL MAINTAIN IN OPERABLE WORKING CONDITION THOSE FEATURES OF FACILITIES AND EQUIPMENT THAT ARE REQUIRED TO BE ACCESSIBLE TO AND USEABLE BY PERSONS WITH DISABILITIES. ISOLATED OR TEMPORARY INTERRUPTIONS IN SERVICE OR ACCESSIBILITY DUE TO MAINTENANCE OR REPAIRS SHALL BE PERMITTED. §11B-108.

2 WHEN ALTERATIONS OR ADDITIONS ARE MADE TO EXISTING BUILDINGS OR FACILITIES, AN ACCESSIBLE PATH OF TRAVEL TO THE SPECIFIC AREA OF ALTERATION OR ADDITION SHALL BE PROVIDED UNLESS OTHERWISE EXEMPT. PRIMARY ACCESSIBLE PATH OF TRAVEL SHALL INCLUDE A PRIMARY ENTRANCE TO THE BUILDING OR FACILITY::TOILET AND BATHING FACILITIES SERVING THE AREA: DRINKING FOUNTAINS SERVING THE AREA; PUBLIC TELEPHONES SERVING THE AREA, AND SIGNS. §11B-202.4

3 WHEN THE ADJUSTED CONSTRUCTION COST IS LESS THAN OR EQUAL TO THE CURRENT VALUATION THRESHOLD, THE COST OF COMPLIANCE WITH SECTION 11B-202.4 IS LIMITED TO 20 PERCENT OF THE ADJUSTED CONSTRUCTION COST OF ALTERATIONS, STRUCTURAL REPAIRS OR ADDITIONS. WHEN THE COST OF FULL COMPLIANCE WOULD EXCEED 20%, COMPLIANCE SHALL BE PROVIDED TO THE GREATEST EXTENT POSSIBLE WITHOUT EXCEEDING 20% IF IT IS DETERMINED BY THE ENFORCING AGENCY THAT THE COST OF COMPLIANCE WITH SECTION 11B-204 IS AN UNREASONABLE HARDSHIP. §11B-202.4

4 ADJUSTED CONSTRUCTION COST OF ALTERATIONS, STRUCTURAL REPAIRS AND ADDITIONS DOES NOT INCLUDE THE COST OF ALTERATIONS TO PATH OF TRAVEL ELEMENTS. §11B-202.4

5 IN CHOOSING WHICH ACCESSIBLE ELEMENTS TO PROVIDE, PRIORITY SHOULD BE GIVEN TO THOSE ELEMENTS THAT WILL PROVIDE THE GREATEST ACCESS IN THE FOLLOWING ORDER: 1)AN ACCESSIBLE ENTRANCE::2)AN ACCESSIBLE ROUTE TO THE ALTERED AREA::3)AT LEAST ONE ACCESSIBLE RESTROOM FOR EACH SEX OR A SINGLE ACCESSIBLE UNISEX RESTROOM::4)ACCESSIBLE TELEPHONES::5)ACCESSIBLE DRINKING FOUNTAINS::AND 6)WHEN POSSIBLE, ADDITIONAL ACCESSIBLE ELEMENTS SUCH AS PARKING, STORAGE, AND ALARMS. §11B-202.4

6 ALTERATIONS TO QUALIFIED HISTORIC BUILDING OR FACILITY SHALL COMPLY WITH CHAPTER 11B UNLESS IT WILL THREATEN OR DESTROY THE HISTORICAL SIGNIFICANCE OR CHARACTER-DEFINING FEATURES OF THE BUILDING OR PROPERTY. IN THOSE CASES, ALTERNATIVE PROVISIONS SHALL BE APPLIED ON AN ITEM-BY-ITEM OR CASE-BY-CASE BASIS WITH SUFFICIENT WRITTEN DOCUMENTATION. §11B-202.5, SHBC 8-602

7 FOR NEW CONSTRUCTION, AT LEAST ONE ACCESSBILE ROUTE SHALL BE PROVIDED WITHIN THE SITE FROM ACCESSIBLE PARKING SPACES AND ACCESSIBLE PASSENGER DROP-OFF AND LOADING ZONES, PUBLIC STREETS AND SIDEWALKS AND PUBLIC TRANSPORTATION STOPS TO THE ACCESSIBLE BUILDING OR FACILITY ENTRANCE THEY SERVE. WHERE MORE THAN ONE ROUTE IS PROVIDED, ALL ROUTES MUST BE ACCESSIBLE. §11B-206.

B. BUILDING BLOCKS

FLOOR OR GROUND SURFACES

1 FLOOR AND GROUND SURFACES SHALL BE STABLE, FIRM, AND SLIP RESISTANT. §11B-302.1

2 CARPET OR CARPET TILE SHALL BE SECURELY ATTACHED AND SHALL HAVE A FIRM CUSHION, PAD, OR BACKING OR NO CUSHION OR PAD. CARPET OR CARPET TILE SHALL HAVE A LEVEL LOOP, TEXTURED LOOP, LEVEL CUT PILE, OR LEVEL CUT/UNCUT PILE TEXTURE. PILE HEIGHT SHALL BE ½ INCH MAXIMUM. §11B-302.2, FIGURE 11B-302.2

CHANGES IN LEVEL

3 VERTICAL CHANGES IN LEVEL FOR FLOOR OR GROUND SURFACES MAY BE ¼ INCH HIGH MAXIMUM AND WITHOUT EDGE TREATMENT. CHANGES IN LEVEL GREATER THAN ¼ INCH AND NOT EXCEEDING ½ INCH IN HEIGHT SHALL BE BEVELED WITH A SLOPE NOT STEEPER THAN 1:2. §11B-303, FIGURES 11B-303.2 & 11B-303.3

4 CHANGES IN LEVEL GREATER THAN ½ INCH IN HEIGHT SHALL BE RAMPED AND SHALL COMPLY WITH THE REQUIREMENTS OF 11B-405 RAMPS OR 11B-406 CURB RAMPS AS APPLICABLE. §11B-303

5 ABRUPT CHANGES IN LEVEL EXCEEDING 4 INCHES IN A VERTICAL DIMENSION BETWEEN WALKS, SIDEWALKS OR OTHER PEDESTRIAN WAYS AND ADJACENT SURFACES OR FEATURES SHALL BE IDENTIFIED BY WARNING CURBS AT LEAST 6 INCHES IN HEIGHT ABOVE THE WALK OR SIDEWALK SURFACE OR BY GUARDS OR HANDRAILS WITH A GUIDE RAIL CENTERED 2 INCHES MINIMUM AND 4 INCHES MAXIMUM ABOVE THE SURFACE OF THE WALK OR SIDEWALK. THESE REQUIREMENTS DO NOT APPLY BETWEEN A WALK OR SIDEWALK AND AN ADJACENT STREET OR DRIVEWAY. §11B-303.5

TURNING SPACE

6 CIRCULAR TURNING SPACES SHALL BE A SPACE OF 60 INCHES DIAMETER MINIMUM AND MAY INCLUDE KNEE AND TOE CLEARANCE COMPLYING WITH 11B-306 KNEE AND TOE CLEARANCE. §11B-304.3.1

7 T-SHAPED TURNING SPACES SHALL BE A T-SHAPED SPACE WITHIN A 60 INCH SQUARE MINIMUM WITH ARMS AND BASE 36 INCHES WIDE MINIMUM. EACH ARM OF THE T SHALL BE CLEAR OF OBSTRUCTIONS 12 INCHES MINIMUM IN EACH DIRECTION AND THE BASE SHALL BE CLEAR OF OBSTRUCTIONS 24 INCHES MINIMUM. §11B-304.3.2, FIGURE 11B-304.3.2

KNEE AND TOE CLEARANCE

8 SPACE UNDER AN ELEMENT BETWEEN THE FINISH FLOOR OR GROUND AND 9 INCHES ABOVE THE FINISH FLOOR OR GROUND SHALL BE CONSIDERED TOE CLEARANCE AND SHALL COMPLY WITH 11B-306.2. TOE CLEARANCE SHALL BE 30 INCHES WIDE MINIMUM. §11B-306.2.1 AND 11B-306.2.5

9 TOE CLEARANCE SHALL EXTEND 25 INCHES MAXIMUM UNDER AN ELEMENT. TOE CLEARANCE SHALL EXTEND 19 INCHES MAXIMUM UNDER LAVATORIES REQUIRED TO BE ACCESSIBLE PER 11B-213.3.4. §11B-306.2.2

10 WHERE KNEE CLEARANCE IS REQUIRED UNDER AN ELEMENT AS PART OF A CLEAR FLOOR SPACE, THE KNEE CLEARANCE SHALL BE 11 INCHES DEEP MIN. AT 9 INCHES ABOVE THE FINISH FLOOR OR GROUND AND 8 INCHES DEEP MIN. AT 27 INCHES ABOVE THE FINISH FLOOR OR GROUND. AT LAVATORIES REQUIRED TO BE ACCESSIBLE BY SECTION 11B-213.3.4, THE KNEE CLEARNCE SHALL BE 27 INCHES HIGH MINIMUM ABOVE THE FINISH FLOOR OR GROUND AT A DEPTH OF 8 INCHES MIN. INCREASING TO 29 INCHES HIGH MIN. AT THE FRONT EDGE OF A COUNTER WITH A BUILT-IN LAVATORY OR AT THE FRONT EDGE OF A WALL-MOUNTED LAVATORY FIXTURE. §11B-306.3.3, FIGURE 11B-306.3(C)

11 AT DINING AND WORK SURFACES REQUIRED TO BE ACCESSIBLE, KNEE CLEARANCE SHALL EXTEND 19 INCHES DEEP MINIMUM AT 27 INCHES ABOVE THE FINISH FLOOR OR GROUND. §11B-306.3

PROTRUDING OBJECTS

12 EXCEPT FOR HANDRAILS, OBJECTS WITH LEADING EDGES MORE THAN 27 INCHES AND NOT MORE THAN 80 INCHES ABOVE THE FINISH FLOOR OR GROUND SHALL PROTRUDE NO MORE THAN 4 INCHES HORIZONTALLY INTO THE CIRCULATION PATH. HANDRAILS MAY PROTRUDE 4½ INCHES MAXIMUM. §11B-307.2, FIGURE 11B-307.2

13 FREE-STANDING OBJECTS MOUNTED ON POSTS OR PYLONS SHALL OVERHANG CIRCULATION PATHS NO MORE THAN 12 INCHES WHEN LOCATED FROM 27 TO 80 INCHES ABOVE THE FINISH FLOOR OR GROUND. §11B-307.3, FIGURE 11B-307.3

14 PROTRUDING OBJECTS SHALL NOT REDUCE THE CLEAR WIDTH REQUIRED FOR ACCESSIBLE ROUTES. §11B-307.5

15 FREE-STANDING OBJECTS MOUNTED ON POSTS OR PYLONS SHALL OVERHANG CIRCULATION PATHS 12 INCHES MAXIMUM WHEN LOCATED 27 INCHES MINIMUM AND 80 INCHES MAXIMUM ABOVE THE FINISH FLOOR OR GROUND. §11B-307.3, FIGURE 11B-307.3

16 VERTICAL CLEARANCE SHALL BE 80 INCHES HIGH MINIMUM. GUARDRAILS OR OTHER BARRIERS SHALL BE PROVIDED WHERE THE VERTICAL CLEARANCE IS LESS THAN 80 INCHES HIGH. THE LEADING EDGE OF SUCH GUARDRAIL OR BARRIER SHALL BE LOCATED 27 INCHES MAXIMUM ABOVE THE FINISH FLOOR OR GROUND. DOOR CLOSERS AND DOOR STOPS SHALL BE PERMITTED TO BE 78 INCHES MINIMUM ABOVE THE FINISH FLOOR OR GROUND. §11B-307.4, FIGURE 11B-307.4

17 WHERE A GUY SUPPORT IS USED WITHIN EITHER THE WIDTH OF A CIRCULATION PATH OR 24 INCHES MAXIMUM OUTSIDE OF A CIRCULATION PATH, A VERTICAL GUY BRACE, SIDEWALK GUY OR SIMILAR DEVICE SHALL BE USED TO PREVENT A HAZARD OR AN OVERHEAD OBSTRUCTION. §11B-307.4.1, FIGURE 11B- 307.4.1

18 PROTRUDING OBJECTS SHALL NOT REDUCE THE CLEAR WIDTH REQUIRED FOR ACCESSIBLE ROUTES. §11B-307.5

REACH RANGES

19 ELECTRICAL CONTROLS AND SWITCHES INTENDED TO BE USED BY THE OCCUPANT OF A ROOM OR AREA TO CONTROL LIGHTING AND RECEPTACLE OUTLETS, APPLIANCES OR COOLING, HEATING AND VENTILATING EQUIPMENT SHALL BE LOCATED WITHIN ALLOWABLE REACH RANGES EXCEPT THE LOW REACH SHALL BE MEASURED TO THE BOTTOM OF THE OUTLET BOX AND HIGH REACH SHALL BE MEASURED TO THE TOP OF THE OUTLET BOX. §11B-308.1.1

20 ELECTRICAL RECEPTACLE OUTLETS ON BRANCH CIRCUITS OF 30 AMPERES OR LESS AND COMMUNICATION SYSTEM RECEPTACLES SHALL BE LOCATED WITHIN ALLOWABLE REACH RANGES EXCEPT THE LOW REACH SHALL BE MEASURED TO THE BOTTOM OF THE OUTLET BOX AND HIGH REACH SHALL BE MEASURED TO THE TOP OF THE OUTLET BOX. §11B-308.1.2

21 HIGH FORWARD REACH THAT IS UNOBSTRUCTED SHALL BE 48 INCHES MAXIMUM AND THE LOW FORWARD REACH SHALL BE 15 INCHES MINIMUM ABOVE THE FINISH FLOOR OR GROUND. §11B-308.2.1, FIGURE 11B-308.2.1

22 HIGH FORWARD REACH SHALL BE 48 INCHES MAXIMUM WHERE THE REACH DEPTH IS 20 INCHES MAXIMUM. HIGH FORWARD REACH SHALL BE 44 INCHES MAXIMUM WHERE THE REACH DEPTH EXCEEDS 20 INCHES AND IS A MAXIMUM OF 25 INCHES IN DEPTH. §11B-308.2.2, FIGURE 11B-308.2.2

23 HIGH SIDE REACH SHALL BE 48 INCHES MAXIMUM AND THE LOW SIDE REACH SHALL BE 15 INCHES MINIMUM ABOVE THE FINISH FLOOR WHERE THE SIDE REACH IS UNOBSTRUCTED OR THE DEPTH OF ANY OBSTRUCTION DOES NOT EXCEED 10 INCHES. §11B-308.3.1, FIGURE 11B-308.3.1

24 WHERE A CLEAR FLOOR OR GROUND SPACE ALLOWS A PARALLEL APPROACH TO AN ELEMENT AND THE HIGH SIDE REACH IS OVER AN OBSTRUCTION, THE HEIGHT OF THE OBSTRUCTION SHALL BE 34 INCHES MAXIMUM AND THE DEPTH OF THE OBSTRUCTION SHALL BE 24 INCHES MAXIMUM. THE HIGH SIDE REACH SHALL BE 48 INCHES MAXIMUM FOR A REACH DEPTH OF 10 INCHES MAXIMUM. WHERE THE REACH DEPTH EXCEEDS 10 INCHES, THE HIGH SIDE REACH SHALL BE 46 INCHES MAXIMUM FOR A REACH DEPTH OF 24 INCHES MAXIMUM. §11B-308.3.2, FIGURE 11B-308.3.2

25 EXCEPTION 1- THE TOP OF WASHING MACHINES AND CLOTHES DRYERS SHALL BE PERMITTED TO BE 36 INCHES MAXIMUM ABOVE THE FINISH FLOOR. §11B-308.3.2

26 EXCEPTION 2- OPERABLE PARTS OF FUEL DISPENSERS SHALL BE PERMITTED TO BE 54 INCHES MAXIMUM MEASURED FROM THE SURFACE OF THE VEHICULAR WAY WHERE FUEL DISPENSERS ARE INSTALLED ON EXISTING CURBS. §11B-308.3.2

OPERABLE PARTS

28 OPERABLE PARTS SHALL BE PLACED WITHIN ON OR MORE OF THE ACCESSIBLE REACH RANGES AND SHALL BE OPERABLE WITH ONE HAND AND SHALL NOT REQUIRE TIGHT GRASPING, PINCHING, OR TWISTING OF THE WRIST. FORCE REQUIRED TO ACTIVATE OPERABLE PARTS SHALL BE 5 POUNDS MAXIMUM. §11B-309.4

C. ACCESSIBLE ROUTES

GENERAL

1 AT LEAST ONE ACCESSIBLE ROUTE SHALL BE PROVIDED WITHIN THE SITE FROM ACCESSIBLE PARKING SPACES AND ACCESSIBLE PASSENGER LOADING ZONES::PUBLIC STREETS AND SIDEWALKS::AND PUBLIC TRANSPORTATION STOPS TO THE ACCESSIBLE BUILDING OR FACILITY ENTRANCE THEY SERVE. WHERE MORE THAN ONE ROUTE IS PROVIDED, ALL ROUTES MUST BE ACCESSIBLE. §11B-206.2.1. EXCEPTIONS: AN ACCESSIBLE ROUTE SHALL NOT BE REQUIRED BETWEEN SITE ARRIVAL POINTS AND THE BUILDING OR FACILITY ENTRANCE IF THE ONLY MEANS OF ACCESS BETWEEN THEM IS A VEHICULAR WAY NOT PROVIIDNG PEDESTRIAN ACCCES. GENERAL CIRCULATION PATHS SHALL BE PERMITTED WHEN LOCATED IN CLOSE PROXIMITY TO AN ACCESSIBLE ROUTE.

2 AT LEAST ONE ACCESSIBLE ROUTE SHALL CONNECT ACCESSIBLE BUILDINGS, ACCESSIBLE FACILITIES, ACCESSIBLE ELEMENTS, AND ACCESSIBLE SPACES THAT ARE ON THE SAME SITE. §11B-206.2.2. EXCEPTION: AN ACCESSIBLE ROUTE SHALL NOT BE REQUIRED BETWEEN ACCESSIBLE BUILDINGS, ACCESSIBLE FACILITIES, ACCESSIBLE ELEMENTS AND ACCCESSIBLE SPACES IF THE ONLY MEANS OF ACCESS BETWEEN THEM IS A VEHICULAR WAY NOT PROVIIDNG PEDESTRIAN ACCESS.

3 AT LEAST ONE ACCESSIBLE ROUTE SHALL CONNECT EACH STORY AND MEZZANINE IN MULTI-STORY BUILDINGS AND FACILITIES. §11B-206.2.3 (SOME EXCEPTIONS APPLY, REFER TO CODE)

4 IN ALTERATIONS OR ADDITIONS, WHERE AN ESCALATOR OR STAIR IS PROVIDED WHERE NONE EXISTED PREVIOUSLY AND MAJOR STRUCTURAL MODIFICATIONS ARE NECESSARY FOR THE INSTALLATION, AN ACCESSIBLE ROUTE SHALL BE PROVIDED BETWEEN THE LEVELS SERVED BY THE ESCALATOR OR STAIR UNLESS EXEMPTED BY 11B-206.2.3 EXCEPTIONS 1-7.

5 IN NEW CONSTRUCTION OF BUILDINGS WHERE ELEVATORS ARE REQUIRED BY 11B-206.2.3 MULTI-STORY BUILDINGS AND FACILITIES, AND WHICH EXCEED 10,000 SQUARE FEET ON ANY FLOOR, AN ACCESSIBLE MEAN OF VERTICAL ACCESS VIA RAMP, ELEVATOR OR LIFT SHALL BE PROVIDED WITH IN 200 FEET OF TRAVEL OF EACH STAIR AND EACH ESCALATOR. §11B-206.2.3.2

6 IN EXISTING BUILDNGS THAT EXCEED 10,000 SQUARE FEET ON ANY FLOOR AND IN WHICH ELEVATORS ARE REQUIRED BY 11B-206.2.3 MULTI-STORY BUILDINGS AND FACILITIES, WHEREEVER A NEWLY CONSTRUCTED MEANS OF VERTICAL ACCESS IS PROVIDED VIA STAIRS OR AN ESCALATOR, AN ACCESSIBLE MEANS OF VERTICAL ACCESS VIA RAMP, ELEVATOR, OR LIFT SHALL BE PROVIDED WITHIN 200 FEET OF TRAVEL OF EACH NEW STAIR OR ESCALATOR. §11B-206.2.3.2

7 AT LEAST ONE ACCESSIBLE ROUTE SHALL CONNECT ACCESSIBLE BUILDING OR FACILITY ENTRANCES WITH ALL ACCESSIBLE SPACES AND ELEMENTS WITHIN THE BUILDING OR FACILITY, INCLUDING MEZZANINES, WHICH ARE OTHERWISE CONNECTED BY A CIRCULATION PATH. §11B-206.2.4 (SEE EXCEPTIONS 1 THROUGH 7)

8 ACCESSIBLE ROUTES SHALL COINCIDE WITH OR BE LOCATED IN THE SAME AREA AS GENERAL CIRCULATION PATHS. WHERE CIRCULATION PATHS ARE INTERIOR, REQUIRED ACCESSIBLE ROUTES SHALL ALSO BE INTERIOR::AN ACCESSIBLE ROUTE SHALL NOT PASS THROUGH KITCHENS, STORAGE ROOMS, RESTROOMS, CLOSETS OR OTHER SPACES USED FOR SIMILAR PURPOSES, EXCEPT AS PERMITTED BY CHAPTER 10. §11B-206.3

EMPLOYEE WORKSTATIONS

9 EMPLOYEE WORKSTATIONS SHALL BE ON AN ACCESSIBLE ROUTE PER 11B-203.9. SPACES AND ELEMENTS WITHIN EMPLOYEE WORKSTATIONS SHALL ONLY BE REQUIRED TO COMPLY WITH SECTIONS 11B-207.1 (MEANS OF EGRESS), 11B-215.3 (AUDIBLE ALARM COVERAGE), 11B-302 (FLOOR OR GROUND SURAFCES), 11B- 303 (CHANGES IN LEVEL), 11-B-308.1.1 (ELECTRICAL SWITCHES), 11B-308.1.2 (ELECTRICAL RECEPTACLE OUTLETS) AND 11B-404.2.3 (DOOR CLEAR WIDTH) UNLESS EXEMPTED BY OTHER PARTS OF THE CODE. COMMON USE CIRCULATION PATHS WITHIN EMPLOYEE WORKSTATIONS SHALL COMPLY WITH SECTION 11B-206.2.8. §11B-203.9

MACHINERY SPACES

10 SPACES FREQUENTED ONLY BY SERVICE PERSONNEL FOR MAINTENANCE, REPAIR OR OCCASIONAL MONITORING OF EQUIPMENT SHALL NOT BE REQUIRED TO COMPLY WITH THESE REQUIREMENTS OR TO BE ON AN ACCESSIBLE ROUTE. MACHINERY SPACES INCLUDE, BUT ARE NOT LIMITED TO, ELEVATOR PITS OR ELEVATOR PENTHOUSES::MECHANICAL, ELECTRICAL OR COMMUNICATIONS EQUIPMENT ROOMS, ETC. §11B-203.5

11 OMIT.

DETECTABLE WARNINGS AND DETECTABLE DIRECTIONAL TEXTURE

12 ALL REQUIRED DETECTABLE WARNINGS ON SHALL BE IN COMPLIANCE WITH THE SELECTED ITEMS BELOW. §11B-247 & §11B-705

13 CURB RAMPS SHALL HAVE DETECTABLE WARNINGS THAT EXTEND 36 INCHES IN THE DIRECTION OF TRAVEL FOR THE FULL WIDTH OF THE RAMP RUN LESS THAN 2 INCHES MAXIMUM ON EACH SIDE, EXCLUDING ANY FLARED SIDES. §11B-247.1.2.2, §11B-705.1.2.2

ON PERPENDICULAR CURB RAMPS, DETECTABLE WARNINGS SHALL BE LOCATED SO THE EDGE NEAREST THE CURB IS 6 INCHES MINIMUM AND 8 INCHES MAXIMUM FROM THE LINE AT THE FACE OF THE CURB MARKING THE TRANSITION BETWEEN THE CURB AND THE GUTTER, STREET OR HIGHWAY. §11B-247.1.2.2, §11B-705.1.2.2

ON PARALLEL CURB RAMPS, DETECTABLE WARNINGS SHALL BE PLACED ON THE TURNING SPACE AT THE FLUSH TRANSITION BETWEEN THE STREET AND SIDEWALK. DETECTABLE WARNINGS SHALL EXTEND THE FULL WIDTH OF THE TURNING SPACE AT THE FLUSH TRANSITION BETWEEN THE STREET AND THE SIDEWALK LESS 2 INCHES MAXIMUM ON EACH SIDE §11B-247.1.2.2, §11B-705.1.2.2, FIGURE 11B-406.3.2

14 ISLANDS OR CUT-THROUGH MEDIANS SHALL HAVE DETECTABLE WARNINGS THAT ARE 36 INCHES MINIMUM IN DEPTH EXTENDING THE FULL WIDTH OF THE PEDESTRIAN PATH OR CUT-THROUGH LESS 2 INCHES MAXIMUM ON EACH SIDE, PLACED AT THE EDGES OF THE PEDESTRIAN ISLAND OR CUT-THROUGH MEDIAN, AND SHALL BE SEPARATED BY 24 INCHES MINIMUM OF WALKING SURFACE WITHOUT DETECTABLE WARNINGS. §11B-247.1.2.3, §11B-705.1.2.3

15 WALKS THAT CROSS OR ADJOIN A ROUTE PROVIDED FOR VEHICULAR TRAFFIC, SUCH AS IN A STREET, DRIVEWAY, OR PARKING FACILITY, SHALL BE SEPARATED BY DETECTABLE WARNINGS, CURBS, RAILINGS OR OTHER ELEMENTS BETWEEN THE PEDESTRIAN AREAS AND VEHICULAR AREAS. §202, §11B-247.1.2.5, §11B-705.1.2.5

16 DETECTABLE WARNINGS PROVIDED TO SEPARATE WALKS THAT CROSS OR ADJOIN A ROUTE PROVIDED FOR VEHICULAR TRAFFIC, SUCH AS IN A STREET, DRIVEWAY, OR PARKING FACILITY, SHALL BE 36 INCHES IN WIDTH AND CONTINUOUS AT THE BOUNDARY BETWEEN THE PEDESTRIAN AREAS AND VEHICULAR AREAS. §202, §11B-247.1.2.5, §11B-705.1.2.5

DETECTABLE WARNINGS SHALL CONSIST OF TRUNCATED DOMES PER 11B-705 AND SHALL BE SPACED PER 11B-705.1.1.2. DETECTABLE WARNING SURFACES SHALL BE YELLOW AND APPROXIMATE FS 33538 OF FEDERAL STANDARD 595C. §11B-705.1.1.3.1

ENTRANCES

17 ENTRANCES SHALL BE PROVIDED IN ACCORDANCE WITH 11B-206.4. ALL ENTRANCES, ENTRANCE DOORS, DOORWAYS, AND GATES AND ALL EXTERIOR GROUND-FLOOR EXITS TO BUILDINGS AND FACILITIES SHALL COMPLY WITH 11B-404, EXCEPT EXTERIOR GROUND FLOOR EXITS SERVING SMOKE-PROOF ENCLOSURES, STAIRWELLS AND EXIT DOORS SERVING STAIRS ONLY. ENTRANCES, DOORWAYS, AND GATES AND SHALL BE ON AN ACCESSIBLE ROUTE COMPLYING WITH 11B-402 ACCESSIBLE ROUTES. §11B-206.4

19 DOORS, DOORWAYS AND GATES PROVIDING USER PASSAGE SHALL COMPLY WITH 11B-206.5 AND 11B-404 INCLUDING DOOR SIZE(S), HARDWARE, LANDINGS, THRESHOLDS, KICKPLATES, OPENING FORCE, CLOSING SPEED, VISION LIGHTS AND MANEUVERING CLEARANCES. §11B-206.5

20 WHERE DIRECT ACCESS IS PROVIDED FOR PEDESTRIANS FROM A PARKING STRUCTURE TO A BUILDING OR FACILITY ENTRANCE, EACH DIRECT ACCESS TO THE BUILDING OR FACILITY ENTRANCE SHALL COMPLY WITH 11B-404 DOORS, DOORWAYS, AND GATES. §11B-206.4.2

21 DIRECT CONNECTIONS TO OTHER FACILITIES SHALL PROVIDE AN ACCESSIBLE ROUTE COMPLYING WITH 11B-404 DOORS, DOORWAYS, AND GATES FROM THE POINT OF CONNECTION TO BOARDING PLATFORMS AND ALL TRANSPORTATION SYSTEM ELEMENTS REQUIRED TO BE ACCESSIBLE. ANY ELEMENTS PROVIDED TO FACILITATE FUTURE DIRECT CONNECTIONS SHALL BE ON AN ACCESSIBLE ROUTE CONNECTING BOARDING PLATFORMS AND ALL TRANSPORTATION SYSTEM ELEMENTS REQUIRED TO BE ACCESSIBLE. §11B-206.4.4.2 (SEE EXCEPTION)

TECHNICAL REQUIREMENTS FOR ACCESSIBLE ROUTES

22 ACCESSIBLE ROUTES SHALL CONSIST OF ONE OR MORE OF THE FOLLOWING COMPONENTS: WALKING SURFACES WITH A RUNNING SLOPE NOT STEEPER THAN 1:20 (5%), DOORWAYS, RAMPS, CURB RAMPS EXCLUDING THE FLARED SIDES, ELEVATORS, AND PLATFORM LIFTS. §11B-402.2

23 THE RUNNING SLOPE OF WALKING SURFACES SHALL NOT BE STEEPER THAN 1:20 (5%). THE CROSS SLOPE OF WALKING SURFACES SHALL NOT BE STEEPER THAN 1:48 (2.083%). §11B-403.3

24 EXCEPT AT TURNS OR PASSING SPACES, THE CLEAR WIDTH OF WALKING SURFACES SHALL BE 36 INCHES MINIMUM. §11B-403.5.1 NOTE: A GREATER WIDTH MAY BE REQUIRED BY OTHER PARTS OF THE CODE AND AS NOTED BELOW:

25 THE CLEAR WIDTH FOR WALKING SURFACES IN CORRIDORS SERVING AN OCCUPANT LOAD OF 10 OR MORE SHALL BE 44 INCHES MINIMUM. §11B-403.5.1 EXCEPTION 2

26 THE CLEAR WIDTH FOR SIDEWALKS AND WALKS SHALL BE 48 INCHES MINIMUM. §11B-403.5.1 EXCEPTION 3

27 THE CLEAR WIDTH FOR AISLES SHALL BE 36 INCHES MINIMUM IF SERVING ELEMENTS ON ONLY ONE SIDE, AND 44 INCHES MINIMUM IF SERVING ELEMENTS ON BOTH SIDES. §11B-403.5.1 EXCEPTION 4

28 THE CLEAR WIDTH FOR ACCESSIBLE ROUTES TO ACCESSIBLE TOILET COMPARTMENTS SHALL BE 44 INCHES EXCEPT FOR DOOR OPENING WIDTHS AND DOOR SWINGS. §11B-403.5.1 EXCEPTION 5

DOORS, DOORWAYS AND GATES

29 DOORS, DOORWAYS, AND GATES PROVIDING USER PASSAGE SHALL BE PROVIDED IN ACCORDANCE WITH 11B-206.5

30 DOORS, DOORWAYS AND GATES THAT ARE PART OF AN ACCESSIBLE ROUTE SHALL COMPLY WITH 11B-404 DOORS, DOORWAYS, AND GATES. §11B-404.1

31 REVOLVING DOORS, REVOLVING GATES, AND TURNSTILES SHALL NOT BE PART OF AN ACCESSIBLE ROUTE. §11B-402.2.1

32 AT LEAST ONE OF THE ACTIVE LEAVES OF DOORWAYS WITH TWO LEAVES SHALL COMPLY WITH 11B-404.2.3 CLEAR WIDTH AND 11B-404.2.4 MANEUVERING CLEARANCES. §11B-404.2.2

33 DOOR OPENINGS SHALL PROVIDE A CLEAR WIDTH OF 32 INCHES MINIMUM. CLEAR OPENINGS OF DOORWAYS WITH SWINGING DOORS SHALL BE MEASURED BETWEEN THE FACE OF THE DOOR AND THE STOP, WITH THE DOOR OPEN 90 DEGREES. OPENINGS MORE THAN 24 INCHES DEEP SHALL PROVIDE A CLEAR OPENING OF 36 INCHES MINIMUM. THERE SHALL BE NO PROJECTIONS INTO THE REQUIRED CLEAR OPENING WIDTH LOWER THAN 34 INCHES ABOVE THE FINISH FLOOR OR GROUND. PROJECTIONS INTO THE CLEAR OPENING WIDTH BETWEEN 34 INCHES AND 80 INCHES ABOVE THE FINISH FLOOR OR GROUND SHALL NOT EXCEED 4 INCHES. §11B-404.2.3 EXCEPTION 1: IN ALTERATIONS, A PROJECTION OF 5/8" MAXIMUM INTO THE REQUIRED CLEAR WIDTH SHALL BE PERMITTED FOR THE LATCH-SIDE STOP. EXCEPTION 2: DOOR CLOSERS AND DOOR STOPS SHALL BE PERMITTED TO BE 78 INCHES MINIMUM ABOVE THE FINISH FLOOR OR GROUND.

34 MINIMUM MANEUVERING CLEARANCES AT DOORS AND GATES SHALL COMPLY WITH 11B-404.2.4. MANEUVERING CLEARANCES SHALL EXTEND THE FULL WIDTH OF THE DOORWAY AND THE REQUIRED LATCH SIDE OR HINGE SIDE CLEARANCE. §11B-404.2.4

35 SWINGING DOORS AND GATES SHALL HAVE MANEUVERING CLEARANCES COMPLYING WITH §11B-404.2.4.1.

36 DOORWAYS LESS THAN 36 INCHES WIDE WITHOUT DOORS OR GATES, SLIDING DOORS, OR FOLDING DOORS SHALL HAVE MANEUVERING CLEARANCES COMPLYING WITH §11B-404.2.4.2

37 MANEUVERING CLEARANCES FOR FORWARD APPROACH SHALL BE PROVIDED WHEN ANY OBSTRUCTION WITHIN 18 INCHES OF THE LATCH SIDE AN INTERIOR DOORWAY, OR WITHIN 24 INCHES OF THE LATCH SIDE OF AN EXTERIOR DOORWAY. PROJECTS MORE THAN 8 INCHES BEYOND THE FACE OF THE DOOR, MEASURED PERPENDICULAR TO THE FACE OF THE DOOR OR GATE. §11B-404.2.4.3

38 THRESHOLDS, IF PROVIDED AT DOORWAYS, SHALL BE ½ INCH HIGH MAXIMUM. RAISED THRESHOLDS AND CHANGES IN LEVEL AT DOORWAYS SHALL COMPLY WITH 11B-302 FLOOR OR GROUND SURFACES AND 11B-303 CHANGES IN LEVEL. §11B-404.2.5.

39 HANDLES, PULLS, LATCHES, LOCKS, AND OTHER OPERABLE PARTS ON DOORS AND GATES SHALL COMPLY WITH 11B-309.4 OPERATION. OPERABLE PARTS OF SUCH HARDWARE SHALL BE 34 INCHES MINIMUM AND 44 INCHES MAXIMUM ABOVE THE FINISH FLOOR OR GROUND. WHERE SLIDING DOORS ARE IN THE FULLY OPEN POSITION, OPERATING HARDWARE SHALL BE EXPOSED AND USABLE FROM BOTH SIDES. §11B-404.2.7

40 THE FORCE FOR PUSHING OR PULLING OPEN A DOOR OR GATE SHALL BE AS FOLLOWS: §11B-404.2.9

a. INTERIOR HINGED DOORS AND GATES: 5 POUNDS MAXIMUM.

b. SLIDING OR FOLDING DOORS: 5 POUNDS MAXIMUM.

c. REQUIRED FIRE DOORS: THE MINIMUM OPENING FORCE ALLOWABLE BY THE APPROPRIATE ADMINISTRATIVE AUTHORITY, NOT TO EXCEED 15 POUNDS.

d. EXTERIOR HINGED DOORS: 5 POUNDS MAXIMUM.

41 SWINGING DOOR AND GATE SURFACES WITHIN 10 INCHES OF THE FINISH FLOOR OR GROUND MEASURED VERTICALLY SHALL HAVE A SMOOTH SURFACE ON THE PUSH SIDE EXTENDING THE FULL WIDTH OF THE DOOR OR GATE. PARTS CREATING HORIZONTAL OR VERTICAL JOINTS IN THESE SURFACES SHALL BE WITHIN 1/16 INCH OF THE SAME PLANE AS THE OTHER AND BE FREE OF SHARP OR ABRASIVE EDGES. CAVITIES CREATED BY ADDED KICK PLATES SHALL BE CAPPED. §11B-404.2.10

RAMPS

42 RAMPS ON ACCESSIBLE ROUTES SHALL COMPLY WITH 11B-405.2 FOR SLOPE, WIDTH, RISE, LANDINGS, HANDRAILS, EDGE PROTECTION AND WET CONDITIONS.

43 RAMP RUNS SHALL HAVE A RUNNING SLOPE

RAMP RUNS SHALL HAVE COMPLIANT HANDRAILS PER 11B-505 HANDRAILS. §11B-405.8 PER EXCEPTION 3, CURB RAMPS DO NOT REQUIRE HANDRAILS AND PER EXCEPTION 4, AT DOOR LANDINGS, HANDRAILS ARE NOT REQUIRED ON RAMP RUNS LESS THAN 6 INCHES IN RISE OR 72 INCHES IN LENGTH.

EDGE PROTECTION COMPLYING WITH 11B-405.9.2 CURB OR BARRIER SHALL BE PROVIDED ON EACH SIDE OF RAMP RUNS AND AT EACH SIDE OF RAMP LANDINGS. §11B-405.9 (SEE EXCEPTIONS)

A CURB OR BARRIER SHALL BE PROVIDED THAT PREVENTS THE PASSAGE OF A 4 INCH DIAMETER SPHERE, WHERE ANY PORTION OF THE SPHERE IS WITHIN 4 INCHES OF THE FINISH FLOOR OR GROUND SURFACE. TO PREVENT WHEEL ENTRAPMENT, THE CURB OR BARRIER SHALL PROVIDE A CONTINUOUS AND UNINTERRUPTED BARRIER ALONG THE LENGTH OF THE RAMP. §11B-405.9.2

LANDINGS SUBJECT TO WET CONDITIONS SHALL BE DESIGNED TO PREVENT THE ACCUMULATION OF WATER. §11B-405.10

HANDRAILS

HANDRAILS SHALL BE PROVIDED ON BOTH SIDES OF STAIRS AND RAMPS. §11B-505.2

HANDRAILS SHALL BE CONTINUOUS WITHIN THE FULL LENGTH OF EACH STAIR FLIGHT OR RAMP RUN. INSIDE HANDRAILS ON SWITCHBACK OR DOGLEG STAIRS AND RAMPS SHALL BE CONTINUOUS BETWEEN FLIGHTS OR RUNS. §11B-505.3

TOP OF GRIPPING SURFACES OF HANDRAILS SHALL BE 34 INCHES MINIMUM AND 38 INCHES MAXIMUM VERTICALLY ABOVE WALKING SURFACES, STAIR NOSINGS, AND RAMP SURFACES. HANDRAILS SHALL BE AT A CONSISTENT HEIGHT ABOVE WALKING SURFACES, STAIR NOSINGS, AND RAMP SURFACES. §11B-505.4

CLEARANCE BETWEEN HANDRAIL GRIPPING SURFACES AND ADJACENT SURFACES SHALL BE 1½ INCHES MINIMUM. HANDRAILS MAY BE LOCATED IN A RECESS IF THE RECESS IS 3 INCHES MAXIMUM DEEP AND 18 INCHES MINIMUM CLEAR ABOVE THE TOP OF THE HANDRAIL. §11B-505.5

HANDRAIL GRIPPING SURFACES SHALL BE CONTINUOUS ALONG THEIR LENGTH AND SHALL NOT BE OBSTRUCTED ALONG THEIR TOPS OR SIDES. THE BOTTOMS OF HANDRAIL GRIPPING SURFACES SHALL NOT BE OBSTRUCTED FOR MORE THAN 20 PERCENT OF THEIR LENGTH. WHERE PROVIDED, HORIZONTAL PROJECTIONS SHALL OCCUR 1½ INCHES MINIMUM BELOW THE BOTTOM OF THE HANDRAIL GRIPPING SURFACE. §11B-505.6

HANDRAIL GRIPPING SURFACES WITH A CIRCULAR CROSS SECTION SHALL HAVE AN OUTSIDE DIAMETER OF 1¼ INCHES MINIMUM AND 2 INCHES MAXIMUM. §11B-505.7.1

HANDRAIL GRIPPING SURFACES WITH A NON-CIRCULAR CROSS SECTION SHALL HAVE A PERIMETER DIMENSION OF 4 INCHES MINIMUM AND 6¼ INCHES MAXIMUM, AND A CROSS-SECTION DIMENSION OF 2¼ INCHES MAXIMUM. §11B-505.7.2

HANDRAIL GRIPPING SURFACES SHALL EXTEND BEYOND AND IN THE SAME DIRECTION OF STAIR FLIGHTS AND RAMP RUNS IN ACCORDANCE WITH SECTION 11B-505.10 HANDRAIL EXTENSIONS. §11B-505.10 EXCEPTION 1: EXTENSIONS ARE NOT REQUIRED FOR CONTINUOUS HANDRAILS AT THE INSIDE OF SWITCHBACK OR DOGLEG STAIRS AND RAMPS. (SEE OTHER EXCEPTIONS)

IN ALTERATIONS, WHERE THE EXTENSION OF THE HANDRAIL IN THE DIRECTION OF STAIR FLIGHT OR RAMP RUN WOULD CREATE A HAZARD, THE EXTENSION OF THE HANDRAIL MAY BE TURNED 90 DEGREES FROM THE DIRECTION OF STAIR FLIGHT OR RAMP RUN. §11B-505.10 EXCEPTION 3

RAMP HANDRAILS SHALL EXTEND HORIZONTALLY ABOVE THE LANDING FOR 12 INCHES MINIMUM BEYOND THE TOP AND BOTTOM OF RAMP RUNS. EXTENSIONS SHALL RETURN TO A WALL, GUARD, OR THE LANDING SURFACE, OR SHALL BE CONTINUOUS TO THE HANDRAIL OF AN ADJACENT RAMP RUN. §11B-505.10.1

AT THE TOP OF A STAIR FLIGHT, HANDRAILS SHALL EXTEND HORIZONTALLY ABOVE THE LANDING FOR 12 INCHES MINIMUM BEGINNING DIRECTLY ABOVE THE FIRST RISER NOSING. EXTENSIONS SHALL RETURN TO A WALL, GUARD, OR THE LANDING SURFACE, OR SHALL BE CONTINUOUS TO THE HANDRAIL OF AN ADJACENT STAIR FLIGHT. §11B-505.10.2

AT THE BOTTOM OF A STAIR FLIGHT, HANDRAILS SHALL EXTEND AT THE SLOPE OF THE STAIR FLIGHT FOR A HORIZONTAL DISTANCE EQUAL TO ONE TREAD DEPTH BEYOND THE LAST RISER NOSING. THE HORIZONTAL EXTENSION OF A HANDRAIL SHALL BE 12 INCHES LONG MINIMUM AND A HEIGHT EQUAL TO THAT OF THE SLOPING PORTION OF THE HANDRAIL AS MEASURED ABOVE THE STAIR NOSINGS. EXTENSION SHALL RETURN TO A WALL, GUARD, OR THE LANDING SURFACE, OR SHALL BE CONTINUOUS TO THE HANDRAIL OF AN ADJACENT STAIR FLIGHT. §11B-505.10.3

STAIRWAYS

A STAIR IS DEFINED AS A CHANGE IN ELEVATION, CONSISTING OF ONE OR MORE RISERS PER CHAPTER 2, SECTION 202.

ALL STEPS ON A FLIGHT OF STAIRS SHALL HAVE UNIFORM RISER HEIGHTS AND UNIFORM TREAD DEPTHS. RISERS SHALL BE 4 INCHES HIGH MINIMUM AND 7 INCHES HIGH MAXIMUM. TREADS SHALL BE 11 INCHES DEEP MINIMUM. CURVED STAIRWAYS WITH WINDER TREADS ARE PERMITTED AT STAIRS WHICH ARE NOT PART OF A REQUIRED MEANS OF EGRESS. §11B-504.2

OPEN RISERS ARE NOT PERMITTED. §11B-504.3 (SEE EXCEPTIONS)

INTERIOR STAIRS SHALL HAVE THE UPPER APPROACH AND LOWER TREAD MARKED BY A STRIPE PROVIDING CLEAR VISUAL CONTRAST. EXTERIOR STAIRS SHALL HAVE THE UPPER APPROACH AND ALL TREADS MARKED BY A STRIPE PROVIDING CLEAR VISUAL CONTRAST. THE STRIPE SHALL BE A MINIMUM OF 2 INCHES WIDE TO A MAXIMUM OF 4 INCHES WIDE PLACED PARALLEL TO, AND NOT MORE THAN 1 INCH FROM, THE NOSE OF THE STEP OR UPPER APPROACH. THE STRIPE SHALL EXTEND THE FULL WIDTH OF THE STEP OR UPPER APPROACH AND SHALL BE OF MATERIAL THAT IS AT LEAST AS SLIP RESISTANT AS THE OTHER TREADS OF THE STAIR. A PAINTED STRIPE SHALL BE ACCEPTABLE. GROOVES SHALL NOT BE USED TO SATISFY THIS REQUIREMENT. §11B- 504.4.1

THE RADIUS OF CURVATURE AT THE LEADING EDGE OF THE TREAD SHALL BE ½ INCH MAXIMUM. NOSINGS THAT PROJECT BEYOND RISERS SHALL HAVE THE UNDERSIDE OF THE LEADING EDGE CURVED OR BEVELED. RISERS SHALL BE PERMITTED TO SLOPE UNDER THE TREAD AT AN ANGLE OF 30 DEGREES MAXIMUM FROM VERTICAL. THE PERMITTED PROJECTION OF THE NOSING SHALL EXTEND 1¼ INCHES MAXIMUM OVER THE TREAD BELOW. §11B-504.5 (SEE EXCEPTION FOR EXISTING BUILDINGS)

STAIRS SHALL HAVE HANDRAILS COMPLYING WITH SECTION 11B-505 HANDRAILS. §11B-504.6

STAIR TREADS AND LANDINGS SUBJECT TO WET CONDITIONS SHALL BE DESIGNED TO PREVENT THE ACCUMULATION OF WATER. §11B-504.7

FLOOR IDENTIFICATION SIGNS REQUIRED BY CHAPTER 10 SHALL COMPLY WITH SECTIONS 11B-703.1 SIGNS GENERAL, 11B-703.2 RAISED CHARACTERS, 11B-703.3 BRAILLE AND 11B-703.5 VISUAL CHARACTERS. THESE SIGNS SHALL BE LOCATED AT THE LANDING OF EACH FLOOR LEVEL, PLACED ADJACENT TO THE DOOR ON THE LATCH SIDE. IN ALL ENCLOSED STAIRWAYS IN BUILDINGS TWO OR MORE STORIES IN HEIGHT TO IDENTIFY THE FLOOR LEVEL. AT THE EXIT DISCHARGE LEVEL, THE SIGN SHALL INCLUDE A RAISED FIVE POINTED STAR LOCATED TO THE LEFT OF THE IDENTIFYING FLOOR LEVEL. THE OUTSIDE DIAMETER OF THE STAR SHALL BE THE SAME AS THE HEIGHT OF THE RAISED CHARACTERS. §11B-504.8

CURB RAMPS, BLENDED TRANSITIONS AND ISLANDS

PERPENDICULAR RAMP RUNS SHALL HAVE A RUNNING SLOPE NOT STEEPER THAN 1:12 (8.33%). §11B-406.2.1

FOR PERPENDICULAR RAMPS, WHERE PROVIDED, CURB RAMP FLARES SHALL NOT BE STEEPER THAN 1:10. §11B-406.2, FIGURE 11B-406.2.2

THE RUNNING SLOPE OF THE CURB RAMP SEGMENTS SHALL BE IN-LINE WITH THE DIRECTION OF SIDEWALK TRAVEL. RAMP RUNS SHALL HAVE A RUNNING SLOPE NOT STEEPER THAN 1:12 (8.33%). §11B-406.3.1, FIGURE 11B-406.3.2

A TURNING SPACE 48 INCHES MINIMUM BY 48 INCHES MINIMUM SHALL BE PROVIDED AT THE BOTTOM OF THE CURB RAMP. THE SLOPE OF THE TURNING SPACE IN ALL DIRECTIONS SHALL BE 1:48 MAXIMUM (2.083%). §11B-406.3.2

BLENDED TRANSITION RAMPS HALL HAVE A RUNNING SLOPE NOT STEEPER THAN 1:20 (5%). §11B-406.4.1

CURB RAMPS AND THE FLARED SIDES OF CURB RAMPS SHALL BE LOCATED SO THAT THEY DO NOT PROJECT INTO VEHICULAR TRAFFIC LANES, PARKING SPACES, OR PARKING ACCESS AISLES. CURB RAMPS AT MARKED CROSSINGS SHALL BE WHOLLY CONTAINED WITHIN THE MARKINGS, EXCLUDING ANY FLARED SIDES. §11B-406.5.1

THE CLEAR WIDTH OF CURB RAMP RUNS (EXCLUDING ANY FLARED SIDES), BLENDED TRANSITIONS, AND TURNING SPACES SHALL BE 48 INCHES MINIMUM. §11B-406.5.2

LANDINGS SHALL BE PROVIDED AT THE TOPS OF CURB RAMPS AND BLENDED TRANSITIONS (PARALLEL CURB RAMPS SHALL NOT BE REQUIRED TO COMPLY). THE LANDING CLEAR LENGTH SHALL BE 48 INCHES MINIMUM. THE LANDING CLEAR WIDTH SHALL BE AT LEAST AS WIDE AS THE CURB RAMP, EXCLUDING ANY FLARED SIDES, OR THE BLENDED TRANSITION LEADING TO THE LANDING. THE SLOPE OF THE LANDING IN ALL DIRECTIONS SHALL BE 1:48 (2.083%) MAXIMUM. §11B-406.5.3

GRADE BREAKS AT THE TOP AND BOTTOM OF CURB RAMP RUNS SHALL BE PERPENDICULAR TO THE DIRECTION OF THE RAMP RUN. GRADE BREAKS SHALL NOT BE PERMITTED ON THE SURFACE OF RAMP RUNS AND TURNING SPACES. SURFACE SLOPES THAT MEET AT GRADE BREAKS SHALL BE FLUSH. §11B-406.5.6

THE CROSS SLOPE OF CURB RAMPS AND BLENDED TRANSITIONS SHALL BE 1:48 (2.083%) MAXIMUM. §11B-406.5.7

COUNTER SLOPES OF ADJOINING GUTTERS AND ROAD SURFACES IMMEDIATELY ADJACENT TO AND WITHIN 24 INCHES OF THE CURB RAMP SHALL NOT BE STEEPER THAN 1:20 (5%). THE ADJACENT SURFACES AT TRANSITIONS AT CURB RAMPS TO WALKS, GUTTERS, AND STREETS SHALL BE AT THE SAME LEVEL. §11B-406.5.8

THE BOTTOM OF DIAGONAL CURB RAMPS SHALL HAVE A CLEAR SPACE 48 INCHES MINIMUM OUTSIDE ACTIVE TRAFFIC LANES OF THE ROADWAY. DIAGONAL CURB RAMPS PROVIDED AT MARKED CROSSINGS SHALL PROVIDE THE 48 INCHES MINIMUM CLEAR SPACE WITHIN THE MARKINGS. §11B-406.5.9

CURB RAMPS AND BLENDED TRANSITIONS SHALL HAVE DETECTABLE WARNINGS COMPLYING WITH 11B-705 DETECTABLE WARNINGS. §11B-406.5.12

RAISED ISLANDS IN CROSSINGS SHALL BE CUT THROUGH LEVEL WITH THE STREET OR HAVE CURB RAMPS AT BOTH SIDES. THE CLEAR WIDTH OF THE ACCESSIBLE ROUTE AT ISLANDS SHALL BE 60 INCHES WIDE MINIMUM. WHERE CURB RAMPS ARE PROVIDED, THEY SHALL COMPLY WITH 11B-406 CURB RAMPS, BLENDED TRANSITIONS AND ISLANDS. LANDINGS COMPLYING WITH 11B-406.5.3 AND THE ACCESSIBLE ROUTE SHALL BE PERMITTED TO OVERLAP. ISLANDS SHALL HAVE DETECTABLE WARNINGS COMPLYING WITH 11B-705. §11B-406.6, FIGURE 11B-406.6

D. GENERAL SITE AND BUILDING ELEMENTS

PARKING SPACES

WHERE PARKING SPACES ARE PROVIDED, ACCESSIBLE PARKING SPACES SHALL BE PROVIDED IN NUMBER AND KIND REQUIRED PER SECTION 11B-208 PARKING SPACES. §11B-208.1 FOR THE PURPOSES OF THIS SECTION, ELECTRIC VEHICLE CHARGING STATIONS ARE NOT PARKING SPACES.

PROVIDE ACCESSIBLE PARKING SPACES AS REQUIRED BY TABLE 11B-208.2. §11B-208.2.

PROVIDE ACCESSIBLE SPACES FOR EACH PARKING FACILITY (PARKING LOTS AND PARKING STRUCTURES). THE NUMBER OF PARKING SPACES REQUIRED TO BE ACCESSIBLE IS TO BE CALCULATED SEPARATELY FOR EACH PARKING FACILITY.:THE REQUIRED NUMBER IS NOT BASED ON THE TOTAL NUMBER OF PARKING SPACES PROVIDED IN ALL OF THE PARKING FACILITIES PROVIDED ON SITE. §11B-208.2

OMIT.

PARKING SPACES PROVIDED FOR GUESTS, EMPLOYEES AND NON-RESIDENTS SHALL COMPLY WITH TABLE 11B-208.2. WHEN ASSIGNED PARKING IS PROVIDED, CHAPTER 11A INDICATES DESIGNATED ACCESSIBLE PARKING FOR THE ADAPTABLE RESIDENTIAL DWELLING UNITS SHALL BE PROVIDED ON REQUESTS OF RESIDENTS WITH DISABILITES ON THE SAME TERMS AND WITH THE FULL RANGE OF CHOICES (IE, OFF-STREET PARKING, CARPORT OR GARAGE) THAT ARE AVAILABLE TO OTHER RESIDENTS PER 11B-208.2.3.3.

ONE IN EVERY SIX OR FRACTION OF SIX PARKING SPACES REQUIRED BY SECTION 11B-208.2 AT LEAST ONE SHALL BE A VAN PARKING SPACE. VAN PARKING SPACE SHALL BE 144 INCHES (12 FEET) WIDE MINIMUM AND 216 INCHES (18 FEET) LONG MINIMUM AND SHALL BE SERVED BY AN ACCESS AISLE 60 INCHES WIDE MINIMUM, PLACED ON THE SIDE OPPOSITE THE DRIVER'S SIDE WHEN THE VEHICLE IS GOING FORWARD INTO THE PARKING SPACE AND SHALL BE DESIGNATED "VAN ACCESSIBLE". ALL SUCH SPACES MAY BE GROUPED ON ONE LEVEL OF A MULTI-STORY PARKING STRUCTURE. EXCEPTION: VAN PARKING SPACES SHALL BE PERMITTED TO BE 108 INCHES (9 FEET) WIDE MINIMUM WHEN THE ACCESS AISLE IS 96 INCHES (8 FEET) WIDE MINIMUM. §11B-208.2.4, 11B-502, FIG 11B-502, 11B-502.3, & 11B-502.3.3

ACCESSIBLE PARKING SPACES COMPLYING WITH SECTION 11B-502 PARKING SPACES SERVING A PARTICULAR BUILDING OR FACILITY SHALL BE LOCATED ON THE SHORTEST ACCESSIBLE ROUTE OF TRAVEL FROM ADJACENT PARKING TO AN ACCESSIBLE ENTRANCE (AS NEAR AS PRACTICAL TO AN ACCESSIBLE ENTRANCE). §11B-208.3.1

IN BUILDINGS WITH MULTIPLE ACCESSIBLE ENTRANCES WITH ADJACENT PARKING, ACCESSIBLE PARKING SPACES COMPLYING WITH SECTION 11B-502 PARKING SPACES SHALL BE DISPERSED AND LOCATED CLOSEST TO THE ACCESSIBLE ENTRANCES. §11B-208.3.1

IN PARKING FACILITIES THAT DO NOT SERVE A PARTICULAR BUILDING OR FACILITY, ACCESSIBLE PARKING SPACES COMPLYING WITH SECTION 11B-502 PARKING SPACES SHALL BE LOCATED ON THE SHORTEST ACCESSIBLE ROUTE OF TRAVEL TO AN ACCESSIBLE PEDESTRIAN ENTRANCE OF THE PARKING FACILITY. §11B-208.3.1

MINIMUM SPACE LENGTH SHALL BE 18 FOOT LONG FOR CAR AND VAN ACCESSIBLE PARKING SPACE(S) AND ACCESS AISLE(S). §11B-502.2, FIGURES 11B-502.2 AND 11B-502.3 AND 11B-502.3.3.

MINIMUM SPACE WIDTH SHALL BE 9 FEET AT ACCESSIBLE CAR PARKING SPACE. §11B-502.2, FIG. 11B-502.2 & FIG. 11B-502.3 AND 11B-502.3.3.

MINIMUM SPACE WIDTH SHALL BE 12 FEET WIDE AT ACCESSIBLE VAN PARKING SPACE WITH MINIMUM 5 FOOT WIDE ACCESS AISLE. VAN PARKING SPACES SHALL BE PERMITTED TO BE MINIMUM 9 FEET WIDE WHERE ACCESS AISLE IS 8 FOOT WIDE MINIMUM. §11B-502.2, FIGURES 11B-502.2 AND 11B-502.3.

CAR AND VAN STALL ACCESS AISLE SHALL BE 5 FOOT WIDE MINIMUM AND SHALL ADJOIN AN ACCESSIBLE ROUTE. TWO PARKING SPACES SHALL BE PERMITTED TO SHARE A COMMON ACCESS AISLE. §11B-502.3, FIGURES 11B-502.2 AND 11B-502.3.

ACCESS AISLES SHALL BE MARKED WITH A BLUE PAINTED BORDERLINE AROUND THEIR PERIMETER. THE AREA WITHIN THE BLUE BORDERLINES SHALL BE MARKED WITH HATCHED LINES A MAXIMUM OF 36 INCHES ON CENTER IN A COLOR CONTRASTING WITH THAT OF THE AISLE SURFACE, PREFERABLY BLUE OR WHITE. THE WORDS "NO PARKING" SHALL BE PAINTED ON THE SURFACE WITHIN EACH ACCESS AISLE IN WHITE LETTERS A MINIMUM OF 12 INCHES IN HEIGHT AND LOCATED TO BE VISIBLE FROM THE ADJACENT VEHICULAR WAY. ACCESS AISLE MARKINGS MAY EXTEND BEYOND THE MINIMUM REQUIRED LENGTH. §11B-502.3.3, FIGURE 11B-502.3.3.

ACCESS AISLES SHALL NOT OVERLAP THE VEHICULAR WAY. ACCESS AISLES SHALL BE PERMITTED TO BE PLACED ON EITHER SIDE OF THE PARKING SPACE EXCEPT FOR VAN PARKING SPACES WHICH SHALL HAVE ACCESS AISLES LOCATED ON THE PASSENGER SIDE OF THE PARKING SPACES. §11B-502.3.4

PARKING SPACES AND ACCESS AISLES SERVING THEM SHALL COMPLY WITH SECTION 11B-302. PROVIDE A MINIMUM VERTICAL CLEARANCE OF 8 FEET 2 INCHES AND ALONG AT LEAST ONE VEHICLE ACCESS ROUTE TO SUCH SPACES FROM SITE ENTRANCES AND EXITS. §11B-502.5

PARKING SPACE IDENTIFICATION SIGNS SHALL INCLUDE THE INTERNATIONAL SYMBOL OF ACCESSIBILITY COMPLYING WITH SECTION 11B-703.7.2.1 INTERNATIONAL SYMBOL OF ACCESSIBILITY, IN WHITE ON A BLUE BACKGROUND. §11B-502.6, FIGURE 11B-703.7.2.1

SIGNS IDENTIFYING VAN PARKING SPACES SHALL CONTAIN ADDITIONAL LANGUAGE OR AN ADDITIONAL SIGN WITH THE DESIGNATION "VAN ACCESSIBLE." SIGNS SHALL BE 60 INCHES MINIMUM ABOVE THE FINISH FLOOR OR GROUND SURFACE MEASURED TO THE BOTTOM OF THE SIGN. §11B-502.6

PARKING IDENTIFICATION SIGNS SHALL BE REFLECTORIZED WITH A MINIMUM AREA OF 70 SQUARE INCHES. §11B-502.6.1

ADDITIONAL LANGUAGE OR AN ADDITIONAL SIGN BELOW THE INTERNATIONAL SYMBOL OF ACCESSIBILITY SHALL STATE "MINIMUM FINE $250." §11B-502.6.2

A PARKING SPACE IDENTIFICATION SIGN SHALL BE VISIBLE FROM EACH PARKING SPACE. SIGNS SHALL BE PERMANENTLY POSTED EITHER IMMEDIATELY ADJACENT TO THE PARKING SPACE OR WITHIN THE PROJECTED PARKING SPACE WIDTH AT THE HEAD END OF THE PARKING SPACE. SIGNS MAY ALSO BE PERMANENTLY POSTED ON A WALL AT THE INTERIOR END OF THE PARKING SPACE. §11B-502.6.3

EACH ACCESSIBLE CAR AND VAN SPACE SHALL HAVE SURFACE IDENTIFICATION COMPLYING WITH EITHER OF THE FOLLOWING SCHEMES: §11B-502.6.4

a. THE PARKING SPACE SHALL BE MARKED WITH AN INTERNATIONAL SYMBOL OF ACCESSIBILITY COMPLYING WITH SECTION 11B-703.7.2.1 INTERNATIONAL SYMBOL OF ACCESSIBILITY IN WHITE ON A BLUE BACKGROUND A MINIMUM 36 INCHES WIDE BY 36 INCHES HIGH. THE CENTERLINE OF THE INTERNATIONAL SYMBOL OF ACCESSIBILITY SHALL BE A MAXIMUM OF 6 INCHES FROM THE CENTERLINE OF THE PARKING SPACE, ITS SIDES PARALLEL TO THE LENGTH OF THE PARKING SPACE AND ITS LOWER CORNER AT, OR LOWER SIDE ALIGNED WITH, THE END OF THE PARKING SPACE LENGTH. §11B-502.6.4.1

b. THE PARKING SPACE SHALL BE OUTLINED OR PAINTED BLUE AND SHALL BE MARKED WITH AN INTERNATIONAL SYMBOL OF ACCESSIBILITY COMPLYING WITH SECTION 11B-703.7.2.1, A MINIMUM 36 INCHES WIDE BY 36 INCHES HIGH IN WHITE OR A SUITABLE CONTRASTING COLOR. THE CENTERLINE OF THE INTERNATIONAL SYMBOL OF ACCESSIBILITY SHALL BE A MAXIMUM OF 6 INCHES FROM THE CENTERLINE OF THE PARKING SPACE, ITS SIDES PARALLEL TO THE LENGTH OF THE PARKING SPACE AND ITS LOWER CORNER AT, OR LOWER SIDE ALIGNED WITH, THE END OF THE PARKING SPACE. §11B-502.6.4.2

AN ADDITIONAL SIGN SHALL BE POSTED EITHER:□1) IN A CONSPICUOUS PLACE AT EACH ENTRANCE TO AN OFF-STREET PARKING FACILITY OR 2) IMMEDIATELY ADJACENT TO ON-SITE ACCESSIBLE PARKING AND VISIBLE FROM EACH PARKING SPACE. §11B-502.8

a. THE ADDITIONAL SIGN SHALL NOT BE LESS THAN 17 INCHES WIDE BY 22 INCHES HIGH. §11B-502.8.1

b. THE ADDITIONAL SIGN SHALL CLEARLY STATE IN LETTERS WITH A MINIMUM HEIGHT OF 1 INCH THE FOLLOWING: §11B- 502.8.2 "UNAUTHORIZED VEHICLES PARKED IN DESIGNATED ACCESSIBLE SPACES NOT DISPLAYING DISTINGUISHING PLACARDS OR SPECIAL LICENSE PLATES ISSUED FOR PERSONS WITH DISABILITIES WILL BE TOWED AWAY AT THE OWNER'S EXPENSE. TOWED VEHICLES MAY BE RECLAIMED AT: _____ OR BY TELEPHONING _____." BLANK SPACES SHALL BE FILLED IN WITH APPROPRIATE INFORMATION AS A PERMANENT PART OF THE SIGN.

SIGNS INTENDED FOR USE BY PEDESTRIANS WITHIN PARKING FACILITIES, INCLUDING DIRECTIONAL OR INFORMATIONAL SIGNS INDICATING PARKING SECTIONS OR LEVELS, SHALL COMPLY WITH THE REQUIREMENTS OF SECTION 11B-216. §11B-216.5.2

RELATIONSHIP TO ACCESSIBLE ROUTES

PARKING SPACES AND ACCESS AISLES SHALL BE DESIGNED SO THAT PERSONS USING THEM ARE NOT REQUIRED TO TRAVEL BEHIND PARKING SPACES OTHER THAN TO PASS BEHIND THE PARKING SPACE IN WHICH THEY PARKED. §11B-502.7.1

A CURB OR WHEEL STOP SHALL BE PROVIDED IF REQUIRED TO PREVENT ENCROACHMENT OF VEHICLES OVER THE REQUIRED CLEAR WIDTH OF ADJACENT ACCESSIBLE ROUTES. §11B-502.7.2

PASSENGER LOADING ZONES, DROP-OFF ZONES, AND BUS STOPS

PARKING FACILITIES THAT PROVIDE VALET PARKING SERVICES SHALL PROVIDE AT LEAST ONE PASSENGER LOADING ZONE COMPLYING WITH SECTION 11B-503. THE PARKING REQUIREMENTS OF SECTION 11B-208.1 PARKING SPACES GENERAL APPLY TO FACILITIES WITH VALET PARKING. §11B-209.4

MECHANICAL ACCESS PARKING GARAGES SHALL PROVIDE AT LEAST ONE PASSENGER LOADING ZONE COMPLYING WITH SECTION 11B-503 AT VEHICLE DROP-OFF AND VEHICLE PICK-UP AREAS. §11B-209.5

PASSENGER DROP-OFF AND LOADING ZONES SHALL PROVIDE A VEHICULAR PULL-UP SPACE 96 INCHES (8 FEET) WIDE MINIMUM AND 20 FEET LONG MINIMUM. §11B-503.2

PASSENGER DROP-OFF AND LOADING ZONES SHALL PROVIDE ACCESS AISLES COMPLYING WITH THE FOLLOWING ADJACENT AND PARALLEL TO THE VEHICLE PULL-UP SPACE. ACCESS AISLES SHALL ADJOIN AN ACCESSIBLE ROUTE AND SHALL NOT OVERLAP THE VEHICULAR WAY. §11B-503.3

a. ACCESS AISLES SERVING VEHICLE PULL-UP SPACES SHALL BE 60 INCHES WIDE MINIMUM. §11B-503.3.1

b. ACCESS AISLES SHALL EXTEND THE FULL LENGTH OF THE VEHICLE PULL-UP SPACES THEY SERVE. §11B-503.3.2

c. ACCESS AISLES SHALL BE MARKED WITH A PAINTED BORDERLINE AROUND THEIR PERIMETER. THE AREA WITHIN THE BORDERLINES SHALL BE MARKED WITH HATCHED LINES A MAXIMUM OF 36 INCHES ON CENTER IN A COLOR CONTRASTING WITH THAT OF THE AISLE SURFACE. §11B-503.3.3

VEHICLE PULL-UP SPACES AND ACCESS AISLES SERVING THEM SHALL COMPLY WITH SECTION 11B-302 FLOOR OR GROUND SURFACES. ACCESS AISLES SHALL BE AT THE SAME LEVEL AS THE VEHICLE PULL-UP SPACE THEY SERVE. CHANGES IN LEVEL ARE NOT PERMITTED. §11B-503.4 EXCEPTION: SLOPES NOT GREATER THAN 1:48 SHALL BE PERMITTED.

VEHICLE PULL-UP SPACES, ACCESS AISLES SERVING THEM, AND A VEHICULAR ROUTE FROM AN ENTRANCE TO THE PASSENGER LOADING ZONE AND FROM THE PASSENGER LOADING ZONE TO A VEHICULAR EXIT SHALL PROVIDE A VERTICAL CLEARANCE OF 114 INCHES (9 FEET, 6 INCHES) MINIMUM. §11B-503.5

EACH PASSENGER LOADING ZONE DESIGNATED FOR PERSONS WITH DISABILITIES SHALL BE IDENTIFIED WITH A REFLECTORIZED SIGN COMPLYING WITH SECTION 11B-703.5 VISUAL CHARACTERS. IT SHALL BE PERMANENTLY POSTED IMMEDIATELY ADJACENT TO AND VISIBLE FROM THE PASSENGER LOADING ZONE STATING "PASSENGER LOADING ZONE ONLY" AND INCLUDING THE INTERNATIONAL SYMBOL OF ACCESSIBILITY (ISA) COMPLYING WITH SECTION 11B-703.7.2.1 ISA.

E. PLUMBING FIXTURES AND FACILITIES

DRINKING FOUNTAINS

WHERE DRINKING FOUNTAINS ARE PROVIDED, NO FEWER THAN TWO DRINKING FOUNTAINS SHALL BE PROVIDED. WHEN PROVIDED, ONE DRINKING FOUNTAIN SHALL COMPLY WITH 11B-602.1 THROUGH 11B-602.6, 11B-602.8 AND 11B- 602.9 AND ONE DRINKING FOUNTAIN SHALL COMPLY WITH 11B- 602.7 AND 11B-602.9. §11B-211.2. EXCEPTION: WHERE A SINGLE DRINKING FOUNTAIN COMPLIES WITH SECTIONS 11B-602.1THROUGH 11B-602.9, IT SHALL BE PERMITTED TO BE SUBSTITUTED FOR TWO SEPARATE DRINKING FOUNTAINS.

WHERE MORE THAN THE MINIMUM NUMBER OF DRINKING FOUNTAINS SPECIFIED IN 11B-211.2 ARE PROVIDED, 50 PERCENT OF THE TOTAL NUMBER OF DRINKING FOUNTAINS PROVIDED SHALL COMPLY WITH 11B-602.1 THROUGH 11B- 602.6, 11B-602.8 AND 11B-602.9, AND 50 PERCENT OF THE TOTAL NUMBER OF DRINKING FOUNTAINS PROVIDED SHALL COMPLY WITH 11B-602.7 AND 11B-602.9. §11B-211.3 (SEE EXCEPTION)

DRINKING FOUNTAINS SHALL COMPLY WITH SECTIONS 11B-307 PROTRUDING OBJECTS AND 11B-602 GENERAL REQUIREMENTS. §11B-602.1

ACCESSIBLE DRINKING FOUNTAINS SHALL COMPLY WITH SECTION 11B-602, INCLUDING CLEAR FLOOR SPACE AT LOW UNIT, KNEE AND TOE CLEARANCE, OPERABLE PARTS, SPOUT HEIGHTS AND LOCATIONS AND WATER FLOW. §11B-602

UNITS SHALL HAVE A CLEAR FLOOR OR GROUND SPACE COMPLYING WITH SECTION 11B-305 CLEAR FLOOR OR GROUND SPACE POSITIONED FOR A FORWARD APPROACH AND CENTERED ON THE UNIT. KNEE AND TOE CLEARANCE COMPLYING WITH SECTION 11B-306 KNEE AND TOE CLEARANCE SHALL BE PROVIDED. §11B-602.2

WHERE DRINKING FOUNTAINS ARE USED BY CHILDREN, A PARALLEL APPROACH COMPLYING WITH SECTION 11B-305 CLEAR FLOOR OR GROUND SURFACES SHALL BE PERMITTED AT UNITS WHERE THE SPOUT IS 30 INCHES MAXIMUM ABOVE THE FINISH FLOOR OR GROUND AND IS 3½" MAXIMUM FROM THE FRONT EDGE OF THE UNIT, INCLUDING BUMPERS. §11B-602.2 EXCEPTION

SPOUT OUTLETS SHALL BE 36 INCHES MAXIMUM ABOVE THE FINISH FLOOR OR GROUND. §11B-602.4

THE SPOUT SHALL BE LOCATED 15 INCHES MINIMUM FROM THE VERTICAL SUPPORT AND 5 INCHES MAXIMUM FROM THE FRONT EDGE OF THE UNIT, INCLUDING BUMPERS. §11B-602.5

THE SPOUT SHALL PROVIDE A FLOW OF WATER 4 INCHES HIGH MINIMUM AND SHALL BE LOCATED 5 INCHES MAXIMUM FROM THE FRONT OF THE UNIT. THE ANGLE OF THE WATER STREAM SHALL BE MEASURED HORIZONTALLY RELATIVE TO THE FRONT FACE OF THE UNIT. WHERE SPOUTS ARE LOCATED LESS THAN 3 INCHES FROM THE FRONT OF THE UNIT, THE ANGLE OF THE WATER STREAM SHALL BE 30 DEGREES MAXIMUM. WHERE SPOUTS ARE LOCATED BETWEEN 3 INCHES AND 5 INCHES MAXIMUM FROM THE FRONT OF THE UNIT, THE ANGLE OF THE WATER STREAM SHALL BE 15 DEGREES MAXIMUM. §11B-602.6

SPOUT OUTLETS OF DRINKING FOUNTAINS FOR STANDING PERSONS SHALL BE 38 INCHES MINIMUM AND 43 INCHES MAXIMUM ABOVE THE FINISH FLOOR OR GROUND. §11B-602.7

WALL- AND POST-MOUNTED CANTILEVERED DRINKING FOUNTAINS SHALL BE 18 INCHES MINIMUM AND 19 INCHES MAXIMUM IN DEPTH. §11B-602.8

ALL DRINKING FOUNTAINS SHALL EITHER BE LOCATED COMPLETELY WITHIN ALCOVES, POSITIONED COMPLETELY BETWEEN WING WALLS, OR OTHERWISE POSITIONED SO AS NOT TO ENCROACH INTO PEDESTRIAN WAYS. THE PROTECTED AREA WITHIN SUCH A DRINKING FOUNTAIN IS LOCATED SHALL BE 32 INCHES WIDE MINIMUM AND 18 INCHES DEEP MINIMUM, AND SHALL COMPLY WITH SECTION 11B-305.7 MANEUVERING CLEARANCE. WHEN USED, WING WALLS OR BARRIERS SHALL PROTECT HORIZONTALLY AT LEAST AS FAR AS THE DRINKING FOUNTAIN AND TO WITHIN 6 INCHES VERTICALLY FROM THE FLOOR OR GROUND SURFACE. §11B-602.9

TOILET AND BATHING ROOM CLEARANCES

WHERE TOILET FACILITIES AND BATHING FACILITIES ARE PROVIDED, THEY SHALL COMPLY WITH 11B-213. WHERE TOILET FACILITIES AND BATHING FACILITIES ARE PROVIDED IN FACILITIES PERMITTED BY 11B-206.2.3 MULTI-STORY BUILDINGS AND FACILITIES EXC

21 WHERE TOWEL OR SANITARY NAPKIN DISPENSERS, WASTE RECEPTACLES, OR OTHER ACCESSORIES ARE PROVIDED IN TOILET FACILITIES, AT LEAST ONE OF EACH TYPE SHALL BE LOCATED ON AN ACCESSIBLE ROUTE. ALL OPERABLE PARTS, INCLUDING COIN SLOTS, SHALL BE 40 INCHES MAXIMUM ABOVE THE FINISH FLOOR. BABY CHANGING STATIONS ARE NOT REQUIRED TO COMPLY WITH SECTION 11B-603.5. §11B- 603.5

22 BATHTUBS SHALL COMPLY WITH SECTION 11B-607 INCLUDING THE REQUIREMENTS FOR CLEARANCES, GRAB BARS, SEATS, CONTROLS, SHOWER SPRAY UNIT AND WATER AND BATHTUB ENCLOSURES.

23 SHOWER COMPARTMENTS SHALL COMPLY WITH SECTION 11B-608 INCLUDING THE REQUIREMENTS FOR CLEARANCES, GRAB BARS, SEATS, CONTROLS, SHOWER SPRAY UNIT AND WATER, THRESHOLDS, SHOWER ENCLOSURES, SHOWER FLOOR OR GROUND SURFACE AND SOAP DISH.

WATER CLOSETS AND TOILET COMPARTMENTS

24 WHERE TOILET COMPARTMENTS ARE PROVIDED, AT LEAST 5 PERCENT OF THE TOILET COMPARTMENTS (OR 5 PERCENT OF THE COMBINATION OF TOILET COMPARTMENTS AND URINALS), BUT NO FEWER THAN ONE TOILET COMPARTMENT, SHALL COMPLY WITH SECTION 11B-604.8.1. IN ADDITION TO THE COMPARTMENTS REQUIRED TO COMPLY WITH 11B-604.8.1, WHERE SIX OR MORE TOILET COMPARTMENTS ARE PROVIDED, OR WHERE THE COMBINATION OF URINALS AND WATER CLOSETS TOTALS SIX OR MORE FIXTURES, TOILET COMPARTMENTS COMPLYING WITH SECTION 11B-604.8.2 SHALL BE PROVIDED IN THE SAME QUANTITY AS THE TOILET COMPARTMENTS REQUIRED TO COMPLY WITH SECTION 11B-604.8.1 §11B-213.3.1

25 WHERE WATER CLOSETS ARE PROVIDED, AT LEAST 5 PERCENT BUT NO FEWER THAN ONE SHALL COMPLY WITH SECTION 11B-604. §11B-213.3.2

26 THE CLEAR WIDTH FOR ACCESSIBLE ROUTES TO ACCESSIBLE TOILET COMPARTMENTS SHALL BE 44 INCHES EXCEPT FOR DOOR-OPENING WIDTHS AND DOOR SWINGS. §11B-403.5.1 EXCEPTION 5

27 THE WATER CLOSET SHALL BE POSITIONED WITH A WALL OR PARTITION TO THE REAR AND TO ONE SIDE. THE CENTERLINE OF THE WATER CLOSET SHALL BE 17 INCHES MINIMUM TO 18 INCHES MAXIMUM FROM THE SIDE WALL OR PARTITION, EXCEPT THAT THE WATER CLOSET SHALL BE 17 INCHES MINIMUM AND 19 INCHES MAXIMUM FROM THE SIDE WALL OR PARTITION IN THE AMBULATORY ACCESSIBLE TOILET COMPARTMENT SPECIFIED IN SECTION 11B-604.8.2 AMBULATORY ACCESSIBLE COMPARTMENTS. WATER CLOSETS SHALL BE ARRANGED FOR A LEFT-HAND OR RIGHT-HAND APPROACH. §11B-604.2

28 CLEARANCE AROUND A WATER CLOSET SHALL BE 60 INCHES MINIMUM MEASURED PERPENDICULAR FROM THE SIDE WALL AND 56 INCHES MINIMUM MEASURED PERPENDICULAR FROM THE REAR WALL. A MINIMUM 60 INCHES WIDE AND 48 INCHES DEEP MANEUVERING SPACE SHALL BE PROVIDED IN FRONT OF THE WATER CLOSET. §11B-604.3.1

29 THE SEAT HEIGHT OF A WATER CLOSET ABOVE THE FINISH FLOOR SHALL BE 17 INCHES MINIMUM AND 19 INCHES MAXIMUM MEASURED TO THE TOP OF THE SEAT. SEATS SHALL NOT BE SPRUNG TO RETURN TO A LIFTED POSITION. SEATS SHALL BE 2 INCHES HIGH MAXIMUM AND A 3 INCH HIGH SEAT SHALL BE PERMITTED ONLY IN ALTERATIONS WHERE THE EXISTING FIXTURE IS LESS THAN 15 INCHES HIGH. §11B-604.4 (SEE EXCEPTION FOR RESIDENTIAL UNITS)

30 THE SIDE WALL GRAB BARS SHALL BE 42 INCHES LONG MINIMUM, LOCATED 12 INCHES MAXIMUM FROM THE REAR WALL AND EXTENDING 54 INCHES MINIMUM FROM THE REAR WALL WITH THE FRONT END POSITIONED 24 INCHES MINIMUM IN FRONT OF THE WATER CLOSET. §11B-604.5.1

31 THE REAR GRAB BAR SHALL BE 36 INCHES LONG MINIMUM AND EXTEND FROM THE CENTERLINE OF THE WATER CLOSET 12 INCHES MINIMUM ON ONE SIDE AND 24 INCHES MINIMUM ON THE OTHER SIDE. §11B-604.5.2 (SEE EXCEPTIONS)

32 FLUSH CONTROLS SHALL BE HAND OPERATED OR AUTOMATIC. HAND OPERATED FLUSH CONTROLS SHALL COMPLY WITH SECTION 11B-309 EXCEPT THEY SHALL BE LOCATED 44 INCHES MAXIMUM ABOVE THE FLOOR. FLUSH CONTROLS SHALL BE LOCATED ON THE OPEN SIDE OF THE WATER CLOSET EXCEPT IN AMBULATORY ACCESSIBLE COMPARTMENTS COMPLYING WITH SECTION 11B-604.8.2. §11B-604.6

33 TOILET PAPER DISPENSERS SHALL COMPLY WITH SECTION 11B-309.4 OPERATION AND SHALL BE 7 INCHES MINIMUM AND 9 INCHES MAXIMUM IN FRONT OF THE WATER CLOSET MEASURED TO THE CENTERLINE OF THE DISPENSER. THE OUTLET OF THE DISPENSER SHALL BE BELOW THE GRAB BAR, 19 INCHES MINIMUM ABOVE THE FINISH FLOOR AND SHALL NOT BE LOCATED BEHIND THE GRAB BARS. DISPENSERS SHALL NOT BE OF A TYPE THAT CONTROL DELIVERY OR THAT DOES NOT ALLOW CONTINUOUS PAPER FLOW. §11B-604.7.1.

34 SANITARY NAPKIN DISPOSAL UNITS, IF PROVIDED, SHALL COMPLY WITH SECTION 11B-309.4 AND SHALL BE WALL MOUNTED AND LOCATED ON THE SIDEWALL BETWEEN THE REAR WALL OF THE TOILET AND TOILET PAPER DISPENSER, ADJACENT TO THE TOILET PAPER DISPENSER. THE DISPOSAL UNIT SHALL BE LOCATED BELOW THE GRAB BAR WITH THE OPENING OF THE DISPOSAL UNIT 19 INCHES MINIMUM (483 MM) ABOVE THE FINISH FLOOR. §11B-604.7.2

35 WHEELCHAIR ACCESSIBLE COMPARTMENTS SHALL BE 60 INCHES WIDE MINIMUM MEASURED PERPENDICULAR TO THE SIDE WALL, AND 56 INCHES DEEP MINIMUM FOR WALL HUNG WATER CLOSETS AND 59 INCHES DEEP MINIMUM FOR FLOOR MOUNTED WATER CLOSETS MEASURED PERPENDICULAR TO THE REAR WALL. WHEELCHAIR ACCESSIBLE COMPARTMENTS FOR CHILDREN'S USE SHALL BE 60 INCHES WIDE MINIMUM MEASURED PERPENDICULAR TO THE SIDE WALL, AND 59 INCHES DEEP MINIMUM FOR WALL HUNG AND FLOOR MOUNTED WATER CLOSETS MEASURED PERPENDICULAR TO THE REAR WALL. §11B-604.8.1.1

36 IN A WHEELCHAIR ACCESSIBLE COMPARTMENT WITH AN IN-SWING DOOR, A MINIMUM 60 INCHES WIDE BY 36 INCHES DEEP MANEUVERING SPACE SHALL BE PROVIDED IN FRONT OF THE CLEARANCE REQUIRED IN SECTION 11B-604.8.1.1 WHEELCHAIR ACCESSIBLE COMPARTMENT SIZE. §11B-604.8.1.1.1, FIGURES 11B-604.8.1.1.2(B) AND 11B-604.8.1.1.3(B)

37 IN A WHEELCHAIR ACCESSIBLE COMPARTMENT WITH A DOOR LOCATED IN THE SIDE WALL OR PARTITION, EITHER IN-SWINGING OR OUT-SWINGING, A MINIMUM 60 INCHES WIDE AND 60 INCHES DEEP MANEUVERING SPACE SHALL BE PROVIDED IN FRONT OF THE WATER CLOSET. §11B-604.8.1.1.2 FIGURE 11B- 604.8.1.1.2

38 IN A WHEEL CHAIR ACCESSIBLE COMPARTMENT WITH END OPENING DOOR LOCATED IN THE FRONT WALL OR PARTITION (FACING WATER CLOSET), EITHER IN-SWINGING OR OUT-SWINGING, A MINIMUM 60 INCHES WIDE AND 48 INCHES DEEP MANEUVERING SPACE SHALL BE PROVIDED IN FRONT OF THE WATER CLOSET. §11B-604.8.1.1.3 FIGURE 11B-604.8.1.1.3

39 TOILET COMPARTMENT DOORS, INCLUDING DOOR HARDWARE, SHALL COMPLY WITH SECTION 11B-404 EXCEPT THAT IF THE APPROACH IS FROM THE PUSH SIDE OF THE COMPARTMENT DOOR, CLEARANCE BETWEEN THE DOOR SIDE OF THE COMPARTMENT AND ANY OBSTRUCTION SHALL BE 46 INCHES MINIMUM MEASURED PERPENDICULAR TO THE COMPARTMENT DOOR IN ITS CLOSED POSITION. DOORS SHALL BE LOCATED IN FRONT PARTITION OR IN THE SIDE WALL OR PARTITION FARTHEST FROM THE WATER CLOSET. §11B-604.8.1.2

40 WHERE TOILET COMPARTMENT DOORS ARE LOCATED IN THE FRONT PARTITION, THE DOOR OPENING SHALL BE 4 INCHES MAXIMUM FROM THE SIDE WALL OR PARTITION FARTHEST FROM THE WATER CLOSET. WHERE LOCATED IN THE SIDE WALL OR PARTITION, THE DOOR OPENING SHALL BE 4 INCHES MAXIMUM FROM THE FRONT PARTITION AND THE DOOR SHALL BE SELF-CLOSING. §11B-604.8.1.2

41 A DOOR PULL COMPLYING WITH SECTION 11B-404.2.7 DOOR AND GATE HARDWARE SHALL BE PLACED ON BOTH SIDES OF THE DOOR NEAR THE LATCH. DOOR SHALL NOT SWING INTO THE CLEAR FLOOR SPACE OR CLEARANCE REQUIRED FOR ANY FIXTURE. DOORS MAY SWING INTO THAT PORTION OF THE MANEUVERING SPACE WHICH DOES NOT OVERLAP THE CLEARANCE REQUIRED AT A WATER CLOSET. §11B-604.8.1.2 (SEE EXCEPTION)

42 AT LEAST ONE SIDE PARTITION SHALL PROVIDE A TOE CLEARANCE OF 9 INCHES MINIMUM ABOVE THE FINISH FLOOR AND 6 INCHES DEEP MINIMUM BEYOND THE COMPARTMENT-SIDE FACE OF THE PARTITION, EXCLUSIVE OF PARTITION SUPPORT MEMBERS. PARTITION COMPONENTS AT TOE CLEARANCES SHALL BE SMOOTH WITHOUT SHARP EDGES OR ABRASIVE SURFACES. COMPARTMENTS FOR CHILDREN'S USE SHALL PROVIDE A TOE CLEARANCE OF 12 INCHES MINIMUM ABOVE THE FINISH FLOOR. §11B-604.8.1.4

43 AMBULATORY ACCESSIBLE COMPARTMENTS SHALL HAVE A DEPTH OF 60 INCHES MINIMUM AND A WIDTH OF 35 INCHES MINIMUM AND 37 INCHES MAXIMUM. §11B-604.8.2.1

44 WATER CLOSETS AND TOILET COMPARTMENTS FOR CHILDREN'S USE SHALL COMPLY WITH SECTION 11B-604.9 AND FOLLOW SUGGESTED DIMENSIONS ON TABLE 11B-604.9. §11B-604.9

45 WHERE URINALS ARE PROVIDED, AT LEAST 10 PERCENT BUT NO FEWER THAN ONE SHALL COMPLY WITH SECTION 11B-605. §11B-213.3.3.

46 URINALS SHALL BE THE STALL-TYPE OR THE WALL-HUNG TYPE WITH THE RIM 17 INCHES MAXIMUM ABOVE THE FINISH FLOOR OR GROUND. URINALS SHALL BE 13½ INCHES DEEP MINIMUM MEASURED FROM THE OUTER FACE OF THE URINAL RIM TO THE BACK OF THE FIXTURE. §11B-605.2

47 FLUSH CONTROLS SHALL BE HAND OPERATED OR AUTOMATIC. HAND OPERATED FLUSH CONTROLS SHALL COMPLY WITH SECTION 11B-309 OPERABLE PARTS EXCEPT THAT THE FLUSH CONTROL SHALL BE MOUNTED AT A MAXIMUM HEIGHT OF 44 INCHES ABOVE THE FINISH FLOOR. §11B-605.4

48 WHERE LAVATORIES ARE PROVIDED, AT LEAST 10 PERCENT BUT NO FEWER THAN ONE SHALL COMPLY WITH SECTION 11B-606 AND SHALL NOT BE LOCATED IN A TOILET COMPARTMENT. §11B- 213.3.4, §11B-606.1.

49 FOR LAVATORIES AND SINKS, A CLEAR FLOOR SPACE COMPLYING WITH SECTION 11B-305 CLEAR FLOOR OR GROUND SURFACES, POSITIONED FOR A FORWARD APPROACH, AND KNEE AND TOE CLEARANCE COMPLYING WITH SECTION 11B-306 KNEE AND TOE CLEARANCE SHALL BE PROVIDED. §11B-606.2 EXCEPTION: A PARALLEL APPROACH COMPLYING WITH SECTION 11B-305 SHALL BE PERMITTED TO A KITCHEN SINK IN A SPACE WHERE A COOKTOP OR CONVENTIONAL RANGE IS NOT PROVIDED AND TO WET BARS.

50 LAVATORIES AND SINKS SHALL BE INSTALLED WITH THE FRONT OF THE HIGHER OF THE RIM OR COUNTER SURFACE 34 INCHES MAXIMUM ABOVE THE FINISH FLOOR OR GROUND. §11B-606.3.

CONTROLS FOR FAUCETS SHALL COMPLY WITH SECTION 11B-309. HAND-OPERATED METERING FAUCETS SHALL REMAIN OPEN FOR TEN SECONDS MINIMUM. §11B-606.4.

SIGNS RELATED TO TOILETS AND BATHING FACILITIES

51 ENTRANCES LEADING TO TOILET ROOMS AND BATHING ROOMS COMPLYING WITH 11B-603 SHALL BE IDENTIFIED BY A GEOMETRIC SYMBOL COMPLYING WITH 11B-703.7.2.6 TOILET AND BATHING ROOM GEOMETRIC SYMBOLS.

52 WHERE EXISTING TOILET ROOMS OR BATHING ROOMS DO NOT COMPLY WITH 11B-603 TOILET AND BATHING ROOMS, DIRECTIONAL SIGNS INDICATING THE LOCATION OF THE NEAREST COMPLIANT TOILET ROOM OR BATHING ROOM WITHIN THE FACILITY SHALL BE PROVIDED.

53 SIGNS SHALL COMPLY WITH 11B-703.5 VISUAL CHARACTERS AND SHALL INCLUDE THE INTERNATIONAL SYMBOL OF ACCESSIBILITY COMPLYING WITH 11B-703.7.2.1 ISA.

54 WHERE EXISTING TOILET ROOMS OR BATHING ROOMS DO NOT COMPLY WITH 11B-603, THE TOILET ROOMS OR BATHING ROOMS COMPLYING WITH 11B-603 TOILET AND BATHING ROOMS SHALL BE IDENTIFIED BY THE INTERNATIONAL SYMBOL OF ACCESSIBILITY COMPLYING WITH 11B-703.7.2.1 ISA.

55 WHERE CLUSTERED SINGLE USER TOILET ROOMS OR BATHING FACILITIES ARE PERMITTED TO USE EXCEPTIONS TO 11B-213.2, TOILET ROOMS OR BATHING FACILITIES COMPLYING WITH 11B-603 TOILET AND BATHING ROOMS SHALL BE IDENTIFIED BY THE INTERNATIONAL SYMBOL OF ACCESSIBILITY COMPLYING WITH 11B-703.7.2.1 ISA UNLESS ALL TOILET ROOMS AND BATHING FACILITIES COMPLY WITH 11B- 603 TOILET AND BATHING ROOMS.

56 EXISTING BUILDINGS THAT HAVE BEEN REMODELED TO PROVIDE SPECIFIC TOILET ROOMS OR BATHING ROOMS FOR PUBLIC USE THAT COMPLY WITH THESE BUILDING STANDARDS SHALL HAVE THE LOCATION OF AND THE DIRECTIONS TO THESE ROOMS POSTED IN OR NEAR THE BUILDING LOBBY OR ENTRANCE ON A SIGN COMPLYING WITH 11B-703.5 VISUAL CHARACTERS, INCLUDING THE INTERNATIONAL SYMBOL OF ACCESSIBILITY COMPLYING WITH 11B-703.7.2.1 ISA. §11B- 216.8

57 PICTOGRAMS SHALL COMPLY WITH THE FOLLOWING:

a. PICTOGRAMS SHALL HAVE A FIELD HEIGHT OF 6 INCHES MINIMUM. CHARACTERS AND BRAILLE SHALL NOT BE LOCATED IN THE PICTOGRAM FIELD. §11B-703.6.1

b. PICTOGRAMS AND THEIR FIELD SHALL HAVE A NON-GLARE FINISH. PICTOGRAMS SHALL CONTRAST WITH THEIR FIELD WITH EITHER A LIGHT PICTOGRAM ON A DARK FIELD OR A DARK PICTOGRAM ON A LIGHT FIELD. §11B-703.6.2

c. PICTOGRAMS SHALL HAVE TEXT DESCRIPTORS LOCATED DIRECTLY BELOW THE PICTOGRAM FIELD. TEXT DESCRIPTORS SHALL COMPLY WITH 11B-703.2 RAISED CHARACTERS, 11B-703.3 BRAILLE AND 11B-703.4 INSTALLATION HEIGHT AND LOCATION. §11B-703.6.3

d. THE INSTALLATION HEIGHT AND LOCATION OF PICTOGRAM SIGNS SHALL BE PER §11B-703.4.1. TACTILE CHARACTERS ON SIGNS SHALL BE LOCATED 48 INCHES MINIMUM ABOVE THE FINISH FLOOR OR GROUND SURFACE, MEASURED FROM THE BASELINE OF THE LOWEST BRAILLE CELL, AND 60 INCHES MAXIMUM ABOVE THE FINISH FLOOR OR GROUND SURFACE, MEASURED FROM THE BASELINE OF THE HIGHEST LINE OF RAISED CHARACTERS.

58 SYMBOLS SHALL COMPLY WITH THE FOLLOWING:

a. DOORWAYS LEADING TO TOILET ROOMS AND BATHING ROOMS SHALL BE IDENTIFIED BY A GEOMETRIC SYMBOL COMPLYING WITH 11B-703.7.2.6. THE SYMBOL SHALL BE MOUNTED AT 58 INCHES MINIMUM AND 60 INCHES MAXIMUM ABOVE THE FINISH FLOOR OR GROUND SURFACE MEASURED FROM THE CENTERLINE OF THE SYMBOL. WHERE A DOOR IS PROVIDED THE SYMBOL SHALL BE MOUNTED WITHIN 1 INCH OF THE VERTICAL CENTERLINE OF THE DOOR. §11B-703.7.2.6.

b. MEN'S TOILET AND BATHING FACILITIES SHALL BE IDENTIFIED BY AN EQUILATERAL TRIANGLE, ¼ INCH THICK WITH EDGES 12 INCHES LONG AND A VERTEX POINTING UPWARD. THE TRIANGLE SYMBOL SHALL CONTRAST WITH THE DOOR, EITHER LIGHT ON A DARK BACKGROUND OR DARK ON A LIGHT BACKGROUND. §11B-703.7.2.6.1

c. WOMEN'S TOILET AND BATHING FACILITIES SHALL BE IDENTIFIED BY A CIRCLE, ¼ INCH THICK AND 12 INCHES IN DIAMETER. THE CIRCLE SYMBOL SHALL CONTRAST WITH THE DOOR, EITHER LIGHT ON A DARK BACKGROUND OR DARK ON A LIGHT BACKGROUND. §11B-703.7.2.6.2

d. UNISEX TOILET AND BATHING FACILITIES SHALL BE IDENTIFIED BY A CIRCLE, ¼ INCH THICK AND 12 INCHES IN DIAMETER WITH A ½ INCH THICK EQUILATERAL TRIANGLE WITH A VERTEX POINTING UPWARD SUPERIMPOSED ON THE CIRCLE AND WITHIN THE 12-INCH DIAMETER. THE TRIANGLE SYMBOL SHALL CONTRAST WITH THE CIRCLE SYMBOL, EITHER LIGHT ON A DARK BACKGROUND OR DARK ON A LIGHT BACKGROUND. THE CIRCLE SYMBOL SHALL CONTRAST WITH THE DOOR, EITHER LIGHT ON A DARK BACKGROUND OR DARK ON A LIGHT BACKGROUND. §11B-703.7.2.6.3

WASHING MACHINE AND CLOTHES DRYERS

59 WASHING MACHINES AND CLOTHES DRYER'S OPERABLE PARTS MUST COMPLY WITH SECTION 11B-309 OPERABLE PARTS. §11B-611.3

60 TOP LOADING MACHINES SHALL HAVE THE DOOR TO THE LAUNDRY COMPARTMENT LOCATED 36 INCHES MAXIMUM ABOVE THE FINISH FLOOR. FRONT LOADING MACHINES SHALL HAVE THE BOTTOM OF THE OPENING TO THE LAUNDRY COMPARTMENT LOCATED 15 INCHES MINIM AND 36 INCHES MAXIMUM ABOVE THE FINISH FLOOR. §11B-611.4

F. COMMUNICATION ELEMENTS AND FEATURES

FIRE ALARM SYSTEMS

1 WHERE FIRE ALARM SYSTEMS AND CARBON MONOXIDE ALARM SYSTEMS PROVIDE AUDIBLE ALARM COVERAGE, ALARMS SHALL COMPLY WITH 11B-215 FIRE ALARM SYSTEMS. §11B-215.1 (SEE EXCEPTION)

2 ALARMS IN PUBLIC USE AREAS AND COMMON USE AREAS SHALL COMPLY WITH CHAPTER 9, SECTION 907.5.2.3.1. §11B-215.2

3 WHERE EMPLOYEE WORK AREAS HAVE AUDIBLE ALARM COVERAGE, THE WIRING SYSTEM SHALL BE DESIGNED SO THAT VISIBLE ALARMS COMPLYING WITH CHAPTER 9, SECTION 907.5.2.3.1 EXCEPTION CAN BE INTEGRATED INTO THE ALARM SYSTEM. §11B-215.3

4 FIRE ALARM SYSTEMS SHALL HAVE PERMANENTLY INSTALLED AUDIBLE AND VISIBLE ALARMS COMPLYING WITH NFPA 72 AND CHAPTER 9, SECTIONS 907.5.2.1 AND 907.5.2.3. §11B-702.1

ASSISTIVE LISTENING SYSTEMS

5 ASSISTIVE LISTENING SYSTEMS SHALL BE PROVIDED IN ASSEMBLY AREAS, INCLUDING CONFERENCE AND MEETING ROOMS. §202, §11B-219.2 NOTE: ASSEMBLY AREAS INCLUDE, BUT ARE NOT LIMITED TO, CLASSROOMS, LECTURE HALLS, COURTROOMS, PUBLIC MEETING ROOMS, PUBLIC HEARING ROOMS, LEGISLATIVE CHAMBERS, MOTION PICTURE HOUSES, AUDITORIA, THEATERS, PLAYHOUSES, DINNER THEATERS, CONCERT HALLS, CENTERS FOR THE PERFORMING ARTS, AMPHITHEATERS, ARENAS, STADIUMS, GRANDSTANDS, OR CONVENTION CENTERS. THIS DOES NOT APPLY TO SYSTEMS USED EXCLUSIVELY FOR PAGING, BACKGROUND MUSIC, OR A COMBINATION OF THESE TWO USES. §202, §11B-219.2

6 PROVIDE A MINIMUM NUMBER OF RECEIVERS EQUAL TO 4 PERCENT OF THE TOTAL NUMBER OF SEATS, BUT IN NO CASE LESS THAN TWO. §11B-219.3

7 WHERE A BUILDING CONTAINS MORE THAN ONE ASSEMBLY AREA UNDER ONE MANAGEMENT, THE TOTAL NUMBER OF REQUIRED RECEIVERS MAY BE CALCULATED USING THE TOTAL NUMBER OF SEATS IN THE ASSEMBLY AREAS PROVIDED THAT ALL RECEIVERS ARE USABLE WITH ALL SYSTEMS. §11B-219.3 EXCEPTION 1.

8 TWENTY-FIVE PERCENT MINIMUM OF RECEIVERS PROVIDED FOR ASSISTIVE LISTENING SYSTEMS, BUT NO FEWER THAN TWO, SHALL BE HEARING-AID COMPATIBLE IN ACCORDANCE WITH SECTION 11B-706.3. §11B-219.3

9 WHERE ALL SEATS IN AN ASSEMBLY AREA ARE SERVED BY MEANS OF AN INDUCTION LOOP ASSISTIVE LISTENING SYSTEM, THE MINIMUM NUMBER OF RECEIVERS REQUIRED BY SECTION 11B-219.3 TO BE HEARING-AID COMPATIBLE SHALL NOT BE REQUIRED TO BE PROVIDED. §11B-219.3, EXCEPTION 2.

10 WHEN ASSISTIVE-LISTENING SYSTEMS ARE LIMITED TO SPECIFIC AREAS OR SEATS, SUCH AREAS OR SEATS SHALL BE WITHIN A 50-FOOT VIEWING DISTANCE OF THE STAGE OR PLAYING AREA AND SHALL HAVE A COMPLETE VIEW OF THE STAGE OR PLAYING AREA. §11B-219.4

11 PERMANENTLY INSTALLED ASSISTIVE-LISTENING SYSTEMS ARE REQUIRED IN AREAS IF (1) THEY ACCOMMODATE AT LEAST 50 PERSONS OR IF THEY HAVE AUDIO-AMPLIFICATION SYSTEMS, AND (2) THEY HAVE FIXED SEATING. IF PORTABLE ASSISTIVE-LISTENING SYSTEMS ARE USED FOR CONFERENCE OR MEETING ROOMS, THE SYSTEM MAY SERVE MORE THAN ONE ROOM. AN ADEQUATE NUMBER OF ELECTRICAL OUTLETS OR OTHER SUPPLEMENTAL WIRING NECESSARY TO SUPPORT A PORTABLE ASSITIVE-LISTENING SYSTEM SHALL BE PROVIDED. §11B-219.5

12 PORTABLE ASSISTIVE-LISTENING SYSTEMS MAY SERVE MORE THAN ONE CONFERENCE OR MEETING ROOMS IF AN ADEQUATE NUMBER OF ELECTRICAL OUTLETS OR OTHER SUPPLEMENTARY WIRING IS PROVIDED AND PERMANENTLY INSTALLED SYSTEMS ARE NOT REQUIRED. §11B-219.5

13 RECEIVERS REQUIRED FOR USE WITH AN ASSISTIVE LISTENING SYSTEM SHALL INCLUDE A 1/8 INCH STANDARD MONO JACK. §11B-706.2

14 RECEIVERS REQUIRED TO BE HEARING-AID COMPATIBLE SHALL INTERFACE WITH TELECOILS IN HEARING AIDS THROUGH THE PROVISION OF NECKLOOPS. §11B-706.3

15 ASSISTIVE LISTENING SYSTEMS SHALL BE CAPABLE OF PROVIDING A SOUND PRESSURE LEVEL FROM 110 – 118 dB WITH A DYNAMIC RANGE ON THE VOLUME CONTROL OF 50 dB. §11B-706.4

16 SIGNAL-TO-NOISE RATIO FOR INTERNALLY GENERATED NOISE IN ASSISTIVE LISTENING SYSTEMS SHALL BE 18 DB MINIMUM. §11B-706.5

17 PEAK CLIPPING SHALL NOT EXCEED 18 dB OF CLIPPING RELATIVE TO THE PEAKS OF SPEECH. §11B-706.6

TWO WAY COMMUNICATION SYSTEMS

18 TWO-WAY COMMUNICATION SYSTEMS THAT ARE PROVIDED TO GAIN ADMITTANCE TO A BUILDING OR FACILITY OR TO RESTRICTED AREAS WITHIN A BUILDING OR FACILITY SHALL PROVIDE BOTH AUDIBLE AND VISUAL SIGNALS. HANDSET CORDS, IF PROVIDED, SHALL BE 29 INCHES LONG MINIMUM. §11B-230.1, §11B-708.1-.3

19 OMIT.

20 OMIT.

G. SPECIAL ROOMS, SPACES, AND ELEMENTS

NEW KITCHENS, KITCHENETTES, AND WET BARS

1 NEW LAVATORIES AND SINKS SHALL COMPLY WITH 11B-606, INCLUDING CLEAR FLOOR SPACE, HEIGHT, FAUCETS, AND AT EXPOSED PIPES AND SURFACES. §11B-804.4

2 AT LEAST 50 PERCENT OF SHELF SPACE IN STORAGE FACILITIES SHALL COMPLY WITH 11B-811, SHALL HAVE A CLEAR FLOOR OR GROUND SPACE COMPLYING WITH SECTION 11B-305 AND SHALL BE WITHIN AT LEAST ONE OF THE REACH RANGES SPECIFIED IN SECTION 11B-308. §11B-804.5

3 WHERE PROVIDED, KITCHEN APPLIANCES SHALL COMPLY WITH SECTION 11B-804.6 AND HAVE A CLEAR FLOOR OR GROUND SPACE COMPLYING WITH SECTION 11B-305, CENTERED ON EACH APPLIANCE. THIS CLEAR FLOOR SPACE MAY OVERLAP. ALL APPLIANCE CONTROLS SHALL COMPLY WITH SECTION 11B-309 (SEE EXCEPTIONS) §11B-804.6

4 WHERE A DISHWASHER IS PROVIDED, THE CLEAR OR GROUND SPACE SHALL BE POSITIONED ADJACENT TO THE DISHWASHER DOOR. THE DISHWASHER DOOR, IN THE OPEN POSITION, SHALL NOT OBSTRUCT THE CLEAR FLOOR OR GROUND SPACE FOR THE DISHWASHER OR THE SINK. §11B-804.6.3

5 WHERE A RANGE OR COOKTOP IS PROVIDED, AND A FORWARD APPROACH IS PROVIDED, THE CLEAR FLOOR OR GROUND SPACE SHALL PROVIDE KNEE AND TOE CLEARNACE COMPLYING WITH SECTION 11B-306. WHERE KNEE AND TOE SPACE IS PROVIDED, THE UNDERSIDE OF THE RANGE OR COOKTOP SHALL BE INSUATEDS OR OTHERWISE CONFIGURED TO PREVENT BURNS, ABRASIONS, OR ELECTRICAL SHOCK. THE LOCATIONS OF CONTROLS SHALL NOT REQUIRE REACHING ACROSS BURNERS. §11B-804.6.4

6 OVENS SHALL COMPLY WITH 11B-804-6.5. SIDE-HINGED DOOR OVENS SHALL HAVE THE WORK SURFACE REQUIRED BY SECTION 11B-804.3 POSITIONED ADJACENT TO THE LATCH ISDE OF THE OVEN DOOR AND BOTTOM-HINGED DOOR OVENS SHALL HAVE THE WORK SURFACE REQUIRED BY SECTION 11B-804.3 POSITIONED TO ONE SIDE OF THE DOOR. OVENS SHALL HAVE CONTROLS ON FRONT PANELS. §11B-804.6.5.1-.3

MAIL BOXES

7 WHERE MAIL BOXES ARE PROVIDED IN AN INTERIOR LOCATION, AT LEAST 5 PERCENT, BUT NO FEWER THAN ONE, OF EACH TYPE SHALL COMPLY WITH 11B-309. §11B-228.2

WINDOWS

8 WHERE GLAZED OPENINGS ARE PROVIDED IN ACCESSIBLE ROOMS OR SPACES FOR OPERATION BY OCCUPANTS, AT LEAST ONE OPENING SHALL COMPLY WITH 11B-309 (OPERABLE PARTS WITHIN REACH RANGES). EACH GLAZED OPENING REQUIRED BY AN ADMINISTRATIVE AUTHORITY TO BE OPERABLE SHALL COMPLY WITH 11B-309. §11B-229.1

H. BUILT-IN ELEMENTS

BENCHES

1 CLEAR FLOOR OR GROUND SPACE COMPLYING WITH 11B-305 SHALL BE PROVIDED AND SHALL BE POSITIONED AT THE END OF THE BENCH SEAT AND PARALLEL TO THE SHORT AXIS OF THE BENCH. §11B-903.2

2 BENCHES SHALL HAVE SEATS THAT ARE 48 INCHES LONG MINIMUM AND 20 INCHES DEEP MINIMUM AND 24 INCHES DEEP MAXIMUM. §11B-903.3

END OF COMMERCIAL ACCESSIBILITY NOTES

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REVISION DATES (DESIGN STAGE ONLY)

Sheet Version 4.0

Z:\B□S ARCHITECTURE\019 JOBS\01935.0 CITY OF LA-RESEDA ICE HOCKEY ROLLER RINK\01935.0 1.CURRENT DRAWINGS_24X36\01935.0_A022_24X36.DWG 12/3/2021 9:07 AM

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED

LICENSED ARCHITECT
LAWRENCE SCARPA
C 21812
REN 10/31/2023
STATE OF CALIFORNIA

BUREAU OF ENGINEERING
VERTICAL CONTROL:
HORIZONTAL CONTROL:
SHEET TITLE: ACCESSIBILITY NOTES
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

DEPARTMENT OF PUBLIC WORKS

NO.	REVISIONS:	DATE:	BY:

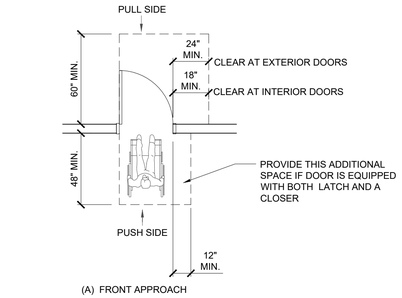
INDEX NO.

CIP NO.

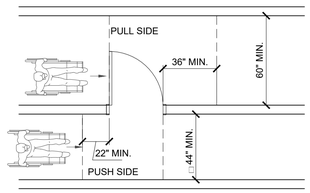
CITY OF LOS ANGELES
CITY ENGINEER
GARY LEE MOORE, P.E., ENV SP
DESIGN GROUP:
DATE:
ENGINEER:
DESIGNED BY:
DRAWN BY:
CHECKED BY:
APPROVED BY:

WORK ORDER NO.
E170121B

SHEET NAME
A0.22
SHEET X OF X SHEETS

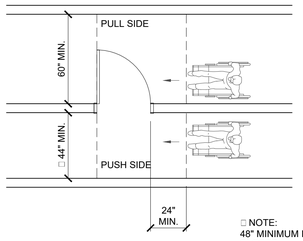


(A) FRONT APPROACH



□ NOTE:
48" MIN. IF DOOR HAS BOTH A LATCH AND A CLOSER

(B) HINGE APPROACH



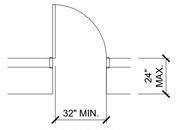
□ NOTE:
48" MINIMUM IF DOOR HAS A CLOSER

(C) LATCH APPROACH

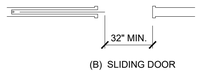
CLEAR DOOR WIDTH & DEPTH

06

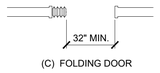
REF: -- SCALE: 3" = 1'-0"



(A) HINGED DOOR



(B) SLIDING DOOR



(C) FOLDING DOOR

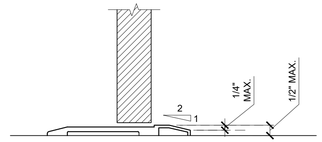
NOTE:

PROVIDE BUMPER IN POCKET TO PREVENT DOOR FROM FULLY RECEDING

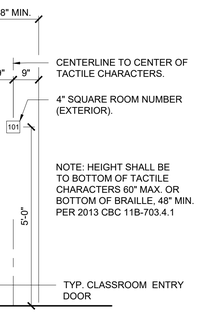
TYP. THRESHOLD REQUIREMENTS

03

REF: -- SCALE: 3" = 1'-0"



NOTE:
CLOSER SPEED FROM 90 DEGREES OPEN TO WITHIN 12" OF LATCH IS 5 SECONDS MIN.



1. PROVIDE ROOM NUMBER SIGNAGE AT ALL DOORS AS SHOWN ABOVE.
2. PROVIDE ROOM SIGNS FOR MECHANICAL ROOMS, ELECTRICAL ROOMS, TRASH ROOMS, STORAGE ROOMS, MACHINE ROOM, ETC. SIGNS SHALL BE SQUARE SHAPE, TYPICAL, AND WALL MOUNTED ADJACENT TO DOOR, SIM. TO ABOVE. ROOM NUMBER/NAME SHALL BE CONTRASTING COLOR, SIGN BACKGROUND SHALL MATCH WALL COLOR.
3. PROVIDE A SIGN IN ALL ASSEMBLY AREAS STATING THE MAX OCCUPANCY.
4. CONTRACTOR SHALL PROVIDE SIGNAGE REQUIRED BY FIRE DEPARTMENT AS NECESSARY.
5. PROVIDE THE FOLLOWING SIGNS:
   a). 'SMOKING IS PROHIBITED WITHIN 25' OF ENTRIES, AIR INTAKES AND WINDOWS.'
   b). 'SMOKING IS PROHIBITED IN ALL COMMON AREAS.'
6. PROVIDE EXIT SIGNS AS REQUIRED BY CODE.

TABLE *11B*-703.5.5
VISUAL CHARACTER HEIGHT

HEIGHT TO FINISH FLOOR OR GROUND FROM BASELINE OF CHARACTER	HORIZONTAL VIEWING DISTANCE	MINIMUM CHARACTER HEIGHT
40 inches (*1016* mm) to less than or equal to 70 inches (*1778* mm)	less than 72 inches (*1829* mm)	5/8 inch (*15.9* mm)
	72 inches (*1829* mm) and greater	5/8 inch (*15.9* mm), plus 1/8 inch (3.2 mm) per foot (305 mm) of viewing distance above 72 inches (*1829* mm)
Greater than 70 inches (*1778* mm) to less than or equal to 120 inches (*3048* mm)	less than 180 inches (*4572* mm)	2 inches (51 mm)
	180 inches (*4572* mm) and greater	2 inches (51 mm), plus 1/8 inch (3.2 mm) per foot (305 mm) of viewing distance above 180 inches (*4572* mm)
greater than 120 inches (*3048* mm)	less than 21 feet (*6401* mm)	3 inches (*76* mm)
	21 feet (*6401* mm) and greater	3 inches (*76* mm), plus 1/8 inch (3.2 mm) per foot (305 mm) of viewing distance above 21 feet (*6401* mm)

FIGURE *11B*-302.2
CARPET PILE HEIGHT

FIGURE *11B*-303.2
VERTICAL CHANGE IN LEVEL

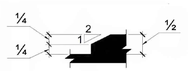
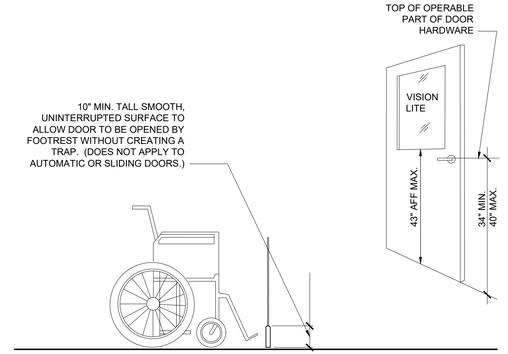


FIGURE *11B*-303.3
BEVELED CHANGE IN LEVEL



TYP. LEVEL MANUEVERING CLEARANCE @ DOORS

11

REF: -- SCALE: 3" = 1'-0"

DOOR SIGNAGE GENERAL NOTES

08

REF: -- SCALE: 3" = 1'-0"

TYP. CHANGE IN LEVEL

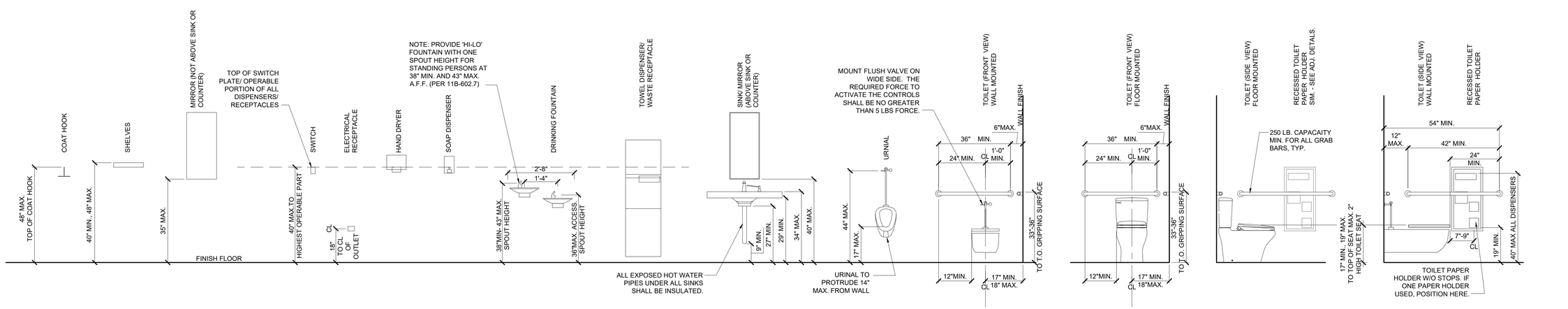
05

REF: DOOR & FINISH DETAILS SCALE: 3" = 1'-0"

DOOR CONSTRUCTION

02

REF: -- SCALE: 3" = 1'-0"



TYP. ACCESSIBLE MOUNTING HEIGHTS

01

REF: -- SCALE: 1/2" = 1'-0"

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REVISION DATES (DESIGN STAGE ONLY)

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

LICENSED ARCHITECT
LAWRENCE SCARPA
C 21812
REN 10/31/2023
STATE OF CALIFORNIA

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED •

BUREAU OF ENGINEERING
VERTICAL CONTROL:
HORIZONTAL CONTROL:
SHEET TITLE: ACCESSIBILITY DETAILS
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

NO.	REVISIONS:	DATE:	BY:

CIP NO.

INDEX NO.

DEPARTMENT OF PUBLIC WORKS
CITY OF LOS ANGELES
GARY LEE MOORE, P.E. ENV. SP
CITY ENGINEER
DESIGN GROUP
DATE:
ENGINEER:
DESIGNED BY:
DRAWN BY:
CHECKED BY:
APPROVED BY:

WORK ORDER NO.
E170121B

SHEET NAME
A0.23
SHEET X OF X SHEETS

Sheet Version 4.0

Z:\B□S ARCHITECTURE\019 JOBS\01935.0 CITY OF LA-RESEDA ICE HOCKEY ROLLER RINK\01935.0 1.CURRENT DRAWINGS_24X36\01935.0_A023_24X36.DWG 12/3/2021 9:07 AM

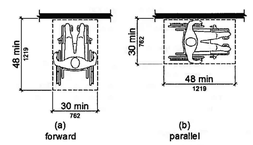


FIGURE *11B*-305.5
POSITION OF CLEAR FLOOR OR GROUND SPACE

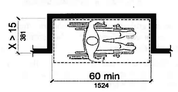


FIGURE *11B*-305.7.2
MANEUVERING CLEARANCE IN AN ALCOVE, PARALLEL APPROACH

TYP. WHEEL CHAIR MANUVERING CLEARANCE

12

REF: -- SCALE: 3" = 1'-0"

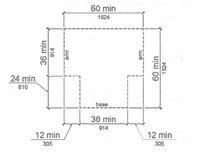
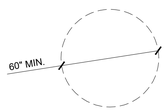


FIGURE *11B*-304.3.3
T-SHAPED TURNING SPACE

T-SHAPED



CIRCULAR

NOTE:
IF KNEE/TOE CLEARANCE OVERLAPS, IT SHALL BE AT BASE OR ONE ARM ONLY.

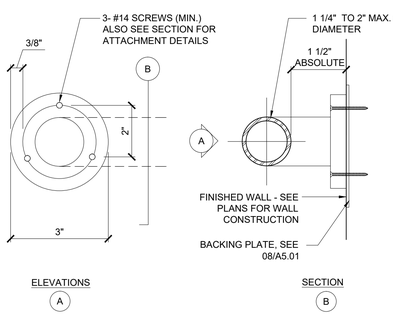
NOTE:
CAN INCLUDE KNEE & TOE SPACE COMPLYING WITH 15/A0.24 PER 11B-306.

NOTE:
DOORS ARE PERMITTED TO SWING INTO BOTH TURNING SPACES PER 11B-304.4, 12" MAX., WITH THE EXCEPTION OF THE ACCESSIBLE WATER CLOSET COMPARTMENT PER 11B-603.2.3.

TURNING SPACE

11

REF: -- SCALE: 3" = 1'-0"



NOTES:
1. MAX SPACING BETWEEN ANCHOR/GRAB BAR SUPPORTS = 48"
2. ALL GRAB BARS AND ACCESSORIES TO BE 18 GAUGE - 304 STAINLESS STEEL.
3. USE 11 GAUGE WELDED 304 STAINLESS STEEL MOUNTING FLANGES
4. GRAB BARS SHALL NOT ROTATE WITHIN THEIR FITTINGS AND SHALL ALLOW FOR A VERTICAL AND HORIZONTAL BENDING STRESS, SHEAR & TENSILE FORCE OF 250 LBS. MIN.

GRAB BAR DIMENSIONS

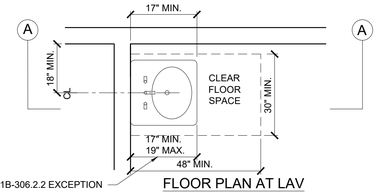
10

REF: 08/A5.01 SCALE: 3" = 1'-0"

TYPICAL ACCESSIBLE SINK

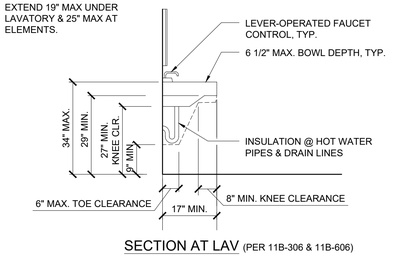
09

REF: -- SCALE: 3" = 1'-0"



FLOOR PLAN AT LAV

PER 11B-306.2.2 EXCEPTION TOE CLEARANCE SHALL EXTEND 19" MAX UNDER LAVATORY & 25" MAX AT ELEMENTS.

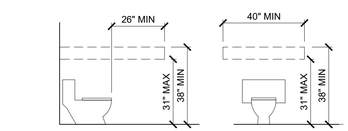


SECTION AT LAV (PER 11B-306 & 11B-606)

TYP. LAVATORY CLEARANCES

08

REF: -- SCALE: 3" = 1'-0"



(A) LOCATION OF GRAB BAR BACKING FOR WATER CLOSET GRAB BARS

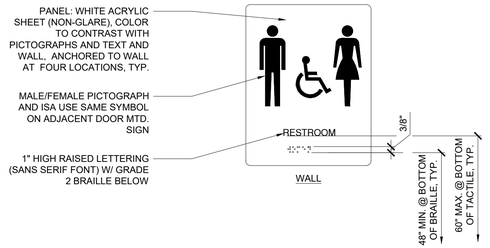
NOTE: PROVIDE GRAB BAR BACKING @ ALL GRAB BARS

TYP. GRAB BAR BACKING @ WATER CLOSETS

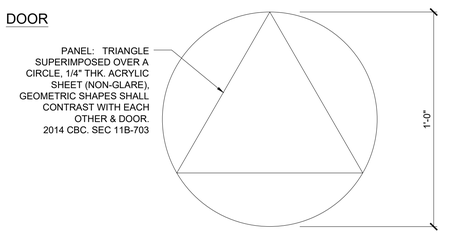
07

REF: -- SCALE: 3" = 1'-0"

UNISEX RESTROOM SIGNAGE



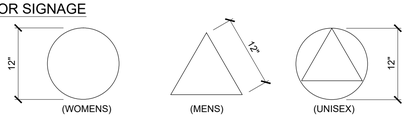
DOOR



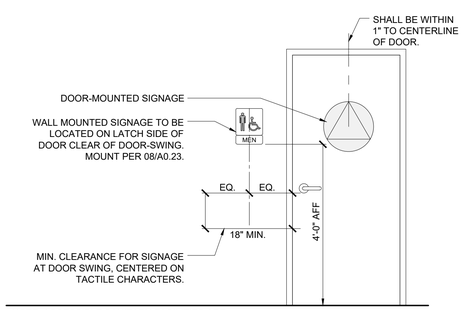
WALL SIGNAGE

LETTERS AND NUMERALS SHALL BE RAISED 1/32", UPPER CASE, SANS SERIF TYPE AND SHALL BE ACCOMPANIED WITH GRADE II BRAILLE. RAISED CHARACTERS SHALL BE AT LEAST 5/8" HIGH, BUT NO HIGHER THAN 2" CHARACTERS SHALL CONTRAST W/ THEIR BACKGROUND AND BE OF A NON-GLARE (MATTE) FINISH. CORRESPONDING GRADE II BRAILLE. DOTS SHALL BE 1/10" O.C. IN EACH CELL WITH 2/10" SPACE BETWEEN CELLS. DOTS SHALL BE RAISED A MINIMUM OF 1/40" ABOVE THE BACKGROUND.

DOOR SIGNAGE



NOTE:
PICTOGRAMS AND/OR LETTERING ARE NOT REQUIRED ON DOOR- MOUNTED SIGNAGE. SIGNAGE SHALL BE 1/4" THK. & CONTRAST W/ COLOR OF THE DOOR. ALL SIGNAGE MUST HAVE NON-GLARE FINISH & CONTRAST W/ COLOR OF WALL.

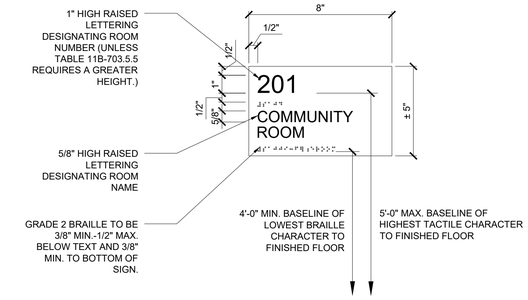


NOTE: ACCESSIBLE SANITARY FACILITIES ARE REQUIRED TO HAVE BOTH DOOR MOUNTED & WALL MOUNTED SIGNAGE.

RESTROOM SIGNAGE

04

REF: -- SCALE: 3" = 1'-0"

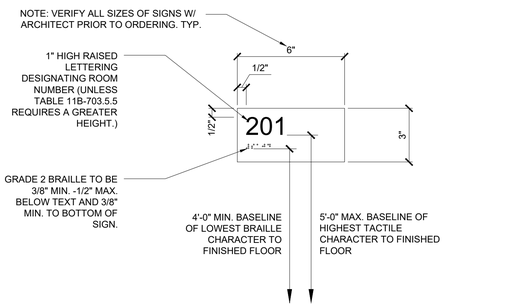


NOTES:
1. ALL TEXT TO BE SANS SERIF FONT RAISED 1/32" MIN., WITH GRADE 2 BRAILLE
2. ALL SIGNAGE SHALL CONFORM TO CCR, TITLE 24, CALIFORNIA BUILDING CODE SECTION 11B-703.
3. SIGN SHALL BE NON- GLARE, ACRYLIC, OR OTHER SOLID MATERIAL OF CONSISTENT COLOR.
4. SIGNS THAT PROVIDE DIRECTION TO OR INFORMATION ABOUT INTERIOR AND EXTERIOR SPACES AND FACILITIES OF THE SITE SHALL COMPLY WITH 11B-703.5 VISUAL CHARACTERS.
5. SIGNS FOR MEANS OF EGRESS SHALL COMPLY WITH 11B-216.4 MEANS OF EGRESS.
6. ACCESSIBLE SIGN TO CONFORM WITH THE REQUIREMENTS OF THE LATEST EDITION OF THE CBC-CHAPTER 11B-703. (703.1 TO 703.7.2.6.3)

TYP. ROOM IDENTIFICATION SIGNAGE

03

REF: -- SCALE: 3" = 1'-0"

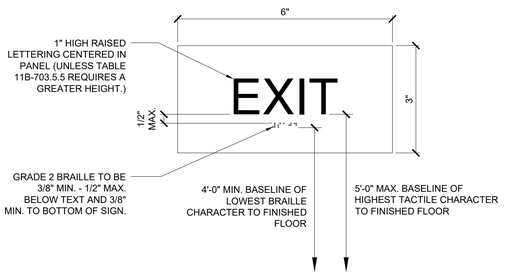


NOTES:
1. ALL TEXT TO BE SANS SERIF FONT RAISED 1/32" MIN., WITH GRADE 2 BRAILLE
2. ALL SIGNAGE SHALL CONFORM TO CCR, TITLE 24, CALIFORNIA BUILDING CODE SECTION 11B-703.
3. SIGN SHALL BE NON- GLARE, ACRYLIC, OR OTHER SOLID MATERIAL OF CONSISTENT COLOR.
4. SIGNS THAT PROVIDE DIRECTION TO OR INFORMATION ABOUT INTERIOR AND EXTERIOR SPACES AND FACILITIES OF THE SITE SHALL COMPLY WITH 11B-703.5 VISUAL CHARACTERS.
5. SIGNS FOR MEANS OF EGRESS SHALL COMPLY WITH 11B-216.4 MEANS OF EGRESS.
6. ACCESSIBLE SIGN TO CONFORM WITH THE REQUIREMENTS OF THE LATEST EDITION OF THE CBC-CHAPTER 11B-703. (703.1 TO 703.7.2.6.3)

TYP. ROOM IDENTIFICATION SIGNAGE

02

REF: -- SCALE: 3" = 1'-0"



NOTES:
1. LOCATE AT ALL GRADE LEVEL EXTERIOR EXIT DOORS.
2. ALL TEXT TO BE SANS SERIF FONT RAISED 1/32" MIN., WITH GRADE 2 BRAILLE.
3. SIGN SHALL BE NON-GLARE, ACRYLIC, OR OTHER SOLID MATERIAL OF CONSISTENT COLOR.
4. SIGNS THAT PROVIDE DIRECTION TO OR INFORMATION ABOUT INTERIOR AND EXTERIOR SPACES AND FACILITIES OF THE SITE SHALL COMPLY WITH 11B-703.5 VISUAL CHARACTERS.
5. SIGNS FOR MEANS OF EGRESS SHALL COMPLY WITH 11B-216.4 MEANS OF EGRESS.
6. ACCESSIBLE SIGN TO CONFORM WITH THE REQUIREMENTS OF THE LATEST EDITION OF THE CBC-CHAPTER 11B-703. (703.1 TO 703.7.2.6.3)

TYPICAL TACTILE EXIT SIGNAGE

01

REF: -- SCALE: 3" = 1'-0"

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

LICENSED ARCHITECT
LAWRENCE SQUARZI
C 21812
REN 10/31/2023
STATE OF CALIFORNIA

THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED

DEPARTMENT OF PUBLIC WORKS
BUREAU OF ENGINEERING

VERTICAL CONTROL:
HORIZONTAL CONTROL:

SHEET TITLE: ACCESSIBILITY DETAILS

PROJECT: RESEDA SKATE FACILITY

ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

NO.	REVISIONS:	DATE:	BY:

CIP NO.

INDEX NO.

CITY OF LOS ANGELES
CITY ENGINEER
DATE:
GARY LEE MOORE, P.E. ENV. SP
DESIGN GROUP
ENGINEER:
DESIGNED BY:
DRAWN BY:
CHECKED BY:
APPROVED BY:

WORK ORDER NO.
E170121B

SHEET NAME
A0.24
SHEET X OF X SHEETS

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REVISION DATES (DESIGN STAGE ONLY)

Sheet Version 4.0

Z:\B□S ARCHITECTURE\019 JOBS\01935.0 CITY OF LA-RESEDA ICE HOCKEY ROLLER RINK\01935.0 1.CURRENT DRAWINGS_24X36\01935.0_A024_24X36.DWG 12/3/2021 9:08 AM

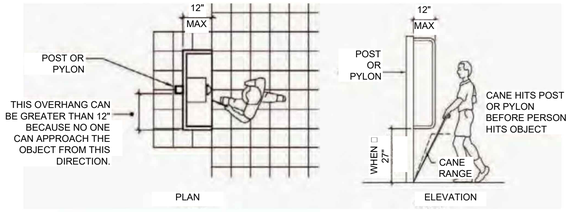


FIGURE 11B-704.2.1.2, 11B-704.2.1.2 PER P/BC 2017-089 - OBJECTS MOUNTED ON POSTS OR PYLONS

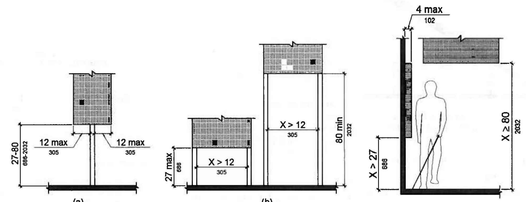


FIGURE *11B*-307.3
POST-MOUNTED PROTRUDING OBJECTS

FIGURE *11B*-307.2
LIMITS OF PROTRUDING OBJECTS

NOTE:
1. DOOR CLOSERS SHALL NOT ENCROACH BELOW 80".
2. PROVIDE 'CANE DETECTION BARRIER' AT ALL OBSTRUCTIONS THAT DO NOT MEET THE CLEARANCES IN THIS DETAIL.

TYP. PROTRUDING OBJECTS CLEARANCE

03

REF: -- SCALE: 3" = 1'-0"

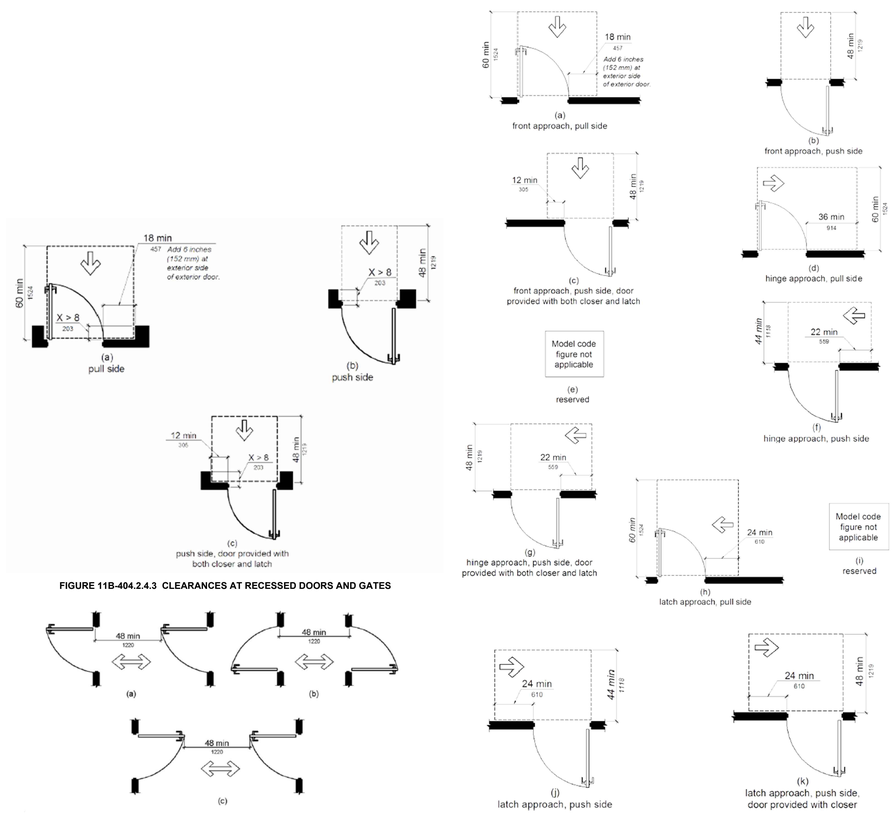


FIGURE 11B-404.2.4.3 CLEARANCES AT RECESSED DOORS AND GATES

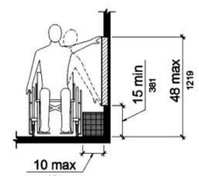
FIGURE 11B-404.2.6 CLEARANCES AT DOORS AND GATES IN A SERIES

FIGURE 11B-404.2.4.1 CLEARANCES AT MANUAL SWINGING DOORS AND GATES

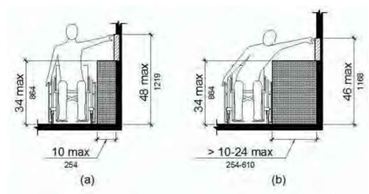
CLEARANCES AT DOORS & GATES

04

REF: -- SCALE: N.T.S



UNOBSTRUCTED HIGH SIDE REACH
(PER 11B-308.3.1)



OBSTRUCTED HIGH SIDE REACH (PER 11B-308.3.2)

TYP. SIDE REACH

02

REF: SCALE: 3" = 1'-0"

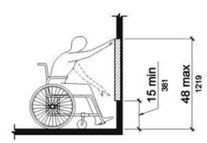


FIGURE *11B*-308.2.1
UNOBSTRUCTED FORWARD REACH

NOTE: IF FORWARD REACH IS OVER A COUNTER OR OBSTRUCTION THAT IS □ 20"-25" MAX., THE MAXIMUM REACH SHALL BE 44".

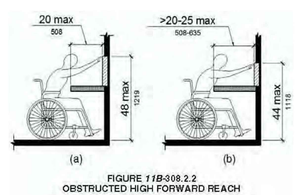


FIGURE *11B*-308.2.2
OBSTRUCTED HIGH FORWARD REACH

TYP. FOWARD REACH

01

REF: -- SCALE: 3" = 1'-0"

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

LICENSED ARCHITECT
LAWRENCE SCARPA
C 21812
REN 10/31/2023
STATE OF CALIFORNIA

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED •

DEPARTMENT OF PUBLIC WORKS
BUREAU OF ENGINEERING

VERTICAL CONTROL:
HORIZONTAL CONTROL:
SHEET TITLE: ACCESSIBILITY DETAILS
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

NO.	REVISIONS:	DATE:	BY:

CIP NO.

INDEX NO.

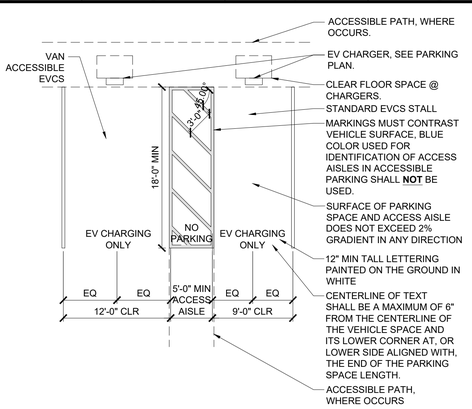
CITY OF LOS ANGELES
GARY LEE MOORE, P.E. ENV SP
DESIGN GROUP
ENGINEER:
DESIGNED BY:
DRAWN BY:
CHECKED BY:
APPROVED BY:
CITY ENGINEER
DATE:

WORK ORDER NO.
E170121B

SHEET NAME
A0.25
SHEET X OF X SHEETS

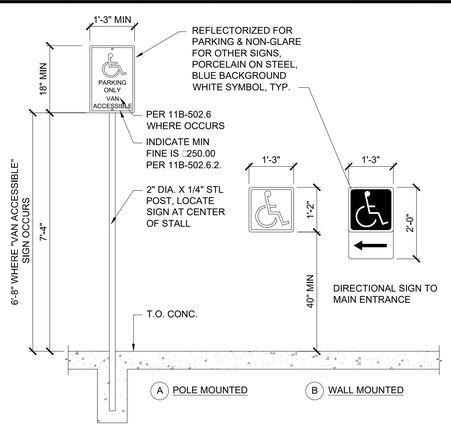
REVISION DATES
(DESIGN STAGE ONLY)

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.



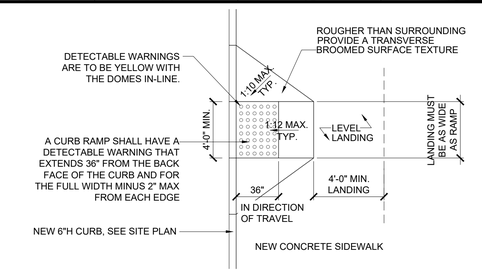
EVCS PARKING 09

REF: 1129B.4 SCALE: 1/8" = 1'-0"



TYPICAL PARKING SIGNAGE 06

REF: 11B-502 SCALE: 1/2" = 1'-0"

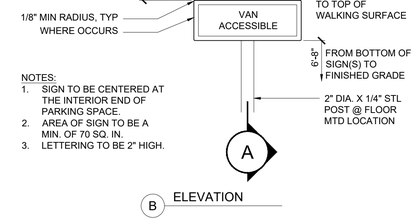


ALL CURB RAMPS TO FOLLOW SEC. 11B-406

NOTES:
1. SLOPE OF RAMP SHALL NOT EXCEED 1 VERTICAL IN 12 HORIZONTAL.
2. PROVIDE A LEVEL LANDING 4'-0" DEEP BY ITS FULL WIDTH.
3. FLARED SIDES OF RAMP SHALL NOT EXCEED 10%.

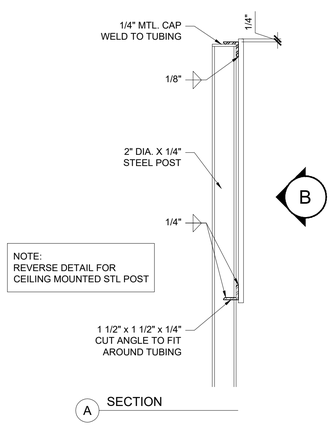
CURB RAMP DETAIL 03

REF: PLANS SCALE: N.T.S.



NOTES:
1. SIGN TO BE CENTERED AT THE INTERIOR END OF PARKING SPACE.
2. AREA OF SIGN TO BE A MIN. OF 70 SQ. IN.
3. LETTERING TO BE 2" HIGH.

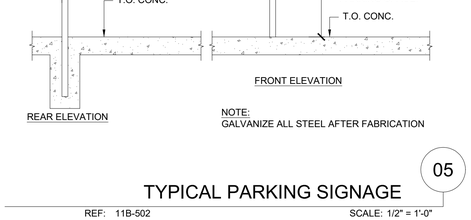
B ELEVATION



A SECTION

PARKING SIGNAGE DETAIL 07

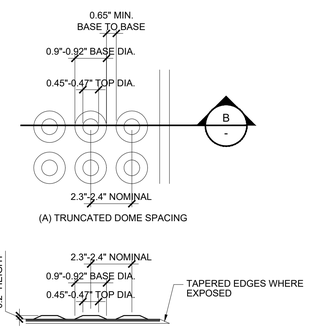
REF: PLANS SCALE: 1"=6"



NOTE:
GALVANIZE ALL STEEL AFTER FABRICATION

TYPICAL PARKING SIGNAGE 05

REF: 11B-502 SCALE: 1/2" = 1'-0"



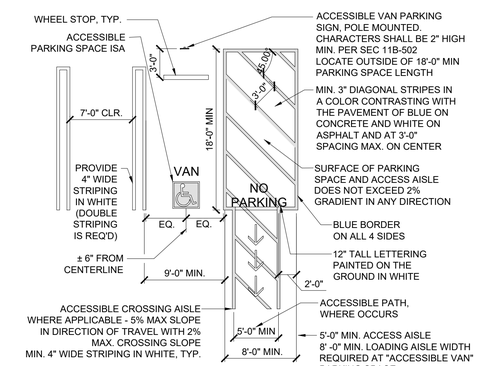
TRUCTATED DOMES 04

REF: PLANS SCALE: 3"=1'-0"

ISA MUST BE ALIGNED WITH THE END OF THE PARKING SPACE AND CENTERED ± 6" FROM THE SPACE CENTERLINE.

INTERNATIONAL SYMBOL OF ACCESSIBILITY 02

REF: 11B-502.6.4 SCALE: 1" = 1'-0"



NOTES:
1. PAINT CURB MARKINGS AND METAL SIGNS COLOR: 15090 FEDERAL STANDARDS 595A AS SPECIFIED IN SEC. 522(b) OF THE REGULATIONS. (SIMILAR TO ROYAL BLUE)
2. NEW AND EXISTING AC PARKING AND ACCESS WILL COMPLY WITH CA ADMINISTRATIVE CODE 24, AND COUNTY OF LA PARKING CODE.
3. SURFACE SLOPES OF AC PARKING SPACES SHALL BE THE MIN. POSSIBLE AND SHALL NOT EXCEED 1/4" PER FOOT IN ANY DIRECTION.

TYP. ACCESSIBLE PARKING 01

REF: PLANS (11B-208) SCALE: 1/8"=1'-0"

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

LICENSED ARCHITECT
LAWRENCE SCARPA
C 21812
REN 10/31/2023
STATE OF CALIFORNIA

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED •

BUREAU OF ENGINEERING
VERTICAL CONTROL:
HORIZONTAL CONTROL:
SHEET TITLE: ACCESSIBILITY DETAILS
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

DEPARTMENT OF PUBLIC WORKS
NO. REVISIONS: DATE: BY:
CIP NO.
INDEX NO.

CITY OF LOS ANGELES
GARY LEE MOORE, P.E. ENV SP
DESIGN GROUP: ENGINEER: DESIGNED BY: DRAWN BY: CHECKED BY: APPROVED BY:
CITY ENGINEER DATE:

WORK ORDER NO.
E170121B

SHEET NAME
A0.26
SHEET X OF X SHEETS

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

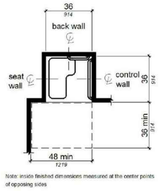
REVISION DATES (DESIGN STAGE ONLY)

Sheet Version 4.0

Z:\B□S ARCHITECTURE\019 JOBS\01935.0 CITY OF LA-RESEDA ICE HOCKEY ROLLER RINK\01935.0 1.CURRENT DRAWINGS_24X36\01935.0_A026_24X36.DWG 12/3/2021 9:08 AM

THESE DIAGRAMS ILLUSTRATE THE SPECIFIC REQUIREMENTS OF THESE REGULATIONS AND ARE INTENDED ONLY AS AN AID FOR BUILDING DESIGN AND CONSTRUCTION.

TUBS AND SHOWERS



Note: inside finished dimensions measured at the center points of opposing sides

FIGURE *11B*-608.2.1
TRANSFER TYPE SHOWER
COMPARTMENT SIZE AND CLEARANCE

Note: Transfer type shower compartments shall be permitted in transient lodging guest rooms, multibedroom housing units in undergraduate student housing and residential dwelling units; and shall not be permitted at other locations to meet the requirements of Section 11B-213.3.6.

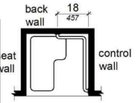
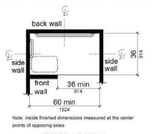


FIGURE 11B-608.3.1
S FOR TRANSFER TYPE SHOWERS

Note: inside finished dimensions measured at the center points of opposing sides

FIGURE *11B*-608.2.2
STANDARD ROLL-IN TYPE
SHOWER COMPARTMENT SIZE AND CLEARANCE



Note: inside finished dimensions measured at the center points of opposing sides

FIGURE *11B*-608.2.3
ALTERNATE ROLL-IN TYPE
SHOWER COMPARTMENT SIZE AND CLEARANCE

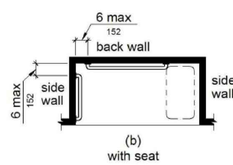


FIGURE *11B*-608.3.2
GRAB BARS FOR STANDARD ROLL-IN TYPE *SHOWER*

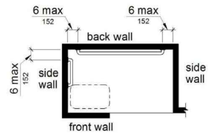


FIGURE *11B*-608.3.3
GRAB BARS FOR ALTERNATE ROLL-IN TYPE SHOWERS

As a covered entity under Title II of the Americans with Disabilities Act, the City of Los Angeles does not discriminate on the basis of disability and, upon request, will provide reasonable accommodation to ensure equal access to its programs, services and activities.

P/BC 2020-088

THESE DIAGRAMS ILLUSTRATE THE SPECIFIC REQUIREMENTS OF THESE REGULATIONS AND ARE INTENDED ONLY AS AN AID FOR BUILDING DESIGN AND CONSTRUCTION.

TUBS AND SHOWERS

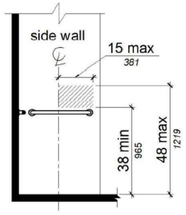


FIGURE 11B-608.5.1

TRANSFER TYPE SHOWER
COMPARTMENT CONTROL

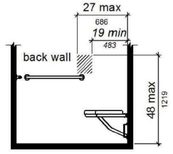


FIGURE 11B-608.5.2
STANDARD ROLL-IN TYPE
SHOWER COMPARTMENT CONTROL
LOCATIONLOCATION

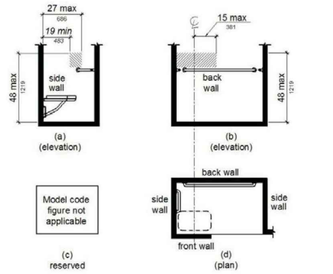


FIGURE 11B-608.5.3

ALTERNATE ROLL-IN TYPE SHOWER COMPARTMENT
CONTROL LOCATION

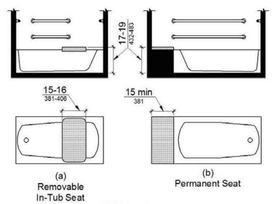


FIGURE 11B-610.2 BATHTUB SEATS

As a covered entity under Title II of the Americans with Disabilities Act, the City of Los Angeles does not discriminate on the basis of disability and, upon request, will provide reasonable accommodation to ensure equal access to its programs, services and activities.

P/BC 2020-088

THESE DIAGRAMS ILLUSTRATE THE SPECIFIC REQUIREMENTS OF THESE REGULATIONS AND ARE INTENDED ONLY AS AN AID FOR BUILDING DESIGN AND CONSTRUCTION.

TUBS AND SHOWERS

11B-610.1 General. Seats in bathtubs and shower compartments shall comply with Section 11B-610.

11B-610.2 Bathtub seats. The top of bathtub seats shall be 17 inches minimum and 19 inches maximum above the bathroom finish floor. The depth of a removable in-tub seat shall be 15 inches (381 mm) minimum and 16 inches maximum. The seat shall be capable of secure placement. Permanent seats at the head end of the bathtub shall be 15 inches deep minimum and shall extend from the back wall to or beyond the outer edge of the bathtub.

11B-610.3 Shower compartment seats. A seat in a standard roll-in shower compartment shall be a folding type, shall be installed on the side wall adjacent to the controls, and shall extend from the back wall to a point within 3 inches of the compartment entry. A seat in an alternate roll-in type shower compartment shall be a folding type, shall be installed on the front wall opposite the back wall, and shall extend from the adjacent side wall to a point within 3 inches of the compartment entry. In transfer type showers, the seat shall extend from the back wall to a point within 3 inches(76 mm) of the compartment entry. The top of the seat shall be 17 inches minimum and 19 inches maximum above the bathroom finish floor. When folded, the seat shall extend 6 inches maximum from the mounting wall. Seats shall comply with Section 11B-610.3.1 or 11B-610.3.2.

11B-610.3.1 Rectangular seats. The rear edge of a rectangular seat shall be 21½ inches maximum and the front edge 15 inches minimum and 16 inches maximum from the seat wall. The side edge of the seat shall be 11½ inches maximum from the adjacent wall.

11B-610.3.2 L-shaped seats. The rear edge of an L-shaped seat shall be 21½ inches maximum and the front edge 15 inches minimum and 16 inches maximum from the seat wall. The rear edge of the "L" portion of the seat shall be 11½ inches maximum from the wall and the front edge shall be 14 inches minimum and 15 inches maximum from the wall. The end of the "L" shall be 22 inches minimum and 23 inches maximum from the main seat wall.

11B-610.4 Structural strength. Allowable stresses shall not be exceeded for materials used when a vertical or horizontal force of 250 pounds (1112 N) is applied at any point on the seat, fastener, mounting device, or supporting structure.

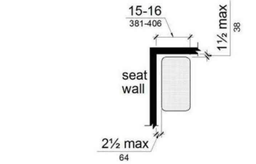


FIGURE *11B*-610.3.1
RECTANGULAR SHOWER SEAT

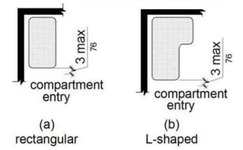


FIGURE *11B*-610.3
EXTENT OF SEAT

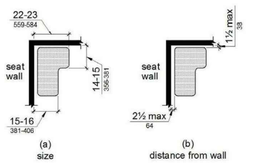


FIGURE *11B*-610.3.2
L-SHAPED SHOWER SEAT

As a covered entity under Title II of the Americans with Disabilities Act, the City of Los Angeles does not discriminate on the basis of disability and, upon request, will provide reasonable accommodation to ensure equal access to its programs, services and activities.

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REVISION DATES (DESIGN STAGE ONLY)

Sheet Version 4.0

CITY OF LOS ANGELES
DEPARTMENT OF PUBLIC WORKS
BUREAU OF ENGINEERING
GARY LEE MOORE, P.E. ENV SP — CITY ENGINEER
DESIGN GROUP — DATE:
ENGINEER:
DESIGNED BY:
DRAWN BY:
CHECKED BY:
APPROVED BY:
VERTICAL CONTROL:
HORIZONTAL CONTROL:
SHEET TITLE: ACCESSIBILITY DETAILS
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335
NO. REVISIONS BY DATE
CIP NO.
INDEX NO.
WORK ORDER NO. E170121B
SHEET NAME A0.27
SHEET X OF X SHEETS

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED

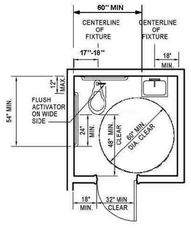
LICENSED ARCHITECT
LAWRENCE SQUARZ
C 21812
REN 10/31/2023
STATE OF CALIFORNIA

P/BC 2017-087

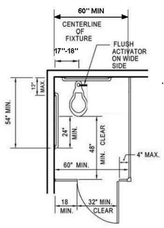
INFORMATION BULLETIN / PUBLIC - BUILDING CODE

REFERENCE NO.: LABC Sec.11B-305,604,605 **Effective:** 01/01/2020
DOCUMENT NO.: P/BC 2020-087 **Revised:**
Previously Issued As: P/BC 2017-087

ACCESSIBILITY DETAILS FOR RESTROOMS AND DRINKING FOUNTAINS



SINGLE-ACCOMMODATION TOILET FACILITY



ACCESSIBLE WATER CLOSET COMPARTMENT WITHIN A MULTIPLE-ACCOMMODATION TOILET FACILITY

Doors shall not swing into the clear floor space or clearance required for any fixture. Other than the door to the accessible water closet compartment, a door in any position, may encroach into the turning space by 12 inches maximum. (11B-603.2.3)
Exceptions: (2) Where the toilet room or bathing room is for individual use and a clear floor space complying with Section 11B-305.3 is provided within the room beyond the arc of the door swing, doors shall be permitted to swing into the clear floor space or clearance required for any fixture.

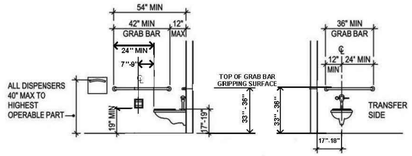


FIGURE *11B*-604.7
DISPENSER OUTLET LOCATION

FIGURE *11B*-604.5.2
REAR WALL GRAB BAR AT WATER CLOSETS

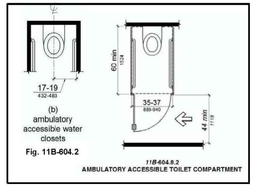
FIGURE *11B*-604.5.1
SIDE WALL GRAB BAR AT WATER CLOSETS

THESE DIAGRAMS ILLUSTRATE THE SPECIFIC REQUIREMENTS OF THESE REGULATIONS AND ARE INTENDED ONLY AS AN AID FOR BUILDING DESIGN AND CONSTRUCTION.

As a covered entity under Title II of the Americans with Disabilities Act, the City of Los Angeles does not discriminate on the basis of disability and, upon request, will provide reasonable accommodation to ensure equal access to its programs, services and activities.

P/BC 2020-087

THESE DIAGRAMS ILLUSTRATE THE SPECIFIC REQUIREMENTS OF THESE REGULATIONS AND ARE INTENDED ONLY AS AN AID FOR BUILDING DESIGN AND CONSTRUCTION.



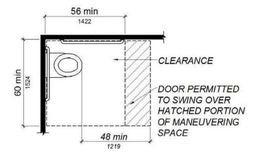


FIGURE 11B-604.3.1 - SIZE OF CLEARANCE AT WATER CLOSETS

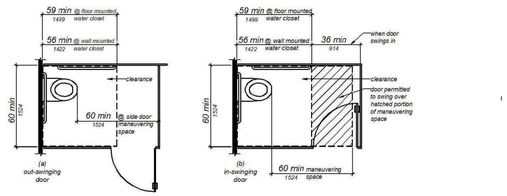


FIGURE 11B-604.8.1.1.2 - MANEUVERING SPACE WITH SIDE-OPENING DOOR

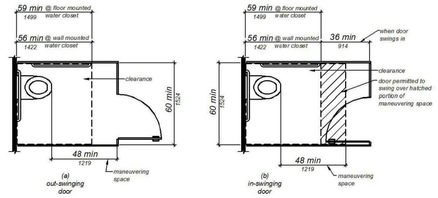


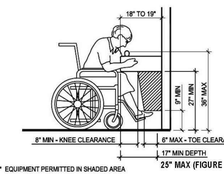
FIGURE 11B-604.8.1.1.3 - MANEUVERING SPACE WITH END-OPENING DOOR

As a covered entity under Title II of the Americans with Disabilities Act, the City of Los Angeles does not discriminate on the basis of disability and, upon request, will provide reasonable accommodation to ensure equal access to its programs, services and activities.

P/BC 2020-087

THESE DIAGRAMS ILLUSTRATE THE SPECIFIC REQUIREMENTS OF THESE REGULATIONS AND ARE INTENDED ONLY AS AN AID FOR BUILDING DESIGN AND CONSTRUCTION.

DRINKING FOUNTAINS



* EQUIPMENT PERMITTED IN SHADED AREA

SPOUT HEIGHT AND KNEE CLEARANCE AT
DRINKING FOUNTAINS

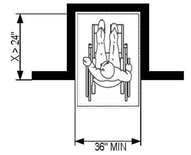
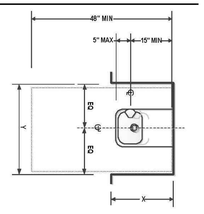


FIGURE 11B-305.7.1
MANEUVERING CLEARANCE IN AN
ALCOVE, FORWARD APPROACH

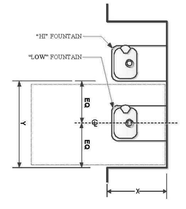
11B-602.6 WATER FLOW.
THE SPOUT SHALL PROVIDE A FLOW OF WATER 4 INCHES HIGH MINIMUM AND SHALL BE LOCATED 5 INCHES MAXIMUM FROM THE FRONT OF THE UNIT. THE ANGLE OF THE WATER STREAM SHALL BE MEASURED HORIZONTALLY RELATIVE TO THE FRONT FACE OF THE UNIT. WHERE SPOUTS ARE LOCATED LESS THAN 3 INCHES OF THE FRONT OF THE UNIT, THE ANGLE OF THE WATER STREAM SHALL BE 30 DEGREES MAXIMUM. WHERE SPOUTS ARE LOCATED BETWEEN 3 INCHES AND 5 INCHES MAXIMUM FROM THE FRONT OF THE UNIT, THE ANGLE OF THE WATER STREAM SHALL BE 15 DEGREES MAXIMUM.

11B-602.7 DRINKING FOUNTAINS FOR STANDING PERSONS.
SPOUT OUTLETS OF DRINKING FOUNTAINS FOR STANDING PERSONS SHALL BE 38 INCHES MINIMUM AND 43 INCHES MAXIMUM ABOVE THE FINISH FLOOR OR GROUND.

11B-602.9 PEDESTRIAN PROTECTION.
ALL DRINKING FOUNTAINS SHALL EITHER BE LOCATED COMPLETELY WITHIN ALCOVES, POSITIONED COMPLETELY BETWEEN WING WALLS, OR OTHERWISE POSITIONED SO AS NOT TO ENCROACH INTO PEDESTRIAN WAYS. THE PROTECTED AREA WITHIN WHICH A DRINKING FOUNTAIN IS LOCATED SHALL BE 32 INCHES WIDE MINIMUM AND 18 INCHES DEEP MINIMUM, AND SHALL COMPLY WITH SECTION 11B-305.7. WHEN USED, WING WALLS OR BARRIERS SHALL PROJECT HORIZONTALLY AT LEAST AS FAR AS THE DRINKING FOUNTAIN AND TO WITHIN 6 INCHES VERTICALLY FROM THE FLOOR OR GROUND SURFACE.



DRINKING FOUNTAIN SPOUT LOCATION
FIGURE 11B-602.5



PLAN OF "HI-LOW" DRINKING FOUNTAIN

NOTE:
IF X = 18" MIN. ALCOVE DEPTH, THEN Y = 32" MIN.
IF ALCOVE DEPTH (X) IS GREATER THAN 24", THEN ALCOVE WIDTH (Y) MUST BE MINIMUM OF 36" CLEAR.

CLEAR FLOOR SPACE
AT "HI-LOW" DRINKING FOUNTAIN ALCOVES

As a covered entity under Title II of the Americans with Disabilities Act, the City of Los Angeles does not discriminate on the basis of disability and, upon request, will provide reasonable accommodation to ensure equal access to its programs, services and activities.

PLAN CHECK CORRECTION NOTES REQUIRED BY THE CITY OF LOS ANGELES

GENERAL NOTES- PART III
A.3 GENERAL REQUIREMENTS
A. THE CONSTRUCTION SHALL NOT RESTRICT A FIVE-FOOT CLEAR AND UNOBSTRUCTED ACCESS TO ANY WATER OR POWER DISTRIBUTION FACILITIES (POWER POLES, PULL BOXES, TRANSFORMERS, VAULTS, PUMPS, VALVES, METERS, APPURTENANCES, ETC) OR TO THE LOCATION OF THE HOOK-UP. THE CONSTRUCTION SHALL NOT BE WITHIN TEN FEET OF ANY POWER LINES-WHETHER OR NOT THE LINES ARE LOCATED ON THE PROPERTY. FAILURE TO COMPLY MAY CAUSE CONSTRUCTION DELAYS AND/OR ADDITIONAL EXPENSES.

B. OMIT (NO GAS IN THIS FACILITY).

C. PROVIDE ULTRA-LOW FLUSH WATER CLOSETS FOR ALL NEW CONSTRUCTION. EXISTING SHOWER HEADS AND TOILETS MUST BE ADAPTED FOR LOW WATER CONSUMPTION.

D. A COPY OF THE EVALUATION REPORT AND/OR CONDITIONS OF LISTING SHALL BE MADE AVAILABLE AT THE JOB SITE.

H. 56-58 MEANS OF EGRESS GENERAL REQUIREMENTS
56.A. EXIT SIGNS SHALL BE INTERNALLY OR EXTERNALLY ILLUMINATED.

B. EXIT SIGNS ILLUMINATED BY AN EXTERNAL SOURCE SHALL HAVE AN INTENSITY OF NOT LESS THAN 5 FOOT CANDLES (54 LUX).

C. INTERNALLY ILLUMINATED SIGNS SHALL BE LISTED AND LABELED AND SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS AND SECTION 2702.

D. EXIT SIGNS SHALL BE ILLUMINATED AT ALL TIMES.

E. EXIT SIGNS SHALL BE CONNECTED TO AN EMERGENCY POWER SYSTEM THAT WILL PROVIDE AN ILLUMINATION OF NOT LESS THAN 90 MINUTES IN CASE OF PRIMARY POWER LOSS.

F. EGRESS DOORS SHALL BE READILY OPENABLE FROM THE EGRESS SIDE WITHOUT THE USE OF A KEY OR SPECIAL KNOWLEDGE OR EFFORT. SEE 1010.1.9.3 FOR EXCEPTIONS.

G. DOOR HANDLES, LOCK AND OTHER OPERATING DEVICES SHALL BE INSTALLED AT A MIN. 34" AND A MAX. 48" ABOVE THE FINISHED FLOOR

H. THIS DOOR TO REMAIN UNLOCKED WHEN BUILDING IS OCCUPIED.

I. ALL EGRESS DOOR OPERATION SHALL ALSO COMPLY WITH SECTION 1010.1.9 & 1010.1.9.12

J. THE MEANS OF EGRESS, INCLUDING THE EXIT DISCHARGE, SHALL BE ILLUMINATED AT ALL TIMES THE BUILDING SPACE SERVED BY THE MEANS OF EGRESS IS OCCUPIED.

K. THE MEANS OF EGRESS ILLUMINATION LEVEL SHALL NOT BE LESS THAN 1 FOOT-CANDLE AT THE WALKING SURFACE.

L. THE POWER SUPPLY FOR MEANS OF EGRESS ILLUMINATION SHALL NORMALLY BE PROVIDED BY THE PREMISES ELECTRICAL SUPPLY. IN THE EVENT OF POWER SUPPLY FAILURE, AN EMERGENCY ELECTRICAL SYSTEM SHALL AUTOMATICALLY ILLUMINATE THE FOLLOWING AREAS:

I. AISLES AND UNENCLOSED EGRESS STAIRWAYS IN ROOMS AND SPACES THAT REQUIRE TWO OR MORE MEANS OF EGRESS..
II. CORRIDORS, EXIT ENCLOSURES AND EXIT PASSAGEWAYS IN BUILDINGS REQUIRED TO HAVE TWO OR MORE EXITS.
III. EXTERIOR EGRESS COMPONENTS AT OTHER THAN THE LEVEL OF EXIT DISCHARGE IS ACCOMPLISHED FOR BUILDINGS REQUIRED TO HAVE TWO OR MORE EXITS.
IV. INTERIOR EXIT DISCHARGE ELEMENTS, AS PERMITTED IN SECTION 1028.1, IN BUILDINGS REQUIRED TO HAVE TWO OR MORE EXITS.
V. EXTERIOR LANDINGS, AS REQUIRED BY SECTION 1010.1.6, FOR EXIT DISCHARGE DOORWAYS IN BUILDINGS REQUIRED TO HAVE TWO OR MORE EXITS.

57. THE EMERGENCY POWER SYSTEM SHALL PROVIDE POWER FOR A DURATION OF NOT LESS THAN 90 MINUTES AND SHALL CONSIST OF STORAGE BATTERIES, UNIT EQUIPMENT OR AN ON-SITE GENERATOR. THE INSTALLATION OF THE EMERGENCY POWER SYSTEM SHALL BE IN ACCORDANCE WITH SECTION 2702.

58. EMERGENCY LIGHTING FACILITIES SHALL BE ARRANGED TO PROVIDE INITIAL ILLUMINATION THAT IS AT LEAST AN AVERAGE OF 1 FOOT-CANDLE (11 LUX) AND A MINIMUM AT ANY POINT OF 0.1 FOOT- CANDLE (1 LUX) MEASURED ALONG THE PATH OF EGRESS AT FLOOR LEVEL. ILLUMINATION LEVELS SHALL BE PERMITTED TO DECLINE TO 0.6 FOOT-CANDLE (6 LUX) AVERAGE AND A MINIMUM AT ANY POINT OF 0.06 FOOT-CANDLE (0. 6 LUX) AT THE END OF THE EMERGENCY LIGHTING TIME DURATION. A MAXIMUM-TO-MINIMUM ILLUMINATION UNIFORMITY RATIO OF 40 TO 1 SHALL NOT BE EXCEEDED.

J. BUILDING ENVELOPE
6. PROVIDE ANTI-GRAFFITI FINISH AT THE FIRST 9 FEET, MEASURED FROM GRADE, AT EXTERIOR WALLS AND DOORS

10.EACH PANE OF SAFETY GLAZING INSTALLED IN HAZARDOUS LOCATIONS SHALL BE IDENTIFIED BY MANUFACTURERS DESIGNATION SPECIFYING WHO APPLIED THE DESIGNATION, THE MANUFACTURER OR INSTALLER AND THE SAFETY GLAZING STANDARD. THE FOLLOWING SHALL BE CONSIDERED SPECIFIC HAZARDOUS LOCATIONS FOR THE PURPOSE OF SAFETY GLAZING. GLAZING IN:
A. SWING DOORS.
B. FIXED AND SLIDING PANELS OF SLIDING DOOR ASSEMBLIES AND PANELS IN SLIDING AND BI-FOLD CLOSET DOOR ASSEMBLIES.
C. STORM DOORS.
D. UNFRAMED SWINGING DOORS.
E. DOORS AND ENCLOSURES FOR HOT TUBES, WHIRLPOOLS, SAUNAS, STEAM ROOMS, BATHTUBS AND SHOWERS.
F. FIXED OR OPERABLE PANELS ADJACENT TO A DOOR WHERE THE NEAREST EXPOSED EDGE OF THE GLAZING IS WITHIN 24 INCHES ARC OF EITHER VERTICAL EDGE OF THE DOOR IN A CLOSED POSITION AND WHERE THE BOTTOM EXPOSED EDGE OF THE GLAZING IS LESS THAN 60 INCHES ABOVE THE WALKING SURFACE. READ CODE FOR EXCEPTIONS.
G. FIXED OR OPERABLE PANEL, OTHER THAN DESCRIBED IN ITEMS E AND F, WHICH MEETS ALL OF THE FOLLOWING CONDITIONS (READ CODE FOR EXCEPTION WITH SPECIAL INSTALLATION).
I. EXPOSED AREA OF AN INDIVIDUAL PANE GREATER THAN 9 SQUARE FEET.
II. EXPOSED BOTTOM EDGE LESS THAN 18 INCHES ABOVE THE FLOOR.
III. EXPOSED TOP EDGE GREATER THAN 36 INCHES ABOVE THE FLOOR.
IV. ONE OR MORE WALKING SURFACES WITHIN 36 INCHES HORIZONTALLY OF THE PLANE OF THE GLAZING.

H. GUARDS AND RAILINGS REGARDLESS OF AREA OR HEIGHT ABOVE A WALKING SURFACE. INCLUDED ARE STRUCTURAL BALUSTER PANELS AND NONSTRUCTURAL IN-FILL PANELS.
I. WALLS AND FENCES ENCLOSING INDOOR AND OUTDOOR SWIMMING POOLS AND SPAS WHERE ALL OF THE FOLLOWING CONDITIONS ARE PRESENT:
I. THE BOTTOM EDGE OF THE GLAZING IS LESS THAN 60 INCHES ABOVE A WALKING SURFACE ON THE POOL OR SPA SIDE OF THE GLAZING.
II. THE GLAZING IS WITHIN 60 INCHES OF A SWIMMING POOL OR SPA WATERS EDGE.

J. ADJACENT TO STAIRWAYS, LANDINGS AND RAMPS WITHIN 36 INCHES HORIZONTALLY OF A WALKING SURFACE::WHEN THE EXPOSED SURFACE OF THE GLASS IS LESS THAN 60 INCHES ABOVE THE PLANE OF THE ADJACENT WALKING SURFACE (READ CODE FOR EXCEPTION WITH SPECIAL INSTALLATION).
K. ADJACENT TO STAIRWAYS WITHIN 60 INCHES HORIZONTALLY OF THE BOTTOM TREAD OF A STAIRWAY IN ANY DIRECTION WHEN THE EXPOSED SURFACE OF THE GLASS IS LESS THAN 60 INCHES ABOVE THE NOSE OF TREAD (READ CODE FOR EXCEPTION WITH SPECIAL INSTALLATION).

GENERAL NOTES REQUIRED BY LAFD

- MEANS OF EGRESS SERVING A ROOM OR SPACE SHALL BE ILLUMINATED AT ALL TIMES THAT THE ROOM OR SPACE IS OCCUPIED. THE ILLUMINATION LEVEL SHALL NOT BE □ 1 FOOTCANDLE AT THE WORKING SURFACE.

- IN THE EVENT OF POWER SUPPLY FAILURE, AN EMERGENCY ELECTRICAL SYSTEM SHALL AUTOMATICALLY ILLUMINATE ALL OF THE FOLLOWING AREAS FOR A DURATION OF NOT □ 90 MIN. EMERGENCY LIGHTING FACILITIES SHALL BE ARRANGED TO PROVIDE INITIAL ILLUMINATION THAT IS NOT LESS THAN AN AVERAGE OF 1 FOOTCANDLE AND A MIN AT ANY POINT OF.1 FOOTCANDLE:
I. AISLES.
II. CORRIDORS.
III. EXIT ACCESS STAIRWAYS AND RAMPS.
IV. INTERIOR AND EXTERIOR EXIT STAIRWAYS AND RAMPS.
V. PASSAGEWAYS.
VI. VESTIBULES AND AREAS ON THE LEVEL OF DISCHARGE USED FOR EXIT DISCHARGE.
VII. ELECTRICAL EQUIPMENT ROOMS
VIII. FIRE COMMAND CENTERS.
IX. FIRE PUMP ROOMS.
X. GENERATOR ROOMS.
XI. PUBLIC RESTROOMS □ 300 SF.

- EXIT SIGNS SHALL BE INTERNALLY OR EXTERNALLY ILLUMINATED.

- TACTILE EXIT SIGNS SHALL BE REQUIRED AT THE FOLLOWING LOCATIONS:
A. "EXIT" SIGN AT EACH GRADE -LEVEL EXTERIOR DOOR
B. EACH EXIT DOOR THAT LEADS DIRECTLY TO A GRADE-LEVEL EXTERIOR EXIT BY MEANS OF A STAIRWAY OR RAMP SHALL BE IDENTIFIED BY A TACTILE EXIT SIGN WITH THE FOLLOWING WORDS AS APPROPRIATE:
I. "EXIT STAIR DOWN"
II. "EXIT RAMP DOWN"
III. "EXIT STAIR UP"
IV. "EXIT RAMP UP"
C. "EXIT ROUTE" AT EACH EXIT DOOR THAT LEADS DIRECTLY TO A GRADE-LEVEL EXTERIOR EXIT BY MEANS OF AN EXIT ENCLOSURE OR AN EXIT PASSAGEWAY.
D. "EXIT ROUTE" AT EACH EXIT ACCESS DOOR FROM AN INTERIOR ROOM OR AREA TO A CORRIDOR OR HALLWAY.
E. "TO EXIT" AT EACH DOOR THROUGH A HORIZONTAL EXIT.

- EXIT SIGNS SHALL BE ILLUMINATED AT ALL TIMES.

- THE FACE OF AN EXIT SIGN ILLUMINATED FROM AN EXTERNAL SOURCE SHALL HAVE AN INTENSITY OF ≥ 5 FOOTCANDLES

- IN CASE OF PRIMARY POWER LOSS, THE SIGN ILLUMINATION MEANS SHALL BE CONNECTED TO AN EMERGENCY POWER SYSTEM FOR A DURATION OF NOT □ 90 MINUTES.

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

LICENSED ARCHITECT
LAWRENCE SCARPA
C 21812
REN 10/31/2023
STATE OF CALIFORNIA

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED •

DEPARTMENT OF PUBLIC WORKS
BUREAU OF ENGINEERING
VERTICAL CONTROL:
HORIZONTAL CONTROL:
SHEET TITLE: PLAN CHECK NOTES
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

NO.	REVISIONS:	DATE:	BY:

CIP NO.

INDEX NO.

CITY OF LOS ANGELES
GARY LEE MOORE, P.E. ENV SP
CITY ENGINEER
DATE:
DESIGN GROUP
ENGINEER:
DESIGNED BY:
DRAWN BY:
CHECKED BY:
APPROVED BY:

WORK ORDER NO.
E170121B

SHEET NAME
A0.28
SHEET X OF X SHEETS

REVISION DATES (DESIGN STAGE ONLY)

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

Sheet Version 4.0

Z:\B□S ARCHITECTURE\019 JOBS\01935.0 CITY OF LA-RESEDA ICE HOCKEY ROLLER RINK\01935.0 1.CURRENT DRAWINGS_24X36\01935.0_A028_24X36.DWG 12/3/2021 9:08 AM

ICE SKATING FACILITY BUILDING AND SAFETY INFORMATION

CONSTRUCTION GROSS AREA (INCLUDES BUILDING AREA WITHIN THE EXTERIOR WALLS):
- 23,902 SF MEMBRANE STRUCTURE: TYPE II-B (SEE NOTES BELOW)
- 3,670 SF CMU STRUCTURE : TYPE II-B

OCCUPANCY CLASSIFICATION FOR SKATING RINK PER CBC 303.5 = A-4.
BUILDING HAS MINOR "B" AND "S" OCCUPANCIES

NFPA 13 SPRINKLERED BUILDING W/ VOICE EVACUATION FIRE ALARM SYSTEM

BUILDING CODE LIMITS PER CBC TABLES 504.3, 504.4 & 506.2 (FOR ONE STORY BUILDING, SPRINKLERED)				
OCC.	TYPE	ALLOWABLE STORIES ABOVE GRADE PLANE (NS)	ALLOWABLE HEIGHT ABOVE GRADE PLANE (NS)	ALLOWABLE AREA (SM)
A-4	II-B	2 STORIES	55 FT	38,000 SF
B	II-B	3 STORIES	55 FT	92,000 SF
S-2	II-B	2 STORIES	55 FT	70,000 SF

BUILDING HEIGHT: PER CBC 202, "GRADE PLANE" IS "A REFERENCE PLANE REPRESENTING THE AVERAGE OF FINISHED GROUND LEVEL ADJOINING THE BUILDING AT EXTERIOR WALLS. WHERE THE FINISHED GROUND LEVEL SLOPES AWAY FROM THE EXTERIOR WALLS, THE REFERENCE PLANE SHALL BE ESTABLISHED BY THE LOWEST POINTS WITHIN THE AREA BETWEEN THE BUILDING AND THE LOT LINE, OR, WHERE THE LOT LINE IS MORE THAN 6 FEET FROM THE BUILDING, BETWEEN THE BUILDING AND A POINT 6 FEET FROM THE BUILDING".

AVERAGE FINISHED GRADE (SEE PLOT PLAN 01/A0.30 FOR CALCULATION): 739.27'
BUILDING HEIGHT PROVIDED = MAX. 42'-6" @ SPRUNG RIDGE (781.77')

FLOOR AREA: PER CBC SECT. 508.4: IN EACH STORY THE BUILDING AREA SHALL BE SUCH THAT THE SUM OF THE RATIOS OF THE ACTUAL BUILDING AREA OF EACH SEPARATED OCCUPANCY DIVIDED BY THE ALLOWABLE BUILDING AREA OF EACH SEPARATED OCCUPANCY SHALL NOT EXCEED 1.

RATIO OF MIXED OCCUPANCIES FOR II-B:
7

(A-4) **24,922**/ 38,000 SF	=	0.656
(B) 650/ 92,000 SF	=	0.01
(S-2) **2,000**/ 70,000 SF	=	0.0285
		0.6945 < 1.0

NOTES:

THE MEMBRANE STRUCTURE PORTION OF THE BUILDING SHALL BE A DEFERRED SUBMITTAL PER THE FOLLOWING BASIS OF DESIGN/ PERFORMANCE CRITERIA (ALSO SEE MODIFICATION SHEET A0.36):

- THE MEMBRANE STRUCTURE SHALL BE A TENSIONED MEMBRANE COVERED FRAME STRUCTURE TO MEET THE DEFINITION IN THE INTERNATIONAL BUILDING CODE (IBC) 2015 AND 2018 IN CHAPTER 2 "DEFINITIONS" AS A "NON-PRESSURIZED BUILDING WHEREIN THE STRUCTURE IS COMPOSED OF A RIGID FRAMEWORK TO SUPPORT A TENSIONED MEMBRANE WHICH PROVIDES THE WEATHER BARRIER."
- CHAPTER 31 SECTION 3102 MEMBRANE STRUCTURES WILL GOVERN SINCE THE STRUCTURE IS TO BE ERECTED FOR A PERIOD OF 180 DAYS OR LONGER. THE MEMBRANE STRUCTURE SHALL COMPLY TO ALL PROVISIONS OF 2019 CBC SECTIONS 3102.1 THROUGH 3102.8.
- PER CBC 2019 SECTION 3102.3: NON-COMBUSTIBLE FRAME OR CABLE-SUPPORTED STRUCTURES COVERED BY AN APPROVED MEMBRANE IN ACCORDANCE WITH SECTION 3102.3.1 SHALL BE CLASSIFIED AS TYPE II B CONSTRUCTION.
- THE ARCHITECTURAL MEMBRANE WHICH WILL BE UTILIZED NEEDS TO HAVE PASSED FIRE TEST PROTOCOLS TO MEET THE INTENT OF THE FIRE PROPAGATION REQUIREMENTS AS OUTLINED IN THE BUILDING CODE.
- THE FRAME SHALL NOT BURN AND WILL BE NON-COMBUSTIBLE.
- THE MEMBRANE SHALL MEET THE REQUIREMENTS OF SECTION 803.1 WITH A CLASS A RATING. THE MEMBRANE SHALL HAVE A FLAME SPREAD OF 25 OR LESS AND A SMOKED DEVELOPED INDEX OF 450 OR LESS AS PER THE TESTING REQUIREMENTS OF ASTM-E-84.
- THE ARCHITECTURAL MEMBRANE IS CONSIDERED NON-RATED. THE OVERALL FRAME IS CONSIDERED NON-COMBUSTIBLE. AS SUCH, THE STRUCTURE CAN BE CONSIDERED TO MEET THE REQUIREMENTS OF A TYPE II B CONSTRUCTION.
- THE MEMBRANE PORTION OF THE STRUCTURE WILL BE DESIGNED AS PER THE ASCE STANDARD 55 "TENSILE MEMBRANE STRUCTURES". "THIS STANDARD PROVIDES MINIMUM CRITERIA FOR THE ANALYSIS, DESIGN AND PERFORMANCE OF MEMBRANE-COVERED CABLE AND RIGID MEMBER STRUCTURES, COLLECTIVELY KNOWN AS TENSILE MEMBRANE STRUCTURES, INCLUDING PERMANENT AND TEMPORARY STRUCTURES… THE REQUIREMENTS OF THIS STANDARD SHALL APPLY WHETHER THE TENSILE MEMBRANE STRUCTURE IS INDEPENDENT OF OR ATTACHED TO ANOTHER STRUCTURE."
- MEMBRANE STRUCTURES ARE CONSIDERED SINGLE STORY BUILDINGS AND SHALL NOT BE LIMITED IN HEIGHT. ASCE-55 2.5.3 HEIGHT LIMITATIONS "TENSILE MEMBRANE STRUCTURES SHALL NOT BE LIMITED IN HEIGHT EXCEPT AS REQUIRED BY APPLICABLE LOCAL ZONING REGULATIONS"

ZONING- PLANNING INFORMATION

LEGAL DESCRIPTION: ASSESSOR PARCEL NUMBER (APN) 2125036902, 2125036903
TRACT: TR 21799

PROJECT SITE ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335
PARCEL AREA: NORTH LOT= 16,848.1 SF
SOUTH LOT= 34,484.3 SF (27,850 SF ORIGINAL LOT□6,634.3 SF OF THE ADDITIONAL TO-BE-ACQUIRED LAND)
TOTAL= 51,332.4 SF

BUILDING FOOTPRINT (INCLUDES ALL BUILDING AND COVERED AREAS)= 28,445 SF (ONLY ON SOUTH LOT)

THE TWO LOTS ARE DESIGNATED AS "Q"-C2-1L-CDO AND "Q"-P-1L-CDO. HOWEVER THEY HAVE BEEN ACQUIRED BY THE DEPARTMENT OF RECREATION AND PARKS, CITY OF LOS ANGELES AND WILL BE RE-ZONED AND RE-DESIGNATED TO OPEN SPACE (SEE A0.31). **UNDER CURRENT ZONING [Q] P-1L-CDO, MAX. HEIGHT IS UNLIMITED.**

1. SEE A0.31, A0.32 FOR CEQA NOE.
2. COMMUNITY PLANNING AREA: RESEDA- WEST VAN NUYS.
3. AREA PLANNING COMMISSION: SOUTH VALLEY
4. NEIGHBORHOOD COUNCIL: RESEDA
5. ZONING INFO: ZI-2339
6. COMMUNITY DESIGN OVERLAY DISTRICT: RESEDA CENTRAL BUSINESS DISTRICT
7. CRA- COMMUNITY REDEVELOPMENT AGENCY: NO
8. FIRE DISTRICT 2

PARKING: PROJECT IS EXEMPT FROM PARKING REQUIREMENTS (SEE A0.31)
PARKING PROVIDED: 1 VAN ACCESSIBLE SPACE
1 VAN EVCS SPACE
7 SHORT TERM BIKE PARKING

DEFERRED SUBMITTALS

(CONTRACTOR IS RESPONSIBLE FOR DESIGN, ENGINEERING, PLAN CHECK & PERMIT.)

THE FOLLOWING ITEMS SHALL BE DEFERRED SUBMITTALS:
- MEMBRANE STRUCTURE (MEMBRANE SYSTEM AND ATTACHMENTS). DESIGN INTENT & PERFORMANCE CRITERIA OUTLINED THROUGHOUT THESE DOCUMENTS. IF ALTERNATIVE SYSTEM THAN THE ONE SPECIFIED IN ARCHITECTURAL/ STRUCTURAL DRAWINGS IS USED FOR PAVILION, A SUPPLEMENTAL PERMIT AND PLAN CHECK WILL BE REQUIRED. APPROVAL OF STRUCTURAL ENGINEER AND ARCHITECT OF RECORD IS REQUIRED. THE SYSTEM SHALL COMPLY WITH THE ACCEPTANCE CRITERIA (LARR OR ICC-ESR#) WITH ALL THE CONDITIONS OF APPROVAL.
- FIRE DETECTION & VOICE ALARM COMMUNICATION SYSTEM DESIGN
- FIRE SPRINKLER SYSTEM DESIGN (NFPA 13)
-STOREFRONT/ CURTAIN WALL ENGINEERING
-CHAIN LINK FENCE (DESIGN INTENT PER 01/ A8.32)

APPLICABLE CODES

I. 2019 LA AMENDMENT BUILDING CODE
II. 2019 LA AMENDMENT GREEN BUILDING CODE
III. 2019 LA AMENDMENT ELECTRICAL CODE
IV. 2019 LA AMENDMENT MECHANICAL CODE
V. 2019 LA AMENDMENT PLUMBING CODE
VII. 2019 LA AMENDMENT FIRE CODE
VIII. CITY'S GREEN BUILDING ORDINANCE
IX. TITLE 24 STANDARDS
X. STANDARD SPECS FOR PUBLIC WORKS CONSTRUCTION ("BROWN BOOK")
XI. LOW IMPACT DEVELOPMENT (LID)
XII. STANDARD URBAN STORMWATER MITIGATION PLAN (SUSMP)

ICE SKATING BUILDING FLOOR AREA SUMMARY

(BUILDING AREAS WITHIN EXTERIOR WALLS, INCLUDES INTERIOR WALLS)
TYPE II-B
A-4=24,922 SF
S-2=2,000 SF
B=650 SF
TOTAL= 27,572 SF

WALL & OPENING PROTECTION CALCULATION

REQUIRED WALL RATINGS PER TABLE 601 *	
	TYPE II-B
STRUCTURAL FRAME	0
EXTERIOR BEARING□	0
INTERIOR BEARING	0
EXTERIOR NON-BEARING	FOR OCCUPANCY A-3, B, S SEE TABLE 602 (FOR MORE INFO)
INTERIOR NON-BEARING	0
FLOOR CONSTRUCTION	0
ROOF CONSTRUCTION	0

□ NOT LESS THAN FIRE RATING BASED ON FIRE SEPARATION DISTANCE PER TABLE 602.

MAX. AREA OF EXTERIOR WALL OPENINGS PER TABLE 705.8 FIRE SEPARATION DISTANCE								
CLASS. OF OPENING	0 - □3 FT.	3 - □5 FT	5 - □10 FT	10 - □15 FT	15 - □20 FT	20 - □25 FT	25 - □30 FT	□30 FT
UNPROTECTED/ SPRINKLERED	NOT PERMITTED	15%	25%	45%	75	NO LIMIT	NO LIMIT	NOT REQUIRED
PROTECTED	NOT PERMITTED	15%	25%	45%	75	NO LIMIT	NO LIMIT	NOT REQUIRED

CULTURAL AFFAIRS APPROVAL (SEE SHEETS A0.02,A2.00, A8.30-A8.34)

CUTURAL AFFAIRS COMMISSION HAS APPROVED THE DESIGN PRESENTED ON 2021-03-10 BASED ON :
- THE ARTICULATION OF THE FENCE/ GATE ON SHERMAN WAY.
- THE ARTICULATION OF GATEWAY/ PORTAL AT THE ICE RINK BUILDING ENTRY.
- THE GRAPHICS ON THE MEMBRANE.
- THE LANDSCAPE AND PAINTED GRAPHICS ON THE ROLLER RINK AREA.
THESE ELEMENTS SHALL BE IMPLEMENTED IN ACCORDANCE TO THESE DRAWINGS.

ICE SKATING BUILDING AREAS/ PLUMBING FIXTURE CALCULATION

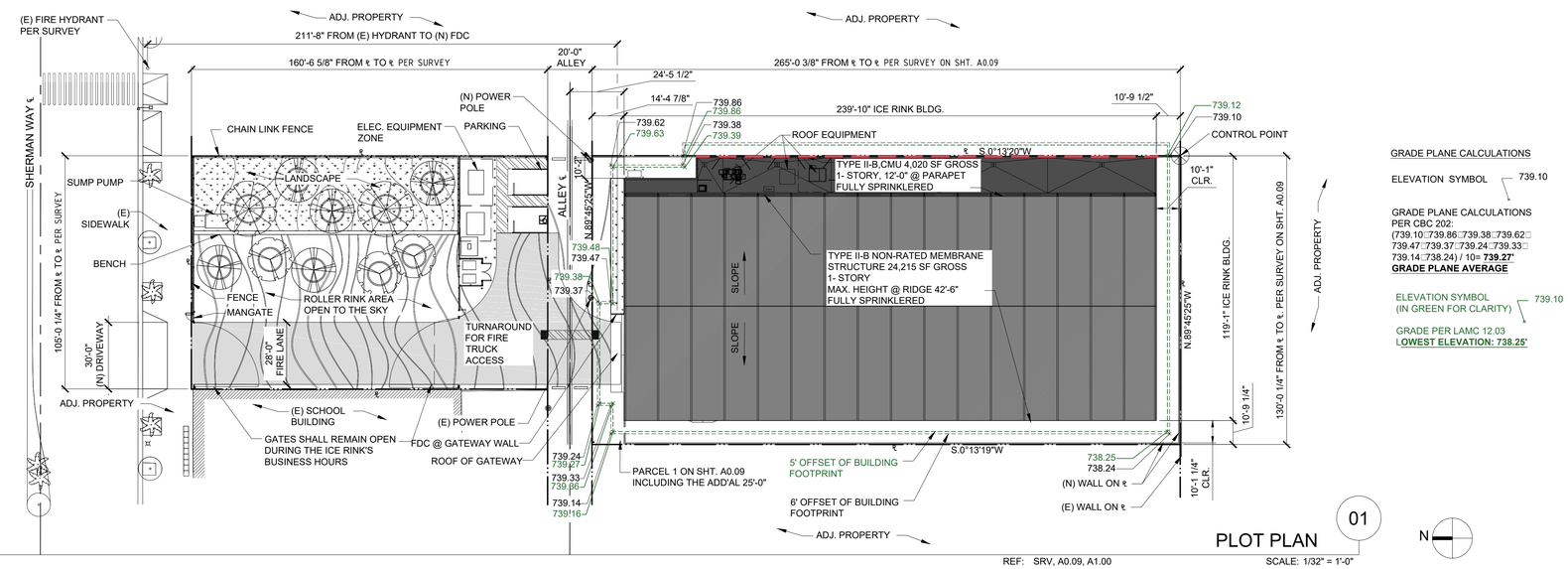
SPACE	AREA (S.F.)	OCCUPANCY	LOAD FACTOR (PER TABLE 1004.5 &1004.6)	OCC. LOAD	REQ'D EXITS	OCC. LOAD FOR PLUMBING FIXTURES PER TABLE A SECT. 422.1 LAPC (LOAD FACTORS: A.2=30, B=200, S=5,000)
NEW ONE-STORY BUILDING, TYPE II-B HYBRID (MEMBRANE & CMU) WITH NEW FIRE SPRINKLER SYSTEM						
ICE RESURFACER ROOM	580	S-2	300 GROSS	1.94	1	0.12
LOBBY	3,780	A-4	15 NET	252	2	126
OFFICE	400	B	150 GROSS	2.67	1	2
SKATE STORAGE	82	B	150 GROSS	0.55	1	0.41
BREAK ROOM	100	B	150 GROSS	0.67	1	0.5
RESTROOMS	420	ACCESSORY TO A-4	-	-	-	-
JANITOR	35	S-2	300 GROSS	0.22	1	0.013
VESTIBULE	120	A-4	15 NET	8	1	4
ICE ROOM	760	S-2	300 GROSS	2.53	1	0.15
ELEC. MECH. ROOM	427	S-2	300 GROSS	1.42	1	0.085
REF. ROOM	90	A-4	50 GROSS	1.8	1	3
REF. BATHROOM	60	ACCESSORY TO A-4	-	-	-	-
GIRL'S ROOM	55	A-4	50 GROSS	1	1	1.9
GIRL'S BATHROOM	60	ACCESSORY TO A-4	-	-	-	-
LOCKER ROOM 1	308	A-4	50 GROSS	6.16	1	10.27
LOCKER ROOM 2	308	A-4	50 GROSS	6.16	1	10.27
SHARED BATHROOM 1	207	ACCESSORY TO A-4	-	-	-	-
LOCKER ROOM 3	308	A-4	50 GROSS	6.16	1	10.27
LOCKER ROOM 4	308	A-4	50 GROSS	6.16	1	10.27
SHARED BATHROOM 2	207	ACCESSORY TO A-4	-	-	-	-
BLEACHERS	136'-8"	A-4	1'-6"	90	2	45
ICE RINK	17,013	A-4	50 GROSS	340.26	2	567
TOTAL				**729.6=730**		

NOTE: WHERE EGRESS WIDTHS CALCULATE LESS THAN 34", A MINIMUM SIZE DOOR OF 34" IS REQUIRED.

TOTAL PLUMBING FIXTURE CALCULATION PER LAPC TABLE 422.1 (USING OCC. LOAD FOR PLUMB. FIXTURES)											
	OCC. LOAD	WATER CLOSET			URINAL			LAVATORY			DRINKING FOUNTAIN
A-4 REQUIRED	TOTAL A-4: 788 OCC. 394 MALES, 394 FEMALES	MALE:3, FEMALE:8			MALE:3			MALE:2, FEMALE:5			3
A-4 PROVIDED											
B REQUIRED	TOTAL B: 4.31 OCC.□□ 2.16 MALES, 2.16 FEMALES	MALE:1, FEMALE:1□□		1 UNISEX	MALE:1□□		NONE	MALE:1, FEMALE:1□□		1 UNISEX	1
B PROVIDED											
S-2 REQUIRED	TOTAL S: 0.37 OCC.□□ 0.185 MALES, 0.185 FEMALES	MALE:1, FEMALE:1□□			NONE□□			MALE:1, FEMALE:1□□			1
S-2 PROVIDED											
TOTAL REQUIRED		**12****			**3****			**8****			**5**
TOTAL PROVIDED		**12**			**3**			**12**			**6 *****

□□PER LAPC 422.2 EXCEPTION (2) IN OCCUPANCIES WITH A TOTAL OF 10 OR LESS, INCLUDING CUSTOMERS AND EMPLOYEES, DESIGNED FOR USE BY NO MORE THAN ONE PERSON AT A TIME, SHALL BE PERMITTED FOR USE BY BOTH SEXES.
□□□4 WATER FOUNTAINS □2 BOTTLE REFILL STATIONS

PLOT PLAN



GRADE PLANE CALCULATIONS

ELEVATION SYMBOL 739.10

GRADE PLANE CALCULATIONS PER CBC 202:
(739.10□739.86□739.38□739.62□ 739.47□739.37□739.24□739.33□ 739.14□738.24) / 10= **739.27'**
GRADE PLANE AVERAGE

ELEVATION SYMBOL (IN GREEN FOR CLARITY) 739.10

GRADE PER LAMC 12.03
LOWEST ELEVATION: 738.25'

01 PLOT PLAN

N

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

LICENSED ARCHITECT LAWRENCE SCARPA C 21812 REN 10/31/2023 STATE OF CALIFORNIA

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED •

BUREAU OF ENGINEERING
VERTICAL CONTROL:
HORIZONTAL CONTROL:
SHEET TITLE: CODE ANALYSIS & PLOT PLAN
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

DEPARTMENT OF PUBLIC WORKS
NO. REVISIONS: DATE: BY:
CIP NO.
INDEX NO.

CITY OF LOS ANGELES
CITY ENGINEER: DATE:
GARY LEE MOORE, P.E., ENV SP
DESIGN GROUP
ENGINEER: DESIGNED BY: DRAWN BY: CHECKED BY: APPROVED BY:

WORK ORDER NO. E170121B

SHEET NAME A0.30
SHEET X OF X SHEETS

REVISION DATES (DESIGN STAGE ONLY)

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

Sheet Version 4.0

Z:\B□S ARCHITECTURE\019 JOBS\01935.0 CITY OF LA-RESEDA ICE HOCKEY ROLLER RINK\01935.0 1.CURRENT DRAWINGS_24X36\01935.0_A030_24X36.DWG 12/14/2021 11:00 AM

DEPARTMENT OF
CITY PLANNING

CITY PLANNING COMMISSION
SAMANTHA MILLMAN
PRESIDENT
VAHID KHORSAND
VICE-PRESIDENT
DAVID H.J. AMBROZ
CAROLINE CHOE
RENEE DAKE WILSON
KAREN MACK
MARC MITCHELL
VERONICA PADILLA-CAMPOS
DANA M. PERLMAN

ROCKY WILES
COMMISSION OFFICE MANAGER
(213) 978-1300

CITY OF LOS ANGELES
CALIFORNIA

ERIC GARCETTI
MAYOR

EXECUTIVE OFFICES
200 N. Spring Street, Room 525
Los Angeles, CA 90012-4801

VINCENT P. BERTONI, AICP
DIRECTOR
(213) 978-1271

KEVIN J. KELLER, AICP
EXECUTIVE OFFICER
(213) 978-1272

LISA M. WEBBER, AICP
DEPUTY DIRECTOR
(213) 978-1274

http://planning.lacity.org

Date: December 6, 2018

To: Michael Shull, General Manager, Department of Recreation and Parks
Frank M. Bush, General Manager, Department of Building and Safety
Ralph M. Terrazas, Fire Chief, Fire Department
Gary Lee Moore, City Engineer, Department of Public Works, Bureau of Engineering

From: Vincent P. Bertoni, AICP, Director of Planning

Subject: Department of Recreation and Parks Authority under City Charter

In response to recent discussions involving management and staff from Department of Recreation and Parks, Department of City Planning and the City Attorney's Office, all parties concur that the City of Los Angeles Charter establishes broad authorization for the Department of Recreation and Parks to pursue parks and recreational facilities located on property owned or controlled by the City for public recreation, including facilities leased to, or operated and/or managed by private operators and any accessory use or building, within the City of Los Angeles. This memorandum does not apply to privately owned and operated park projects. The following Charter Sections (only applicable language listed) provide the aforementioned authority:

Section 590. Powers and Duties of the Department.

The Department of Recreation and Parks shall have the power and duty:
(a) to establish, construct, maintain, operate and control, wherever located:
(1) all parks of the City of Los Angeles;
(2) all recreational facilities, museums, observatories, municipal auditoriums, sports centers and all lands, waters, facilities or equipment set aside or dedicated for recreational purposes and public enjoyment; and
(3) all property acquired by it or assigned to its jurisdiction for public recreation.
(b) to design, construct and operate, lease, rent or sell concessions or privileges to be exercised for the benefit, education, amusement, convenience or enjoyment of the public, in connection with any function, site or facility under the jurisdiction of the department;
(c) to establish schedules of charges for special services;
(d) to promote public recreation and cooperate with other public agencies and organizations for that purpose; and

(e) to establish, maintain and operate playgrounds or other recreational facilities upon portions of public streets, under terms and conditions provided by ordinance.

Section 591. Board of Recreation and Parks Commissioners.

The Board of Recreation and Park Commissioners shall have the power:
(a) to control all recreation and park sites;
(b) to control, appropriate and expend all money in the Recreation and Parks Fund and authorize the City Treasurer to invest any surplus funds under its control in accordance with Section 303(b); and
(c) to organize the work of the department into divisions and to appoint an administrative officer for each division or for any group of divisions.

Section 594. Control and Management of Recreation and Park Lands.

(a) Management and Control. The Department of Recreation and Parks shall operate, manage and control all property now or hereafter owned or controlled by the City for public recreation, including parks, and shall have power in the name of the City to acquire and take by purchase, lease, condemnation, gift, in trust or otherwise, any and all property necessary or convenient for recreation, including park purposes.
(b) Acquisition of Property. No real property shall be acquired by the City for recreation sites, including parks, unless first approved by the Board of Recreation and Park Commissioners.
(c) Restrictions on Transfer of Dedicated Parks. All lands heretofore or hereafter set apart or dedicated as a public park shall forever remain for the use of the public inviolate; but the board may authorize use of the lands for any park purpose, and for…….
(d) Transfer to Purposes other than Recreation and Park Purposes. No sites under the management and control of the department shall be devoted or transferred to any other purpose in whole or in part, except in compliance with……

As stated in Section 591 of the Los Angeles Charter, the Board of Recreation and Park Commissioners (Board) has the power to control all City-owned and operated parks and recreational facilities. In addition, all proposed park projects require approval by the Board, thus ensuring consistency with adopted City plans. The Board shall have the authority to determine appropriate locations for park projects, uses associated with park projects, accessory structures and buildings, and any off-street parking to satisfy park project needs. This authorization exempts Department of Recreation and Parks projects, including facilities leased to, or operated and/or managed by private operators and any accessory use or building, from the regulations of Chapter I of the Los Angeles Municipal Code and any General Provisions and Zoning chapters that may be adopted subsequent to this memorandum, including but not limited to the following:

A. Use for each zone (Parks and recreational facilities shall be permitted in all zones.)
B. Restriction for each zone (Parks and recreational facilities, including any accessory use or building, shall be permitted in all zones.)
C. Area for each zone (The area of each structure and/or building shall not be restricted in all zones.)
D. Specific Plans
E. Districts, including Overlays
F. Off-street parking
G. Height
H. Signs

Further, any Department of Recreation and Parks project, including facilities leased to, or operated and/or managed by private operators and any accessory use or building, shall not be subject to any Department of City Planning entitlements for development, including but not limited to the following:

A. Project Permit Compliance
B. Zone Change (Changes to zones will continue to be reflected during the community plan update process.)
C. Conditional Use Permit (The sale of alcoholic beverages for on or off-site consumption requires approval by the RAP Board. Department of Recreation and Parks will be responsible for coordinating directly with the California Department of Alcoholic Beverage Control regarding license authorizations.)
D. Variance
E. Adjustment
F. Site Plan Review
G. Previously approved entitlements having a Sunset Clause

All other City regulations for development projects, not administered or regulated by Chapter I of the Los Angeles Municipal Code, shall continue to be enforced by each respective City department, unless otherwise stated by said department. All Department of Recreation and Parks projects that require building permits for construction, including tenant improvements, shall be subject to all current building code regulations as enforced by the Department of Building and Safety.

In addition, this memorandum does not supersede any State of California or Federal regulations, including but not limited to, the California Coastal Act (California Government Code Sections 30000-30900), the Subdivision Map Act (California Government Code Sections 66410-66499.58), or the Americans With Disabilities Act.

Finally, the Department of City Planning and the Department of Recreation and Parks will jointly write a Memorandum of Understanding for the purpose of maintaining communication regarding all proposed park projects. Department of Recreation and Parks staff has agreed to convene with Department of City Planning staff on a quarterly basis, as needed, to solicit urban design feedback for all proposed park projects to ensure consistency with applicable design guidelines and adopted plans.

FORM GEN. 160 (Rev. 11-02)

CITY OF LOS ANGELES
INTERDEPARTMENTAL CORRESPONDENCE

Date: January 5th, 2021

To: Department of Building and Safety

From: Darryl Ford
Superintendent
Planning, Construction and Maintenance Branch
Department of Recreation and Parks

Subject: Reseda Skate Facility Development

Pursuant to the letter, dated December 6, 2018, issued by Department of City Planning, it is agreed that the City of Los Angeles Charter exempts the Department of Recreation and Parks (RAP) projects from the regulations of Chapter 1 of the Los Angeles Municipal Code (CH 1 LAMC). City of Los Angeles, Department of Public Works, Bureau of Engineering is tasked to manage the development of the following proposed project inside RAP's property.

Project name: Reseda Skate Facility Development
Project address: 18210 Sherman Way, Los Angeles, CA 91335
Scope of work: the project's scope of work mainly consists of constructing an approximately 25,300 square-feet ice rink building. In addition, there will be landscape and hardscape improvements.

Since the proposed project is located on RAP's property and it is leased to concessionaire for operation, it is exempt from the regulations of CH 1 LMAC. Please contact my staff, Sean Phan, at 213-202-2637 or sean.phan@lacity.org if you have any questions.

Cc: Fernando Torres Jr, RAP

Attachment:

Department of Recreation and Parks Authority under City Charter

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

LICENSED ARCHITECT
LAWRENCE SCARPA
C 21812
REN 10/31/2023
STATE OF CALIFORNIA

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED •

BUREAU OF ENGINEERING
VERTICAL CONTROL:
HORIZONTAL CONTROL:
SHEET TITLE: LETTER FROM PLANNING & RAP
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

DEPARTMENT OF PUBLIC WORKS
NO. | REVISIONS | DATE: | BY:
INDEX NO.
CIP NO.

CITY OF LOS ANGELES
GARY LEE MOORE, P.E., ENV SP
CITY ENGINEER
DESIGN GROUP
ENGINEER:
DESIGNED BY:
DRAWN BY:
CHECKED BY:
APPROVED BY:
DATE:

WORK ORDER NO.
E170121B

SHEET NAME
A0.31
SHEET X OF X SHEETS

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REVISION DATES
(DESIGN STAGE ONLY)

Sheet Version 4.0

Z:\B□S ARCHITECTURE\019 JOBS\01935.0 CITY OF LA-RESEDA ICE HOCKEY ROLLER RINK\01935.0 1.CURRENT DRAWINGS_24X36\01935.0_A031_24X36.DWG 12/3/2021 9:09 AM

COUNTY CLERK'S USE
ORIGINAL FILED
JAN 24 2018
LOS ANGELES, COUNTY CLERK

CITY OF LOS ANGELES
OFFICE OF THE CITY CLERK
ROOM 395, CITY HALL
LOS ANGELES, CALIFORNIA 90012
CALIFORNIA ENVIRONMENTAL QUALITY ACT

NOTICE OF EXEMPTION
(Articles II and III – City CEQA Guidelines)

CITY CLERK'S USE
DOCUMENT FILED
City Clerk's Office
NE-17-005-86
Filed by:
Certified by
Date: 1-24-18

Submission of this form is optional. The form shall be filed with the County Clerk, 12400 E. Imperial Highway, Norwalk, California, 90650, pursuant to Public Resources Code Section 21152(b). Pursuant to Public Resources Code Section 21167(d), the filing of this notice starts a 35-day statute of limitations on court challenges to the approval of the project.

LEAD CITY AGENCY AND ADDRESS: Environmental Management Group, Los Angeles City Engineer, 1149 S. Broadway, MS 939, Los Angeles, CA 90015

COUNCIL DISTRICT: 3

PROJECT TITLE: Reseda Skate Facility
W.O. E170121B

LOG REFERENCE

PROJECT LOCATION: T.G. 530 J5
18210 and18132 Sherman Way, Los Angeles, CA 91335

DESCRIPTION OF NATURE, PURPOSE, AND BENEFICIARIES OF PROJECT:
The project includes the acquisition of two parcels in order to preserve them for open space that will be used for recreation and park purposes. Also, the project will include the construction of a skate facility including an ice rink, a roller rink and project required parking in the community of Reseda. The project design includes both rinks at 18210 Sherman Way. The ice rink will be approximately 28,000 square feet that will include an approximately 85-foot x 200-foot ice surface, Zamboni machine room, locker rooms for two (2) teams, restrooms, office space, skate rental area, pro shop and concessions space; and other ancillary spaces required by ice hockey and figure skating. The roller rink will be an approximately 8,445 square foot one-story outdoor facility built on grade with a shade structure that will include an approximately 60-foot x 120-foot skating area with approximately ten (10) parking spaces, approximately 1,200 square feet of indoor air-conditioned space for offices, restrooms and storage. The two buildings will be separated by an existing alley. The parking area will be located at 18132 Sherman Way and will include approximately 127 spaces accessible by a long driveway. Fencing, landscaping and security lighting will also be included. The beneficiaries of the project include the local community and all users of the skate facility.

CONTACT PERSON: Maria Martin
TELEPHONE NUMBER: 213-485-5753

EXEMPT STATUS: (Check One)

	CITY CEQA GUIDELINES	STATE CEQA GUIDELINES
☐ MINISTERIAL	Art. II, Sec. 2.b	Sec. 15268
☐ DECLARED EMERGENCY	Art. II, Sec. 2.a(1)	Sec. 15269(a)
☐ EMERGENCY PROJECT	Art. II, Sec. 2.a(2)(3)	Sec. 15269(b)(c)
☐ GENERAL EXEMPTION	Art. II, Sec. 1	Sec. 15061(b)(3)
☒ CATEGORICAL EXEMPTION*	Art. III, Sec. 1 (y)	Sec. 15325
		Sec. 15332(f)
☐ STATUTORY*	Art. _____	Sec. _____

* See Public Resources Code Sec. 21080 and set forth state and city guidelines provisions.

JUSTIFICATION FOR PROJECT EXEMPTION: Class 25 consists of the transfers of ownership of interests in land to preserve open space or lands for park uses. Class 32 consists of in-fill development projects where the site was previously developed and is now vacant. The Project parcels will be acquired by the Department of Recreation and Parks and re-zoned to Open Space. The project includes a parking lot and a skate facility that is a total of approximately 32,650 square feet of infill construction on a vacant lot that was previously a commercial use along an existing urban business commercial corridor. None of the limitations set forth in State CEQA Guidelines 15300.2 apply (see attached narrative).

IF FILED BY APPLICANT, ATTACH CERTIFIED DOCUMENT OF EXEMPTION FINDING

SIGNATURE:	TITLE:	DATE:
ME Martin Maria Martin	Environmental Affairs Officer Environmental Management Group	1/23/18
FEE: $75.00_____ RECEIPT NO.	REC'D BY	DATE

DISTRIBUTION: (1) County Clerk (2) City Clerk (3) Agency Record

CATEGORICAL EXEMPTION NARRATIVE

I. PROJECT HISTORY

The City of Los Angeles (City) is proposing to acquire land and re-zone it to Open Space, then construct a skate facility including an ice rink, a roller rink and project required parking in the community of Reseda. This project is called the Reseda Skate Facility. The project site is in the Reseda-West Van Nuys Community Plan Area of Los Angeles within Council District 3 (CD3). The project is proposed to be constructed on two (2) vacant non-contiguous parcels that are each comprised of two (2) lots, void of any structures and separated by an alley located at 18132 Sherman Way (APN 2125036900 and 2125036901) and 18210 Sherman Way (APN 2125036902 and 2125036903). These parcels are currently owned by the Community Redevelopment Agency (CRA) and will be purchased by the City's Department of Recreation and Parks (RAP) to preserve the land for recreational and park uses.

The project sites are bounded by Sherman Way to the north, Lindley Avenue to the east, Etiwanda Avenue to the west and Gault Street to the south. This Project includes the acquisition of the aforementioned parcels in order to preserve them for recreational and park uses and is considered infill development. The Project is in a fully developed urban area of Los Angeles within the Reseda Central Business District Community Design Overlay area. The parcels and surrounding parcels are currently zoned and designated for Commercial uses and Parking, but will be re-zoned and re-designated to Open Space after the acquisition.

II. ENVIRONMENTAL REVIEW

Basis for Categorical Exemption

A Project qualifies for a Class 25 Categorical Exemption if it involves the transfers of ownership of interests in land in order to preserve open space or lands for park purposes. The Proposed Project includes the acquisition of the parcels by the RAP from the CRA. The parcels will be re-zoned and re-designated to Open Space for recreational and park purposes.

Additionally, a Project qualifies for a Class 32 Categorical Exemption if it is developed on an infill site and meets the conditions described in this section. The five (5) conditions which the Project must meet in order to qualify for the Class 32 Categorical Exemption are as follows:

(a) The Project is consistent with the applicable general plan designation and all applicable general plan policies as well as with the applicable zoning designation and regulations:

The proposed Project is located on two parcels (the site) that will be acquired by the City. The proposed Project is located at 18132 Sherman Way (APN 2125036900 and 2125036901) and 18210 Sherman Way (APN 2125036902 and 2125036903). The parcels will be acquired by the RAP from the CRA. The site is currently vacant. The site is zoned [Q]C2-1L-CDO and [Q]P-1L-CDO and both have a General Plan Land Use Designation of Community Residential.

The Establishment of a New Open Space Zone
Ordinance No. 166,168 created a new zoning classification entitled "Open Space" applicable to publically owned property, which could be placed in that zone by right. Per Ordinance No. 166,168, the purpose of the Open Space zone is to provide regulations for publicly owned land in order to implement the City's adopted General Plan, including the recreation, parks and open space designations in the City's adopted district and community plans, and other relevant elements,

including the Open Space, Conservation and Public Recreation Elements. According to the City Attorney Report Number R90-0377, governmental agencies have sovereign immunity from local zoning regulations that extends to land and facilities. The City Council's ability to regulate Open Space land use in relation to the City's Department of Recreation and Parks (RAP) include various provisions of the Los Angeles City Charter that grant RAP special authority to control the use of specific types of City land and facilities. When property is under control of RAP for recreation and parks purposes, RAP has the authority under the City Charter to determine whether a particular use is appropriate. The Council may not by ordinance vest such authority in itself or in the Planning Commission. Thus, RAP is not subject to the conditional use regulations of the Los Angeles Municipal Code. The new Open Space zone would be applicable to publically-owned land such as the Reseda Skate Facility. As such, the Project is conformance with the General Plan and Zoning designation.

The Reseda Central Business District (CBD) Community Design Overlay (CDO) District
Ordinance No. 176,557 was approved by the City Planning Commission effective on May 2, 2005, as part of the City of Los Angeles General Plan. It established the Reseda Central Business District (CBD) Community Design Overlay (CDO) District *Design Guidelines and Standards* (Reseda CDO) for Projects dealing with commercial properties within the Reseda CDO Boundary. The Reseda CDO is complemented by the Reseda CBD Streetscape Plan (Reseda Streetscape Plan), approved by the City Planning Commission on September 23, 2004, as part of the City of Los Angeles General Plan. The Reseda Streetscape Plan incorporates streetscape design guidelines and standards that provide direction in the design of Projects in the public right-of-way. These two plans help direct development towards a more cohesive design concept. The design of the Reseda Skate Facility will integrate the *Design Guidelines and Standards* of both the Reseda CDO and Reseda Streetscape Plan including but not limited to Site Planning, Landscaping, Architecture, Street Lighting, Bicycle Parking, and Signage. As such, the Project is conformance with the General Plan and Zoning designation.

Reseda CBD CDO Permanent [Q] Conditions
Ordinance No. 176,558, which became effective on June 28, 1992, changed zones within the Reseda CBD CDO Business District and imposed permanent [Q] conditions on the property. Specifically, per the Ordinance, commercial projects located on Sherman Way shall provide a street front entrance to remain open during business hours for pedestrian access. The front entrance will be provided directly onto the public right-of way. The height of the buildings shall be no more than 45 feet. The total signage for the Project shall be limited to 2 square feet for each 1 foot of building frontage (excluding window signage). The sign area will be calculated using only the frontage and shall be affixed to the wall from which the calculations were taken. The area of the wall sign will be limited to 2 square feet for each 1 foot of building frontage. Projecting Signs will be a maximum 16 square feet and shall not project more than 30 inches or half the width of the adjacent public sidewalk, whichever is less. Any awning signs will be limited to 1 square foot for each 1 foot of building frontage. Rear signage will be non-illuminated. The Project will comply with all of these design features and standards. As such, the Project is conformance with the General Plan and Zoning designation.

(b) The proposed development occurs within city limits on a Project site of no more than five acres substantially surrounded by urban uses:

The subject site is wholly within the City of Los Angeles, on a site that is approximately 2.2 acres. Lots adjacent to the subject site are developed with commercial uses to the east, west, and north. Surface parking lots and single-family residential uses are located to the south. The site is located within an existing commercial business corridor that has store frontages along Sherman Way with

surface parking lots to the rear and access via an alley. The site is less than five acres and is in an urbanized area.

As such, the proposed development occurs within city limits on a Project site of no more than five acres substantially surrounded by urban uses.

c) The Project site has no value as habitat for endangered, rare or threatened species:

The site is in a highly urbanized area and not a wildland area. There are no endangered, rare, or threatened species on the Project site. The Project will be subject to Regulatory Compliance Measures (RCMs), which require compliance with the City of Los Angeles Noise Ordinance; pollutant discharge, dewatering, stormwater mitigations; and Best Management Practices for stormwater runoff. These RCMs will reduce any potential impacts on noise and water to less than significant.

As such, the Project site has no value as habitat for endangered, rare or threatened species.

d) Approval of the Project would not result in any significant effects relating to traffic, noise, air quality, or water quality:

The total Project square footage is 36,335, which includes a 28,000 square-foot ice rink and an 8,445 square-foot one-story outdoor roller rink facility built on grade. The two buildings will be separated by an existing alley. The parking area will be located at 18132 Sherman Way and will include approximately 127 spaces accessible by a long driveway. Fencing, landscaping and security lighting will also be included. The Project site is currently paved and there will be no material excavation or export volume beyond the demolition debris since the site is currently flat and construction proposed will be at grade. The material import volume is anticipated to be approximately 14,472 cubic feet of concrete and building envelope materials.

Traffic - The Project abuts a residential neighborhood. A *Traffic Technical Study* for the Project dated December 1, 2017, finds that no impact is anticipated, however, the contractor shall apply the following BMPs:

BMP TRANS-2: Coordination with Emergency Service Providers

A. Coordinate with emergency service providers (police, fire, ambulance and paramedic services) to provide advance notice of any lane closures, construction hours and changes to local access and to identify alternative routes where appropriate.

There are no unusual circumstances known to this office. Therefore, this exception has no application here.

Noise - The Project is in close proximity to sensitive residential receptors. A *Noise Technical Study* for the Project dated December 1, 2017, finds that there is no noise impact anticipated, however, the contractor shall comply with the City of Los Angeles Noise Ordinance No. 144,331. The following BMPs, or any other best management practices as recommended by an acoustical engineer or other qualified professional, can be used, as applicable, during Project construction to ensure noise compliance:

BMP-NOI-1 Implement Construction Noise Control Practices - The construction contractor will conduct all activities in compliance with the applicable restrictions contained in the City of Los Angeles Municipal Code, including limiting maximum noise levels at adjacent homes to 75 dBA or

less. Such compliance will be achieved using methods that may include, but are not limited to:

A. Prohibiting construction activity (including deliveries, equipment maintenance, or operation of any construction equipment) at the project site before 7 a.m. or after 9 p.m. Monday through Friday, before 8:00 a.m. or after 6:00 p.m. on any Saturday or national holiday, or at any time on Sunday;
B. Constructing temporary noise barriers (such as from acoustical panels or acoustical blankets);
C. Using low-noise-generating construction equipment;
D. Maintaining all construction equipment, including mufflers and ancillary noise abatement equipment;
E. Ensuring that all mobile and stationary noise-producing construction equipment used on the project site that is regulated for noise output by a local, state, or federal agency complies with such regulation while in the course of project activity;
F. Scheduling high noise-producing activities during periods that are least sensitive;
G. Switching off construction equipment when not in use;
H. Positioning stationary construction equipment, such as generators and compressors, as far away as practical from noise-sensitive receptors;
I. Restricting the use of noise-producing signals, including horns, whistles, alarms, and bells, to safety warning purposes only;
J. Routing construction-related truck traffic away from noise-sensitive areas; and
K. Reducing construction vehicle speeds.

BMP NOI-2: Implement Ground-Borne Vibration Control Measures to Reduce Construction-Generated Vibration -The construction contractor will conduct all activities so as to limit ground-borne vibration at the adjacent commercial building to 0.5 in/s PPV or less, as follows:

A. Operating heavy construction equipment at least 6 feet from the building, wherever possible. Where a 6-foot buffer cannot be maintained, other methods shall be used, such as using smaller pieces of equipment or hand tools; and
B. Monitoring shall be conducted during construction to check for vibration-related damage If considered appropriate by the structural engineer. Such monitoring may include vibration measurements, or other tests and observations deemed necessary.

BMP-NOI-3: Implement Operational Noise Control Measures - The ice rink building and outdoor roller rink will be designed and constructed so that all operational noise is controlled to comply with the noise standards of the City Municipal Code at surrounding noise-sensitive uses. The combined noise levels from all on-site project noise sources will not exceed a 1-hour L_{eq} of 50 dBA at the adjacent residences or 60 dBA at the nearby church or school buildings during the daytime hours of 7 a.m. to 10 p.m. or 40 dBA at the adjacent residences or 55 dBA at the nearby church or school buildings during the nighttime hours of 10 p.m. to 7 a.m. Methods to achieve compliance may include, but are not limited to:

A. Selecting mechanical equipment designed to produce low noise levels. This includes the mechanical (i.e., heating, ventilation, air-conditioning [HVAC]) equipment for heating and cooling interior spaces as well as equipment associated with refrigeration and maintenance of the rink itself;

B. Locating mechanical equipment inside the building or shielding it with screens, walls (including parapet walls for rooftop equipment), acoustical louvers, or other noise barriers;
C. Designing the building shell to provide adequate interior-to-exterior noise control and contain noise within the building. This includes proper specifications for windows, doors, and ventilation systems;
D. Limiting the maximum noise levels produced by the P.A. and amplified sound systems installed within the ice rink building;
E. Orienting doors, windows, and other openings away from adjacent homes. Where windows or emergency doors need to be oriented toward homes or other noise-sensitive uses, ensure they remain closed when not in use;
F. Using entry/exit vestibules at the ice rink building with two independent sets of doors to minimize noise that might propagate out of the building when patrons arrive or leave;
G. Designing, installing, and operating any P.A. or amplified sound system at the outdoor roller rink to control noise;
H. All noise control methods will be included in the final architectural and engineering designs and specifications for project construction; and
I. The hours of operation for the outdoor roller rink will be limited to 7 a.m. to 10 p.m. daily. Any activity outside of these hours will be permitted only if the operator can prove, to the City's satisfaction, that such activity will not exceed applicable noise standards at any residential property.

Air Quality - The Project is in close proximity to sensitive receptors. An *Air Quality Technical Study* for the Project dated December 1, 2017, finds that no impact is anticipated, however, the contractor shall comply with the following BMP:

BMP AQ-1: Construction

a) All exposed areas will be frequently watered to reduce the generation of dust.
b) Vehicle speed of construction vehicles/equipment in exposed areas (i.e., unpaved access) shall be reduced to reduce the generation of dust.

Water Quality - The Project site is currently paved and there will be no material excavation or export volume beyond the demolition debris since the site is currently flat and construction proposed will be at grade. There is no water quality impact anticipated, however, the contractor shall apply the following *Section III B (1) j-Stone, Clay, Glass, Concrete* of the *Board of Public Works Rules and Regulations Governing Pollution Control of Discharges Into the Stormdrain System* BMPs during Project construction:

1) Store dry materials and waste inside or in covered bermed areas.
2) Regularly clean up spills and dust.
3) Wash vehicles and equipment in designated areas that drain to recycle ponds or process wastewater treatment systems.
4) Use and properly maintain dust collection systems.
5) Store dry bulk materials in an enclosed silo or building.
6) Materials may include sand, gravel, clay, cement, fly ash, kiln dust, and gypsum.
7) Cover material storage piles.
8) Divert run-on around storage areas using curbs, dikes, diversion swales or positive drainage away from material storage piles.
9) Store only washed sand and gravel outdoors.

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.
REVISION DATES (DESIGN STAGE ONLY)
Sheet Version 4.0

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

LICENSED ARCHITECT
LAWRENCE SCARPA
C 21812
REN 10/31/2023
STATE OF CALIFORNIA

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED •

BUREAU OF ENGINEERING
VERTICAL CONTROL:
HORIZONTAL CONTROL:
SHEET TITLE: CEQA_NOE
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

DEPARTMENT OF PUBLIC WORKS
NO. | REVISIONS: | DATE: | BY:
INDEX NO.
CIP NO.

CITY OF LOS ANGELES
GARY LEE MOORE, P.E., ENV SP
CITY ENGINEER
DESIGN GROUP:
DATE:
ENGINEER:
DESIGNED BY:
DRAWN BY:
CHECKED BY:
APPROVED BY:

WORK ORDER NO.
E170121B

SHEET NAME
A0.32
SHEET X OF X SHEETS

Z:\B□S ARCHITECTURE\019 JOBS\01935.0 CITY OF LA-RESEDA ICE HOCKEY ROLLER RINK\01935.0 1.CURRENT DRAWINGS_24X36\01935.0_A0.32_24X36.DWG 12/3/2021 9:09 AM

10) Use dust collection systems (i.e.: bag houses) to collect airborne particles generated as a result of handling and mixing operations. Properly remove and recycle or dispose of collected dust to minimize exposure of collected dust to the environment.
11) Routinely clean material handling equipment and vehicles to remove accumulated dust and residue.
12) Clean exposed mixing equipment after mixing operations is complete.
13) Pour and cure precast products in a covered area. Clean forms before storing outdoors.
14) Install sediment basins, silt fence, vegetated filter strips, or other sediment removal measures downstream/downslope of handling and mixing operations.
15) Comply with other BMP's deemed appropriate by the Director.

As such, approval of the Project would not result in any significant effects relating to traffic, noise, air quality, or water quality

e) The site can be adequately served by all required utilities and public services:

The Project site will be adequately served by all public utilities and services given that the construction of the building will be on a site which has been previously developed with commercial buildings. The existing infrastructure will remain and will serve the new building.

Therefore, it can be found that the Project meets the qualifications of the Class 32 Exemption.

Consideration of Potential Exceptions to use of a Categorical Exemption

The State CEQA Guidelines (CCR Sec 15300.2) limit the use of categorical exemptions in the following circumstances:

1. Location. Exemption Classes 3, 4, 5, 6, and 11 are qualified by consideration of where the project is to be located – a project that is ordinarily insignificant in its impact on the environment may be significant in a particularly sensitive environment. Therefore, these classes are considered to apply all instances, except where the project may impact on an environmental resource of hazardous or critical concern where designated, precisely mapped, and officially adopted pursuant to law by federal, state, or local agencies.

The Project is exempt under Class 25 (Transfers of Ownership in Land to Preserve Existing Natural Conditions and Historical Resources). This Project includes the acquisition of the Project parcels in order to preserve them for recreational and park uses. The Project parcels will be acquired by the RAP, then will be re-zoned and re-designated as Open Space. Therefore, this exception has no application here.

Additionally, the Project is exempt under Class 32 (In-fill Development Projects). The new skate facility will be built on a site that has previously been developed with commercial uses but is now vacant. The proposed Project will be located on same site and general location as the previous commercial structures and will have less capacity as a skate facility than the commercial structure that was previously built on the site. Therefore, this exception has no application here.

2. Cumulative Impact. This exception applies when, although a particular project may not have a significant impact, the cumulative impact of successive projects of the same type in the same place, over time is significant. There are no other known projects that could involve cumulatively significant impacts. Therefore, this exception has no application here.

3. Significant Effect. This exception applies when, although the project may otherwise be exempt,

there is a reasonable possibility that the project will have a significant effect due to unusual circumstances.

Traffic - The Project abuts a residential neighborhood. A *Traffic Technical Study* for the Project dated December 1, 2017, finds that no impact is anticipated, however, the contractor shall apply the following BMPs:

BMP TRANS-2: Coordination with Emergency Service Providers

A. Coordinate with emergency service providers (police, fire, ambulance and paramedic services) to provide advance notice of any lane closures, construction hours and changes to local access and to identify alternative routes where appropriate.

There are no unusual circumstances known to this office. Therefore, this exception has no application here.

Noise - The Project is in close proximity to sensitive residential receptors. A *Noise Technical Study* for the Project dated December 1, 2017, finds that there is no noise impact anticipated, however, the contractor shall comply with the City of Los Angeles Noise Ordinance No. 144,331. The following BMPs, or any other best management practices as recommended by an acoustical engineer or other qualified professional, can be used, as applicable, during Project construction to ensure noise compliance:

BMP-NOI-1 Implement Construction Noise Control Practices - The construction contractor will conduct all activities in compliance with the applicable restrictions contained in the City of Los Angeles Municipal Code, including limiting maximum noise levels at adjacent homes to 75 dBA or less. Such compliance will be achieved using methods that may include, but are not limited to:

A. Prohibiting construction activity (including deliveries, equipment maintenance, or operation of any construction equipment) at the project site before 7 a.m. or after 9 p.m. Monday through Friday, before 8:00 a.m. or after 6:00 p.m. on any Saturday or national holiday, or at any time on Sunday;
B. Constructing temporary noise barriers (such as from acoustical panels or acoustical blankets);
C. Using low-noise-generating construction equipment;
D. Maintaining all construction equipment, including mufflers and ancillary noise abatement equipment;
E. Ensuring that all mobile and stationary noise-producing construction equipment used on the project site that is regulated for noise output by a local, state, or federal agency complies with such regulation while in the course of project activity;
F. Scheduling high noise-producing activities during periods that are least sensitive;
G. Switching off construction equipment when not in use;
H. Positioning stationary construction equipment, such as generators and compressors, as far away as practical from noise-sensitive receptors;
I. Restricting the use of noise-producing signals, including horns, whistles, alarms, and bells, to safety warning purposes only;
J. Routing construction-related truck traffic away from noise-sensitive areas; and
K. Reducing construction vehicle speeds.

BMP NOI-2: Implement Ground-Borne Vibration Control Measures to Reduce Construction-Generated Vibration - The construction contractor will conduct all activities so as to limit ground-borne vibration at the adjacent commercial building to 0.5 in/s PPV or less, as follows:

A. Operating heavy construction equipment at least 6 feet from the building, wherever possible. Where a 6-foot buffer cannot be maintained, other methods shall be used, such as using smaller pieces of equipment or hand tools; and
B. Monitoring shall be conducted during construction to check for vibration-related damage If considered appropriate by the structural engineer. Such monitoring may include vibration measurements, or other tests and observations deemed necessary.

BMP-NOI-3: Implement Operational Noise Control Measures - The ice rink building and outdoor roller rink will be designed and constructed so that all operational noise is controlled to comply with the noise standards of the City Municipal Code at surrounding noise-sensitive uses. The combined noise levels from all on-site project noise sources will not exceed a 1-hour L_{eq} of 50 dBA at the adjacent residences or 60 dBA at the nearby church or school buildings during the daytime hours of 7 a.m. to 10 p.m. or 40 dBA at the adjacent residences or 55 dBA at the nearby church or school buildings during the nighttime hours of 10 p.m. to 7 a.m. Methods to achieve compliance may include, but are not limited to:

A. Selecting mechanical equipment designed to produce low noise levels. This includes the mechanical (i.e., heating, ventilation, air-conditioning [HVAC]) equipment for heating and cooling interior spaces as well as equipment associated with refrigeration and maintenance of the rink itself;
B. Locating mechanical equipment inside the building or shielding it with screens, walls (including parapet walls for rooftop equipment), acoustical louvers, or other noise barriers;
C. Designing the building shell to provide adequate interior-to-exterior noise control and contain noise within the building. This includes proper specifications for windows, doors, and ventilation systems;
D. Limiting the maximum noise levels produced by the P.A. and amplified sound systems installed within the ice rink building;
E. Orienting doors, windows, and other openings away from adjacent homes. Where windows or emergency doors need to be oriented toward homes or other noise-sensitive uses, ensure they remain closed when not in use;
F. Using entry/exit vestibules at the ice rink building with two independent sets of doors to minimize noise that might propagate out of the building when patrons arrive or leave;
G. Designing, installing, and operating any P.A. or amplified sound system at the outdoor roller rink to control noise;
H. All noise control methods will be included in the final architectural and engineering designs and specifications for project construction; and
I. The hours of operation for the outdoor roller rink will be limited to 7 a.m. to 10 p.m. daily. Any activity outside of these hours will be permitted only if the operator can prove, to the City's satisfaction, that such activity will not exceed applicable noise standards at any residential property.

There are no unusual circumstances known to this office. Therefore, this exception has no application here.

Air Quality - The Project is in close proximity to sensitive receptors. An *Air Quality Technical Study* for the Project dated December 1, 2017, finds that no impact is anticipated, however, the contractor shall comply with the following BMPs in compliance with the SCAQMD Fugitive Dust Rule:

BMP AQ-1: Construction

a) All exposed areas will be frequently watered to reduce the generation of dust.
b) Vehicle speed of construction vehicles/equipment in exposed areas (i.e., unpaved access) shall be reduced to reduce the generation of dust.

There are no unusual circumstances known to this office. Therefore, this exception has no application here.

Water Quality - The Project site is currently paved and there will be no material excavation or export volume beyond the demolition debris since the site is currently flat and construction proposed will be at grade. There is no water quality impact anticipated, however, the contractor shall apply the following *Section III B (1) j-Stone, Clay, Glass, Concrete* of the *Board of Public Works Rules and Regulations Governing Pollution Control of Discharges Into the Stormdrain System* BMPs during Project construction:

1) Store dry materials and waste inside or in covered bermed areas.
2) Regularly clean up spills and dust.
3) Wash vehicles and equipment in designated areas that drain to recycle ponds or process wastewater treatment systems.
4) Use and properly maintain dust collection systems.
5) Store dry bulk materials in an enclosed silo or building.
6) Materials may include sand, gravel, clay, cement, fly ash, kiln dust, and gypsum.
7) Cover material storage piles.
8) Divert run-on around storage areas using curbs, dikes, diversion swales or positive drainage away from material storage piles.
9) Store only washed sand and gravel outdoors.
10) Use dust collection systems (i.e.: bag houses) to collect airborne particles generated as a result of handling and mixing operations. Properly remove and recycle or dispose of collected dust to minimize exposure of collected dust to the environment.
11) Routinely clean material handling equipment and vehicles to remove accumulated dust and residue.
12) Clean exposed mixing equipment after mixing operations is complete.
13) Pour and cure precast products in a covered area. Clean forms before storing outdoors.
14) Install sediment basins, silt fence, vegetated filter strips, or other sediment removal measures downstream/downslope of handling and mixing operations.
15) Comply with other BMP's deemed appropriate by the Director.

As such, there are no unusual circumstances known to this office. Therefore, this exception has no application here.

Hazardous Materials - The Project is in close proximity to sensitive receptors; however, as of November 30, 2017, the Project site was not on list of hazardous materials sites and would not create a significant hazard to the public or the environment. A *Phase II Environmental Site Assessment* for the Project dated December 28, 2017, found that a vapor encroachment condition (VEC) exists on the northeastern portion of the site due to its proximity to several dry-cleaning establishments. The current plans identify the area affected as a parking lot area that would remain capped. Other potential issues would be addressed through various project design features in accordance with applicable local and State regulations. Additionally, potentially significant impacts

related to hazardous materials are not anticipated to represent a significant environmental condition in connection with the Project; as such, there are no unusual circumstances known to this office. Therefore, this exception has no application here.

Cultural Resources – According to the City of Los Angeles General Plan Framework EIR, the Project site is not located within any *Invertebrate Paleontological Resource Sensitivity Area*. Also, a Cultural Resources *Technical Study* for the Project dated December 1, 2017, finds that no impact is anticipated, however, the contractor shall comply with the following BMPs:

BMP CUL-1: Archaeological and/or Tribal Cultural Resource

- In the event of an unanticipated discovery, all work must be suspended within 50 feet of the find until a qualified archaeologist evaluates it. In the unlikely event that human remains are encountered during Project development, all work must cease near the find immediately.
- In accordance with California Health and Safety Code Section 7050.5, the County Coroner must be notified if potentially human bone is discovered. The Coroner will then determine within two working days of being notified if the remains are subject to his or her authority. If the Coroner recognizes the remains to be Native American, he or she shall contact the NAHC by phone within 24 hours, in accordance with Public Resources Code Section 5097.98. The NAHC will then designate a MLD with respect to the human remains. The MLD then has the opportunity to recommend to the property owner or the person responsible for the excavation work means for treating or disposing, with appropriate dignity, the human remains and associated grave goods. Work may not resume in the area of the find until all requirements of the health and safety code have been met. As such, there are no unusual circumstances known to this office. Therefore, this exception has no application here.

4. Scenic Highway. A categorical exemption shall not be used for a project which may result in damage to scenic resources, including but not limited to, trees, historic buildings, rock outcroppings, or similar resources, within a highway officially designated as a state scenic highway. The proposed Project is not within sight of any state designated scenic highway. Therefore, this exception has no application here.

5. Hazardous Waste Site. This exception applies when a project is located on a site listed as a hazardous waste site under Government Code Section 65962.5.

The Project is in close proximity to sensitive receptors; however, as of November 30, 2017, the Project site was not on any such list. Also, according to the *Hazardous Materials* discussion above, potentially significant impacts related to hazardous materials are not anticipated to represent a significant environmental condition in connection with the Project. Therefore, this exception has no application here.

6. Historical Resources. This exception applies when a project may cause a substantial adverse change in the significance of a historical resource.

No historical resource is involved in the proposed Project since the site is vacant, so this exception has no application here.

RESOURCES

1. Reseda Central Business District Community Design Overly District (CDO) Design Guidelines and Standards. Approved by the City Planning Commission September 23, 2004.
2. Reseda Central Business District Streetscape Plan. Approved by the City Planning Commission September 23, 2004.
3. Ordinance No. 166,168, relating to the establishment of the "Open Space" zone. Effective date: October 4, 1990.
4. Ordinance No. 176,558, relating to the establishment of the [Q] Qualified Classification conditions for the Reseda CBD CDO. Effective date: May 2, 2005
5. Office of the City Attorney, Report No. R90-0377 Regarding Ordinance 166,168, and Ordinance Establishing a New "OS" Open Space Zone. Dated July 2, 1990.

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REVISION DATES (DESIGN STAGE ONLY)

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

LICENSED ARCHITECT
LAWRENCE SCARPA
C 21812
REN 10/31/2023
STATE OF CALIFORNIA

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED

BUREAU OF ENGINEERING

VERTICAL CONTROL:
HORIZONTAL CONTROL:
SHEET TITLE: CEQA_NOE
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

DEPARTMENT OF PUBLIC WORKS

NO.	REVISIONS:	DATE:	BY:

CIP NO.

INDEX NO.

CITY OF LOS ANGELES

CITY ENGINEER
GARY LEE MOORE, P.E., ENV SP
DATE:
DESIGN GROUP:
ENGINEER:
DESIGNED BY:
DRAWN BY:
CHECKED BY:
APPROVED BY:

WORK ORDER NO.
E170121B

SHEET NAME
A0.33
SHEET X OF X SHEETS

Sheet Version 4.0

Z:\B□S ARCHITECTURE\019 JOBS\01935.0 CITY OF LA-RESEDA ICE HOCKEY ROLLER RINK\01935.0 1.CURRENT DRAWINGS_24X36\01935.0_A0.33_24X36.DWG 12/3/2021 9:09 AM

FORM GEN. 160 (Rev. 11-02)

CITY OF LOS ANGELES
DEPARTMENTAL CORRESPONDENCE

Date: July 12, 2018; Revised July 13, 2018

To: Neil Drucker, Project Manager
Architectural Division, Bureau of Engineering

From: Maria Martin, Manager
Environmental Management Group, Bureau of Engineering

Subject: **SUMMARY OF FINDINGS AND DESIGN MEASURES FOR THE LIMITED PHASE II ENVIRONMENTAL SITE ASSESSMENT (ESA) REPORT AND ADDENDUM REPORT - PROPOSED RESEDA SKATE FACILITY, 18132 AND 18210 SHERMAN WAY***

The City of Los Angeles, Department of Recreation and Parks requires that residential environmental standards be met at their facilities. Therefore, to lower human health risks to meet those standards, future site development at the above-referenced facility site would require the services of an experienced, California-licensed professional geologist or experienced civil engineer to prepare and supervise implementation of a Soil Management Plan (SMP). The SMP would address soil management procedures during any soil removal, grading, and trenching activity. In addition, to further define the source of the onsite subsurface vapors, technical experts recommend offsite sampling in the vicinity of the northeast corner of the site, as vapor levels are highest near this corner. A summary of findings and associated design measures is provided below.

1. West Parcel – 18210 Sherman Way, Reseda, CA

The findings for the west parcel show an unacceptable residential health risk at the northwest lot of the west parcel. The southwest lot of the west parcel has an acceptable residential health risk.

A single measure is necessary to lower health risks to acceptable residential levels at the northwest lot. This would include removal or encapsulation of soil at one shallow location. Elevated levels of dieldrin (an insecticide) exist at six inches deep at Boring B-1A in the northwest lot. The location is shown in Figure 1. The approach to this and any additional sampling to confirm complete removal of the elevated dieldrin soil (i.e., confirmation and/or delineation sampling) would be described in the SMP.

A second recommendation applies to the west parcel and the entire Project site. This recommendation requires vapor, visual and olfactory (odor) monitoring to be performed during grading and trenching activities within the construction phase of the development project. This is because elevated levels of insecticide and volatile organic compound vapor (vapor) have been found in subsurface soils at the Project site. With this monitoring, any obvious additional impact may be addressed as needed. Details of this type of monitoring and associated soil management would be provided in the SMP.

*Draft final reviewed on July 10, 2018 by Jay Roberts, Project Manager for the Limited Phase II ESA for Reseda Skate Facility, Ninyo & Moore and Neil Drucker, Project Manager, Bureau of Engineering.

materials, equipment, and installation cost is $66,085 to $75,215, plus operations, maintenance, monitoring, and permitting costs.

3. Offsite

Additional offsite sampling is recommended and currently planned. This sampling will determine whether the source of onsite subsurface vapors is coming from the known source to the east, and/or from some other unknown offsite source, located north to northeast of the northeast corner of the site. The proposed offsite sampling locations are shown in Figure 1 as well as the known source to the east (Cavalier Dry Cleaners). The offsite sampling locations are planned borings B-14 to B-18. The farthest locations, B-16 to B18, would be drilled and sampled for vapor, only in the event that elevated vapors are first detected at the closer sampling locations, B-14 and B-15.

Cost Recovery: Should pursuit of cost recovery for onsite vapor protection systems and/or if coordination with regulators become necessary, offsite sampling data, the Phase II ESA Report and Addendum Report, the SMP Implementation Report, and this Memorandum would be important documents for consideration by the City Attorney, local decision makers, and/or involved enforcement agencies.

MEM:ES:hf

Q:\Eileen\Reseda Skate Facility\Tech Studies\Phase I and II ESA - Haz Mat\Summary of Findings and Design Measures, Limited Phase II ESA Addendum Report -7-12-2018.docx

4. A grading permit shall be obtained for all structural fill and retaining wall backfill (106.1.2).

5. All man-made fill shall be compacted to a minimum 90 percent of the maximum dry density of the fill material per the latest version of ASTM D 1557. Where cohesionless soil having less than 15 percent finer than 0.005 millimeters is used for fill, it shall be compacted to a minimum of 95 percent relative compaction based on maximum dry density. Placement of gravel in lieu of compacted fill is only allowed if complying with LAMC Section 91.7011.3.

6. If import soils are used, no footings shall be poured until the soils engineer has submitted a compaction report containing in-place shear test data and settlement data to the Grading Division of the Department; and, obtained approval (7008.2).

7. Compacted fill shall extend beyond the footings a minimum distance equal to the depth of the fill below the bottom of footings or a minimum of three feet whichever is greater, except at locations where lateral over excavation is not possible (i.e., foundations adjacent to property lines or structures), in which case the foundations may be deepened to bear in native soils, as recommended (7011.3).

8. Existing uncertified fill shall not be used for support of footings, concrete slabs or new fill (1809.2, 7011.3).

9. Drainage in conformance with the provisions of the Code shall be maintained during and subsequent to construction (7013.12).

10. The applicant is advised that the approval of this report does not waive the requirements for excavations contained in the General Safety Orders of the California Department of Industrial Relations (3301.1).

11. Excavations shall not remove lateral support from a public way, adjacent property or an existing structure. Note: Lateral support shall be considered to be removed when the excavation extends below a plane projected downward at an angle of 45 degrees from the bottom of a footing of an existing structure, from the edge of the public way or an adjacent property. (3307.3.1)

12. Prior to the issuance of any permit that authorizes an excavation where the excavation is to be of a greater depth than are the walls or foundation of any adjoining building or structure and located closer to the property line than the depth of the excavation, the owner of the subject site shall provide the Department with evidence that the adjacent property owner has been given a 30-day written notice of such intent to make an excavation (3307.1).

13. The soils engineer shall review and approve the shoring and/or underpinning plans prior to issuance of the permit (3307.3.2).

14. Prior to the issuance of the permits, the soils engineer and the structural designer shall evaluate all applicable surcharge loads for the design of the retaining walls and shoring.

15. Unsurcharged temporary excavations over 5 feet exposing soil shall be trimmed back at a gradient not exceeding 1:1, as recommended.

be filed with the Grading Division of the Department upon completion of the work. (108.9 & 7008.2)

29. Prior to excavation an initial inspection shall be called with the LADBS Inspector. During the initial inspection, the sequence of construction; [shoring; ABC slot cuts; underpinning; pile installation;] protection fences; and, dust and traffic control will be scheduled (108.9.1).

30. Installation of shoring, underpinning, slot cutting and/or pile excavations shall be performed under the inspection and approval of the soils engineer (1705.8).

31. Prior to the placing of compacted fill, a representative of the soils engineer shall inspect and approve the bottom excavations. The representative shall post a notice on the job site for the LADBS Inspector and the Contractor stating that the soil inspected meets the conditions of the report. No fill shall be placed until the LADBS Inspector has also inspected and approved the bottom excavations. A written certification to this effect shall be included in the final compaction report filed with the Grading Division of the Department. All fill shall be placed under the inspection and approval of the soils engineer. A compaction report together with the approved soil report and Department approval letter shall be submitted to the Grading Division of the Department upon completion of the compaction. In addition, an Engineer's Certificate of Compliance with the legal description as indicated in the grading permit and the permit number shall be included (7011.3).

32. No footing/slab shall be poured until the compaction report is submitted and approved by the Grading Division of the Department.

YANG LIU
Geotechnical Engineer II

Log No. 110593
213-482-0480

cc: City of LA - GED, Project Consultant
VN District Office

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

LICENSED ARCHITECT
LAWRENCE SCARPA
C 21812
REN 10/31/2023
STATE OF CALIFORNIA

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED •

BUREAU OF ENGINEERING
VERTICAL CONTROL:
HORIZONTAL CONTROL:
SHEET TITLE: ENVIRONM. DESIGN RECOMMENDATION
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

DEPARTMENT OF PUBLIC WORKS
NO. | REVISIONS: | DATE: | BY:
CIP NO.
INDEX NO.

CITY OF LOS ANGELES
CITY ENGINEER
GARY LEE MOORE, P.E., ENV SP
DESIGN GROUP:
DATE:
ENGINEER:
DESIGNED BY:
DRAWN BY:
CHECKED BY:
APPROVED BY:

WORK ORDER NO.
E170121B

SHEET NAME
A0.34
SHEET X OF X SHEETS

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REVISION DATES (DESIGN STAGE ONLY)

Sheet Version 4.0

Z:\B□S ARCHITECTURE\019 JOBS\01935.0 CITY OF LA-RESEDA ICE HOCKEY ROLLER RINK\01935.0 1.CURRENT DRAWINGS_24X36\01935.0_A034_24X36.DWG 12/3/2021 9:09 AM

BOARD OF BUILDING AND SAFETY COMMISSIONERS

VAN AMBATIELOS
PRESIDENT

E. FELICIA BRANNON
VICE PRESIDENT

JOSELYN GEAGA-ROSENTHAL
GEORGE HOVAGUIMIAN
JAVIER NUNEZ

CITY OF LOS ANGELES
CALIFORNIA

ERIC GARCETTI
MAYOR

DEPARTMENT OF BUILDING AND SAFETY
201 NORTH FIGUEROA STREET
LOS ANGELES, CA 90012

FRANK M. BUSH
GENERAL MANAGER
SUPERINTENDENT OF BUILDING

OSAMA YOUNAN, P.E.
EXECUTIVE OFFICER

SOILS REPORT APPROVAL LETTER

November 8, 2019

LOG # 110593
SOILS/GEOLOGY FILE - 2

City of Los Angeles
221 N. Figueroa St., # 350
Los Angeles, CA 90012

TRACT: 21799
LOT(S): 5 (arb 1 and 2)
LOCATION: 18128 - 18138 W. Sherman Way

CURRENT REFERENCE REPORT/LETTER(S)	REPORT No.	DATE OF DOCUMENT	PREPARED BY
Soils Report	19-080	08/28/2019	City of LA - GED

The Grading Division of the Department of Building and Safety has reviewed the referenced report that provides recommendations for the proposed roller rink, indoor ice-skating rink, and surface parking. The earth materials at the subsurface exploration locations consist of up to 5 feet of uncertified fill underlain by lean clay. The consultants recommend to support the proposed structures on conventional foundations bearing on native undisturbed soils and/or compacted fill.

The referenced report is acceptable, provided the following conditions are complied with during site development:

(Note: Numbers in parenthesis ( ) refer to applicable sections of the 2017 City of LA Building Code. P/BC numbers refer the applicable Information Bulletin. Information Bulletins can be accessed on the internet at LADBS.ORG.)

1. The soils engineer shall review and approve the detailed plans prior to issuance of any permit. This approval shall be by signature on the plans that clearly indicates the soils engineer has reviewed the plans prepared by the design engineer; and, that the plans included the recommendations contained in their reports (7006.1).

2. All recommendations of the report that are in addition to or more restrictive than the conditions contained herein shall be incorporated into the plans.

3. A copy of the subject and appropriate referenced reports and this approval letter shall be attached to the District Office and field set of plans (7006.1). Submit one copy of the above reports to the Building Department Plan Checker prior to issuance of the permit.

4. A grading permit shall be obtained for all structural fill and retaining wall backfill (106.1.2).

5. All man-made fill shall be compacted to a minimum 90 percent of the maximum dry density of the fill material per the latest version of ASTM D 1557. Where cohesionless soil having less than 15 percent finer than 0.005 millimeters is used for fill, it shall be compacted to a minimum of 95 percent relative compaction based on maximum dry density. Placement of gravel in lieu of compacted fill is only allowed if complying with LAMC Section 91.7011.3.

6. If import soils are used, no footings shall be poured until the soils engineer has submitted a compaction report containing in-place shear test data and settlement data to the Grading Division of the Department; and, obtained approval (7008.2).

7. Compacted fill shall extend beyond the footings a minimum distance equal to the depth of the fill below the bottom of footings or a minimum of three feet whichever is greater, except at locations where lateral over excavation is not possible (i.e., foundations adjacent to property lines or structures), in which case the foundations may be deepened to bear in native soils, as recommended (7011.3).

8. Existing uncertified fill shall not be used for support of footings, concrete slabs or new fill (1809.2, 7011.3).

9. Drainage in conformance with the provisions of the Code shall be maintained during and subsequent to construction (7013.12).

10. The applicant is advised that the approval of this report does not waive the requirements for excavations contained in the General Safety Orders of the California Department of Industrial Relations (3301.1).

11. Excavations shall not remove lateral support from a public way, adjacent property or an existing structure. Note: Lateral support shall be considered to be removed when the excavation extends below a plane projected downward at an angle of 45 degrees from the bottom of a footing of an existing structure, from the edge of the public way or an adjacent property. (3307.3.1)

12. Prior to the issuance of any permit that authorizes an excavation where the excavation is to be of a greater depth than are the walls or foundation of any adjoining building or structure and located closer to the property line than the depth of the excavation, the owner of the subject site shall provide the Department with evidence that the adjacent property owner has been given a 30-day written notice of such intent to make an excavation (3307.1).

13. The soils engineer shall review and approve the shoring and/or underpinning plans prior to issuance of the permit (3307.3.2).

14. Prior to the issuance of the permits, the soils engineer and the structural designer shall evaluate all applicable surcharge loads for the design of the retaining walls and shoring.

15. Unsurcharged temporary excavations over 5 feet exposing soil shall be trimmed back at a gradient not exceeding 1:1, as recommended.

16. Shoring shall be designed for the lateral earth pressures specified in the section titled "Temporary Shoring" starting on page 7 of the referenced report; all surcharge loads shall be included into the design.

17. Shoring shall be designed for a maximum lateral deflection of 1 inch, provided there are no structures within a 1:1 plane projected up from the base of the excavation. Where a structure is within a 1:1 plane projected up from the base of the excavation, shoring shall be designed for a maximum lateral deflection of ½ inch, or to a lower deflection determined by the consultant that does not present any potential hazard to the adjacent structure.

18. A shoring monitoring program shall be implemented to the satisfaction of the soils engineer.

19. All foundations shall derive entire support from native undisturbed soils and / or compacted fill, as recommended and shall be approved by the geologist and soils engineer by inspection.

20. Footings supported on approved compacted fill or expansive soil shall be reinforced with a minimum of four (4), ½-inch diameter (#4) deformed reinforcing bars. Two (2) bars shall be placed near the bottom and two (2) bars placed near the top of the footing.

21. The foundation/slab design shall satisfy all requirements of the Information Bulletin P/BC 2014-116 "Foundation Design for Expansive Soils" (1803.5.3). [Note: Soils with an Expansion Index greater than 20 are considered to be expansive, in accordance with Section 1803.5.3 of the 2014 LABC.]

22. Slabs placed on approved compacted fill shall be at least 3½ inches thick and shall be reinforced with ½-inch diameter (#4) reinforcing bars spaced a maximum of 16 inches on center each way.

23. Concrete floor slabs placed on expansive soil shall be placed on a 4-inch fill of coarse aggregate or on a moisture barrier membrane.

24. The seismic design shall be based on a Site Class D as recommended. All other seismic design parameters shall be reviewed by LADBS building plan check.

25. All roof, pad and deck drainage shall be conducted to the street in an acceptable manner in non-erosive devices or other approved location in a manner that is acceptable to the LADBS and the Department of Public Works (7013.10).

26. All concentrated drainage shall be conducted in an approved device and disposed of in a manner approved by the LADBS (7013.10).

27. The soils engineer shall inspect all excavations to determine that conditions anticipated in the report have been encountered and to provide recommendations for the correction of hazards found during grading (7008 & 1705.6).

28. Prior to pouring concrete, a representative of the consulting soils engineer shall inspect and approve the footing excavations. The representative shall post a notice on the job site for the LADBS Inspector and the Contractor stating that the work inspected meets the conditions of the report. No concrete shall be poured until the LADBS Inspector has also inspected and approved the footing excavations. A written certification to this effect shall

be filed with the Grading Division of the Department upon completion of the work. (108.9 & 7008.2)

29. Prior to excavation an initial inspection shall be called with the LADBS Inspector. During the initial inspection, the sequence of construction; [shoring; ABC slot cuts; underpinning; pile installation;] protection fences; and, dust and traffic control will be scheduled (108.9.1).

30. Installation of shoring, underpinning, slot cutting and/or pile excavations shall be performed under the inspection and approval of the soils engineer (1705.8).

31. Prior to the placing of compacted fill, a representative of the soils engineer shall inspect and approve the bottom excavations. The representative shall post a notice on the job site for the LADBS Inspector and the Contractor stating that the soil inspected meets the conditions of the report. No fill shall be placed until the LADBS Inspector has also inspected and approved the bottom excavations. A written certification to this effect shall be included in the final compaction report filed with the Grading Division of the Department. All fill shall be placed under the inspection and approval of the soils engineer. A compaction report together with the approved soil report and Department approval letter shall be submitted to the Grading Division of the Department upon completion of the compaction. In addition, an Engineer's Certificate of Compliance with the legal description as indicated in the grading permit and the permit number shall be included (7011.3).

32. No footing/slab shall be poured until the compaction report is submitted and approved by the Grading Division of the Department.

YING LIU
Geotechnical Engineer II

Log No. 110593
213-482-0480

cc: City of LA - GED, Project Consultant
VN District Office

BOARD OF BUILDING AND SAFETY COMMISSIONERS

VAN AMBATIELOS
PRESIDENT

JAVIER NUNEZ
VICE PRESIDENT

JOSELYN GEAGA-ROSENTHAL
GEORGE HOVAGUIMIAN
ELVIN W. MOON

CITY OF LOS ANGELES
CALIFORNIA

ERIC GARCETTI
MAYOR

DEPARTMENT OF BUILDING AND SAFETY
201 NORTH FIGUEROA STREET
LOS ANGELES, CA 90012

OSAMA YOUNAN, P.E.
GENERAL MANAGER
SUPERINTENDENT OF BUILDING

JOHN WEIGHT
EXECUTIVE OFFICER

SOILS REPORT APPROVAL LETTER

March 25, 2021

LOG # 116702
SOILS/GEOLOGY FILE - 2

City of Los Angeles
221 N. Figueroa St., # 350
Los Angeles, CA 90012

TRACT: 21799
LOT(S): 5 (arb 1 and 2)
LOCATION: 18128 - 18138 W. Sherman Way

CURRENT REFERENCE REPORT/LETTER(S)	REPORT No.	DATE OF DOCUMENT	PREPARED BY
Addendum Report	19-080	12/21/2020	City of LA – GED

PREVIOUS REFERENCE REPORT/LETTER(S)	REPORT No.	DATE OF DOCUMENT	PREPARED BY
Dept. Approval Letter	110593	11/08/2019	LADBS
Soils Report	19-080	08/28/2019	City of LA – GED

The Grading Division of the Department of Building and Safety has reviewed the referenced addendum report that provides supplemental recommendations for the proposed Peseda Skate Facility Project. The project scope is described on page one of the 12/21/2020 report.

The Department reviewed and conditionally approved the previous referenced report for the proposed roller rink, indoor ice-skating rink, and surface parking. The earth materials at the subsurface exploration locations consist of up to 5 feet of uncertified fill underlain by lean clay. The consultants recommend to support the proposed structures on conventional foundations bearing on native undisturbed soils and/or compacted fill.

The referenced addendum report provides an alternative deep foundation option for the Shade Structure.

The referenced report is acceptable, provided the following conditions are complied with during site development:

(Note: Numbers in parenthesis ( ) refer to applicable sections of the 2017 City of LA Building Code. P/BC numbers refer the applicable Information Bulletin. Information Bulletins can be accessed on the internet at LADBS.ORG.)

1. All conditions of the previous Department approval letter dated 11/08/2019 (Log # 110593), except as specifically modified herein, shall be complied with.

2. All latest recommendations of the 12/21/2020 report that are in addition to or more restrictive than the conditions contained herein shall be incorporated into the plans.

3. CIDH piles shall be designed as recommended on pages 2 and 3 of the 12/21/2020 report.

4. Onsite storm water infiltration shall not be used at the subject site.

YING LIU
Geotechnical Engineer II

Log No. 116702
213-482-0480

cc: City of LA - GED, Project Consultant
VN District Office

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED

LICENSED ARCHITECT
LAWRENCE SCARPA
C 21812
REN 10/31/2023
STATE OF CALIFORNIA

BUREAU OF ENGINEERING
VERTICAL CONTROL:
HORIZONTAL CONTROL:
SHEET TITLE: SOILS REPORT APPROVAL LETTER
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

DEPARTMENT OF PUBLIC WORKS
NO. | REVISIONS: | DATE: | BY:
CIP NO.
INDEX NO.

CITY OF LOS ANGELES
GARY LEE MOORE, P.E., ENV SP
CITY ENGINEER
DESIGN GROUP:
ENGINEER:
DESIGNED BY:
DRAWN BY:
CHECKED BY:
APPROVED BY:
DATE:

WORK ORDER NO.
E170121B

SHEET NAME
A0.35
SHEET X OF X SHEETS

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REVISION DATES (DESIGN STAGE ONLY)

Sheet Version 4.0

Z:\B□S ARCHITECTURE\019 JOBS\01935.0 CITY OF LA-RESEDA ICE HOCKEY ROLLER RINK\01935.0 1.CURRENT DRAWINGS_24X36\01935.0_A035_24X36.DWG 12/3/2021 9:10 AM

REQUEST FOR MODIFICATION OF BUILDING ORDINANCES

CITY OF LOS ANGELES — DEPARTMENT OF BUILDING AND SAFETY
UNDER AUTHORITY OF L.A.M.C. SECTION 98.0403

PERMIT APP. #: 21010-10000-01858	DATE: 09/10/2021	For City Dept. Use Only: Building, Zoning, Grading, Shoring, Mech., Elec., Plumb., Green, D.A., Misc.
JOB ADDRESS: 18210 Sherman Way		
Tract: TR 21799	Block: Lot: 2	
Owner: Bureau of Engineering | Department of Public Works | David Wang	Petitioner: Brooks + Scarpa Architects	
Address: 1149 S. Broadway, Suite 830	Address: 3929 W 139th Street	
City: Los Angeles, State: CA, Zip: 90015, Phone: (213) 485-2134	City: Hawthorne, State: CA, Zip: 90250, Phone: (480) 434-3479	
REQUEST (SUBMIT PLANS OR ADDITIONAL SHEETS AS NECESSARY)	CODE SECTIONS: CBC 2019 - SECTION 3102.6.1	

To allow for a type II-B combustible Membrane Structure, as defined by CBC 3102, in a mixed construction building.

JUSTIFICATION (SUBMIT PLANS OR ADDITIONAL SHEETS AS NECESSARY)

Attached exhibits: Justification list, Drawing sheets A0.30,A0.41,A0.42, MECH diagrams, IBC ref. ltr. provided by Basis-of-Design manufacturer, fire testing report of coated membrane per ASTM E108-04, LARR 25820 renewing approval of PVC membrane on polyester base& CA State Fire Marshal registration of product into CA-approved list of flame retardant chemicals & fabrics per NFPA 701 #2

Angela Brooks, FAIA (Owner/Petitioner Name (Print)) — A Brooks (Signature) — Principal, Brooks+Scarpa Architects (Position)

FOR CITY DEPARTMENT'S USE ONLY BELOW THIS LINE

Concurrences required from the following Department(s):

	Print Name	Sign	Approved	Denied
☑ Los Angeles Fire Department	Oscar Salgado 11.11.21	Oscar Salgado	☑	☐
☐ Public Works Bureau of Engineering	Print Name	Sign	☐	☐
☐ Department of City Planning	Print Name	Sign	☐	☐
☐ Department of County Health	Print Name	Sign	☐	☐
☐ Other	Print Name	Sign	☐	☐

DEPARTMENT ACTION

☒ GRANTED ☐ DENIED

Reviewed by: (Staff) (Print): Aimee Trudeyon — Sign — Date: 8-31-21

Action taken by: (Supervisor) (Print): Ryan Case — Sign — Date: 12/10/21

NOTE: IN CASE OF DENIAL, SEE PAGE #2 OF THIS FORM FOR APPEAL PROCEDURES

CONDITIONS OF APPROVAL (Continued on Page 2):

For Cashiers Use Only
(PROCESS ONLY WHEN FEES ARE VERIFIED)

M.d #2316
Date paid 7/1/21

FEES (DEPARTMENT USE ONLY)

Appeal Processing Fee...(No. of Items) =	1X $130 + $39/addl	= 130
Inspection Fee .....(No. of Insp.) =	X $ 84.00	= 0
Research Fee ... (Total Hours Worked) =	X $104.00	= 208
Subtotal.....		= 338
Development Services Center Surcharge	X 3%	= 10.14
Systems Development Surcharge.....	X 6%	= 20.28
Total Fees.....		= 368.42
Fees verified by:		
Print and Sign: Aimee Trudeyon		

PC-Build.Mod 00 (Rev.04/15/2021) Page 1 of 2 www.ladbs.org

Permit App #: ***Job Address:***

CONDITIONS OF APPROVAL (Continued from Page 1)

CITY OF LOS ANGELES
BOARD OF BUILDING AND SAFETY/DISABLED ACCESS COMMISSION APPEAL FORM

(Must be Attached to the Modification Request Form, Page 1)

AFFIDAVIT – LADBS BOARD OF BUILDING AND SAFETY COMMISSIONERS – RESOLUTION NO. 832-93

I, _____ (Print or Type Name of the Person Signing this Form) do state and swear as follows:

1. The name and mailing address of the owner of the property (as defined in the resolution 832-93) at _____ as shown on the appeal application (LADBS Com 31) are correct, and
2. The owner of the property as shown on the appeal application will be made aware of the appeal and will receive a copy of the appeal.

I declare under PENALTY OF PERJURY that the forgoing is true and correct.

Owner's Name(s) _____ (Please Type or Print) _____ (Please Type or Print)

Owner's Signature(s) _____ (Please Sign) (Two Officers' Signatures Required for Corporations)

Name of Corporation _____ (Please Print Name of Corporation) _____ (Please Type or Print)

Dated this _____ day of _____ 20__

CALIFORNIA ALL-PURPOSE ACKNOWLEDGEMENT——————SIGNATURE(S) MUST BE NOTARIZED

State of CALIFORNIA County of _____ on _____

before me, _____ Name, Title of Officer (e.g. Jane Doe, Notary Public), personally appeared _____ Name(s) of Signer(s),

who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument in person(s), or the entity upon behalf of which the person(s) acted, executed the instrument. **I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing is true and correct.**

WITNESS my hand and official seal. Signature _____

As a covered entity under Title II of the Americans with Disabilities Act, the City of Los Angeles does not discriminate on the basis of disability and, upon request, will provide reasonable accommodation to ensure equal access to its programs, services and activities.

APPEAL OF DEPARTMENT ACTION TO THE BOARD OF BUILDING AND SAFETY COMMISSIONERS/DISABLED ACCESS APPEALS COMMISSION

Applicant's Name — Applicant's Title

Signature — Date

FEES (DEPARTMENT USE ONLY)

Board Fee .....(No. of Items)	1	X	$130.00	= 0.00
Inspection Fee.....(No of Insp.) =		X	$84.00	= 0.00
Research Fee.... (Total Hours Worked) =		X	$104.00	= 0.00
Subtotal.....				= 0.00
Development Services Center Surcharge		X	3%	= 0.00
Systems Development Surcharge.....		X	6%	= 0.00
Total Fees.....				= 0.00
Fees verified by:				
Print and Sign				

For Cashiers Use Only
(PROCESS ONLY WHEN FEES ARE VERIFIED)

PC-Build.Mod 00 (Rev.04/15/2021) Page 2 of 2 www.ladbs.org

2021-10-18 JUSTIFICATION

1. Membrane and interior liner shall be flame resistant in accordance with the provisions set forth in CCR, Title 19, Division 1, Chapter 8. Tops and sidewalls shall be made either from fabric that has been flame resistant treated with an approved exterior chemical process by an approved application concern, or from inherently flame resistant fabric approved and listed by the State Fire Marshal (see CCR, Title 19, Division 1, Chapter 8).

2. Membrane shall also meet the fire propagation performance criteria of Test Method 1 or Test Method 2, as appropriate, of NFPA 701

3. One side of the membrane structure shall sit in a type II-B building make of CMU block walls, the other three shall sit on a concrete curb at grade, framed with non-combustible structural members.

4. Combustible finishes and decorative materials such as but not limited to, signs, banners, shall be kept clear from all building and membrane structure walls, roofs and ceilings. The protective netting in particular, shall be treated by a California Registered Applicator per California Title 19 Regulation below. Upon completion of treatment, applicator will issue a certificate of flame resistance.

TITLE 19 California Code of Regulations:
Article 4 Registration of Flame-Retardant

1272. Fabric Registration. Manufacturers who market a flame-retardant fabric or material for use as draperies, upholstery, wall coverings, etc., or a flame-retardant canvas for use in tents, may have their product listed under its trade name as a registered flame-retardant fabric or material provided that:
(a) The fabric or material is treated by a registered flame-retardant application concern with a registered chemical;

5. Storage approximate to the membrane within 20'-0" of the finished floor shall be prohibited unless a 1-HR rated wall is provided between the membrane structure and the storage area (such as at the skate storage and office).

6. Storage shall be prohibited of the roof of building within the membrane structure.

7. Furnishing such as but not limited to, seating, bleachers, etc., inside the membrane structure shall be non-combustible materials.

8. All mechanical exhaust, excluding roof and bathroom vents, shall terminate at a minimum of 10' from the membrane structure. 10' distance shall be measured in section from the edge of the exhaust, as shown in the diagrams attached. Cooling tower and dehumidifier complies with this req'ment. Condensing unit can be at approx. 8' from the membrane structure since there are no clearance req'ments to combustibles on the condenser discharge. (reference attached exhibits)

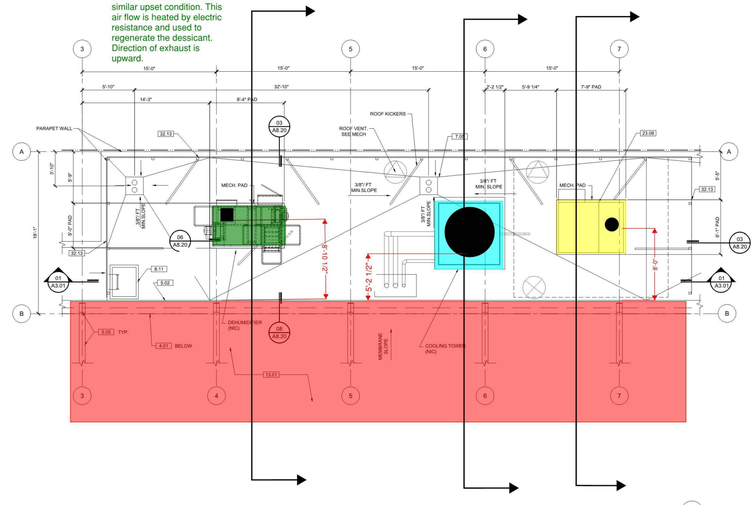
9. The building shall be fire sprinklered per NFPA 13 and provided with a fire alarm system.

#8

DEHUMIDIFIER :This will be intermittent and approximately 1500 cfm @ 140 deg F and maximum conceivable is 180 deg F if the desiccant wheel fails or similar upset condition. This air flow is heated by electric resistance and used to regenerate the desiccant. Direction of exhaust is upward.

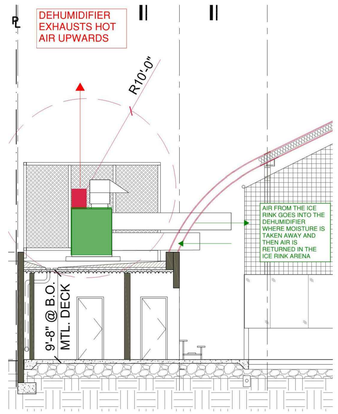
COOLING TOWER :exhausting moist air upward

CONDENSING UNIT: exhausting upward- maximum temp<140F



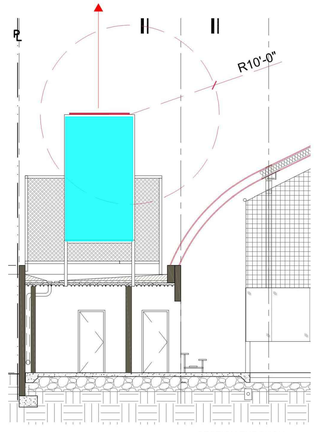
MECHANICAL ROOF ENL. PLAN 01
REF: A1.20 SCALE: 1/4" = 1'-0"

DEHUMIDIFIER EXHAUSTS HOT AIR UPWARDS



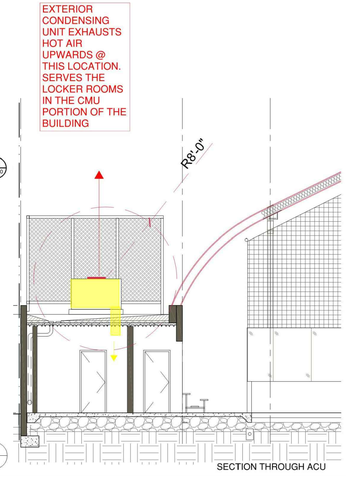
SECTION THROUGH THE DEHUMIDIFIER

COOLING TOWER EXHAUSTS MOIST AIR UPWARDS



SECTION THROUGH COOLING TOWER

EXTERIOR CONDENSING UNIT EXHAUSTS HOT AIR UPWARDS @ THIS LOCATION. SERVES THE LOCKER ROOMS IN THE CMU PORTION OF THE BUILDING



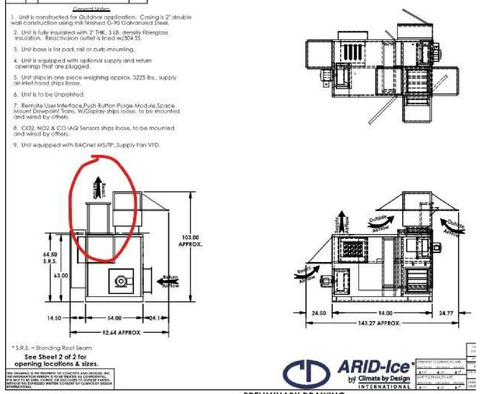
SECTION THROUGH ACU

PRELIMINARY DRAWING

DATE	REV	REVISION DESCRIPTION	BY

All Dimensions and specifications are preliminary and may change. Please consult factory for final dimensions and sp

1. Unit is constructed for Outdoor application. Casing is 2" double wall construction using mill finished G-90 Galvanized Steel.
2. Unit is fully insulated with 2" THK, 3 LB. density fiberglass insulation. Reactivation outlet is lined w/304 SS.
3. Unit base is for pad, rail or curb mounting.
4. Unit is equipped with optional supply and return openings that are plugged.
5. Unit ships in one piece weighing approx. 3225 lbs.; supply air inlet transition ships loose.
6. Unit is to be Unpainted.
7. Remote User Interface Push Button Purge Module Space Mount Dewpoint Trans. W/Display ships loose, to be mounted and wired by others.
8. CO2, NO2 & CO IAQ Sensors ships loose, to be mounted and wired by others.
9. Unit equipped with BACnet MS/TP, Supply Fan VFD.



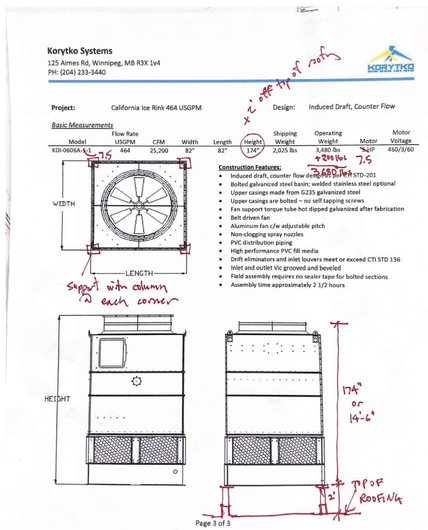
* S.R.S. = Standing Rool Seam

See Sheet 2 of 2 for opening locations & sizes.

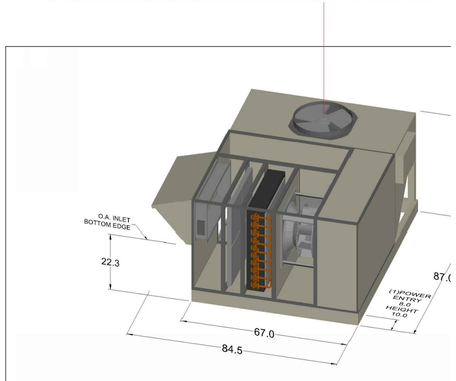
THIS DRAWING & THE PROPERTY OF CLIMATEC AND DESIGNS, INC. AND IS NOT TO BE USED IN WHOLE OR IN PART FOR ANY PROJECT WITHOUT WRITTEN AUTHORIZATION FROM CLIMATEC AND DESIGNS, INC. INTERNATIONAL

ARID-Ice by Climate by Design INTERNATIONAL

PRELIMINARY DRAWING



Page 3 of 3



Notes:
(1) Recommended location for optional field cut side power connection.

Product Drawing	Unit Tag: Rebel 001	Sales Office: Norman S. Wright-Climatec Mech'l Equip	
Product:	Project Name: Reseda Skate Facility	Sales Engineer:	13600 Industrial P
Model: DPS005A	Apr. 29, 2021 | Rev/Rev: | Sheet: 3 of 3	Scale: NTS | Tolerance: +/- 0.25" | Dwg Units: in [mm]	www.DaikinApplied

No change to this drawing may be made unless approved in writing by Daikin Applied. Purchaser must determine that the equipment is fit and sufficient for the job specifications.

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

LICENSED ARCHITECT LAWRENCE SCARPA C 21812 REN 10/31/2023 STATE OF CALIFORNIA

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED •

DEPARTMENT OF PUBLIC WORKS
BUREAU OF ENGINEERING

VERTICAL CONTROL:
HORIZONTAL CONTROL:

SHEET TITLE: MODIFICATON
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

NO.	REVISIONS:	DATE:	BY:

CIP NO.

INDEX NO.

CITY ENGINEER
DATE:

ENGINEER: GARY LEE MOORE, P.E. ENV SP
DESIGN GROUP:
DESIGNED BY:
DRAWN BY:
CHECKED BY:
APPROVED BY:

CITY OF LOS ANGELES

WORK ORDER NO.
E170121B

SHEET NAME
A0.36
SHEET X OF X SHEETS

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REVISION DATES (DESIGN STAGE ONLY)

Sheet Version 4.0

Z:\B□S ARCHITECTURE\019 JOBS\01935.0 CITY OF LA-RESEDA ICE HOCKEY ROLLER RINK\01935.0 1.CURRENT DRAWINGS_24X36\01935.0_A036_24X36.DWG 12/3/2021 9:10 AM

NORTH LOT OCCUPANT LOAD CALCULATION PER CBC TABLE 1004.5				
ROOM	OCCUPANCY	AREA OR LENGTH	LOAD FACTOR	# OF OCCUPANTS
SEATING AREA D	A-4	118'-0"	1'-6"	78
ROLLER PARK	A-4	4,000 SF	15	84
			TOTAL	**162**

ICE RINK BUILDING OCCUPANT LOAD CALCULATION PER CBC TABLE 1004.5				
ROOM	OCCUPANCY	AREA OR LENGTH	LOAD FACTOR	# OF OCCUPANTS
ICE RESURFACER ROOM	S-2	580 SF	300	2
LOBBY	A-4	3,780 SF	15	252
OFFICE	B	400 SF	150	3
SKATE STORAGE	B	82 SF	150	1
BREAK ROOM	B	100 SF	150	1
JANITOR	S-2	35 SF	300	1
VESTIBULE	A-4	120 SF	15	8
ICE ROOM	S-2	760 SF	300	3
ELEC.-MECH ROOM	S-2	427 SF	300	2
GIRL'S ROOM	A-4	55 SF	50	1
REF. ROOM	A-4	90 SF	50	2
LOCKER ROOM A	A-4	308 SF	50	7
LOCKER ROOM B	A-4	308 SF	50	7
LOCKER ROOM C	A-4	308 SF	50	7
LOCKER ROOM D	A-4	308 SF	50	7
SEATING AREA A	A-4	47'-4"	1'-6"	31
SEATING AREA B	A-4	42'-0"	1'-6"	28
SEATING AREA C	A-4	47'-4"	1'-6"	31
ICE RINK	A-4	17,013 SF	50	340
BACK OF HOUSE	S-2	675 SF	300	2
			TOTAL	736

TOTAL OCCUPANT LOAD	
OCCUPANCY	# OF OCCUPANTS
A-4	721
B	5
S-2	10
TOTAL	**736**

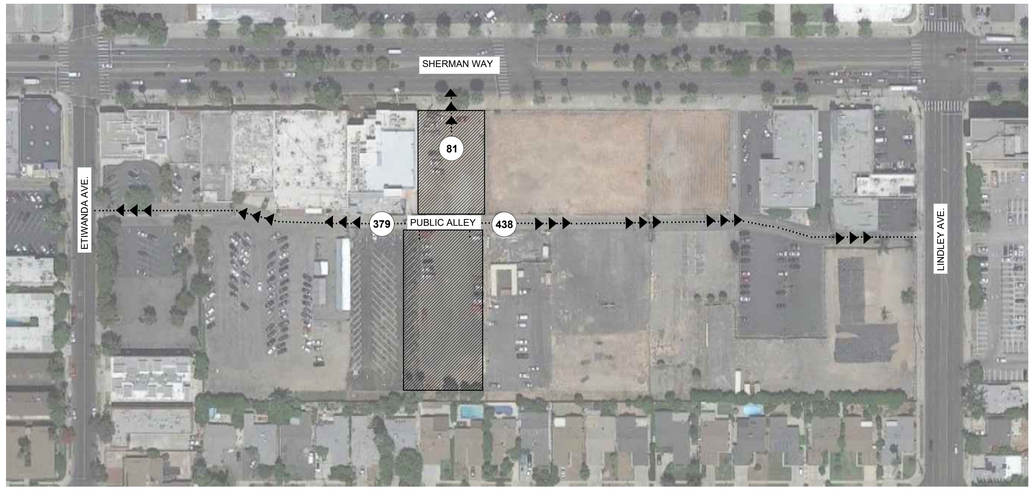
LEGEND

- EXIT DISCHARGE
- EGRESS ROUTE
- WALL MOUNTED EXIT SIGN
- PANIC HARDWARE
- 100 — OCCUPANT LOAD PER CBC TABLE 1004.5

EXIT LOAD CALCULATION				
EXIT	OCC. LOAD	CAPACITY FACTOR	MIN. CALCULATED OPENING	OPENING WIDTH PROVIDED
EXIT A1/A2	81	0.15" *	12 1/8"	34"
EXIT B**	307	0.15" *	46"	74" **
EXIT C***	2	0.15" *	3"	70" ***
EXIT D	224	0.15" *	33 1/2"	34"
EXIT E	191	0.15" *	28 3/4"	70"

□PER CBC 1005.3.2 EXCEPTION 1: "MEANS OF EGRESS CAPACITY FACTOR OF 0.15 INCH (3.8 MM) PER OCCUPANT IN BUILDINGS EQUIPPED THROUGHOUT WITH AN AUTOMATIC SPRINKLER SYSTEM'.
□□MAIN EXIT OF SUFFICIENT CAPACITY TO ACCOMMODATE NOT LESS THAN 1/2 OCCUPANT LOAD, PER CBC 1029.2. (736/2 X 0.15" = 55-1/4") □ 74".
□□□ADDITIONAL MEANS OF EGRESS WITH CAPACITY FOR NOT LESS THAN 1/2 OCCUPANT LOAD, PER CBC 1029.3. (736/2 X 0.15" = 55-1/4") □70".

NOTE A: PROVIDE SIGN " ICE RINK GATES SHALL REMAIN OPEN WHEN THE FACILITY IS USED BY THE PUBLIC."

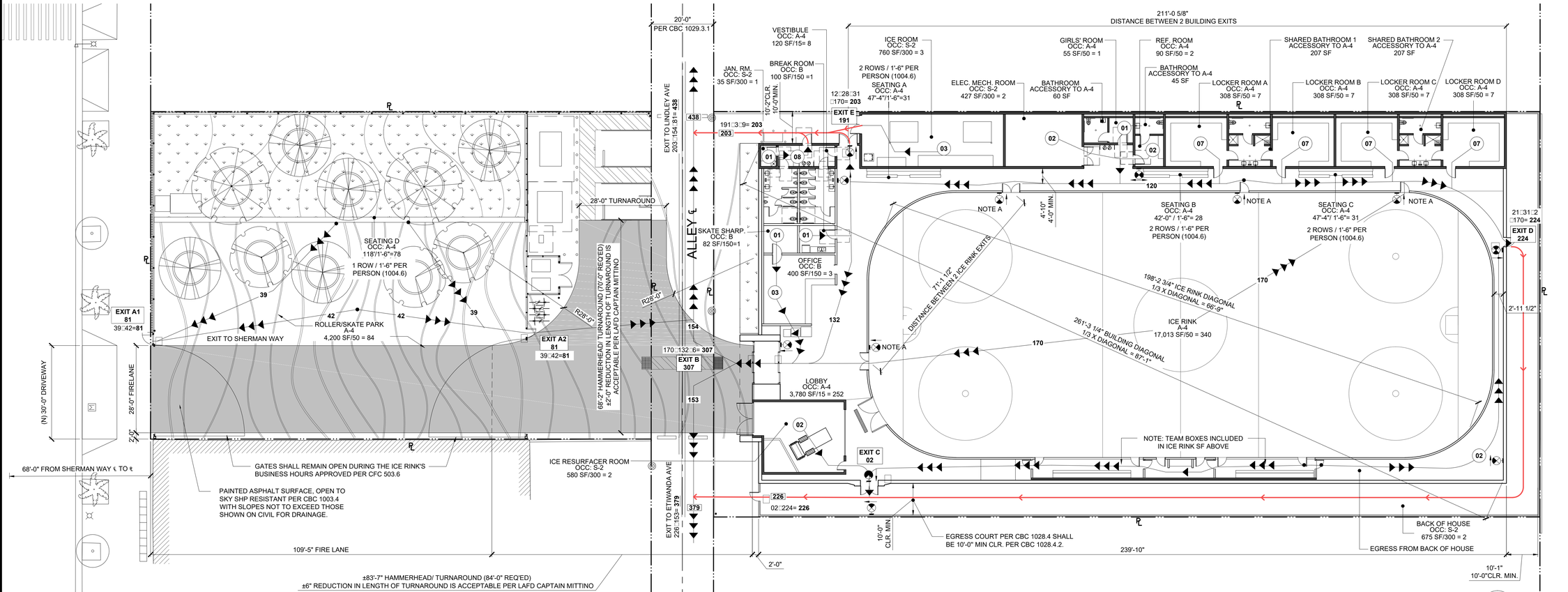


02

SITE PLAN EGRESS DIAGRAM

REF: --

SCALE: NTS



01

FIRST FLOOR/ SITE PLAN MEANS OF EGRESS/ FIRE LANE

REF: --

SCALE: 1/16"=1'-0"

N

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

LICENSED ARCHITECT
LAWRENCE SCARPA
C 21812
REN 10/31/2023
STATE OF CALIFORNIA

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED

BUREAU OF ENGINEERING
VERTICAL CONTROL:
HORIZONTAL CONTROL:
SHEET TITLE: EGRESS EXITING DIAGRAM & FIRE LANE
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

DEPARTMENT OF PUBLIC WORKS
NO. | REVISIONS: | DATE: | BY:
CIP NO.
INDEX NO.

CITY OF LOS ANGELES
GARY LEE MOORE, P.E. ENV SP
CITY ENGINEER
DESIGN GROUP:
ENGINEER:
DESIGNED BY:
DRAWN BY:
CHECKED BY:
APPROVED BY:
DATE:

WORK ORDER NO.
E170121B

SHEET NAME
A0.41
SHEET X OF X SHEETS

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REVISION DATES (DESIGN STAGE ONLY)

Sheet Version 4.0

Z:\B□S ARCHITECTURE\019 JOBS\01935.0 CITY OF LA-RESEDA ICE HOCKEY ROLLER RINK\01935.0 1.CURRENT DRAWINGS_24X36\01935.0_A041_24X36.DWG 12/3/2021 9:10 AM

EXITING NOTES:

1. COMMON PATH OF TRAVEL (75'-0" PER TABLE 1006.2.1 COMMON PATH OF EGRESS FOR 'A' OCCUPANCY. SECT. 1014.2 EGRESS MAY OCCUR THROUGH INTERVENING SPACES WHERE SPACES ARE ACCESSORY TO ONE ANOTHER AND CANNOT BE LOCKED TO PREVENT EGRESS)
2. EXIT ACCESS (250'-0" MAX. PER TABLE 1017.2, FOR 'A' OCC, W/ SPRINKLER SYSTEM, MOST RESTRICTIVE)
3. PER 1029.2, THE MAIN EXIT SHALL BE OF SUFFICIENT CAPACITY TO TO ACCOMMODATE NOT LESS THAN ONE HALF OF THE OCCUPANT LOAD, BUT SUCH CAPACITY SHALL BE NOT LESS THAN THE TOTAL REQUIRED CAPACITY OF ALL MEANS OF EGRESS LEADING TO THE EXIT.
4. ALL FIRE RATED DOORS SHALL BE SELF OR AUTOMATIC CLOSING.
5. SIZES & DISTRIBUTION OF PORTABLE FIRE EXTINGUISHERS DESIGNED FOR PRIMARILY CLASS A FIRE HAZARDS, PER CBC 906.3.1
6. LOCATIONS OF PORTABLE FIRE EXTINGUISHERS SHOWN TO COMPLY WITH LIGHT HAZARD OCCUPANCY PER CBC T906.3(1)

FIRE PROTECTION NOTES:

1. THIS BUILDING MUST BE EQUIPPED WITH AN AUTOMATIC FIRE EXTINGUISHING SYSTEM, COMPLYING WITH NFPA 13□THE SPRINKLER SYSTEM SHALL BE APPROVED BY PLUMBING DIV. PRIOR TO INSTALLATION.
2. AN APPROVED FIRE ALARM SYSTEM INSTALLED IN ACCORDANCE WITH THE PROVISIONS OF THIS CODE AND NFPA 72 SHALL BE PROVIDED IN NEW BUILDINGS AND STRUCTURES IN ACCORDANCE WITH SECTIONS 907.2.1 THROUGH 907.2.23 AND PROVIDE OCCUPANT NOTIFICATION IN ACCORDANCE WITH SECTION 907.5

LEGEND

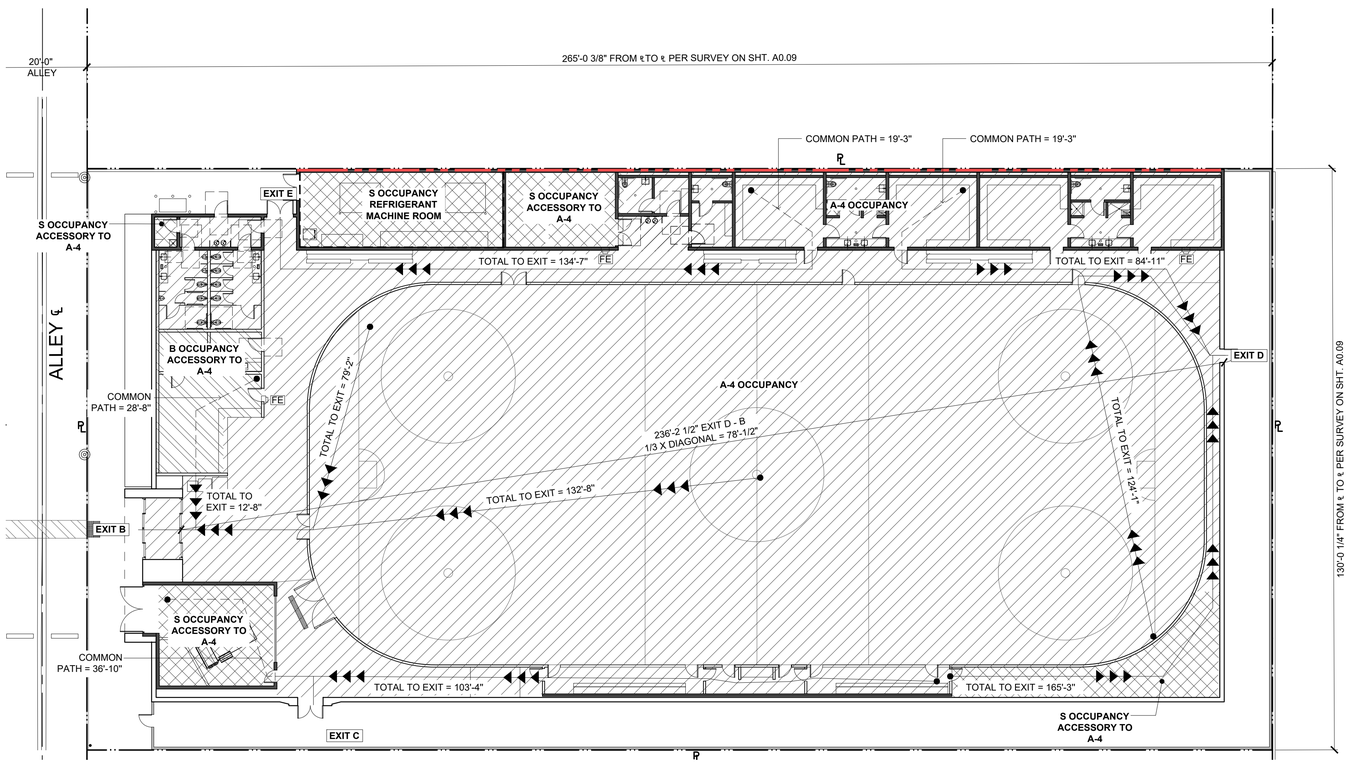
TOTAL TO EXIT = #	EXIT ACCESS TRAVEL DISTANCE
▶▶▶	EXIT ACCESS
- - - -→	COMMON PATH OF TRAVEL
——→	EXIT DISCHARGE
●	MOST REMOTE POINT FOR EGRESS
	WALL MOUNTED EXIT SIGN
FE	FIRE EXTINGUISHER

TOTAL BUILDING AREA= 27,572 □ 38,000 ALLOWED PER TABLE 506.2 FOR TYPE II-B, OCCUPANCY A-4.

PER CBC 508.2.3 AGGREGATE ACCESSORY B □ S OCCUPANCIES= 2,650 SF □2,752 SF (10% x 27,572). PER CBC 508.2.4 NO OCCUPANCY SEPARATION IS REQUIRED.

WALL LEGEND

	1-HOUR RATED EXTERIOR WALL PER CBC TABLE 602
	1-HOUR SEPARATION AND/OR PROTECTION PER CBC TABLE 509 (REFRIGERANT MACHINE ROOM.)
	CMU- TYPE II-B STRUCTURE



FIRE RATED WALL DIAGRAM/ OCCUPANCY SEPARATIONS & EXIT ACCESS TRAVEL DISTANCE

01

REF: A0.41 SCALE: 1/16" = 1'-0"

N

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REVISION DATES (DESIGN STAGE ONLY)

Sheet Version 4.0

Z:\B□S ARCHITECTURE\019 JOBS\01935.0 CITY OF LA-RESEDA ICE HOCKEY ROLLER RINK\01935.0 1.CURRENT DRAWINGS_24X36\01935.0_A042_24X36.DWG 12/3/2021 9:10 AM

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

LICENSED ARCHITECT
LAWRENCE SCARPA
C 21812
REN 10/31/2023
STATE OF CALIFORNIA

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED •

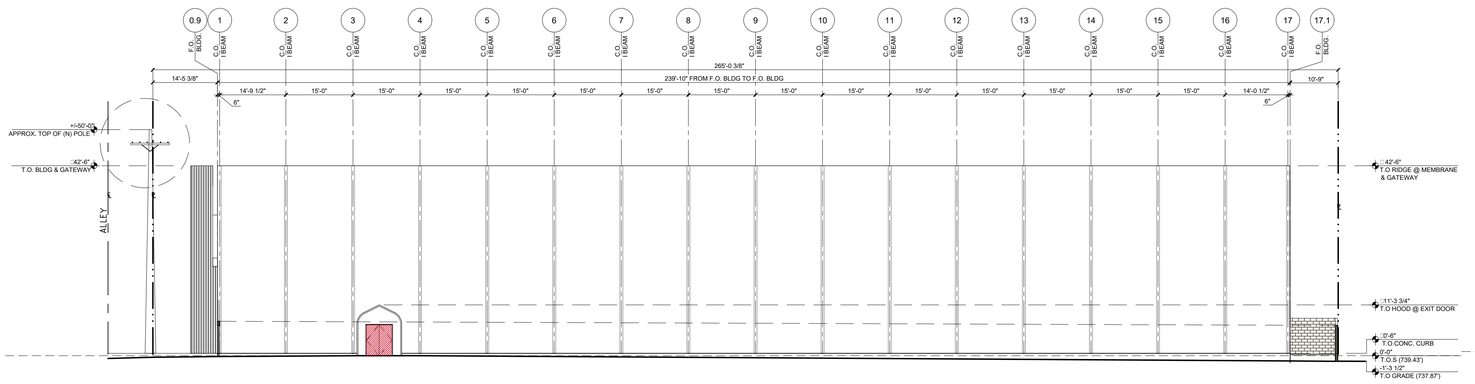
BUREAU OF ENGINEERING
VERTICAL CONTROL:
HORIZONTAL CONTROL:
SHEET TITLE: FIRE RATED WALL & EXIT ACCESS TRAVEL
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

DEPARTMENT OF PUBLIC WORKS
NO. | REVISIONS | DATE | BY:
CIP NO.
INDEX NO.

CITY OF LOS ANGELES
GARY LEE MOORE, P.E. ENV SP — CITY ENGINEER
DESIGN GROUP: — DATE:
ENGINEER:
DESIGNED BY:
DRAWN BY:
CHECKED BY:
APPROVED BY:

WORK ORDER NO.
E170121B

SHEET NAME
A0.42
SHEET X OF X SHEETS



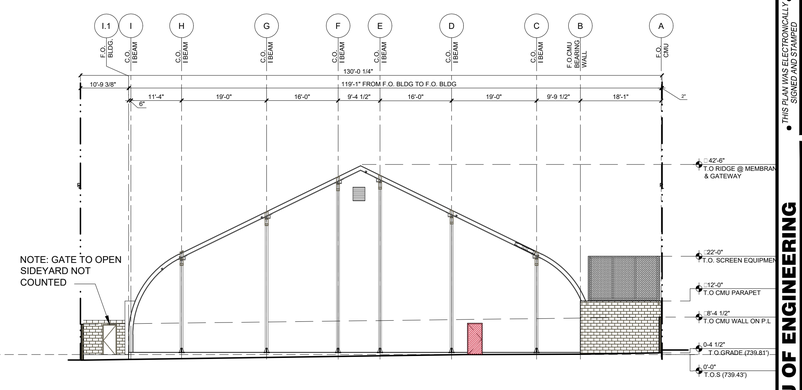
OPENINGS PER FLOOR							
	OPENINGS (SF)	/	TOTAL AREA (SF)	=	% OPEN	≥ x ≤	% ALLOWED
MEMBRANE STRUCTURE	42	/	14,500	=	0.2	□	45

PER TABLE 705.8, UNPROTECTED, SPRINKLERED BUILDING AT 10' TO LESS THAN 15'

NOTE: HOOD CONSTRUCTION AROUND THE DOOR AND THE DOOR ON THE WEST ELEVATION PROJECT ABOUT 10" FROM THE BUILDING WALL. PROJECTION SHALL COMPLY WITH CBC SECTION 705.2.

WEST ELEVATION 05

REF: 02/A2.01 SCALE: 1/16" = 1'-0"

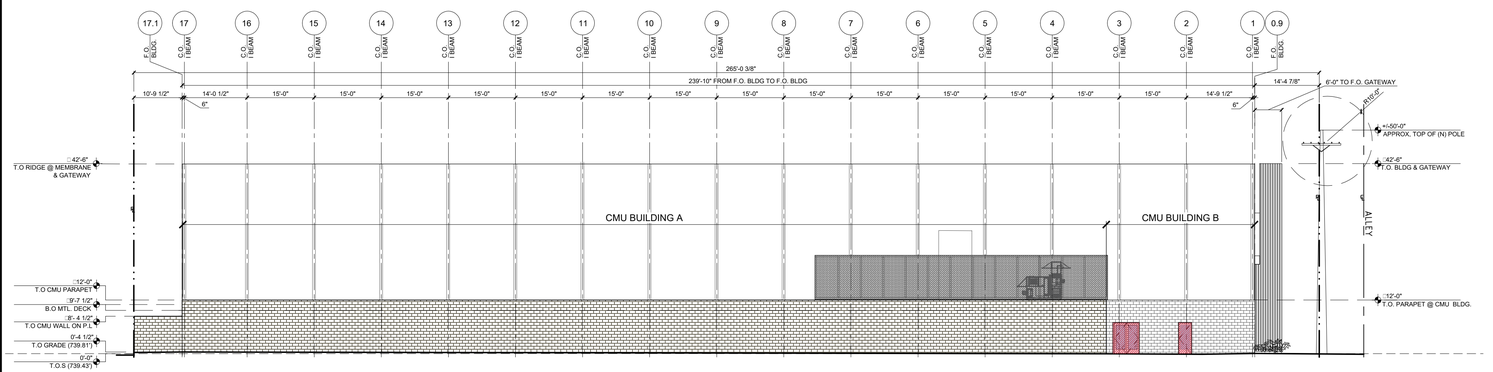


OPENINGS PER FLOOR							
	OPENINGS (SF)	/	TOTAL AREA (SF)	=	% OPEN	≥ x ≤	% ALLOWED
MEMBRANE STRUCTURE	21	/	2,900	=	0	□	45
CMU BUILDING	0	/	183	=	0	□	45

PER TABLE 705.8, UNPROTECTED, SPRINKLERED BUILDING AT 10' TO LESS THAN 15'

SOUTH ELEVATION 02

REF: 02/A2.00 SCALE: 1/16" = 1'-0"



OPENINGS PER FLOOR							
	OPENINGS (SF)	/	TOTAL AREA (SF)	=	% OPEN	≥ x ≤	% ALLOWED
MEMBRANE STRUCTURE	0	/	14,500	=	0	□	75[1]
CMU BUILDING A	0	/	2,075	=	0	□	NOT PERMITTED[2]
CMU BUILDING B	63	/	330	=	19	□	45[3]

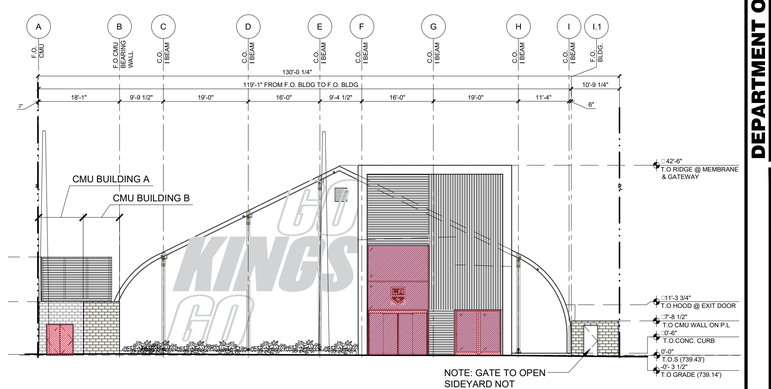
[1] PER TABLE 705.8, UNPROTECTED, SPRINKLERED BUILDING AT 15' TO LESS THAN 20'.

[2] PER TABLE 705.8, UNPROTECTED, SPRINKLERED BUILDING AT 0' TO LESS THAN 3'.

[3] PER TABLE 705.8, UNPROTECTED, SPRINKLERED BUILDING AT 10' TO LESS THAN15'.

EAST ELEVATION 04

REF: 01/A2.01 SCALE: 1/16" = 1'-0"



OPENINGS PER FLOOR							
	OPENINGS (SF)	/	TOTAL AREA (SF)	=	% OPEN	≥ x ≤	% ALLOWED
MEMBRANE STRUCTURE	480	/	2,900	=	16	□	UNLIMITED□
CMU BUILDING A	42	/	100	=	42	□	UNLIMITED□
CMU BUILDING B	0	/	83	=	0	□	UNLIMITED□

□PER TABLE 705.8, UNPROTECTED, SPRINKLERED BUILDING AT 20' TO LESS THAN 25'.

□PER TABLE 705.8, UNPROTECTED, SPRINKLERED BUILDING AT 30' OR GREATER

NOTE: FIRE SEPARATION DISTANCE MEASURED FROM THE CENTER LINE OF THE ALLEY, FOR NORTH ELEVATION OPENINGS.

NORTH ELEVATION 01

REF: 01/A2.00 SCALE: 1/16" = 1'-0"

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

LICENSED ARCHITECT
LAWRENCE SCARPA
C 21812
REN 10/31/2023
STATE OF CALIFORNIA

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED •

BUREAU OF ENGINEERING

VERTICAL CONTROL:
HORIZONTAL CONTROL:
SHEET TITLE: ALLOWABLE OPENINGS
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

DEPARTMENT OF PUBLIC WORKS

NO.	REVISIONS:	DATE:	BY:

CIP NO.

INDEX NO.

CITY OF LOS ANGELES

GARY LEE MOORE, P.E. ENV SP
DESIGN GROUP

CITY ENGINEER
DATE:
ENGINEER:
DESIGNED BY:
DRAWN BY:
CHECKED BY:
APPROVED BY:

WORK ORDER NO.
E170121B

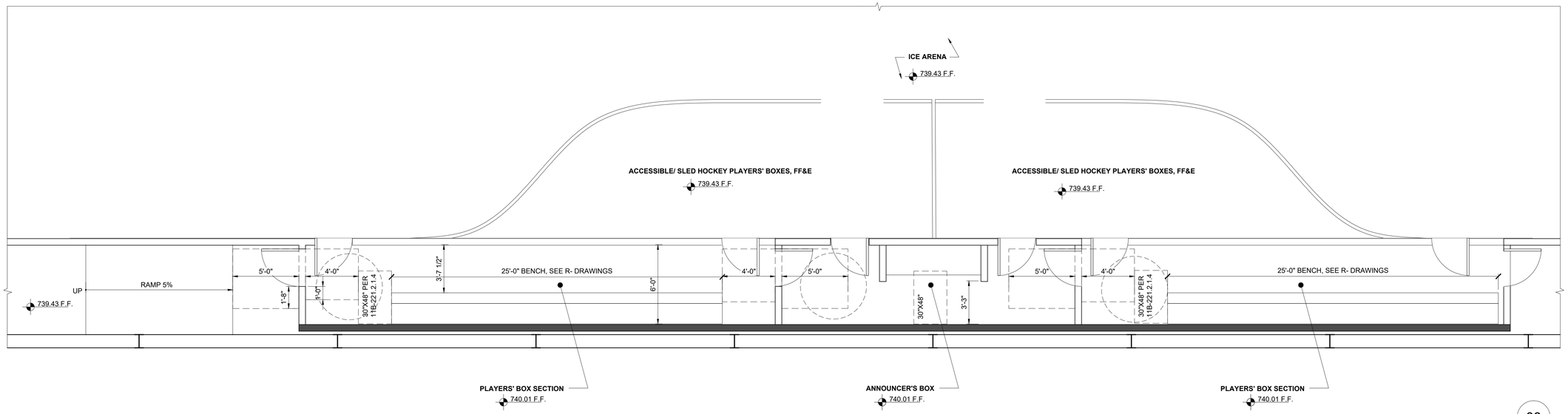
SHEET NAME
A0.43
SHEET X OF X SHEETS

REVISION DATES (DESIGN STAGE ONLY)

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

Sheet Version 4.0

Z:\B□S ARCHITECTURE\019 JOBS\01935.0 CITY OF LA-RESEDA ICE HOCKEY ROLLER RINK\01935.0 1.CURRENT DRAWINGS_24X36\01935.0_A043_24X36.DWG 12/3/2021 9:11 AM

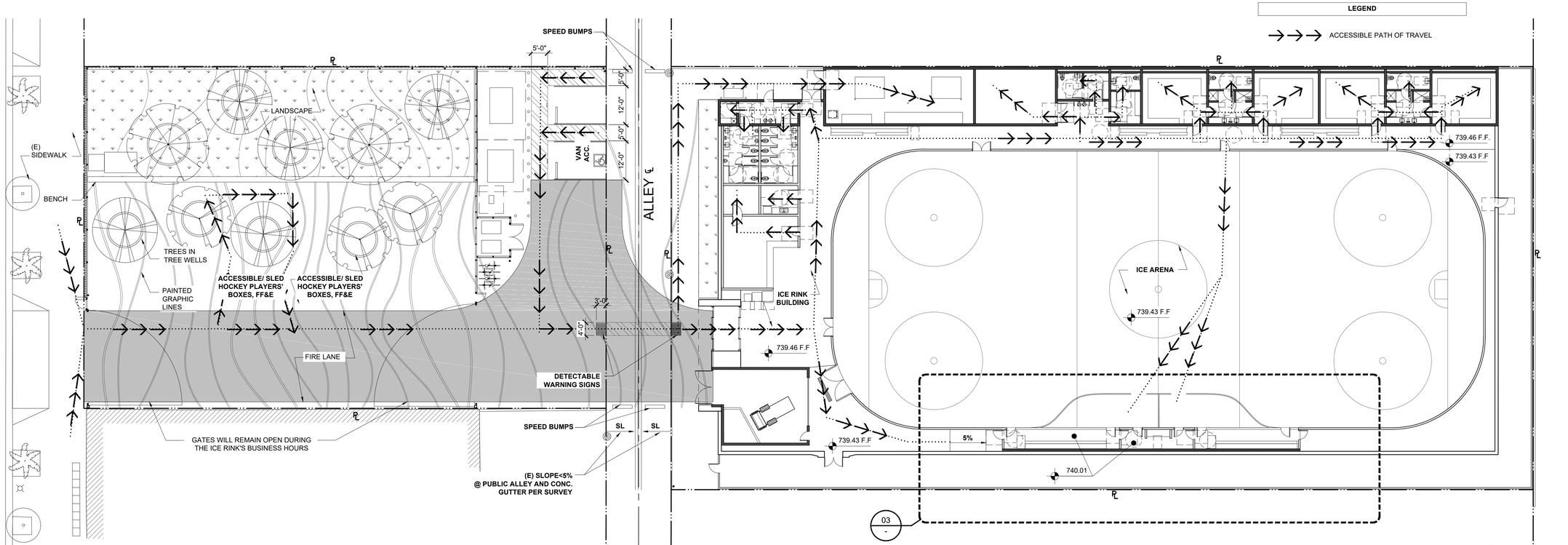


03

TEAMS' BOXES ENLARGED PLAN

REF: 01/-

SCALE: 1/4" = 1'-0"



01

ACCESSIBLE PATH OF TRAVEL DIAGRAM

REF: A1.00

SCALE: 1/16" = 1'-0"

N

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

LICENSED ARCHITECT
LAWRENCE SCARPA
C 21812
REN 10/31/2023
STATE OF CALIFORNIA

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED •

BUREAU OF ENGINEERING

VERTICAL CONTROL:
HORIZONTAL CONTROL:

SHEET TITLE: ACCESSIBLE PATH OF TRAVEL

PROJECT: RESEDA SKATE FACILITY

ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

DEPARTMENT OF PUBLIC WORKS

NO.	REVISIONS:	DATE:	BY:

CIP NO.

INDEX NO.

CITY OF LOS ANGELES

CITY ENGINEER: GARY LEE MOORE, P.E. ENV SP — DATE:

DESIGN GROUP

ENGINEER:
DESIGNED BY:
DRAWN BY:
CHECKED BY:
APPROVED BY:

WORK ORDER NO.
E170121B

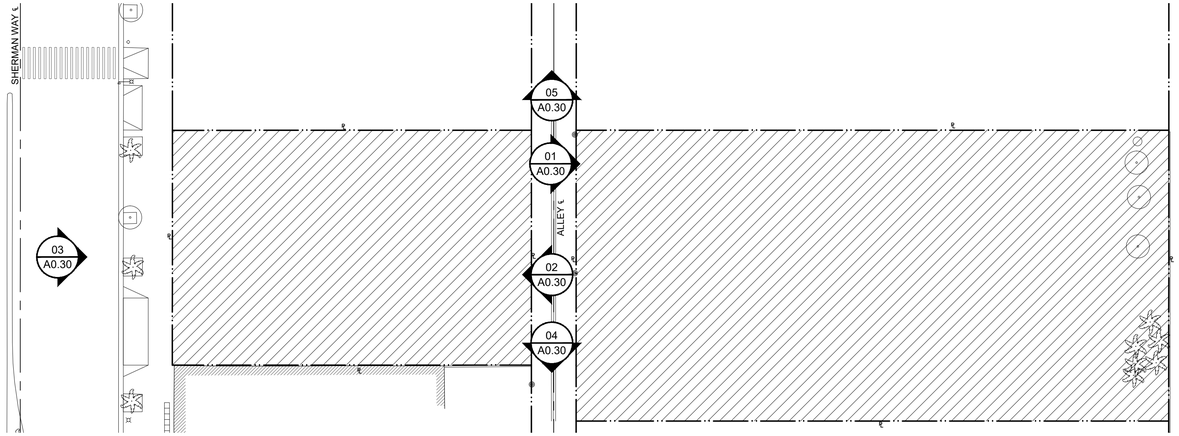
SHEET NAME
A0.50
SHEET X OF X SHEETS

REVISION DATES (DESIGN STAGE ONLY)

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

Sheet Version 4.0

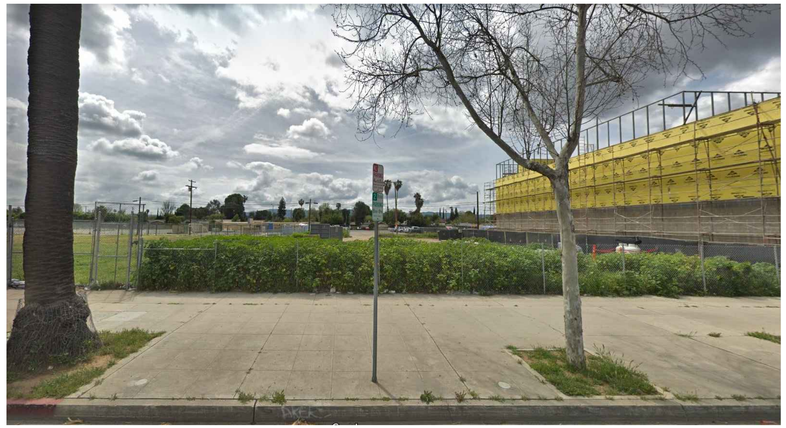
Z:\B□S ARCHITECTURE\019 JOBS\01935.0 CITY OF LA-RESEDA ICE HOCKEY ROLLER RINK\01935.0 1.CURRENT DRAWINGS_24X36\01935.0_A0.50_24X36.DWG 12/3/2021 9:11 AM



KEY SITE PLAN 06

REF: A1.00 SCALE: 1/32" = 1'-0"

N



NORTH LOT VIEW FROM SHERMAN WAY 03

REF: 06/- SCALE: N/A

VIEW OF THE TWO LOTS FROM THE ALLEY FACING EAST 05

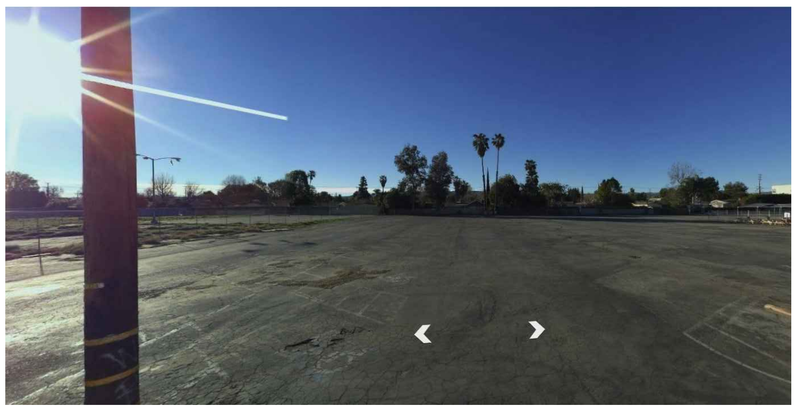
REF: 06/- SCALE: N/A

NORTH LOT VIEW FROM THE ALLEY 02

REF: 06/- SCALE: N/A

VIEW OF THE TWO LOTS FROM THE ALLEY FACING WEST 04

REF: 06/- SCALE: N/A



SOUTH LOT VIEW FROM THE ALLEY 01

REF: 06/- SCALE: N/A

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REVISION DATES (DESIGN STAGE ONLY)

Sheet Version 4.0

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED •

LICENSED ARCHITECT
LAWRENCE SUARA
C 21812
REN 10/31/2023
STATE OF CALIFORNIA

DEPARTMENT OF PUBLIC WORKS
BUREAU OF ENGINEERING

VERTICAL CONTROL:
HORIZONTAL CONTROL:

SHEET TITLE: (E) SITE PHOTOS

PROJECT: RESEDA SKATE FACILITY

ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

NO.	REVISIONS:	DATE:	BY:

CIP NO.

INDEX NO.

CITY OF LOS ANGELES

GARY LEE MOORE, P.E. ENV SP CITY ENGINEER

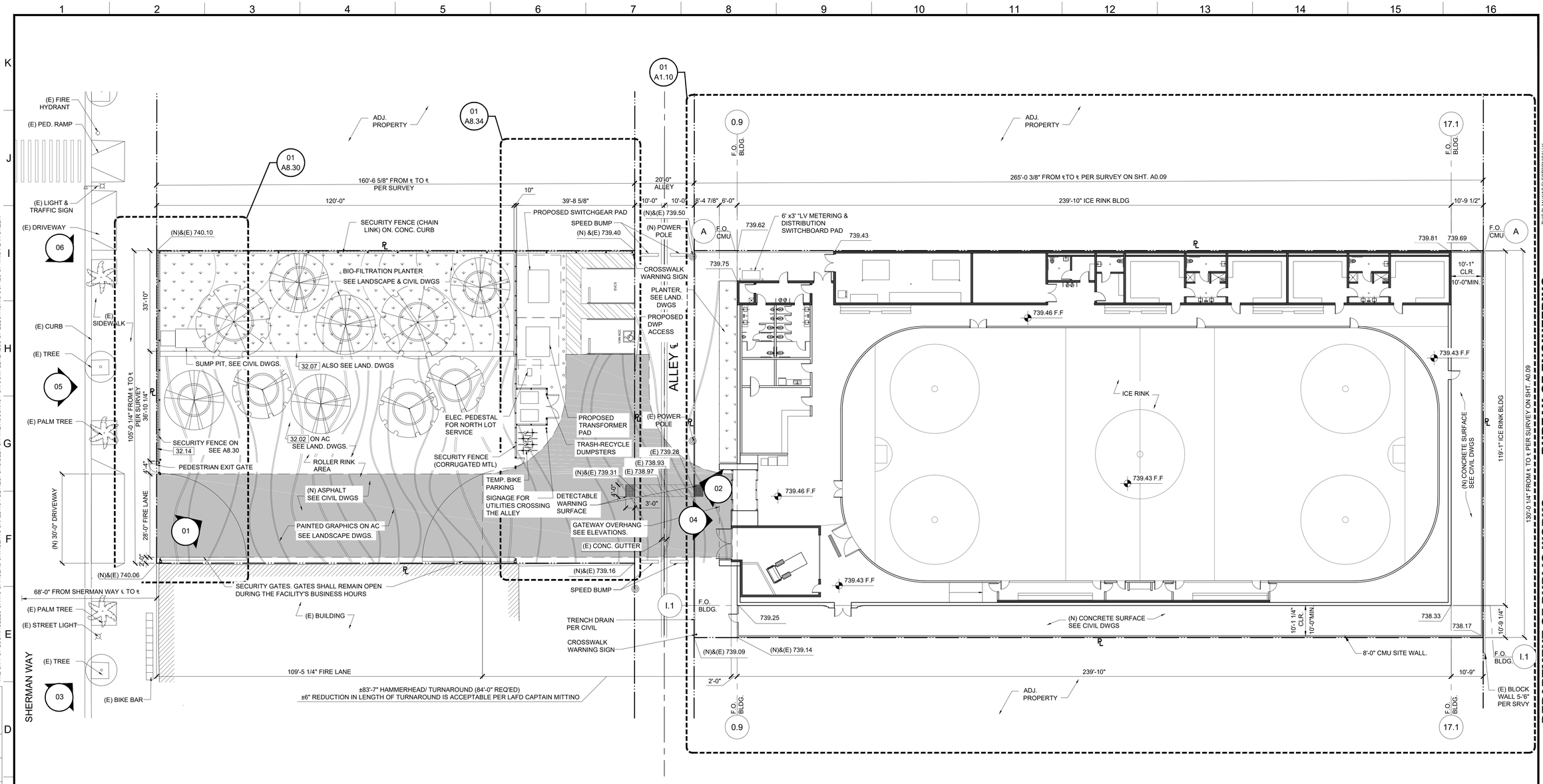
DESIGN GROUP DATE:

ENGINEER:
DESIGNED BY:
DRAWN BY:
CHECKED BY:
APPROVED BY:

WORK ORDER NO.
E170121B

SHEET NAME
A0.90
SHEET X OF X SHEETS

Z:\B□S ARCHITECTURE\019 JOBS\01935.0 CITY OF LA-RESEDA ICE HOCKEY ROLLER RINK\01935.0 1.CURRENT DRAWINGS_24X36\01935.0_A090_24X36.DWG 12/3/2021 9:11 AM



NOTES:
1. ALL ELEVATION BUBBLES 01 ON THIS SHEET REFER TO SHEET A0.02 3D MODEL IMAGES. SEE A2.00 & A2.01 FOR TECHNICAL ELEVATIONS THAT ARE CROSS-REFERENCED ON PLANS.

2. ELEVATIONS @ CORNER OF PROPERTY AND DIMENSIONS NOT SHOWN ON SURVEY ARE EXTRAPOLIATED FROM SURVEY. CONTRACTOR SHALL VERIFY ALL PROPERTY DIMENSIONS, CORNERS AND ELEVATIONS W/ SURVEYING EQUIPMENT PRIOR TO BEGINING CONSTRUCTION AND NOTIFY ARCHITECT OF ANY DISCREPANCY OF (E) ELEVATIONS OR (E) PROPERTY DIMENSIONS. ARCHITECT SHALL BE COMPENSATED BY OWNER FOR ANY CHANGES DUE TO INCOMPLETE SURVEY.

SITE PLAN 01

REF: SURVEY, A0.09, A0.30, A0.41,A0.50 SCALE: 1/16" = 1'-0"

N

KEYNOTES

NOTE: ITEMS IDENTIFIED ARE TYPICAL TO ALL LIKE ITEMS UNLESS NOTED OTHERWISE.

01 - GENERAL REQUIREMENTS
02 - NOT USED

03 - CONCRETE
3.01 CONC. SLAB ON GRADE PER STRUCT'L.
3.02 CONC. O/MTL. DECK PER STRUCT'L.
3.03 CONC. CURB
3.04 CONC. FOOTING PER STRUCT'L.
3.05 CONC. PAVING PER CIVIL DWGS.
3.06 CONC. SIDEWALK PER CIVIL DWGS.
3.07 CONC. PAD

04 - MASONRY
4.01 CMU BLDNG. WALL
4.02 CMU SITE WALL W/ 2" CMU CAP.

05 - METALS
5.01 STL. COLUMN PER STRUCT'L. PTD.
5.02 STL. BEAM PER STRUCT'L. PTD.
5.03 HSS POST PER STRUCT'L. PTD.
5.04 HSS BEAM PER STRUCT'L. PTD.
5.05 MEMBRANE STRUCTURE I BEAM.
5.06 MTL. DECK.
5.07 MTL. GUARD RAILING.
5.08 MTL. STUD WALL.

06 - WOOD AND PLASTICS

07 - THERMAL & MOISTURE PROTECTION
7.01 W.P. MEMBRANE PER DETL. & SPECS.
7.02 SINGLE PLY PVC ROOFING PER SPECS.
7.03 R-21 RIGID INSULATION @ WALLS.
7.04 UNDERSLAB MOISTURE VAPOR BARRIER.
7.05 ROOF DRAIN AND OVERFLOW.
7.06 CLEAR WATER-REPELLENT GRAFITTI COATING AT CMU WALL. (ALL EXPOSED SURFACES).
7.07 BATT INSULATION.

08 - OPENINGS (SEE DOOR/WINDOW SCHED)
8.01 STL. DOOR. & FRAME, PAINTED.
8.02 CLR. ANODIZED ALUM. STOREFRONT DOOR.
8.03 CLR. ANODIZED ALUM. STOREFRONT WINDOW.
8.04 DOOR HARDWARE SET PER SCHED.
8.05 EXTERIOR WALL LOUVER.
8.06 EXTERIOR WALL VENT WITH CAP.
8.07 ROLLING STL. DOOR & FRAME.
8.08 ICE RINK GATES
8.09 OVERHEAD GLASS DOOR.
8.10 ACCESS PANEL, COLOR TO MATCH ADJACENT MATERIAL.
8.11 ROOF ACCESS HATCH.

09 - FINISHES (SEE FIN. SCHED)
9.01 5/8" TYPE 'X' GYP. BD., PROVIDE 'WET RATED' AT BATHROOMS, PAINT.
9.02 CONC. FLR. SEAL PER FIN. SCHED.
9.03 RUBBER FLR. PER SPECS.
9.04 PAINT PER SPECS.
9.05 REVEAL PER DETAILS.
9.06 GRAFITTI COATING, TYP. @ ALL EXTERIOR SOLID WALLS.
9.07 GLAZED FINISH ON CMU.
9.08 CERAMIC TILE.

10 - SPECIALTIES
10.01 MIRROR PER SPECS.
10.02 SIGNAGE.
10.03 TOILET PAPER ROLL HOLDER PER ACCESSORY SCHED.
10.04 GRAB BAR.
10.05 COAT HOOK.
10.06 WASTE RECEPTACLE.
10.07 FOLDING SHOWER SEAT.
10.08 SHOWER ROD.
10.09 SHELF.
10.10 NETTING. NIC
10.11 FIRE EXTINGUISHER. RECESSED CABINET
10.12 TOILET SEAT COVER DISPENSER.
10.13 PAPER TOWEL DISPENSER.
10.14 BATHROOM PARTITION W/ ROBE HOOK @ EA. DOOR

11 - EQUIPMENT/APPLIANCES (SEE EQMT. SCHED)

12 - FURNISHINGS
12.01 BICYCLE RACKS FOR SHORT-TERM BIKE PARKING.
12.02 DASHERBOARDS. NIC.
12.03 BENCH. NIC.
12.04 BLEACHERS. NIC.
12.05 SCOREBOARD. NIC.
12.06 SKATE RACKS. NIC.

13 - SPECIAL CONSTRUCTION
13.01 MEMBRANE STRUCTURE.

14 - CONVEYING EQUIPMENT (NOT USED)

21 - FIRE SUPPRESSION
21.01 FIRE EXTINGUISHER.
21.02 FIRE SPRINKLER HORIZ. MAIN (SEE DIAGRAM)
21.03 FIRE SPRINKLER VALVE ASSEMBLY
21.04 FIRE DEPT. MAIN CONNECTION @ FRONT OF PROJECT. LAFD SHALL APPROVE FINAL LOCATION.
21.05 FIRE SPRINKLER HEAD.

22 - PLUMBING
22.01 WATER CLOSET PER PLUMBING LEGEND
22.02 LAV. SINK & FAUCET. PER PLUMBING LEGEND
22.03 JANITOR MOP SINK.
22.04 PLUMBING VENT PIPE.
22.05 DRINKING FOUNTAIN.
22.06 ULTRA LOW-FLOW TOILET.
22.07 SHOWER HEAD/ CONTROLS.
22.08 SHOWER DRAIN.
22.09 AREA DRAIN.
22.10 HOSE BIB.

23 - HEATING, VENTILATING, AND AIR-CONDITIONING
23.01 HVAC UNIT PER MECH.
23.02 AIR REGISTER WALL MOUNTED.
23.03 CEILING AIR REGISTER.
23.04 MAKE UP AIR LOUVER PER MECH. DWGS
23.05 BATHRM EXHAUST FAN PER SPECS.
23.06 BATHRM EXHAUST DUCT.
23.07 MECH. DUCT.
23.08 MECH. EQUIPMENT.

26 - ELECTRICAL
26.01 ELEC. PANEL PER PLANS & SCHED.
26.02 EXTERIOR LIGHT PER SCHED.
26.03 INTERIOR LIGHT PER SCHED.

27 - COMMUNICATION

28 - ELECTRONIC SAFETY AND SECURITY
28.01 SMOKE ALARM.
28.02 SECURITY CAMERA.
28.03 FIRE ALARM MAIN PANEL.

31 - EARTHWORK
31.01 APPROVED COMPACT FILL PER GEO & SOIL ENGINEER REPORT.

32 - EXTERIOR IMPROVEMENTS
32.01 ASPHALT PAVING PER CIVIL.
32.02 GRAPHICS/PAINT.SEE LAND. DWGS.
32.03 STORMWATER MANAGEMENT PER CIVIL DWGS.
32.04 STL. SECURITY GATE, PTD.
32.05 STL. SECURITY FENCE, PTD.
32.06 EXTERIOR AREA DRAINS.
32.07 BENCH.
32.08 TRENCH DRAIN.
32.09 TREE, SEE LANDSCAPE DWGS.
32.10 PLANTING, SEE LANDSCAPE DWGS.
32.11 (N) CONCRETE SIDEWALK, CURB, GUTTER PER CITY OF LA STANDARDS.
32.12 (N) CONC. APRON & DRIVEWAY CURB CUT PER CITY OF LA STANDARDS.
32.13 EQUIPMENT SCREEN.
32.14 CONC. WALL @ SITE FENCE.

33 - UTILITIES
33.01 WATER METER.
33.02 ELECTRICAL TRANSFORMER W/ BOLLARDS AS REQ'D.
33.03 ELECTRICAL METER.
33.04 POWER POLE.

REVISION DATES (DESIGN STAGE ONLY)

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

Sheet Version 4.0

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

LICENSED ARCHITECT
LAWRENCE SCARPA
C 21812
REN 10/31/2023
STATE OF CALIFORNIA

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED

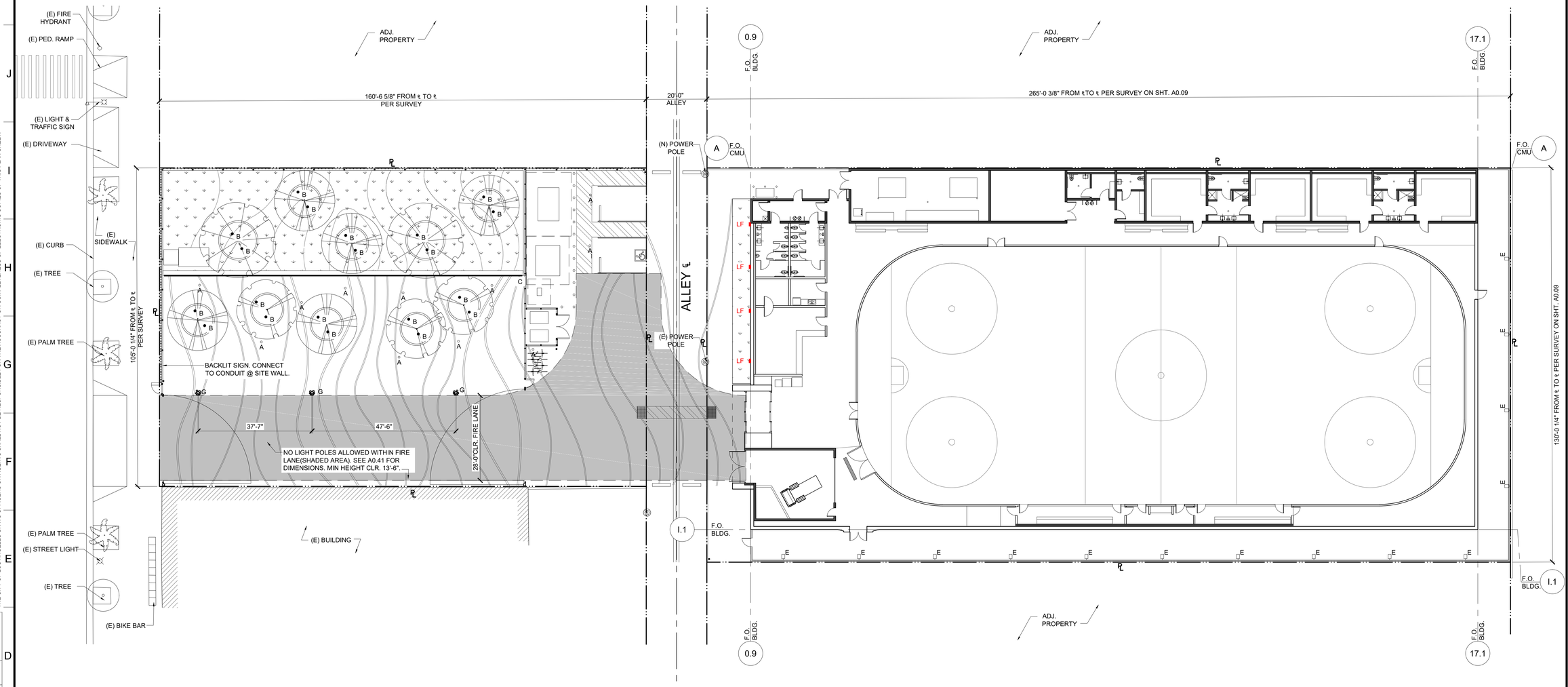
BUREAU OF ENGINEERING
VERTICAL CONTROL:
HORIZONTAL CONTROL:
SHEET TITLE: SITE PLAN
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

CITY OF LOS ANGELES
DEPARTMENT OF PUBLIC WORKS
GARY LEE MOORE, P.E., ENV SP
CITY ENGINEER
DESIGN GROUP*
ENGINEER:
DESIGNED BY:
DRAWN BY:
CHECKED BY:
APPROVED BY:
DATE:
NO. REVISIONS: BY: DATE:
CIP NO.
INDEX NO.

WORK ORDER NO.
E170121B

SHEET NAME
A1.00
SHEET X OF X SHEETS

Z:\B□S ARCHITECTURE\019 JOBS\01935.0 CITY OF LA-RESEDA ICE HOCKEY ROLLER RINK\01935.0 1.CURRENT DRAWINGS_24X36\01935.0_A100_24X36.DWG 12/3/2021 9:11 AM



NOTES:
1. SEE ELEC. DWGS AND SHEET A7.00 FOR SITE LIGHTING FIXTURE SCHEDULE.
2. FOR FIXTURES NOTED LF (SHOWN IN RED FOR CLARITY) SEE AUDIOVISUAL/ SPECIALTY SCHEDULE ON A7.00A.

SITE LIGHTING PLAN

01

REF: A1.00, A7.00, A7.00A

SCALE: 1/16" = 1'-0"

N

KEYNOTES

NOTE: ITEMS IDENTIFIED ARE TYPICAL TO ALL LIKE ITEMS UNLESS NOTED OTHERWISE.

01 - GENERAL REQUIREMENTS
02 - NOT USED

03 - CONCRETE
3.01 CONC. SLAB ON GRADE PER STRUCT'L.
3.02 CONC. O/MTL. DECK PER STRUCT'L.
3.03 CONC. CURB
3.04 CONC. FOOTING PER STRUCT'L.
3.05 CONC. PAVING PER CIVIL DWGS.
3.06 CONC. SIDEWALK PER CIVIL DWGS.
3.07 CONC. PAD

04 - MASONRY
4.01 CMU BLDNG. WALL
4.02 CMU SITE WALL W/ 2" CMU CAP.

05 - METALS
5.01 STL. COLUMN PER STRUCT'L. PTD.
5.02 STL. BEAM PER STRUCT'L. PTD.
5.03 HSS POST PER STRUCT'L. PTD.
5.04 HSS BEAM PER STRUCT'L. PTD.
5.05 MEMBRANE STRUCTURE I BEAM.
5.06 MTL. DECK.
5.07 MTL. GUARD RAILING.
5.08 MTL. STUD WALL.

06 - WOOD AND PLASTICS

07 - THERMAL & MOISTURE PROTECTION
7.01 W.P. MEMBRANE PER DETL. & SPECS.
7.02 SINGLE PLY PVC ROOFING PER SPECS.
7.03 R-21 RIGID INSULATION @ WALLS.
7.04 UNDERSLAB MOISTURE VAPOR BARRIER.
7.05 ROOF DRAIN AND OVERFLOW.
7.06 CLEAR WATER-REPELLENT GRAFITTI COATING AT CMU WALL. (ALL EXPOSED SURFACES).
7.07 BATT INSULATION.

08 - OPENINGS (SEE DOOR/WINDOW SCHED)
8.01 STL. DOOR. & FRAME, PAINTED.
8.02 CLR. ANODIZED ALUM. STOREFRONT DOOR.
8.03 CLR. ANODIZED ALUM. STOREFRONT WINDOW.
8.04 DOOR HARDWARE SET PER SCHED.
8.05 EXTERIOR WALL LOUVER.
8.06 EXTERIOR WALL VENT WITH CAP.
8.07 ROLLING STL. DOOR & FRAME.
8.08 ICE RINK GATES
8.09 OVERHEAD GLASS DOOR.
8.10 ACCESS PANEL, COLOR TO MATCH ADJACENT MATERIAL.
8.11 ROOF ACCESS HATCH.

09 - FINISHES (SEE FIN. SCHED)
9.01 5/8" TYPE 'X' GYP. BD., PROVIDE 'WET RATED' AT BATHROOMS. PAINT.
9.02 CONC. FLR. SEAL PER FIN. SCHED.
9.03 RUBBER FLR. PER SPECS.
9.04 PAINT PER SPECS.
9.05 REVEAL PER DETAILS.
9.06 GRAFITTI COATING, TYP. @ ALL EXTERIOR SOLID WALLS.
9.07 GLAZED FINISH ON CMU.
9.08 CERAMIC TILE.

10 - SPECIALTIES
10.01 MIRROR PER SPECS.
10.02 SIGNAGE.
10.03 TOILET PAPER ROLL HOLDER PER ACCESSORY SCHED.
10.04 GRAB BAR.
10.05 COAT HOOK.
10.06 WASTE RECEPTACLE.
10.07 FOLDING SHOWER SEAT.
10.08 SHOWER ROD.
10.09 SHELF.
10.10 NETTING. NIC
10.11 FIRE EXTINGUISHER. RECESSED CABINET
10.12 TOILET SEAT COVER DISPENSER.
10.13 PAPER TOWEL DISPENSER.
10.14 BATHROOM PARTITION W/ ROBE HOOK @ EA. DOOR

11 - EQUIPMENT/APPLIANCES (SEE EQMT. SCHED)

12 - FURNISHINGS
12.01 BICYCLE RACKS FOR SHORT-TERM BIKE PARKING.
12.02 DASHERBOARDS. NIC.
12.03 BENCH. NIC.
12.04 BLEACHERS. NIC.
12.05 SCOREBOARD. NIC.
12.06 SKATE RACKS. NIC.

13 - SPECIAL CONSTRUCTION
13.01 MEMBRANE STRUCTURE.

14 - CONVEYING EQUIPMENT (NOT USED)

21 - FIRE SUPPRESSION
21.01 FIRE EXTINGUISHER.
21.02 FIRE SPRINKLER HORIZ. MAIN (SEE DIAGRAM)
21.03 FIRE SPRINKLER VALVE ASSEMBLY
21.04 FIRE DEPT. MAIN CONNECTION @ FRONT OF PROJECT. LAFD SHALL APPROVE FINAL LOCATION.
21.05 FIRE SPRINKLER HEAD.

22 - PLUMBING
22.01 WATER CLOSET PER PLUMBING LEGEND
22.02 LAV. SINK & FAUCET. PER PLUMBING LEGEND
22.03 JANITOR MOP SINK.
22.04 PLUMBING VENT PIPE.
22.05 DRINKING FOUNTAIN.
22.06 ULTRA LOW-FLOW TOILET.
22.07 SHOWER HEAD/ CONTROLS.
22.08 SHOWER DRAIN.
22.09 AREA DRAIN.
22.10 HOSE BIB.

23 - HEATING, VENTILATING, AND AIR-CONDITIONING
23.01 HVAC UNIT PER MECH.
23.02 AIR REGISTER WALL MOUNTED.
23.03 CEILING AIR REGISTER.
23.04 MAKE UP AIR LOUVER PER MECH. DWGS
23.05 BATHRM EXHAUST FAN PER SPECS.
23.06 BATHRM EXHAUST DUCT.
23.07 MECH. DUCT.
23.08 MECH. EQUIPMENT.

26 - ELECTRICAL
26.01 ELEC. PANEL PER PLANS & SCHED.
26.02 EXTERIOR LIGHT PER SCHED.
26.03 INTERIOR LIGHT PER SCHED.

27 - COMMUNICATION

28 - ELECTRONIC SAFETY AND SECURITY
28.01 SMOKE ALARM.
28.02 SECURITY CAMERA.
28.03 FIRE ALARM MAIN PANEL.

31 - EARTHWORK
31.01 APPROVED COMPACT FILL PER GEO & SOIL ENGINEER REPORT.

32 - EXTERIOR IMPROVEMENTS
32.01 ASPHALT PAVING PER CIVIL.
32.02 GRAPHICS/PAINT.SEE LAND. DWGS.
32.03 STORMWATER MANAGEMENT PER CIVIL DWGS.
32.04 STL. SECURITY GATE, PTD.
32.05 STL. SECURITY FENCE, PTD.
32.06 EXTERIOR AREA DRAINS.
32.07 BENCH.
32.08 TRENCH DRAIN.
32.09 TREE, SEE LANDSCAPE DWGS.
32.10 PLANTING, SEE LANDSCAPE DWGS.
32.11 (N) CONCRETE SIDEWALK, CURB, GUTTER PER CITY OF LA STANDARDS.
32.12 (N) CONC. APRON & DRIVEWAY CURB CUT PER CITY OF LA STANDARDS.
32.13 EQUIPMENT SCREEN.
32.14 CONC. WALL @ SITE FENCE.

33 - UTILITIES
33.01 WATER METER.
33.02 ELECTRICAL TRANSFORMER W/ BOLLARDS AS REQ'D.
33.03 ELECTRICAL METER.
33.04 POWER POLE.

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REVISION DATES (DESIGN STAGE ONLY)

Sheet Version 4.0

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

LICENSED ARCHITECT
LAWRENCE SCARPA
C 21812
REN 10/31/2023
STATE OF CALIFORNIA

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED •

BUREAU OF ENGINEERING
VERTICAL CONTROL:
HORIZONTAL CONTROL:
SHEET TITLE: SITE LIGHTING PLAN
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

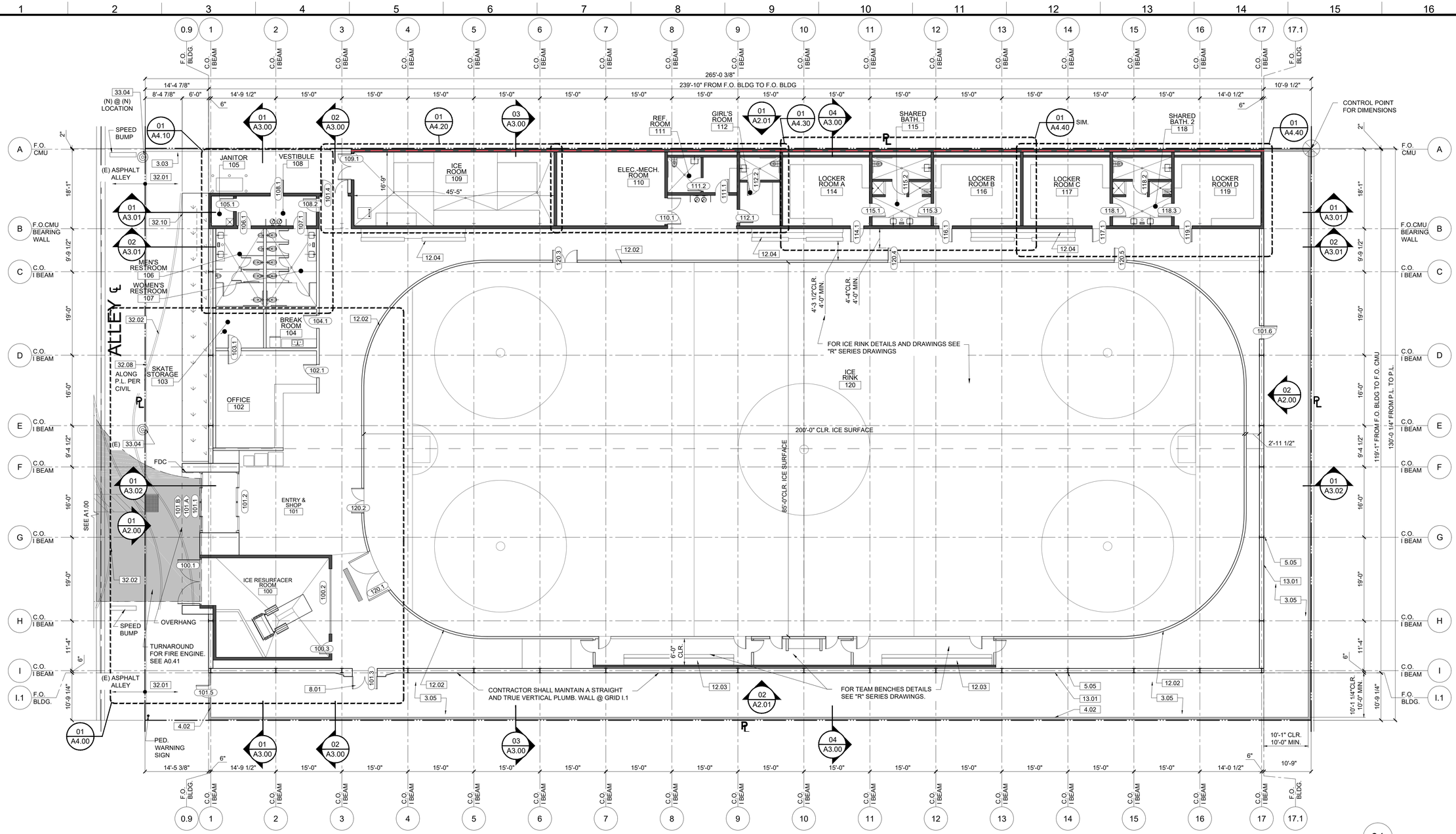
DEPARTMENT OF PUBLIC WORKS
NO. | REVISIONS | DATE: | BY:
CIP NO.
INDEX NO.

CITY OF LOS ANGELES
CITY ENGINEER
GARY LEE MOORE, P.E., ENV SP
DESIGN GROUP
DATE:
ENGINEER:
DESIGNED BY:
DRAWN BY:
CHECKED BY:
APPROVED BY:

WORK ORDER NO.
E170121B

SHEET NAME
A1.01
SHEET X OF X SHEETS

Z:\B□S ARCHITECTURE\019 JOBS\01935.0 CITY OF LA-RESEDA ICE HOCKEY ROLLER RINK\01935.0 1.CURRENT DRAWINGS_24X36\01935.0_A101_24X36.DWG 12/3/2021 9:12 AM



ICE RINK FLOOR PLAN

01

REF: A0.30, A0.50, A1.00, A1.10A, A1.11, A1.12

SCALE: 3/32" = 1'-0"

N

KEYNOTES

NOTE: ITEMS IDENTIFIED ARE TYPICAL TO ALL LIKE ITEMS UNLESS NOTED OTHERWISE.

01 - GENERAL REQUIREMENTS
02 - NOT USED

03 - CONCRETE
3.01 CONC. SLAB ON GRADE PER STRUCT'L.
3.02 CONC. O/MTL. DECK PER STRUCT'L.
3.03 CONC. CURB
3.04 CONC. FOOTING PER STRUCT'L.
3.05 CONC. PAVING PER CIVIL DWGS.
3.06 CONC. SIDEWALK PER CIVIL DWGS.
3.07 CONC. PAD

04 - MASONRY
4.01 CMU BLDNG. WALL
4.02 CMU SITE WALL W/ 2" CMU CAP.

05 - METALS
5.01 STL. COLUMN PER STRUCT'L. PTD.
5.02 STL. BEAM PER STRUCT'L. PTD.
5.03 HSS POST PER STRUCT'L. PTD.
5.04 HSS BEAM PER STRUCT'L. PTD.
5.05 MEMBRANE STRUCTURE I BEAM.
5.06 MTL. DECK.
5.07 MTL. GUARD RAILING.
5.08 MTL. STUD WALL.

06 - WOOD AND PLASTICS

07 - THERMAL & MOISTURE PROTECTION
7.01 W.P. MEMBRANE PER DETL. & SPECS.
7.02 SINGLE PLY PVC ROOFING PER SPECS.
7.03 R-21 RIGID INSULATION @ WALLS.
7.04 UNDERSLAB MOISTURE VAPOR BARRIER.
7.05 ROOF DRAIN AND OVERFLOW.
7.06 CLEAR WATER-REPELLENT GRAFITTI COATING AT CMU WALL. (ALL EXPOSED SURFACES).
7.07 BATT INSULATION.

08 - OPENINGS (SEE DOOR/WINDOW SCHED)
8.01 STL. DOOR & FRAME, PAINTED.
8.02 CLR. ANODIZED ALUM. STOREFRONT DOOR.
8.03 CLR. ANODIZED ALUM. STOREFRONT WINDOW.
8.04 DOOR HARDWARE SET PER SCHED.
8.05 EXTERIOR WALL LOUVER.
8.06 EXTERIOR WALL VENT WITH CAP.
8.07 ROLLING STL. DOOR & FRAME.
8.08 ICE RINK GATES
8.09 OVERHEAD GLASS DOOR.
8.10 ACCESS PANEL, COLOR TO MATCH ADJACENT MATERIAL.
8.11 ROOF ACCESS HATCH.

09 - FINISHES (SEE FIN. SCHED)
9.01 5/8" TYPE 'X' GYP. BD., PROVIDE 'WET RATED' AT BATHROOMS. PAINT.
9.02 CONC. FLR. SEAL PER FIN. SCHED.
9.03 RUBBER FLR. PER SPECS.
9.04 PAINT PER SPECS.
9.05 REVEAL PER DETAILS.
9.06 GRAFITTI COATING, TYP. @ ALL EXTERIOR SOLID WALLS.
9.07 GLAZED FINISH ON CMU.
9.08 CERAMIC TILE.

10 - SPECIALTIES
10.01 MIRROR PER SPECS.
10.02 SIGNAGE.
10.03 TOILET PAPER ROLL HOLDER PER ACCESSORY SCHED.
10.04 GRAB BAR.
10.05 COAT HOOK.
10.06 WASTE RECEPTACLE.
10.07 FOLDING SHOWER SEAT.
10.08 SHOWER ROD.
10.09 SHELF.
10.10 NETTING. NIC
10.11 FIRE EXTINGUISHER. RECESSED CABINET.
10.12 TOILET SEAT COVER DISPENSER.
10.13 PAPER TOWEL DISPENSER.
10.14 BATHROOM PARTITION W/ ROBE HOOK @ EA. DOOR

11 - EQUIPMENT/APPLIANCES (SEE EQMT. SCHED)

12 - FURNISHINGS
12.01 BICYCLE RACKS FOR SHORT-TERM BIKE PARKING.
12.02 DASHERBOARDS. NIC.
12.03 BENCH. NIC.
12.04 BLEACHERS. NIC.
12.05 SCOREBOARD. NIC.
12.06 SKATE RACKS. NIC.

13 - SPECIAL CONSTRUCTION
13.01 MEMBRANE STRUCTURE.

14 - CONVEYING EQUIPMENT (NOT USED)

21 - FIRE SUPPRESSION
21.01 FIRE EXTINGUISHER.
21.02 FIRE SPRINKLER HORIZ. MAIN (SEE DIAGRAM)
21.03 FIRE SPRINKLER VALVE ASSEMBLY
21.04 FIRE DEPT. MAIN CONNECTION @ FRONT OF PROJECT. LAFD SHALL APPROVE FINAL LOCATION.
21.05 FIRE SPRINKLER HEAD.

22 - PLUMBING
22.01 WATER CLOSET PER PLUMBING LEGEND
22.02 LAV. SINK & FAUCET. PER PLUMBING LEGEND
22.03 JANITOR MOP SINK.
22.04 PLUMBING VENT PIPE.
22.05 DRINKING FOUNTAIN.
22.06 ULTRA LOW-FLOW TOILET.
22.07 SHOWER HEAD/ CONTROLS.
22.08 SHOWER DRAIN.
22.09 AREA DRAIN.
22.10 HOSE BIB.

23 - HEATING, VENTILATING, AND AIR-CONDITIONING
23.01 HVAC UNIT PER MECH.
23.02 AIR REGISTER WALL MOUNTED.
23.03 CEILING AIR REGISTER.
23.04 MAKE UP AIR LOUVER PER MECH. DWGS
23.05 BATHRM EXHAUST FAN PER SPECS.
23.06 BATHRM EXHAUST DUCT.
23.07 MECH. DUCT.
23.08 MECH. EQUIPMENT.

26 - ELECTRICAL
26.01 ELEC. PANEL PER PLANS & SCHED.
26.02 EXTERIOR LIGHT PER SCHED.
26.03 INTERIOR LIGHT PER SCHED.

27 - COMMUNICATION

28 - ELECTRONIC SAFETY AND SECURITY
28.01 SMOKE ALARM.
28.02 SECURITY CAMERA.
28.03 FIRE ALARM MAIN PANEL.

31 - EARTHWORK
31.01 APPROVED COMPACT FILL PER GEO & SOIL ENGINEER REPORT.

32 - EXTERIOR IMPROVEMENTS
32.01 ASPHALT PAVING PER CIVIL.
32.02 GRAPHICS/PAINT.SEE LAND. DWGS.
32.03 STORMWATER MANAGEMENT PER CIVIL DWGS.
32.04 STL. SECURITY GATE, PTD.
32.05 STL. SECURITY FENCE, PTD.
32.06 EXTERIOR AREA DRAINS.
32.07 BENCH.
32.08 TRENCH DRAIN.
32.09 TREE, SEE LANDSCAPE DWGS.
32.10 PLANTING, SEE LANDSCAPE DWGS.
32.11 (N) CONCRETE SIDEWALK, CURB, GUTTER PER CITY OF LA STANDARDS.
32.12 (N) CONC. APRON & DRIVEWAY CURB CUT PER CITY OF LA STANDARDS.
32.13 EQUIPMENT SCREEN.
32.14 CONC. WALL @ SITE FENCE.

33 - UTILITIES
33.01 WATER METER.
33.02 ELECTRICAL TRANSFORMER W/ BOLLARDS AS REQ'D.
33.03 ELECTRICAL METER.
33.04 POWER POLE.

REVISION DATES (DESIGN STAGE ONLY)

Sheet Version 4.0

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

LICENSED ARCHITECT
LAWRENCE SCARPA
C 21812
REN 10/31/2023
STATE OF CALIFORNIA

THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED

BUREAU OF ENGINEERING
VERTICAL CONTROL:
HORIZONTAL CONTROL:
SHEET TITLE: FLOOR PLAN
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

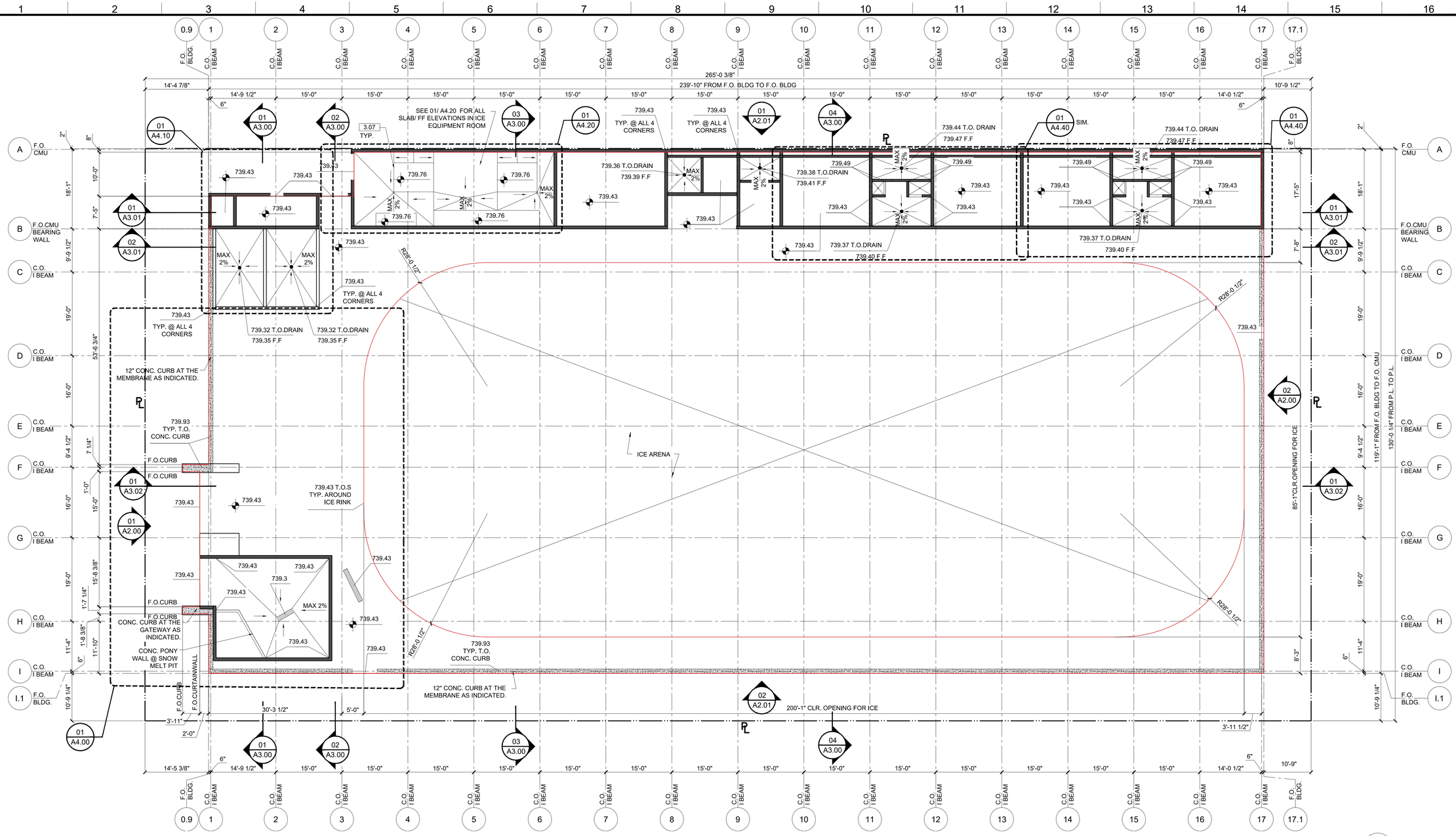
DEPARTMENT OF PUBLIC WORKS
NO. REVISIONS: DATE: BY:
CIP NO.
INDEX NO.

CITY OF LOS ANGELES
GARY LEE MOORE, P.E. ENV SP
DESIGN GROUP
CITY ENGINEER: DATE:
ENGINEER:
DESIGNED BY:
DRAWN BY:
CHECKED BY:
APPROVED BY:

WORK ORDER NO.
E170121B

SHEET NAME
A1.10
SHEET X OF X SHEETS

Z:\B□S ARCHITECTURE\019 JOBS\01935.0 CITY OF LA-RESEDA ICE HOCKEY ROLLER RINK\01935.0 1.CURRENT DRAWINGS_24X36\01935.0_A110_24X36.DWG 12/3/2021 9:12 AM



NOTE:
1. OUTLINE OF SLAB IS MARKED IN RED ON THIS PLAN FOR CLARITY

ICE RINK SLAB PLAN

01

REF: A1.10, A1.11, ENLARGED PLANS, SECTIONS SCALE: 3/32" = 1'-0"

N

KEYNOTES

NOTE: ITEMS IDENTIFIED ARE TYPICAL TO ALL LIKE ITEMS UNLESS NOTED OTHERWISE.

01 - GENERAL REQUIREMENTS
02 - NOT USED

03 - CONCRETE
3.01 CONC. SLAB ON GRADE PER STRUCT'L.
3.02 CONC. O/MTL. DECK PER STRUCT'L.
3.03 CONC. CURB
3.04 CONC. FOOTING PER STRUCT'L.
3.05 CONC. PAVING PER CIVIL DWGS.
3.06 CONC. SIDEWALK PER CIVIL DWGS.
3.07 CONC. PAD

04 - MASONRY
4.01 CMU BLDNG. WALL
4.02 CMU SITE WALL W/ 2" CMU CAP.

05 - METALS
5.01 STL. COLUMN PER STRUCT'L. PTD.
5.02 STL. BEAM PER STRUCT'L. PTD.
5.03 HSS POST PER STRUCT'L. PTD.
5.04 HSS BEAM PER STRUCT'L. PTD.
5.05 MEMBRANE STRUCTURE I BEAM.
5.06 MTL. DECK.
5.07 MTL. GUARD RAILING.
5.08 MTL. STUD WALL.

06 - WOOD AND PLASTICS

07 - THERMAL & MOISTURE PROTECTION
7.01 W.P. MEMBRANE PER DETL. & SPECS.
7.02 SINGLE PLY PVC ROOFING PER SPECS.
7.03 R-21 RIGID INSULATION @ WALLS.
7.04 UNDERSLAB MOISTURE VAPOR BARRIER.
7.05 ROOF DRAIN AND OVERFLOW.
7.06 CLEAR WATER-REPELLENT GRAFITTI COATING AT CMU WALL. (ALL EXPOSED SURFACES).
7.07 BATT INSULATION.

08 - OPENINGS (SEE DOOR/WINDOW SCHED)
8.01 STL. DOOR. & FRAME, PAINTED.
8.02 CLR. ANODIZED ALUM. STOREFRONT DOOR.
8.03 CLR. ANODIZED ALUM. STOREFRONT WINDOW.
8.04 DOOR HARDWARE SET PER SCHED.
8.05 EXTERIOR WALL LOUVER.
8.06 EXTERIOR WALL VENT WITH CAP.
8.07 ROLLING STL. DOOR & FRAME.
8.08 ICE RINK GATES.
8.09 OVERHEAD GLASS DOOR.
8.10 ACCESS PANEL, COLOR TO MATCH ADJACENT MATERIAL.
8.11 ROOF ACCESS HATCH.

09 - FINISHES (SEE FIN. SCHED)
9.01 5/8" TYPE 'X' GYP. BD., PROVIDE 'WET RATED' AT BATHROOMS. PAINT.
9.02 CONC. FLR. SEAL PER FIN. SCHED.
9.03 RUBBER FLR. PER SPECS.
9.04 PAINT PER SPECS.
9.05 REVEAL PER DETAILS.
9.06 GRAFITTI COATING, TYP. @ ALL EXTERIOR SOLID WALLS.
9.07 GLAZED FINISH ON CMU.
9.08 CERAMIC TILE.

10 - SPECIALTIES
10.01 MIRROR PER SPECS.
10.02 SIGNAGE.
10.03 TOILET PAPER ROLL HOLDER PER ACCESSORY SCHED.
10.04 GRAB BAR.
10.05 COAT HOOK.
10.06 WASTE RECEPTACLE.
10.07 FOLDING SHOWER SEAT.
10.08 SHOWER ROD.
10.09 SHELF.
10.10 NETTING. NIC
10.11 FIRE EXTINGUISHER. RECESSED CABINET
10.12 TOILET SEAT COVER DISPENSER.
10.13 PAPER TOWEL DISPENSER.
10.14 BATHROOM PARTITION W/ ROBE HOOK @ EA. DOOR

11 - EQUIPMENT/APPLIANCES (SEE EQMT. SCHED)

12 - FURNISHINGS
12.01 BICYCLE RACKS FOR SHORT-TERM BIKE PARKING.
12.02 DASHERBOARDS. NIC.
12.03 BENCH. NIC.
12.04 BLEACHERS. NIC.
12.05 SCOREBOARD. NIC.
12.06 SKATE RACKS. NIC.

13 - SPECIAL CONSTRUCTION
13.01 MEMBRANE STRUCTURE.

14 - CONVEYING EQUIPMENT (NOT USED)

21 - FIRE SUPPRESSION
21.01 FIRE EXTINGUISHER.
21.02 FIRE SPRINKLER HORIZ. MAIN (SEE DIAGRAM)
21.03 FIRE SPRINKLER VALVE ASSEMBLY
21.04 FIRE DEPT. MAIN CONNECTION @ FRONT OF PROJECT. LAFD SHALL APPROVE FINAL LOCATION.
21.05 FIRE SPRINKLER HEAD.

22 - PLUMBING
22.01 WATER CLOSET PER PLUMBING LEGEND
22.02 LAV. SINK & FAUCET. PER PLUMBING LEGEND
22.03 JANITOR MOP SINK.
22.04 PLUMBING VENT PIPE.
22.05 DRINKING FOUNTAIN.
22.06 ULTRA LOW-FLOW TOILET.
22.07 SHOWER HEAD/ CONTROLS.
22.08 SHOWER DRAIN.
22.09 AREA DRAIN.
22.10 HOSE BIB.

23 - HEATING, VENTILATING, AND AIR-CONDITIONING
23.01 HVAC UNIT PER MECH.
23.02 AIR REGISTER WALL MOUNTED.
23.03 CEILING AIR REGISTER.
23.04 MAKE UP AIR LOUVER PER MECH. DWGS
23.05 BATHRM EXHAUST FAN PER SPECS.
23.06 BATHRM EXHAUST DUCT.
23.07 MECH. DUCT.
23.08 MECH. EQUIPMENT.

26 - ELECTRICAL
26.01 ELEC. PANEL PER PLANS & SCHED.
26.02 EXTERIOR LIGHT PER SCHED.
26.03 INTERIOR LIGHT PER SCHED.

27 - COMMUNICATION

28 - ELECTRONIC SAFETY AND SECURITY
28.01 SMOKE ALARM.
28.02 SECURITY CAMERA.
28.03 FIRE ALARM MAIN PANEL.

31 - EARTHWORK
31.01 APPROVED COMPACT FILL PER GEO & SOIL ENGINEER REPORT.

32 - EXTERIOR IMPROVEMENTS
32.01 ASPHALT PAVING PER CIVIL.
32.02 GRAPHICS/PAINT.SEE LAND. DWGS.
32.03 STORMWATER MANAGEMENT PER CIVIL DWGS.
32.04 STL. SECURITY GATE, PTD.
32.05 STL. SECURITY FENCE, PTD.
32.06 EXTERIOR AREA DRAINS.
32.07 BENCH.
32.08 TRENCH DRAIN.
32.09 TREE, SEE LANDSCAPE DWGS.
32.10 PLANTING, SEE LANDSCAPE DWGS.
32.11 (N) CONCRETE SIDEWALK, CURB, GUTTER PER CITY OF LA STANDARDS.
32.12 (N) CONC. APRON & DRIVEWAY CURB CUT PER CITY OF LA STANDARDS.
32.13 EQUIPMENT SCREEN.
32.14 CONC. WALL @ SITE FENCE.

33 - UTILITIES
33.01 WATER METER.
33.02 ELECTRICAL TRANSFORMER W/ BOLLARDS AS REQ'D.
33.03 ELECTRICAL METER.
33.04 POWER POLE.

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

LICENSED ARCHITECT
LAWRENCE SCARPA
C 21812
REN 10/31/2023
STATE OF CALIFORNIA

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED •

DEPARTMENT OF PUBLIC WORKS
BUREAU OF ENGINEERING

VERTICAL CONTROL:
HORIZONTAL CONTROL:
SHEET TITLE: SLAB PLAN
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

NO.	REVISIONS:	DATE:	BY:

CIP NO.

INDEX NO.

CITY OF LOS ANGELES
CITY ENGINEER
GARY LEE MOORE, P.E. ENV SP
DESIGN GROUP:
ENGINEER:
DESIGNED BY:
DRAWN BY:
CHECKED BY:
APPROVED BY:
DATE:

WORK ORDER NO.
E170121B

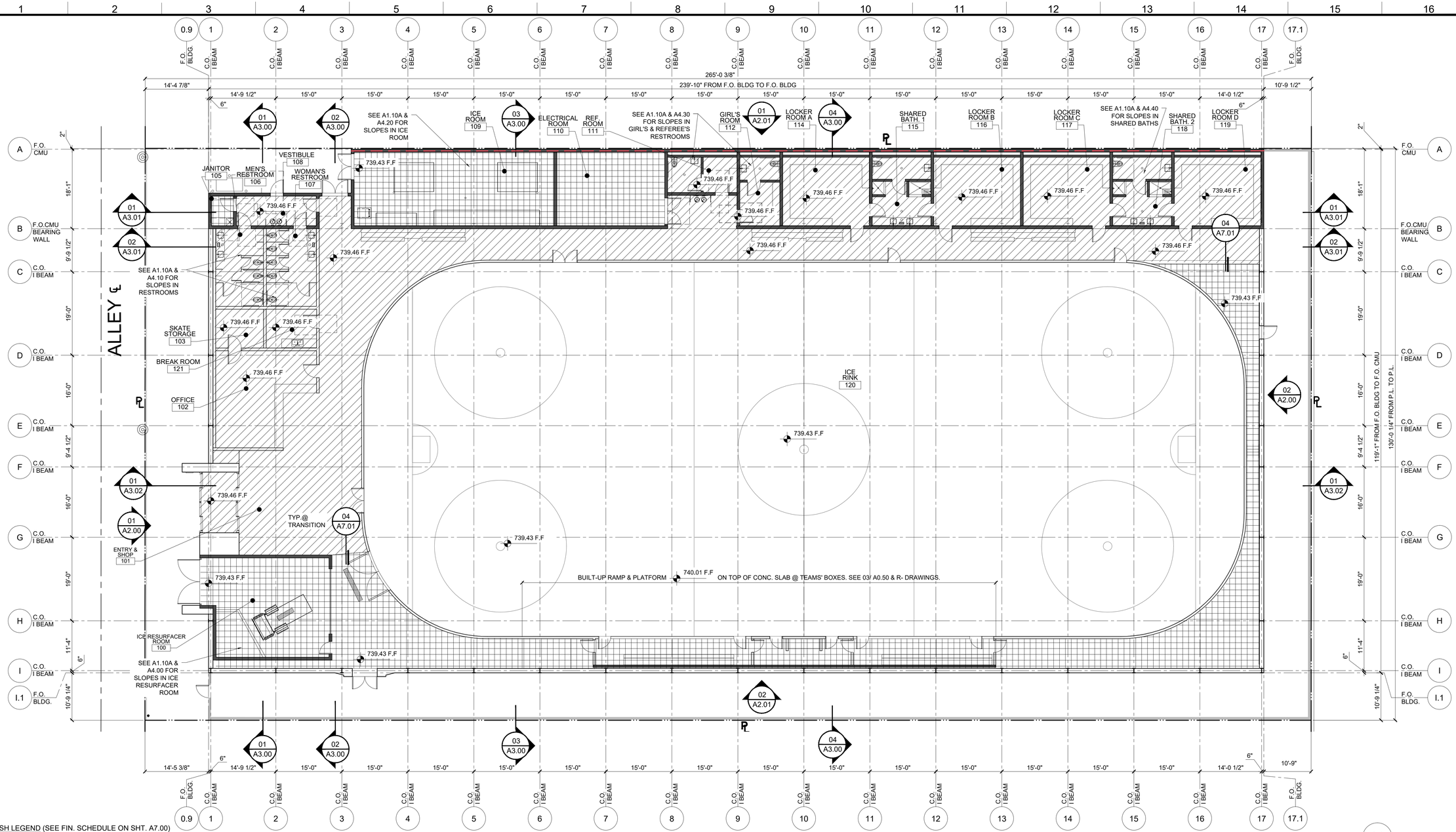
SHEET NAME
A1.10A
SHEET X OF X SHEETS

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REVISION DATES (DESIGN STAGE ONLY)

Sheet Version 4.0

Z:\B□S ARCHITECTURE\019 JOBS\01935.0 CITY OF LA-RESEDA ICE HOCKEY ROLLER RINK\01935.0 1.CURRENT DRAWINGS_24X36\01935.0_A110A_24X36.DWG 12/3/2021 9:12 AM



FINISH LEGEND (SEE FIN. SCHEDULE ON SHT. A7.00)

RUBBER FLOORING 9.03

SEALED CONCRETE 3.01

FLOOR FINISH PLAN 01

REF: A1.10, A1.10A, A7.00 SCALE: 3/32" = 1'-0"

N

KEYNOTES

NOTE: ITEMS IDENTIFIED ARE TYPICAL TO ALL LIKE ITEMS UNLESS NOTED OTHERWISE.

01 - GENERAL REQUIREMENTS

02 - NOT USED

03 - CONCRETE

3.01 CONC. SLAB ON GRADE PER STRUCT'L.
3.02 CONC. O/MTL. DECK PER STRUCT'L.
3.03 CONC. CURB
3.04 CONC. FOOTING PER STRUCT'L.
3.05 CONC. PAVING PER CIVIL DWGS.
3.06 CONC. SIDEWALK PER CIVIL DWGS.
3.07 CONC. PAD

04 - MASONRY

4.01 CMU BLDNG. WALL
4.02 CMU SITE WALL W/ 2" CMU CAP.

05 - METALS

5.01 STL. COLUMN PER STRUCT'L. PTD.
5.02 STL. BEAM PER STRUCT'L. PTD.
5.03 HSS POST PER STRUCT'L. PTD.
5.04 HSS BEAM PER STRUCT'L. PTD.
5.05 MEMBRANE STRUCTURE I BEAM.
5.06 MTL. DECK.
5.07 MTL. GUARD RAILING.
5.08 MTL. STUD WALL.

06 - WOOD AND PLASTICS

07 - THERMAL & MOISTURE PROTECTION

7.01 W.P. MEMBRANE PER DETL. & SPECS.
7.02 SINGLE PLY PVC ROOFING PER SPECS.
7.03 R-21 RIGID INSULATION @ WALLS.
7.04 UNDERSLAB MOISTURE VAPOR BARRIER.
7.05 ROOF DRAIN AND OVERFLOW.
7.06 CLEAR WATER-REPELLENT GRAFITTI COATING AT CMU WALL. (ALL EXPOSED SURFACES).
7.07 BATT INSULATION.

08 - OPENINGS (SEE DOOR/WINDOW SCHED)

8.01 STL. DOOR. & FRAME, PAINTED.
8.02 CLR. ANODIZED ALUM. STOREFRONT DOOR.
8.03 CLR. ANODIZED ALUM. STOREFRONT WINDOW.
8.04 DOOR HARDWARE SET PER SCHED.
8.05 EXTERIOR WALL LOUVER.
8.06 EXTERIOR WALL VENT WITH CAP.
8.07 ROLLING STL. DOOR & FRAME.
8.08 ICE RINK GATES
8.09 OVERHEAD GLASS DOOR.
8.10 ACCESS PANEL, COLOR TO MATCH ADJACENT MATERIAL.
8.11 ROOF ACCESS HATCH.

09 - FINISHES (SEE FIN. SCHED)

9.01 5/8" TYPE 'X' GYP. BD., PROVIDE 'WET RATED' AT BATHROOMS. PAINT.
9.02 CONC. FLR. SEAL PER FIN. SCHED.
9.03 RUBBER FLR. PER SPECS.
9.04 PAINT PER SPECS.
9.05 REVEAL PER DETAILS.
9.06 GRAFITTI COATING, TYP. @ ALL EXTERIOR SOLID WALLS.
9.07 GLAZED FINISH ON CMU.
9.08 CERAMIC TILE.

10 - SPECIALTIES

10.01 MIRROR PER SPECS.
10.02 SIGNAGE.
10.03 TOILET PAPER ROLL HOLDER PER ACCESSORY SCHED.
10.04 GRAB BAR.
10.05 COAT HOOK.
10.06 WASTE RECEPTACLE.
10.07 FOLDING SHOWER SEAT.
10.08 SHOWER ROD.
10.09 SHELF.
10.10 NETTING. NIC
10.11 FIRE EXTINGUISHER. RECESSED CABINET
10.12 TOILET SEAT COVER DISPENSER.
10.13 PAPER TOWEL DISPENSER.
10.14 BATHROOM PARTITION W/ ROBE HOOK @ EA. DOOR

11 - EQUIPMENT/APPLIANCES (SEE EQMT. SCHED)

12 - FURNISHINGS

12.01 BICYCLE RACKS FOR SHORT-TERM BIKE PARKING.
12.02 DASHERBOARDS. NIC.
12.03 BENCH. NIC.
12.04 BLEACHERS. NIC.
12.05 SCOREBOARD. NIC.
12.06 SKATE RACKS. NIC.

13 - SPECIAL CONSTRUCTION

13.01 MEMBRANE STRUCTURE.

14 - CONVEYING EQUIPMENT (NOT USED)

21 - FIRE SUPPRESSION

21.01 FIRE EXTINGUISHER.
21.02 FIRE SPRINKLER HORIZ. MAIN (SEE DIAGRAM)
21.03 FIRE SPRINKLER VALVE ASSEMBLY
21.04 FIRE DEPT. MAIN CONNECTION @ FRONT OF PROJECT. LAFD SHALL APPROVE FINAL LOCATION.
21.05 FIRE SPRINKLER HEAD.

22 - PLUMBING

22.01 WATER CLOSET PER PLUMBING LEGEND
22.02 LAV. SINK & FAUCET. PER PLUMBING LEGEND
22.03 JANITOR MOP SINK.
22.04 PLUMBING VENT PIPE.
22.05 DRINKING FOUNTAIN.
22.06 ULTRA LOW-FLOW TOILET.
22.07 SHOWER HEAD/ CONTROLS.
22.08 SHOWER DRAIN.
22.09 AREA DRAIN.
22.10 HOSE BIB.
23.05 BATHRM EXHAUST FAN PER SPECS.
23.06 BATHRM EXHAUST DUCT.
23.07 MECH. DUCT.
23.08 MECH. EQUIPMENT.

26 - ELECTRICAL

26.01 ELEC. PANEL PER PLANS & SCHED.
26.02 EXTERIOR LIGHT PER SCHED.
26.03 INTERIOR LIGHT PER SCHED.

27 - COMMUNICATION

28 - ELECTRONIC SAFETY AND SECURITY

28.01 SMOKE ALARM.
28.02 SECURITY CAMERA.
28.03 FIRE ALARM MAIN PANEL.

31 - EARTHWORK

31.01 APPROVED COMPACT FILL PER GEO & SOIL ENGINEER REPORT.

32 - EXTERIOR IMPROVEMENTS

32.01 ASPHALT PAVING PER CIVIL.
32.02 GRAPHICS/PAINT.SEE LAND. DWGS.
32.03 STORMWATER MANAGEMENT PER CIVIL DWGS.
32.04 STL. SECURITY GATE, PTD.
32.05 STL. SECURITY FENCE, PTD.
32.06 EXTERIOR AREA DRAINS.
32.07 BENCH.
32.08 TRENCH DRAIN.
32.09 TREE, SEE LANDSCAPE DWGS.
32.10 PLANTING, SEE LANDSCAPE DWGS.
32.11 (N) CONCRETE SIDEWALK, CURB, GUTTER PER CITY OF LA STANDARDS.
32.12 (N) CONC. APRON & DRIVEWAY CURB CUT PER CITY OF LA STANDARDS.
32.13 EQUIPMENT SCREEN.
32.14 CONC. WALL @ SITE FENCE.

33 - UTILITIES

33.01 WATER METER.
33.02 ELECTRICAL TRANSFORMER W/ BOLLARDS AS REQ'D.
33.03 ELECTRICAL METER.
33.04 POWER POLE.

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REVISION DATES (DESIGN STAGE ONLY)

Sheet Version 4.0

Z:\B□S ARCHITECTURE\019 JOBS\01935.0 CITY OF LA-RESEDA ICE HOCKEY ROLLER RINK\01935.0 1.CURRENT DRAWINGS_24X36\01935.0_A111_24X36.DWG 12/3/2021 9:13 AM

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

LICENSED ARCHITECT
LAWRENCE SCARPA
C 21812
REN 10/31/2023
STATE OF CALIFORNIA

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED •

DEPARTMENT OF PUBLIC WORKS
BUREAU OF ENGINEERING

NO. | REVISIONS: | DATE: | BY:

VERTICAL CONTROL:
HORIZONTAL CONTROL:

SHEET TITLE: FINISH FLOOR PLAN

PROJECT: RESEDA SKATE FACILITY

ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

CIP NO.

INDEX NO.

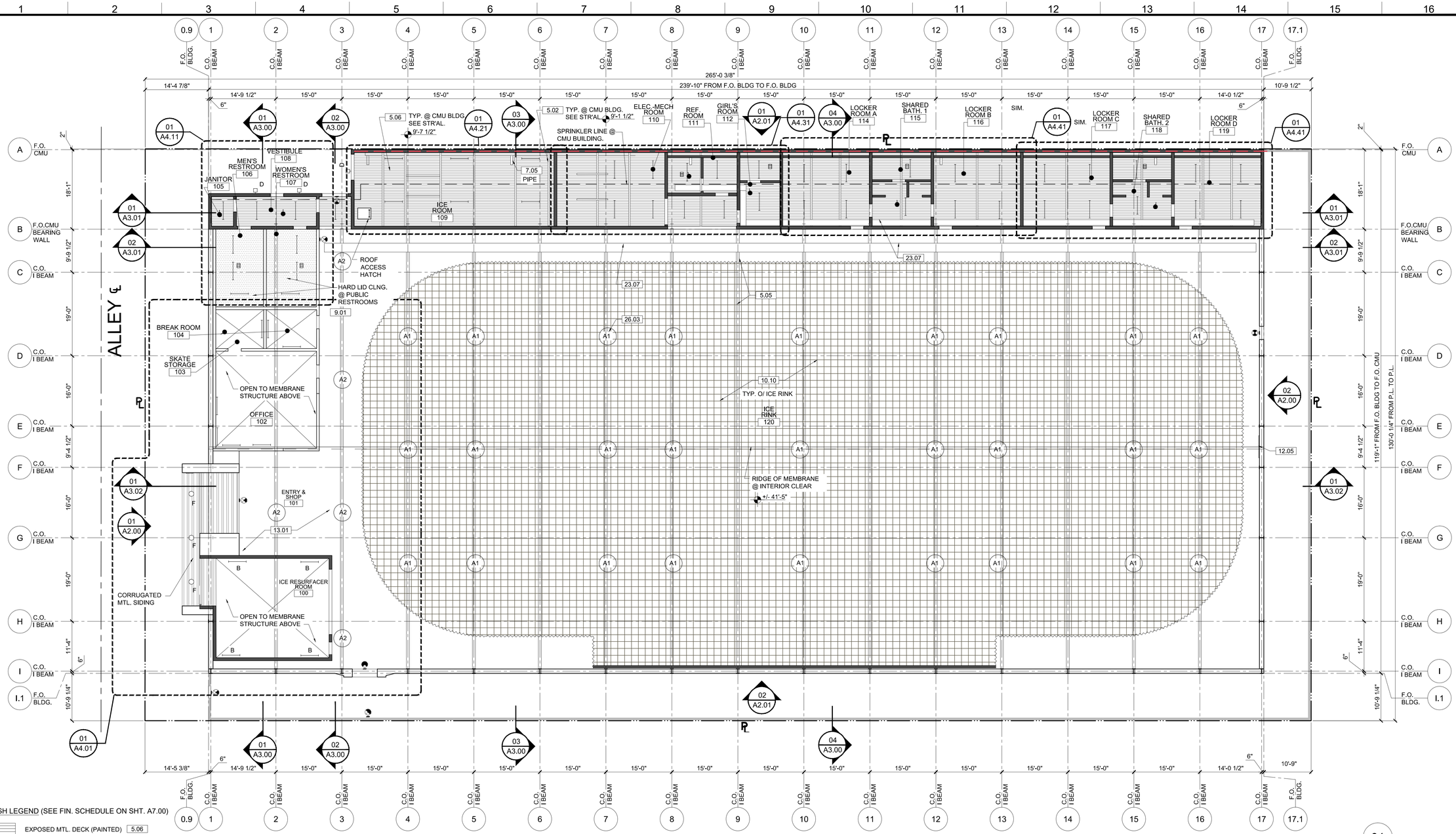
CITY OF LOS ANGELES
GARY LEE MOORE, P.E. ENV SP
DESIGN GROUP

CITY ENGINEER | DATE:

ENGINEER: | DESIGNED BY: | DRAWN BY: | CHECKED BY: | APPROVED BY:

WORK ORDER NO.
E170121B

SHEET NAME
A1.11
SHEET X OF X SHEETS



FINISH LEGEND (SEE FIN. SCHEDULE ON SHT. A7.00)

- EXPOSED MTL. DECK (PAINTED) 5.06
- GYP. BRD. CLNG. 9.01
- NETTING 10.10

PER THE OFFICE OF THE FIRE STATE MARSHALL,THE CALIFORNIA TITLE19 REGULATIONS ALLOWS THE MANUFACTURER OR FABRICATOR TO MEET THE FIRE RESISTANCE REQUIREMENTS BY HAVING THE NETTING TREATED BY A CALIFORNIA LICENSED GENERAL APPLICATOR. SEE ALSO MODIFICATION, SHEET A0.36 AND A7.00A

SEE ALSO A1.13 FOR SPECIALTY AUDIOVISUAL EQUIPMENT LAYOUT.

KEYNOTES

NOTE: ITEMS IDENTIFIED ARE TYPICAL TO ALL LIKE ITEMS UNLESS NOTED OTHERWISE.

01 - GENERAL REQUIREMENTS
02 - NOT USED

03 - CONCRETE
3.01 CONC. SLAB ON GRADE PER STRUCT'L.
3.02 CONC. O/MTL. DECK PER STRUCT'L.
3.03 CONC. CURB
3.04 CONC. FOOTING PER STRUCT'L.
3.05 CONC. PAVING PER CIVIL DWGS.
3.06 CONC. SIDEWALK PER CIVIL DWGS.
3.07 CONC. PAD

04 - MASONRY
4.01 CMU BLDNG. WALL
4.02 CMU SITE WALL W/ 2" CMU CAP.

05 - METALS
5.01 STL. COLUMN PER STRUCT'L. PTD.
5.02 STL. BEAM PER STRUCT'L. PTD.
5.03 HSS POST PER STRUCT'L. PTD.
5.04 HSS BEAM PER STRUCT'L. PTD.
5.05 MEMBRANE STRUCTURE I BEAM.
5.06 MTL. DECK.
5.07 MTL. GUARD RAILING.
5.08 MTL. STUD WALL.

06 - WOOD AND PLASTICS

07 - THERMAL & MOISTURE PROTECTION
7.01 W.P. MEMBRANE PER DETL. & SPECS.
7.02 SINGLE PLY PVC ROOFING PER SPECS.
7.03 R-21 RIGID INSULATION @ WALLS.
7.04 UNDERSLAB MOISTURE VAPOR BARRIER.
7.05 ROOF DRAIN AND OVERFLOW.
7.06 CLEAR WATER-REPELLENT GRAFITTI COATING AT CMU WALL. (ALL EXPOSED SURFACES).
7.07 BATT INSULATION.

08 - OPENINGS (SEE DOOR/WINDOW SCHED)
8.01 STL. DOOR. & FRAME, PAINTED.
8.02 CLR. ANODIZED ALUM. STOREFRONT DOOR.
8.03 CLR. ANODIZED ALUM. STOREFRONT WINDOW.
8.04 DOOR HARDWARE SET PER SCHED.
8.05 EXTERIOR WALL LOUVER.
8.06 EXTERIOR WALL VENT WITH CAP.
8.07 ROLLING STL. DOOR & FRAME.
8.08 ICE RINK GATES
8.09 OVERHEAD GLASS DOOR.
8.10 ACCESS PANEL, COLOR TO MATCH ADJACENT MATERIAL.
8.11 ROOF ACCESS HATCH.

09 - FINISHES (SEE FIN. SCHED)
9.01 5/8" TYPE 'X' GYP. BD., PROVIDE 'WET RATED' AT BATHROOMS. PAINT.
9.02 CONC. FLR. SEAL PER FIN. SCHED.
9.03 RUBBER FLR. PER SPECS.
9.04 PAINT PER SPECS.
9.05 REVEAL PER DETAILS.
9.06 GRAFITTI COATING, TYP. @ ALL EXTERIOR SOLID WALLS.
9.07 GLAZED FINISH ON CMU.
9.08 CERAMIC TILE.

10 - SPECIALTIES
10.01 MIRROR PER SPECS.
10.02 SIGNAGE.
10.03 TOILET PAPER ROLL HOLDER PER ACCESSORY SCHED.
10.04 GRAB BAR.
10.05 COAT HOOK.
10.06 WASTE RECEPTACLE.
10.07 FOLDING SHOWER SEAT.
10.08 SHOWER ROD.
10.09 SHELF.
10.10 NETTING. NIC
10.11 FIRE EXTINGUISHER. RECESSED CABINET.
10.12 TOILET SEAT COVER DISPENSER.
10.13 PAPER TOWEL DISPENSER.
10.14 BATHROOM PARTITION W/ ROBE HOOK @ EA. DOOR

11 - EQUIPMENT/APPLIANCES (SEE EQMT. SCHED)

12 - FURNISHINGS
12.01 BICYCLE RACKS FOR SHORT-TERM BIKE PARKING.
12.02 DASHERBOARDS. NIC.
12.03 BENCH. NIC.
12.04 BLEACHERS. NIC.
12.05 SCOREBOARD. NIC.
12.06 SKATE RACKS. NIC.

13 - SPECIAL CONSTRUCTION
13.01 MEMBRANE STRUCTURE.

14 - CONVEYING EQUIPMENT (NOT USED)

21 - FIRE SUPPRESSION
21.01 FIRE EXTINGUISHER.
21.02 FIRE SPRINKLER HORIZ. MAIN (SEE DIAGRAM)
21.03 FIRE SPRINKLER VALVE ASSEMBLY
21.04 FIRE DEPT. MAIN CONNECTION @ FRONT OF PROJECT. LAFD SHALL APPROVE FINAL LOCATION.
21.05 FIRE SPRINKLER HEAD.

22 - PLUMBING
22.01 WATER CLOSET PER PLUMBING LEGEND
22.02 LAV. SINK & FAUCET. PER PLUMBING LEGEND
22.03 JANITOR MOP SINK.
22.04 PLUMBING VENT PIPE.
22.05 DRINKING FOUNTAIN.
22.06 ULTRA LOW-FLOW TOILET.
22.07 SHOWER HEAD/ CONTROLS.
22.08 SHOWER DRAIN.
22.09 AREA DRAIN.
22.10 HOSE BIB.

23 - HEATING, VENTILATING, AND AIR-CONDITIONING
23.01 HVAC UNIT PER MECH.
23.02 AIR REGISTER WALL MOUNTED.
23.03 CEILING AIR REGISTER.
23.04 MAKE UP AIR LOUVER PER MECH. DWGS
23.05 BATHRM EXHAUST FAN PER SPECS.
23.06 BATHRM EXHAUST DUCT.
23.07 MECH. DUCT.
23.08 MECH. EQUIPMENT.

26 - ELECTRICAL
26.01 ELEC. PANEL PER PLANS & SCHED.
26.02 EXTERIOR LIGHT PER SCHED.
26.03 INTERIOR LIGHT PER SCHED.

27 - COMMUNICATION

28 - ELECTRONIC SAFETY AND SECURITY
28.01 SMOKE ALARM.
28.02 SECURITY CAMERA.
28.03 FIRE ALARM MAIN PANEL.

31 - EARTHWORK
31.01 APPROVED COMPACT FILL PER GEO & SOIL ENGINEER REPORT.

32 - EXTERIOR IMPROVEMENTS
32.01 ASPHALT PAVING PER CIVIL.
32.02 GRAPHICS/PAINT.SEE LAND. DWGS.
32.03 STORMWATER MANAGEMENT PER CIVIL DWGS.
32.04 STL. SECURITY GATE, PTD.
32.05 STL. SECURITY FENCE, PTD.
32.06 EXTERIOR AREA DRAINS.
32.07 BENCH.
32.08 TRENCH DRAIN.
32.09 TREE, SEE LANDSCAPE DWGS.
32.10 PLANTING, SEE LANDSCAPE DWGS.
32.11 (N) CONCRETE SIDEWALK, CURB, GUTTER PER CITY OF LA STANDARDS.
32.12 (N) CONC. APRON & DRIVEWAY CURB CUT PER CITY OF LA STANDARDS.
32.13 EQUIPMENT SCREEN.
32.14 CONC. WALL @ SITE FENCE.

33 - UTILITIES
33.01 WATER METER.
33.02 ELECTRICAL TRANSFORMER W/ BOLLARDS AS REQ'D.
33.03 ELECTRICAL METER.
33.04 POWER POLE.

REFLECTED CEILING PLAN

01

REF: A1.10

SCALE: 3/32" = 1'-0"

N

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REVISION DATES (DESIGN STAGE ONLY)

Sheet Version 4.0

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

LICENSED ARCHITECT
LAWRENCE SCARPA
C 21812
REN 10/31/2023
STATE OF CALIFORNIA

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED

BUREAU OF ENGINEERING
VERTICAL CONTROL:
HORIZONTAL CONTROL:
SHEET TITLE: REFLECTED CEILING PLAN
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

DEPARTMENT OF PUBLIC WORKS
NO. | REVISIONS: | DATE: | BY:

CIP NO.

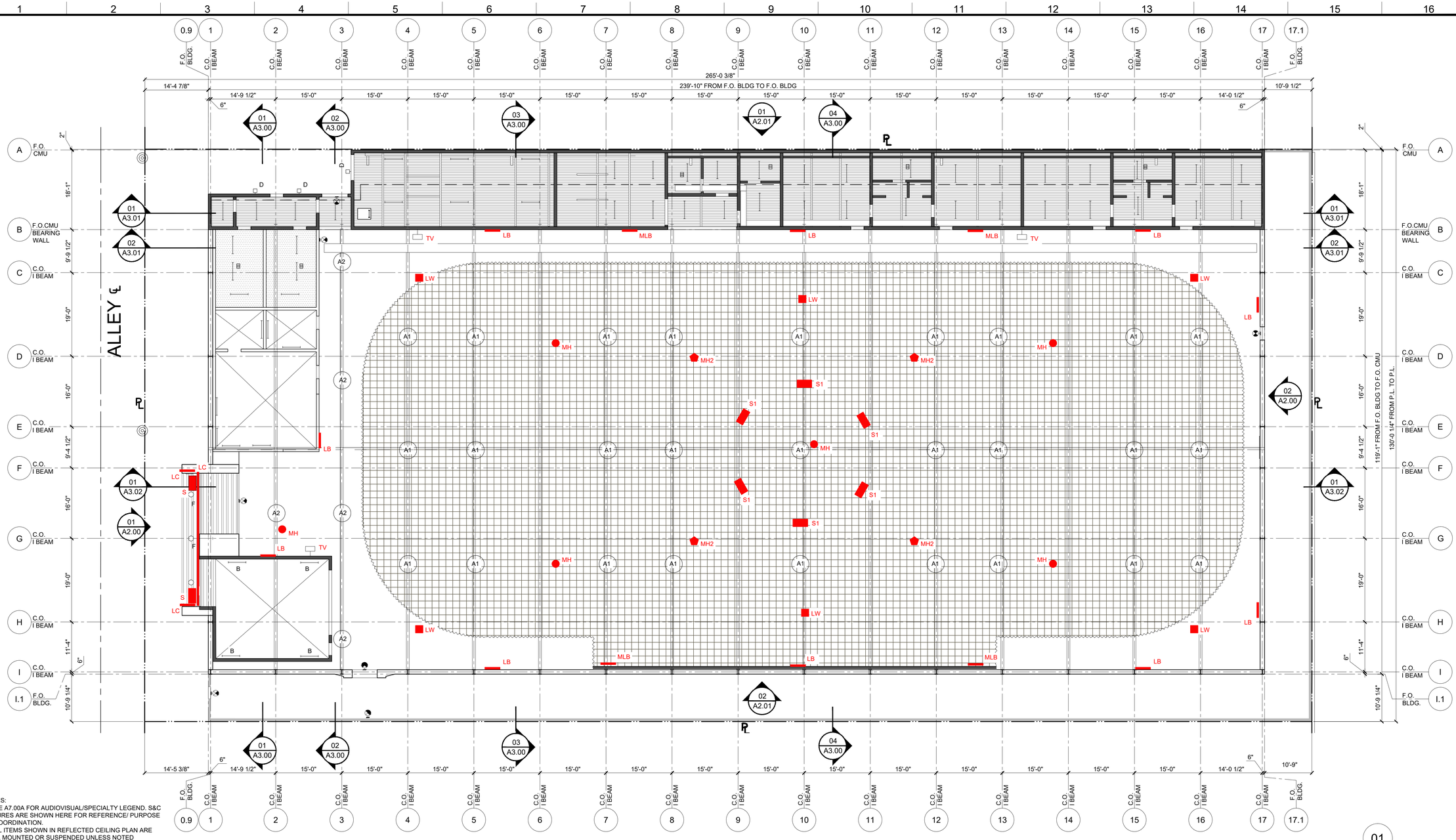
INDEX NO.

CITY OF LOS ANGELES
GARY LEE MOORE, P.E. ENV SP
CITY ENGINEER
DESIGN GROUP
ENGINEER:
DESIGNED BY:
DRAWN BY:
CHECKED BY:
APPROVED BY:
DATE:

WORK ORDER NO.
E170121B

SHEET NAME
A1.12
SHEET X OF X SHEETS

Z:\B□S ARCHITECTURE\019 JOBS\01935.0 CITY OF LA-RESEDA ICE HOCKEY ROLLER RINK\01935.0 1.CURRENT DRAWINGS_24X36\01935.0_A112_24X36.DWG 12/3/2021 9:13 AM



NOTES:
1) SEE A7.00A FOR AUDIOVISUAL/SPECIALTY LEGEND. S&C FIXTURES ARE SHOWN HERE FOR REFERENCE/ PURPOSE OF COORDINATION.
2) ALL ITEMS SHOWN IN REFLECTED CEILING PLAN ARE WALL MOUNTED OR SUSPENDED UNLESS NOTED OTHERWISE. CONTRACTOR TO VERIFY QUANTITY, FINAL LOCATION & HEIGHT WITH OWNER & ARCHITECT.
3) AV SPECIALTY EQUIPMENT IS SHOWN IN RED FOR CLARITY.

AUDIOVISUAL/ SPECIALTY LIGHTING RCP

01

REF: --

SCALE: 3/32" = 1'-0"

N

KEYNOTES

NOTE: ITEMS IDENTIFIED ARE TYPICAL TO ALL LIKE ITEMS UNLESS NOTED OTHERWISE.

01 - GENERAL REQUIREMENTS
02 - NOT USED

03 - CONCRETE
3.01 CONC. SLAB ON GRADE PER STRUCT'L.
3.02 CONC. O/MTL. DECK PER STRUCT'L.
3.03 CONC. CURB
3.04 CONC. FOOTING PER STRUCT'L.
3.05 CONC. PAVING PER CIVIL DWGS.
3.06 CONC. SIDEWALK PER CIVIL DWGS.
3.07 CONC. PAD

04 - MASONRY
4.01 CMU BLDNG. WALL
4.02 CMU SITE WALL W/ 2" CMU CAP.

05 - METALS
5.01 STL. COLUMN PER STRUCT'L. PTD.
5.02 STL. BEAM PER STRUCT'L. PTD.
5.03 HSS POST PER STRUCT'L. PTD.
5.04 HSS BEAM PER STRUCT'L. PTD.
5.05 MEMBRANE STRUCTURE I BEAM.
5.06 MTL. DECK.
5.07 MTL. GUARD RAILING.
5.08 MTL. STUD WALL.

06 - WOOD AND PLASTICS

07 - THERMAL & MOISTURE PROTECTION
7.01 W.P. MEMBRANE PER DETL. & SPECS.
7.02 SINGLE PLY PVC ROOFING PER SPECS.
7.03 R-21 RIGID INSULATION @ WALLS.
7.04 UNDERSLAB MOISTURE VAPOR BARRIER.
7.05 ROOF DRAIN AND OVERFLOW.
7.06 CLEAR WATER-REPELLENT GRAFITTI COATING AT CMU WALL. (ALL EXPOSED SURFACES).
7.07 BATT INSULATION.

08 - OPENINGS (SEE DOOR/WINDOW SCHED)
8.01 STL. DOOR. & FRAME, PAINTED.
8.02 CLR. ANODIZED ALUM. STOREFRONT DOOR.
8.03 CLR. ANODIZED ALUM. STOREFRONT WINDOW.
8.04 DOOR HARDWARE SET PER SCHED.
8.05 EXTERIOR WALL LOUVER.
8.06 EXTERIOR WALL VENT WITH CAP.
8.07 ROLLING STL. DOOR & FRAME.
8.08 ICE RINK GATES
8.09 OVERHEAD GLASS DOOR.
8.10 ACCESS PANEL, COLOR TO MATCH ADJACENT MATERIAL.
8.11 ROOF ACCESS HATCH.

09 - FINISHES (SEE FIN. SCHED)
9.01 5/8" TYPE 'X' GYP. BD., PROVIDE 'WET RATED' AT BATHROOMS. PAINT.
9.02 CONC. FLR. SEAL PER FIN. SCHED.
9.03 RUBBER FLR. PER SPECS.
9.04 PAINT PER SPECS.
9.05 REVEAL PER DETAILS.
9.06 GRAFITTI COATING, TYP. @ ALL EXTERIOR SOLID WALLS.
9.07 GLAZED FINISH ON CMU.
9.08 CERAMIC TILE.

10 - SPECIALTIES
10.01 MIRROR PER SPECS.
10.02 SIGNAGE.
10.03 TOILET PAPER ROLL HOLDER PER ACCESSORY SCHED.
10.04 GRAB BAR.
10.05 COAT HOOK.
10.06 WASTE RECEPTACLE.
10.07 FOLDING SHOWER SEAT.
10.08 SHOWER ROD.
10.09 SHELF.
10.10 NETTING. NIC
10.11 FIRE EXTINGUISHER. RECESSED CABINET
10.12 TOILET SEAT COVER DISPENSER.
10.13 PAPER TOWEL DISPENSER.
10.14 BATHROOM PARTITION W/ ROBE HOOK @ EA. DOOR

11 - EQUIPMENT/APPLIANCES (SEE EQMT. SCHED)

12 - FURNISHINGS
12.01 BICYCLE RACKS FOR SHORT-TERM BIKE PARKING.
12.02 DASHERBOARDS. NIC.
12.03 BENCH. NIC.
12.04 BLEACHERS. NIC.
12.05 SCOREBOARD. NIC.
12.06 SKATE RACKS. NIC.

13 - SPECIAL CONSTRUCTION
13.01 MEMBRANE STRUCTURE.

14 - CONVEYING EQUIPMENT (NOT USED)

21 - FIRE SUPPRESSION
21.01 FIRE EXTINGUISHER.
21.02 FIRE SPRINKLER HORIZ. MAIN (SEE DIAGRAM)
21.03 FIRE SPRINKLER VALVE ASSEMBLY
21.04 FIRE DEPT. MAIN CONNECTION @ FRONT OF PROJECT. LAFD SHALL APPROVE FINAL LOCATION.
21.05 FIRE SPRINKLER HEAD.

22 - PLUMBING
22.01 WATER CLOSET PER PLUMBING LEGEND
22.02 LAV. SINK & FAUCET. PER PLUMBING LEGEND
22.03 JANITOR MOP SINK.
22.04 PLUMBING VENT PIPE.
22.05 DRINKING FOUNTAIN.
22.06 ULTRA LOW-FLOW TOILET.
22.07 SHOWER HEAD/ CONTROLS.
22.08 SHOWER DRAIN.
22.09 AREA DRAIN.
22.10 HOSE BIB.

23 - HEATING, VENTILATING, AND AIR-CONDITIONING
23.01 HVAC UNIT PER MECH.
23.02 AIR REGISTER WALL MOUNTED.
23.03 CEILING AIR REGISTER.
23.04 MAKE UP AIR LOUVER PER MECH. DWGS
23.05 BATHRM EXHAUST FAN PER SPECS.
23.06 BATHRM EXHAUST DUCT.
23.07 MECH. DUCT.
23.08 MECH. EQUIPMENT.

26 - ELECTRICAL
26.01 ELEC. PANEL PER PLANS & SCHED.
26.02 EXTERIOR LIGHT PER SCHED.
26.03 INTERIOR LIGHT PER SCHED.

27 - COMMUNICATION

28 - ELECTRONIC SAFETY AND SECURITY
28.01 SMOKE ALARM.
28.02 SECURITY CAMERA.
28.03 FIRE ALARM MAIN PANEL.

31 - EARTHWORK
31.01 APPROVED COMPACT FILL PER GEO & SOIL ENGINEER REPORT.

32 - EXTERIOR IMPROVEMENTS
32.01 ASPHALT PAVING PER CIVIL.
32.02 GRAPHICS/PAINT.SEE LAND. DWGS.
32.03 STORMWATER MANAGEMENT PER CIVIL DWGS.
32.04 STL. SECURITY GATE, PTD.
32.05 STL. SECURITY FENCE, PTD.
32.06 EXTERIOR AREA DRAINS.
32.07 BENCH.
32.08 TRENCH DRAIN.
32.09 TREE, SEE LANDSCAPE DWGS.
32.10 PLANTING, SEE LANDSCAPE DWGS.
32.11 (N) CONCRETE SIDEWALK, CURB, GUTTER PER CITY OF LA STANDARDS.
32.12 (N) CONC. APRON & DRIVEWAY CURB CUT PER CITY OF LA STANDARDS.
32.13 EQUIPMENT SCREEN.
32.14 CONC. WALL @ SITE FENCE.

33 - UTILITIES
33.01 WATER METER.
33.02 ELECTRICAL TRANSFORMER W/ BOLLARDS AS REQ'D.
33.03 ELECTRICAL METER.
33.04 POWER POLE.

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

LICENSED ARCHITECT
LAWRENCE SCARPA
C 21812
REN 10/31/2023
STATE OF CALIFORNIA

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED

BUREAU OF ENGINEERING
VERTICAL CONTROL:
HORIZONTAL CONTROL:
SHEET TITLE: SPECIALTY LIGHTING & EQUIPMENT RCP (FF&E)
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

DEPARTMENT OF PUBLIC WORKS
NO.	REVISIONS:	DATE:	BY:

CIP NO.

INDEX NO.

CITY OF LOS ANGELES
CITY ENGINEER
GARY LEE MOORE, P.E. ENV SP
DESIGN GROUP
DATE:
ENGINEER:
DESIGNED BY:
DRAWN BY:
CHECKED BY:
APPROVED BY:

WORK ORDER NO.
E170121B

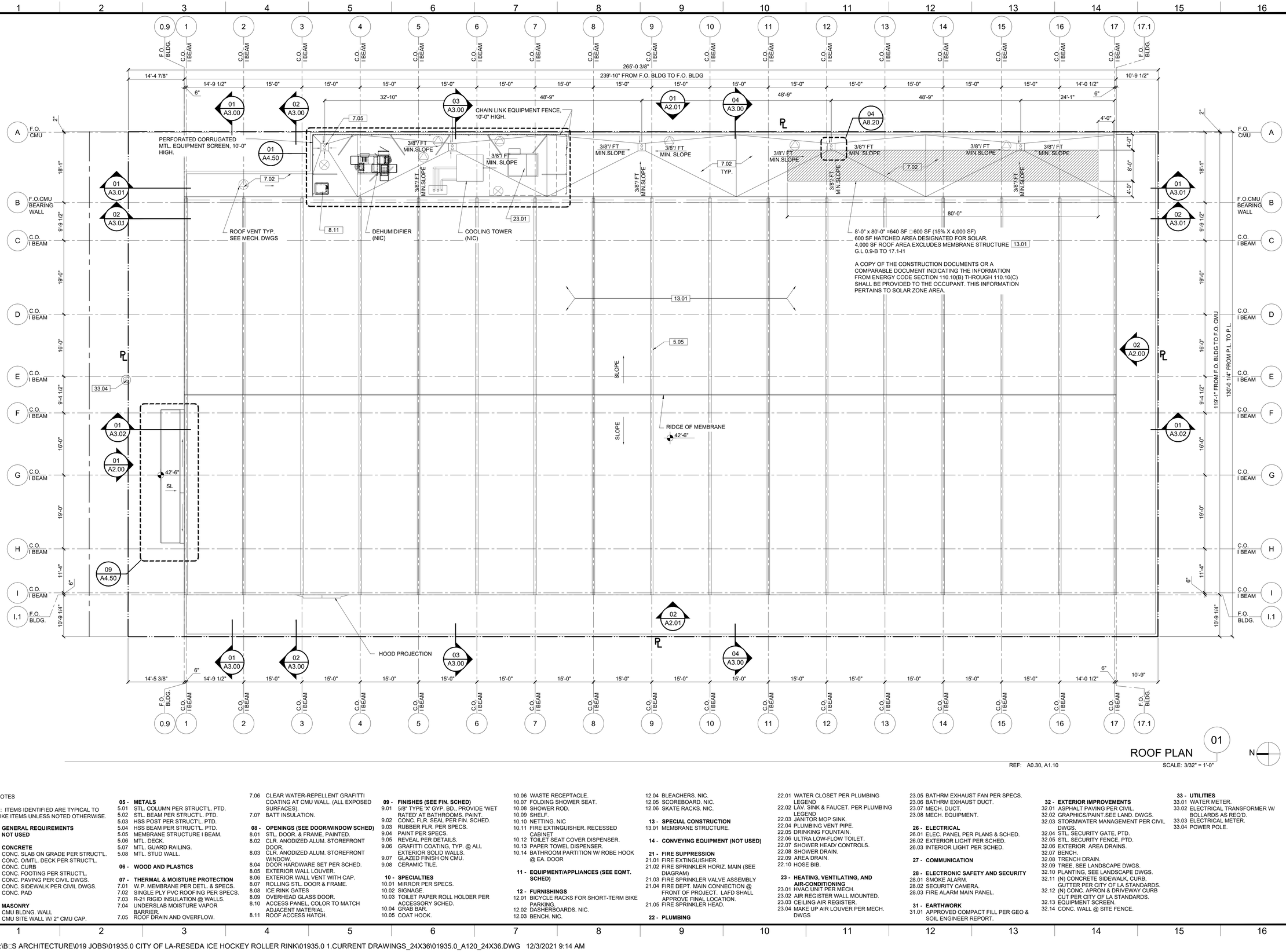
SHEET NAME
A1.13
SHEET X OF X SHEETS

REVISION DATES (DESIGN STAGE ONLY)

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

Sheet Version 4.0

Z:\B□S ARCHITECTURE\019 JOBS\01935.0 CITY OF LA-RESEDA ICE HOCKEY ROLLER RINK\01935.0 1.CURRENT DRAWINGS_24X36\01935.0_A113_24X36.DWG 12/3/2021 9:14 AM



ROOF PLAN 01

REF: A0.30, A1.10 SCALE: 3/32" = 1'-0"

N

KEYNOTES

NOTE: ITEMS IDENTIFIED ARE TYPICAL TO ALL LIKE ITEMS UNLESS NOTED OTHERWISE.

01 - GENERAL REQUIREMENTS
02 - NOT USED

03 - CONCRETE
3.01 CONC. SLAB ON GRADE PER STRUCT'L.
3.02 CONC. O/MTL. DECK PER STRUCT'L.
3.03 CONC. CURB
3.04 CONC. FOOTING PER STRUCT'L.
3.05 CONC. PAVING PER CIVIL DWGS.
3.06 CONC. SIDEWALK PER CIVIL DWGS.
3.07 CONC. PAD

04 - MASONRY
4.01 CMU BLDNG. WALL
4.02 CMU SITE WALL W/ 2" CMU CAP.

05 - METALS
5.01 STL. COLUMN PER STRUCT'L. PTD.
5.02 STL. BEAM PER STRUCT'L. PTD.
5.03 HSS POST PER STRUCT'L. PTD.
5.04 HSS BEAM PER STRUCT'L. PTD.
5.05 MEMBRANE STRUCTURE I BEAM.
5.06 MTL. DECK.
5.07 MTL. GUARD RAILING.
5.08 MTL. STUD WALL.

06 - WOOD AND PLASTICS

07 - THERMAL & MOISTURE PROTECTION
7.01 W.P. MEMBRANE PER DETL. & SPECS.
7.02 SINGLE PLY PVC ROOFING PER SPECS.
7.03 R-21 RIGID INSULATION @ WALLS.
7.04 UNDERSLAB MOISTURE VAPOR BARRIER.
7.05 ROOF DRAIN AND OVERFLOW.
7.06 CLEAR WATER-REPELLENT GRAFITTI COATING AT CMU WALL. (ALL EXPOSED SURFACES).
7.07 BATT INSULATION.

08 - OPENINGS (SEE DOOR/WINDOW SCHED)
8.01 STL. DOOR. & FRAME, PAINTED.
8.02 CLR. ANODIZED ALUM. STOREFRONT DOOR.
8.03 CLR. ANODIZED ALUM. STOREFRONT WINDOW.
8.04 DOOR HARDWARE SET PER SCHED.
8.05 EXTERIOR WALL LOUVER.
8.06 EXTERIOR WALL VENT WITH CAP.
8.07 ROLLING STL. DOOR & FRAME.
8.08 ICE RINK GATES
8.09 OVERHEAD GLASS DOOR.
8.10 ACCESS PANEL, COLOR TO MATCH ADJACENT MATERIAL.
8.11 ROOF ACCESS HATCH.

09 - FINISHES (SEE FIN. SCHED)
9.01 5/8" TYPE 'X' GYP. BD., PROVIDE 'WET RATED' AT BATHROOMS, PAINT.
9.02 CONC. FLR. SEAL PER FIN. SCHED.
9.03 RUBBER FLR. PER SPECS.
9.04 PAINT PER SPECS.
9.05 REVEAL PER DETAILS.
9.06 GRAFITTI COATING, TYP. @ ALL EXTERIOR SOLID WALLS.
9.07 GLAZED FINISH ON CMU.
9.08 CERAMIC TILE.

10 - SPECIALTIES
10.01 MIRROR PER SPECS.
10.02 SIGNAGE.
10.03 TOILET PAPER ROLL HOLDER PER ACCESSORY SCHED.
10.04 GRAB BAR.
10.05 COAT HOOK.
10.06 WASTE RECEPTACLE.
10.07 FOLDING SHOWER SEAT.
10.08 SHOWER ROD.
10.09 SHELF.
10.10 NETTING. NIC
10.11 FIRE EXTINGUISHER. RECESSED CABINET
10.12 TOILET SEAT COVER DISPENSER.
10.13 PAPER TOWEL DISPENSER.
10.14 BATHROOM PARTITION W/ ROBE HOOK @ EA. DOOR

11 - EQUIPMENT/APPLIANCES (SEE EQMT. SCHED)

12 - FURNISHINGS
12.01 BICYCLE RACKS FOR SHORT-TERM BIKE PARKING.
12.02 DASHERBOARDS. NIC.
12.03 BENCH. NIC.
12.04 BLEACHERS. NIC.
12.05 SCOREBOARD. NIC.
12.06 SKATE RACKS. NIC.

13 - SPECIAL CONSTRUCTION
13.01 MEMBRANE STRUCTURE.

14 - CONVEYING EQUIPMENT (NOT USED)

21 - FIRE SUPPRESSION
21.01 FIRE EXTINGUISHER.
21.02 FIRE SPRINKLER HORIZ. MAIN (SEE DIAGRAM)
21.03 FIRE SPRINKLER VALVE ASSEMBLY
21.04 FIRE DEPT. MAIN CONNECTION @ FRONT OF PROJECT. LAFD SHALL APPROVE FINAL LOCATION.
21.05 FIRE SPRINKLER HEAD.

22 - PLUMBING
22.01 WATER CLOSET PER PLUMBING LEGEND
22.02 LAV. SINK & FAUCET. PER PLUMBING LEGEND
22.03 JANITOR MOP SINK.
22.04 PLUMBING VENT PIPE.
22.05 DRINKING FOUNTAIN.
22.06 ULTRA LOW-FLOW TOILET.
22.07 SHOWER HEAD/ CONTROLS.
22.08 SHOWER DRAIN.
22.09 AREA DRAIN.
22.10 HOSE BIB.

23.05 BATHRM EXHAUST FAN PER SPECS.
23.06 BATHRM EXHAUST DUCT.
23.07 MECH. DUCT.
23.08 MECH. EQUIPMENT.

26 - ELECTRICAL
26.01 ELEC. PANEL PER PLANS & SCHED.
26.02 EXTERIOR LIGHT PER SCHED.
26.03 INTERIOR LIGHT PER SCHED.

27 - COMMUNICATION

28 - ELECTRONIC SAFETY AND SECURITY
28.01 SMOKE ALARM.
28.02 SECURITY CAMERA.
28.03 FIRE ALARM MAIN PANEL.

31 - EARTHWORK
31.01 APPROVED COMPACT FILL PER GEO & SOIL ENGINEER REPORT.

32 - EXTERIOR IMPROVEMENTS
32.01 ASPHALT PAVING PER CIVIL.
32.02 GRAPHICS/PAINT.SEE LAND. DWGS.
32.03 STORMWATER MANAGEMENT PER CIVIL DWGS.
32.04 STL. SECURITY GATE, PTD.
32.05 STL. SECURITY FENCE, PTD.
32.06 EXTERIOR AREA DRAINS.
32.07 BENCH.
32.08 TRENCH DRAIN.
32.09 TREE, SEE LANDSCAPE DWGS.
32.10 PLANTING, SEE LANDSCAPE DWGS.
32.11 (N) CONCRETE SIDEWALK, CURB, GUTTER PER CITY OF LA STANDARDS.
32.12 (N) CONC. APRON & DRIVEWAY CURB CUT PER CITY OF LA STANDARDS.
32.13 EQUIPMENT SCREEN.
32.14 CONC. WALL @ SITE FENCE.

33 - UTILITIES
33.01 WATER METER.
33.02 ELECTRICAL TRANSFORMER W/ BOLLARDS AS REQ'D.
33.03 ELECTRICAL METER.
33.04 POWER POLE.

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

LICENSED ARCHITECT
LAWRENCE SQUARZ
C 21812
REN 10/31/2023
STATE OF CALIFORNIA

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED

DEPARTMENT OF PUBLIC WORKS
BUREAU OF ENGINEERING
VERTICAL CONTROL:
HORIZONTAL CONTROL:
SHEET TITLE: ROOF PLAN
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

NO.	REVISIONS:	DATE:	BY:

CIP NO.

INDEX NO.

CITY OF LOS ANGELES
CITY ENGINEER
GARY LEE MOORE, P.E., ENV SP
DATE:
DESIGN GROUP*
ENGINEER:
DESIGNED BY:
DRAWN BY:
CHECKED BY:
APPROVED BY:

WORK ORDER NO.
E170121B

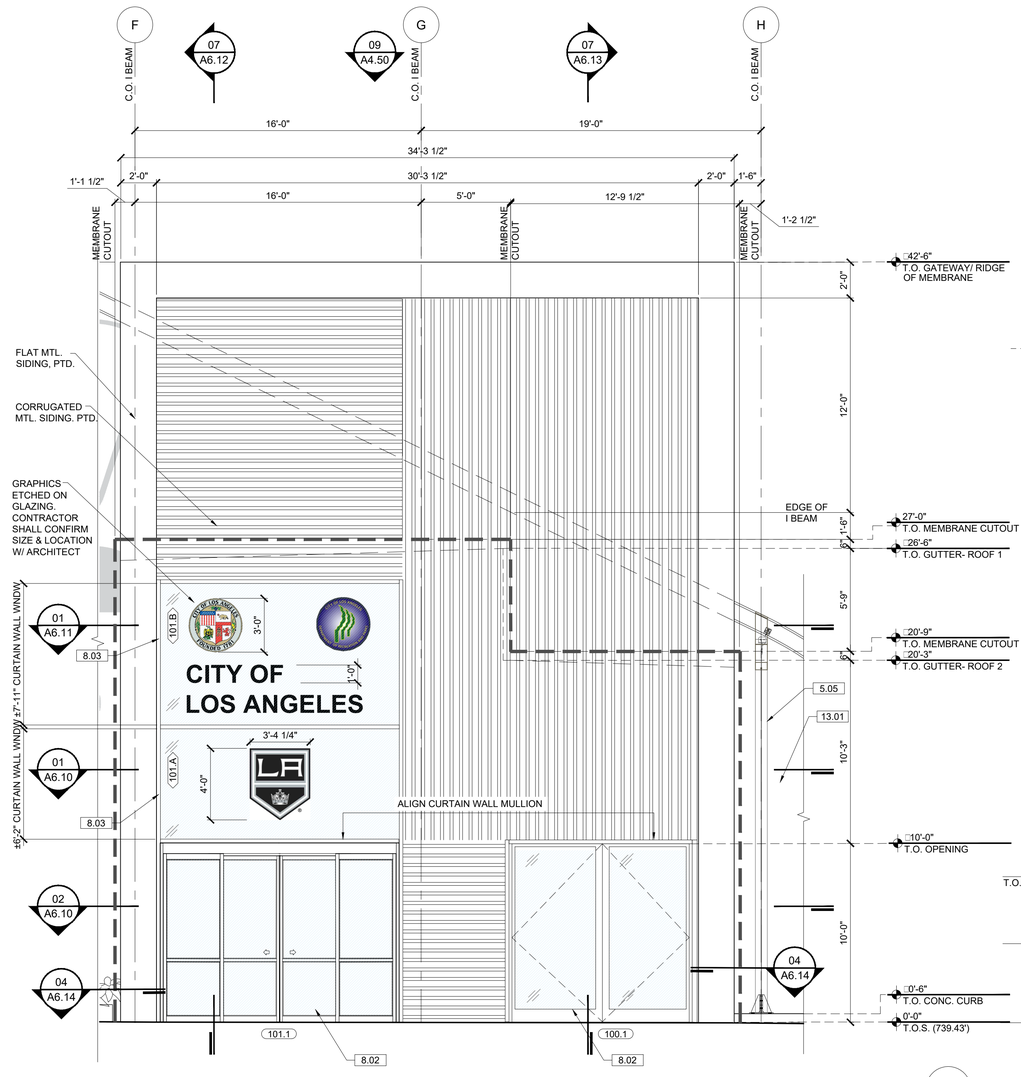
SHEET NAME
A1.20
SHEET X OF X SHEETS

REVISION DATES (DESIGN STAGE ONLY)

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

Sheet Version 4.0

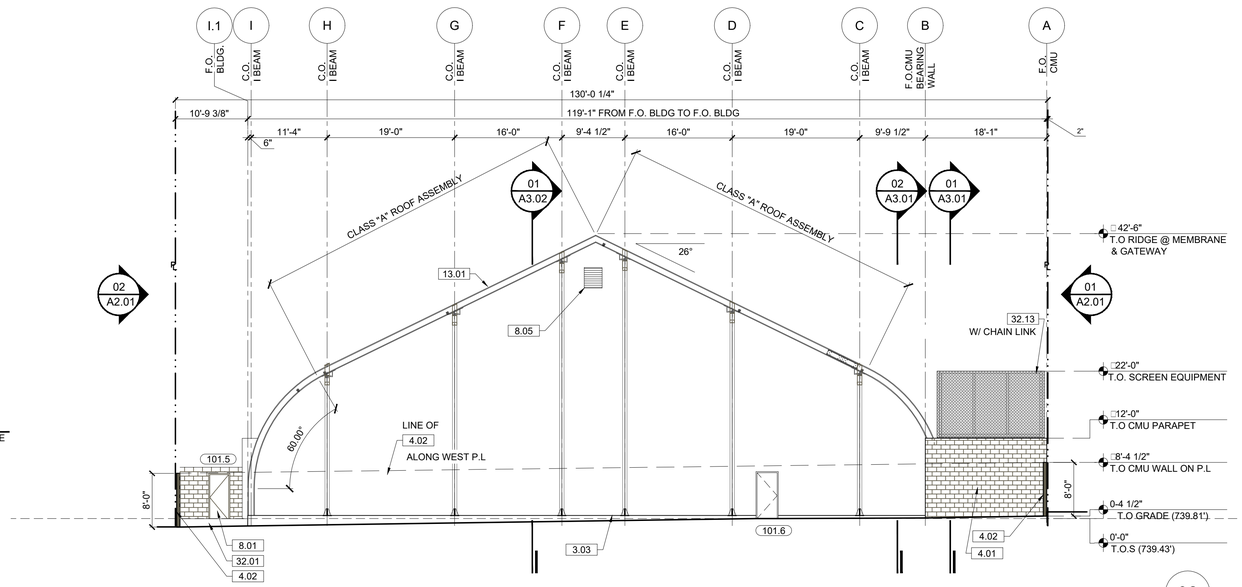
Z:\B□S ARCHITECTURE\019 JOBS\01935.0 CITY OF LA-RESEDA ICE HOCKEY ROLLER RINK\01935.0 1.CURRENT DRAWINGS_24X36\01935.0_A120_24X36.DWG 12/3/2021 9:14 AM



GATEWAY ELEVATION

07

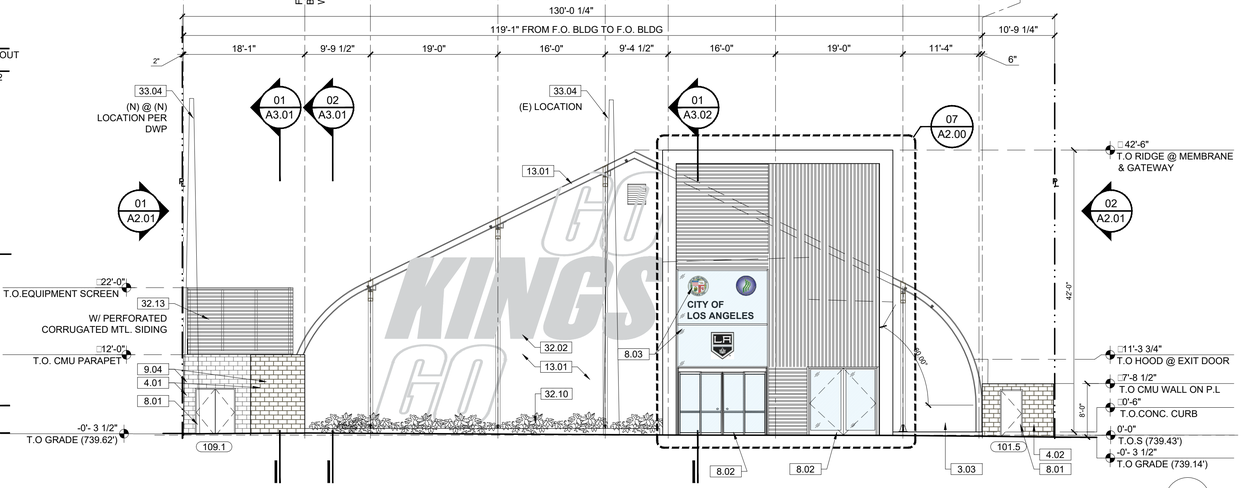
REF: 01/-, A4.00, A4.50, A6.10, A6.11, A6.12, A6.13 SCALE: 1/4" = 1'-0"



SOUTH ELEVATION

02

REF: A1.10, A0.02 SCALE: 3/32" = 1'-0"



NORTH ELEVATION

01

REF: A1.10, A0.02 SCALE: 3/32" = 1'-0"

KEYNOTES

NOTE: ITEMS IDENTIFIED ARE TYPICAL TO ALL LIKE ITEMS UNLESS NOTED OTHERWISE.

01 - GENERAL REQUIREMENTS
02 - NOT USED

03 - CONCRETE
3.01 CONC. SLAB ON GRADE PER STRUCT'L.
3.02 CONC. O/MTL. DECK PER STRUCT'L.
3.03 CONC. CURB
3.04 CONC. FOOTING PER STRUCT'L.
3.05 CONC. PAVING PER CIVIL DWGS.
3.06 CONC. SIDEWALK PER CIVIL DWGS.
3.07 CONC. PAD

04 - MASONRY
4.01 CMU BLDNG. WALL
4.02 CMU SITE WALL W/ 2" CMU CAP.

05 - METALS
5.01 STL. COLUMN PER STRUCT'L. PTD.
5.02 STL. BEAM PER STRUCT'L. PTD.
5.03 HSS POST PER STRUCT'L. PTD.
5.04 HSS BEAM PER STRUCT'L. PTD.
5.05 MEMBRANE STRUCTURE I BEAM.
5.06 MTL. DECK.
5.07 MTL. GUARD RAILING.
5.08 MTL. STUD WALL.

06 - WOOD AND PLASTICS

07 - THERMAL & MOISTURE PROTECTION
7.01 W.P. MEMBRANE PER DETL. & SPECS.
7.02 SINGLE PLY PVC ROOFING PER SPECS.
7.03 R-21 RIGID INSULATION @ WALLS.
7.04 UNDERSLAB MOISTURE VAPOR BARRIER.
7.05 ROOF DRAIN AND OVERFLOW.
7.06 CLEAR WATER-REPELLENT GRAFITTI COATING AT CMU WALL. (ALL EXPOSED SURFACES).
7.07 BATT INSULATION.

08 - OPENINGS (SEE DOOR/WINDOW SCHED)
8.01 STL. DOOR. & FRAME, PAINTED.
8.02 CLR. ANODIZED ALUM. STOREFRONT DOOR.
8.03 CLR. ANODIZED ALUM. STOREFRONT WINDOW.
8.04 DOOR HARDWARE SET PER SCHED.
8.05 EXTERIOR WALL LOUVER.
8.06 EXTERIOR WALL VENT WITH CAP.
8.07 ROLLING STL. DOOR & FRAME.
8.08 ICE RINK GATES
8.09 OVERHEAD GLASS DOOR.
8.10 ACCESS PANEL, COLOR TO MATCH ADJACENT MATERIAL.
8.11 ROOF ACCESS HATCH.

09 - FINISHES (SEE FIN. SCHED)
9.01 5/8" TYPE 'X' GYP. BD., PROVIDE 'WET RATED' AT BATHROOMS. PAINT.
9.02 CONC. FLR. SEAL PER FIN. SCHED.
9.03 RUBBER FLR. PER SPECS.
9.04 PAINT PER SPECS.
9.05 REVEAL PER DETAILS.
9.06 GRAFITTI COATING, TYP. @ ALL EXTERIOR SOLID WALLS.
9.07 GLAZED FINISH ON CMU.
9.08 CERAMIC TILE.

10 - SPECIALTIES
10.01 MIRROR PER SPECS.
10.02 SIGNAGE.
10.03 TOILET PAPER ROLL HOLDER PER ACCESSORY SCHED.
10.04 GRAB BAR.
10.05 COAT HOOK.
10.06 WASTE RECEPTACLE.
10.07 FOLDING SHOWER SEAT.
10.08 SHOWER ROD.
10.09 SHELF.
10.10 NETTING. NIC
10.11 FIRE EXTINGUISHER. RECESSED CABINET
10.12 TOILET SEAT COVER DISPENSER.
10.13 PAPER TOWEL DISPENSER.
10.14 BATHROOM PARTITION W/ ROBE HOOK @ EA. DOOR

11 - EQUIPMENT/APPLIANCES (SEE EQMT. SCHED)

12 - FURNISHINGS
12.01 BICYCLE RACKS FOR SHORT-TERM BIKE PARKING.
12.02 DASHERBOARDS. NIC.
12.03 BENCH. NIC.
12.04 BLEACHERS. NIC.
12.05 SCOREBOARD. NIC.
12.06 SKATE RACKS. NIC.

13 - SPECIAL CONSTRUCTION
13.01 MEMBRANE STRUCTURE.

14 - CONVEYING EQUIPMENT (NOT USED)

21 - FIRE SUPPRESSION
21.01 FIRE EXTINGUISHER.
21.02 FIRE SPRINKLER HORIZ. MAIN (SEE DIAGRAM)
21.03 FIRE SPRINKLER VALVE ASSEMBLY
21.04 FIRE DEPT. MAIN CONNECTION @ FRONT OF PROJECT. LAFD SHALL APPROVE FINAL LOCATION.
21.05 FIRE SPRINKLER HEAD.

22 - PLUMBING
22.01 WATER CLOSET PER PLUMBING LEGEND
22.02 LAV. SINK & FAUCET. PER PLUMBING LEGEND
22.03 JANITOR MOP SINK.
22.04 PLUMBING VENT PIPE.
22.05 DRINKING FOUNTAIN.
22.06 ULTRA LOW-FLOW TOILET.
22.07 SHOWER HEAD/ CONTROLS.
22.08 SHOWER DRAIN.
22.09 AREA DRAIN.
22.10 HOSE BIB.

23 - HEATING, VENTILATING, AND AIR-CONDITIONING
23.01 HVAC UNIT PER MECH.
23.02 AIR REGISTER WALL MOUNTED.
23.03 CEILING AIR REGISTER.
23.04 MAKE UP AIR LOUVER PER MECH. DWGS
23.05 BATHRM EXHAUST FAN PER SPECS.
23.06 BATHRM EXHAUST DUCT.
23.07 MECH. DUCT.
23.08 MECH. EQUIPMENT.

26 - ELECTRICAL
26.01 ELEC. PANEL PER PLANS & SCHED.
26.02 EXTERIOR LIGHT PER SCHED.
26.03 INTERIOR LIGHT PER SCHED.

27 - COMMUNICATION

28 - ELECTRONIC SAFETY AND SECURITY
28.01 SMOKE ALARM.
28.02 SECURITY CAMERA.
28.03 FIRE ALARM MAIN PANEL.

31 - EARTHWORK
31.01 APPROVED COMPACT FILL PER GEO & SOIL ENGINEER REPORT.

32 - EXTERIOR IMPROVEMENTS
32.01 ASPHALT PAVING PER CIVIL.
32.02 GRAPHICS/PAINT.SEE LAND. DWGS.
32.03 STORMWATER MANAGEMENT PER CIVIL DWGS.
32.04 STL. SECURITY GATE, PTD.
32.05 STL. SECURITY FENCE, PTD.
32.06 EXTERIOR AREA DRAINS.
32.07 BENCH.
32.08 TRENCH DRAIN.
32.09 TREE, SEE LANDSCAPE DWGS.
32.10 PLANTING, SEE LANDSCAPE DWGS.
32.11 (N) CONCRETE SIDEWALK, CURB, GUTTER PER CITY OF LA STANDARDS.
32.12 (N) CONC. APRON & DRIVEWAY CURB CUT PER CITY OF LA STANDARDS.
32.13 EQUIPMENT SCREEN.
32.14 CONC. WALL @ SITE FENCE.

33 - UTILITIES
33.01 WATER METER.
33.02 ELECTRICAL TRANSFORMER W/ BOLLARDS AS REQ'D.
33.03 ELECTRICAL METER.
33.04 POWER POLE.

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REVISION DATES (DESIGN STAGE ONLY)

Sheet Version 4.0

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

LICENSED ARCHITECT LAWRENCE SQUIRE C 21812 REN 10/31/2023 STATE OF CALIFORNIA

THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED

BUREAU OF ENGINEERING
VERTICAL CONTROL:
HORIZONTAL CONTROL:
SHEET TITLE: ELEVATIONS
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

DEPARTMENT OF PUBLIC WORKS
NO. REVISIONS: DATE: BY:

CIP NO.

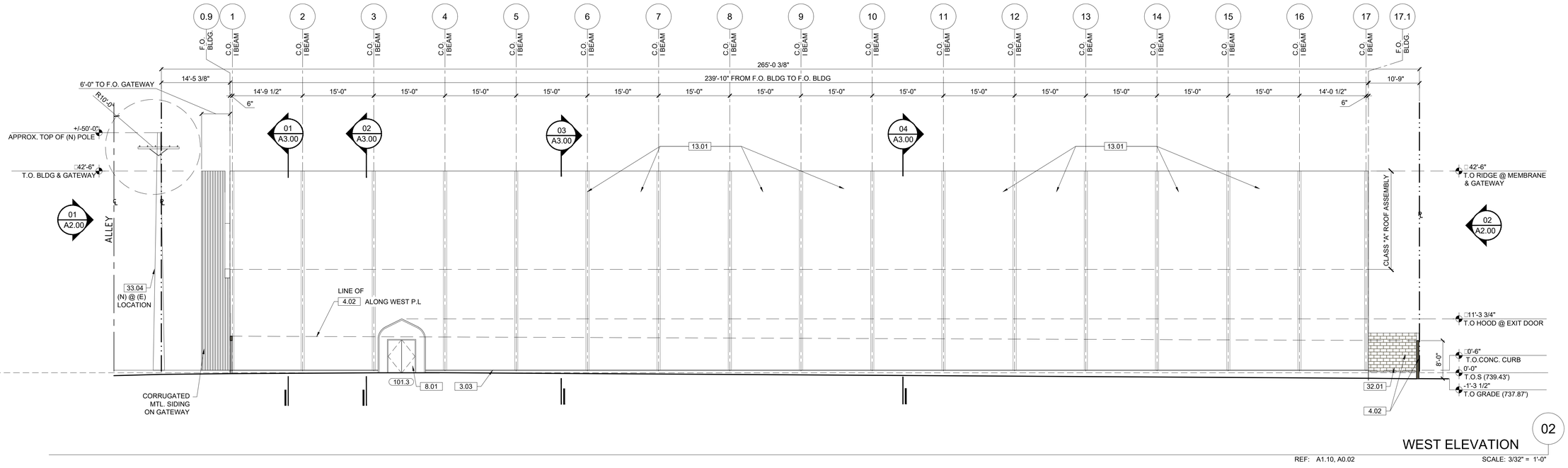
INDEX NO.

CITY OF LOS ANGELES
CITY ENGINEER
GARY LEE MOORE, P.E., ENV SP
DESIGN GROUP
DATE:
ENGINEER:
DESIGNED BY:
DRAWN BY:
CHECKED BY:
APPROVED BY:

WORK ORDER NO.
E170121B

SHEET NAME
A2.00
SHEET X OF X SHEETS

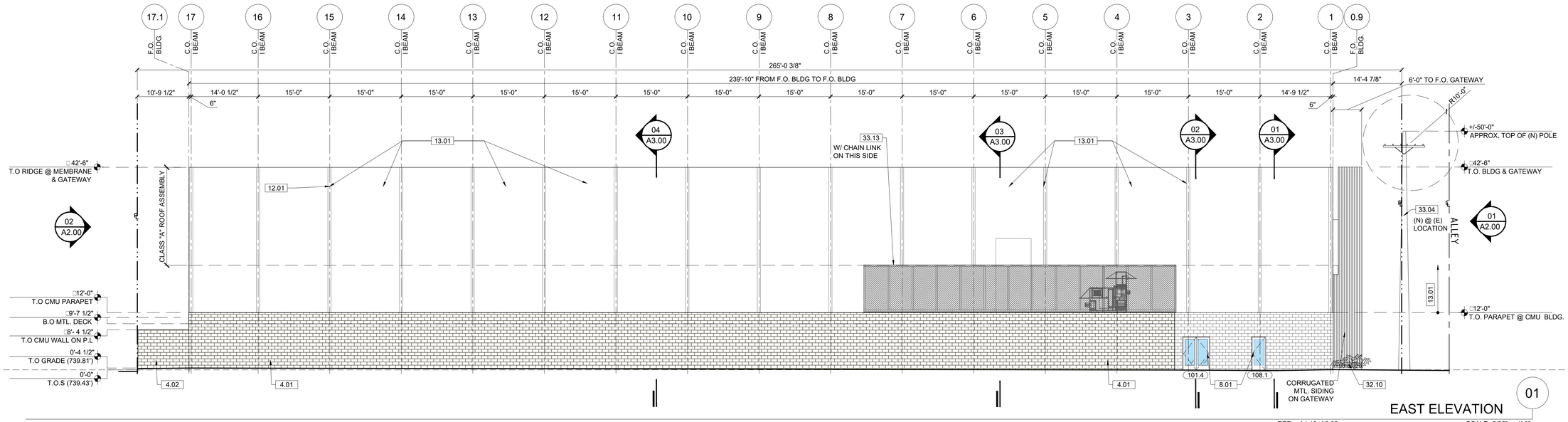
Z:\B□S ARCHITECTURE\019 JOBS\01935.0 CITY OF LA-RESEDA ICE HOCKEY ROLLER RINK\01935.0 1.CURRENT DRAWINGS_24X36\01935.0_A200_24X36.DWG 12/3/2021 9:14 AM



WEST ELEVATION 02

REF: A1.10, A0.02

SCALE: 3/32" = 1'-0"



EAST ELEVATION 01

REF: A1.10, A0.02

SCALE: 3/32" = 1'-0"

KEYNOTES

NOTE: ITEMS IDENTIFIED ARE TYPICAL TO ALL LIKE ITEMS UNLESS NOTED OTHERWISE.

01 - GENERAL REQUIREMENTS

02 - NOT USED

03 - CONCRETE

3.01 CONC. SLAB ON GRADE PER STRUCT'L.
3.02 CONC. O/MTL. DECK PER STRUCT'L.
3.03 CONC. CURB
3.04 CONC. FOOTING PER STRUCT'L.
3.05 CONC. PAVING PER CIVIL DWGS.
3.06 CONC. SIDEWALK PER CIVIL DWGS.
3.07 CONC. PAD

04 - MASONRY

4.01 CMU BLDNG. WALL
4.02 CMU SITE WALL W/ 2" CMU CAP.

05 - METALS

5.01 STL. COLUMN PER STRUCT'L. PTD.
5.02 STL. BEAM PER STRUCT'L. PTD.
5.03 HSS POST PER STRUCT'L. PTD.
5.04 HSS BEAM PER STRUCT'L. PTD.
5.05 MEMBRANE STRUCTURE I BEAM.
5.06 MTL. DECK.
5.07 MTL. GUARD RAILING.
5.08 MTL. STUD WALL.

06 - WOOD AND PLASTICS

07 - THERMAL & MOISTURE PROTECTION

7.01 W.P. MEMBRANE PER DETL. & SPECS.
7.02 SINGLE PLY PVC ROOFING PER SPECS.
7.03 R-21 RIGID INSULATION @ WALLS.
7.04 UNDERSLAB MOISTURE VAPOR BARRIER.
7.05 ROOF DRAIN AND OVERFLOW.
7.06 CLEAR WATER-REPELLENT GRAFITTI COATING AT CMU WALL. (ALL EXPOSED SURFACES).
7.07 BATT INSULATION.

08 - OPENINGS (SEE DOOR/WINDOW SCHED)

8.01 STL. DOOR. & FRAME, PAINTED.
8.02 CLR. ANODIZED ALUM. STOREFRONT DOOR.
8.03 CLR. ANODIZED ALUM. STOREFRONT WINDOW.
8.04 DOOR HARDWARE SET PER SCHED.
8.05 EXTERIOR WALL LOUVER.
8.06 EXTERIOR WALL VENT WITH CAP.
8.07 ROLLING STL. DOOR & FRAME.
8.08 ICE RINK GATES
8.09 OVERHEAD GLASS DOOR.
8.10 ACCESS PANEL, COLOR TO MATCH ADJACENT MATERIAL.
8.11 ROOF ACCESS HATCH.

09 - FINISHES (SEE FIN. SCHED)

9.01 5/8" TYPE 'X' GYP. BD., PROVIDE 'WET RATED' AT BATHROOMS. PAINT.
9.02 CONC. FLR. SEAL PER FIN. SCHED.
9.03 RUBBER FLR. PER SPECS.
9.04 PAINT PER SPECS.
9.05 REVEAL PER DETAILS.
9.06 GRAFITTI COATING, TYP. @ ALL EXTERIOR SOLID WALLS.
9.07 GLAZED FINISH ON CMU.
9.08 CERAMIC TILE.

10 - SPECIALTIES

10.01 MIRROR PER SPECS.
10.02 SIGNAGE.
10.03 TOILET PAPER ROLL HOLDER PER ACCESSORY SCHED.
10.04 GRAB BAR.
10.05 COAT HOOK.
10.06 WASTE RECEPTACLE.
10.07 FOLDING SHOWER SEAT.
10.08 SHOWER ROD.
10.09 SHELF.
10.10 NETTING. NIC
10.11 FIRE EXTINGUISHER. RECESSED CABINET
10.12 TOILET SEAT COVER DISPENSER.
10.13 PAPER TOWEL DISPENSER.
10.14 BATHROOM PARTITION W/ ROBE HOOK @ EA. DOOR

11 - EQUIPMENT/APPLIANCES (SEE EQMT. SCHED)

12 - FURNISHINGS

12.01 BICYCLE RACKS FOR SHORT-TERM BIKE PARKING.
12.02 DASHERBOARDS. NIC.
12.03 BENCH. NIC.
12.04 BLEACHERS. NIC.
12.05 SCOREBOARD. NIC.
12.06 SKATE RACKS. NIC.

13 - SPECIAL CONSTRUCTION

13.01 MEMBRANE STRUCTURE.

14 - CONVEYING EQUIPMENT (NOT USED)

21 - FIRE SUPPRESSION

21.01 FIRE EXTINGUISHER.
21.02 FIRE SPRINKLER HORIZ. MAIN (SEE DIAGRAM)
21.03 FIRE SPRINKLER VALVE ASSEMBLY
21.04 FIRE DEPT. MAIN CONNECTION @ FRONT OF PROJECT. LAFD SHALL APPROVE FINAL LOCATION.
21.05 FIRE SPRINKLER HEAD.

22 - PLUMBING

22.01 WATER CLOSET PER PLUMBING LEGEND
22.02 LAV, SINK & FAUCET. PER PLUMBING LEGEND
22.03 JANITOR MOP SINK.
22.04 PLUMBING VENT PIPE.
22.05 DRINKING FOUNTAIN.
22.06 ULTRA LOW-FLOW TOILET.
22.07 SHOWER HEAD/ CONTROLS.
22.08 SHOWER DRAIN.
22.09 AREA DRAIN.
22.10 HOSE BIB.

23 - HEATING, VENTILATING, AND AIR-CONDITIONING

23.01 HVAC UNIT PER MECH.
23.02 AIR REGISTER WALL MOUNTED.
23.03 CEILING AIR REGISTER.
23.04 MAKE UP AIR LOUVER PER MECH. DWGS
23.05 BATHRM EXHAUST FAN PER SPECS.
23.06 BATHRM EXHAUST DUCT.
23.07 MECH. DUCT.
23.08 MECH. EQUIPMENT.

26 - ELECTRICAL

26.01 ELEC. PANEL PER PLANS & SCHED.
26.02 EXTERIOR LIGHT PER SCHED.
26.03 INTERIOR LIGHT PER SCHED.

27 - COMMUNICATION

28 - ELECTRONIC SAFETY AND SECURITY

28.01 SMOKE ALARM.
28.02 SECURITY CAMERA.
28.03 FIRE ALARM MAIN PANEL.

31 - EARTHWORK

31.01 APPROVED COMPACT FILL PER GEO & SOIL ENGINEER REPORT.

32 - EXTERIOR IMPROVEMENTS

32.01 ASPHALT PAVING PER CIVIL.
32.02 GRAPHICS/PAINT.SEE LAND. DWGS.
32.03 STORMWATER MANAGEMENT PER CIVIL DWGS.
32.04 STL. SECURITY GATE, PTD.
32.05 STL. SECURITY FENCE, PTD.
32.06 EXTERIOR AREA DRAINS.
32.07 BENCH.
32.08 TRENCH DRAIN.
32.09 TREE, SEE LANDSCAPE DWGS.
32.10 PLANTING, SEE LANDSCAPE DWGS.
32.11 (N) CONCRETE SIDEWALK, CURB, GUTTER PER CITY OF LA STANDARDS.
32.12 (N) CONC. APRON & DRIVEWAY CURB CUT PER CITY OF LA STANDARDS.
32.13 EQUIPMENT SCREEN.
32.14 CONC. WALL @ SITE FENCE.

33 - UTILITIES

33.01 WATER METER.
33.02 ELECTRICAL TRANSFORMER W/ BOLLARDS AS REQ'D.
33.03 ELECTRICAL METER.
33.04 POWER POLE.

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

LICENSED ARCHITECT
LAWRENCE SCARPA
C 21812
REN 10/31/2023
STATE OF CALIFORNIA

THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED

BUREAU OF ENGINEERING
VERTICAL CONTROL:
HORIZONTAL CONTROL:
SHEET TITLE: ELEVATIONS
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

DEPARTMENT OF PUBLIC WORKS
NO. REVISIONS: DATE: BY:
CIP NO.
INDEX NO.

CITY OF LOS ANGELES
GARY LEE MOORE, P.E. ENV SP
DESIGN GROUP
CITY ENGINEER
DATE:
ENGINEER:
DESIGNED BY:
DRAWN BY:
CHECKED BY:
APPROVED BY:

WORK ORDER NO.
E170121B

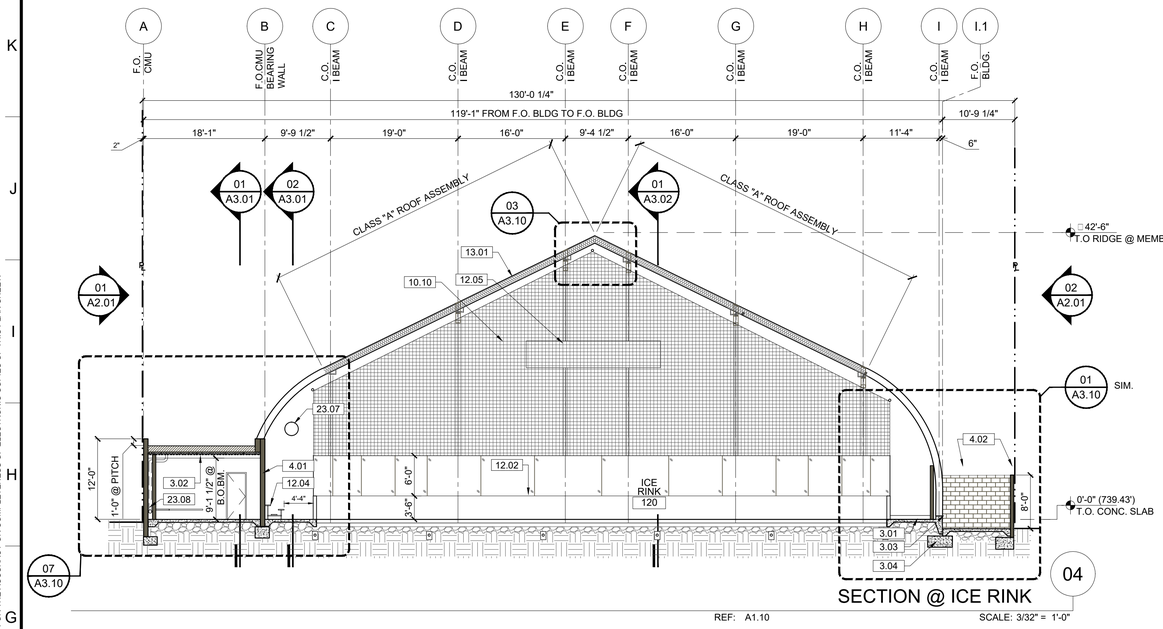
SHEET NAME
A2.01
SHEET X OF X SHEETS

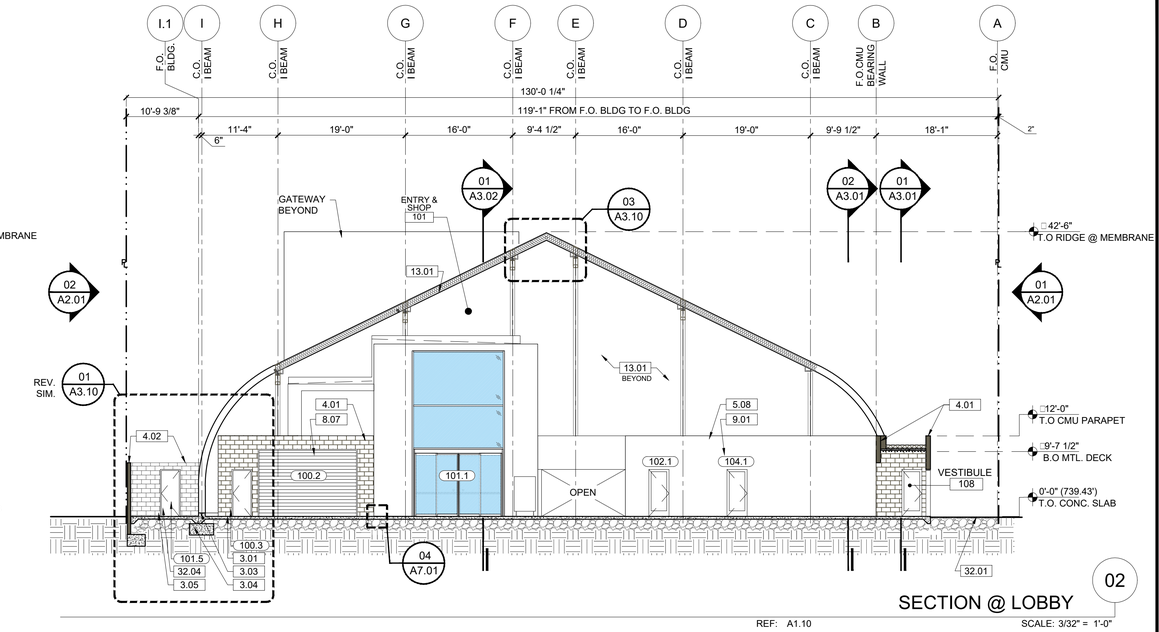
REVISION DATES (DESIGN STAGE ONLY)

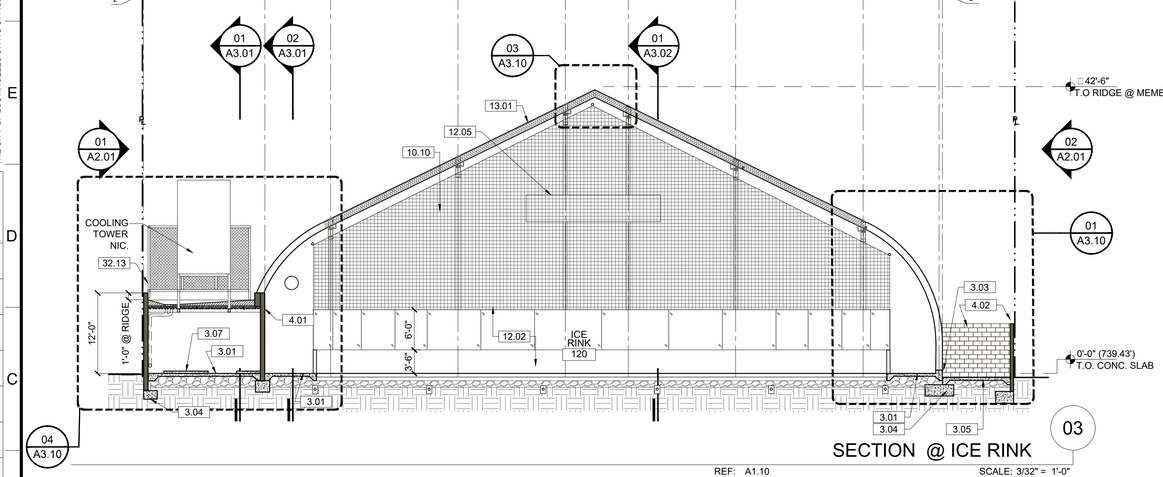
THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

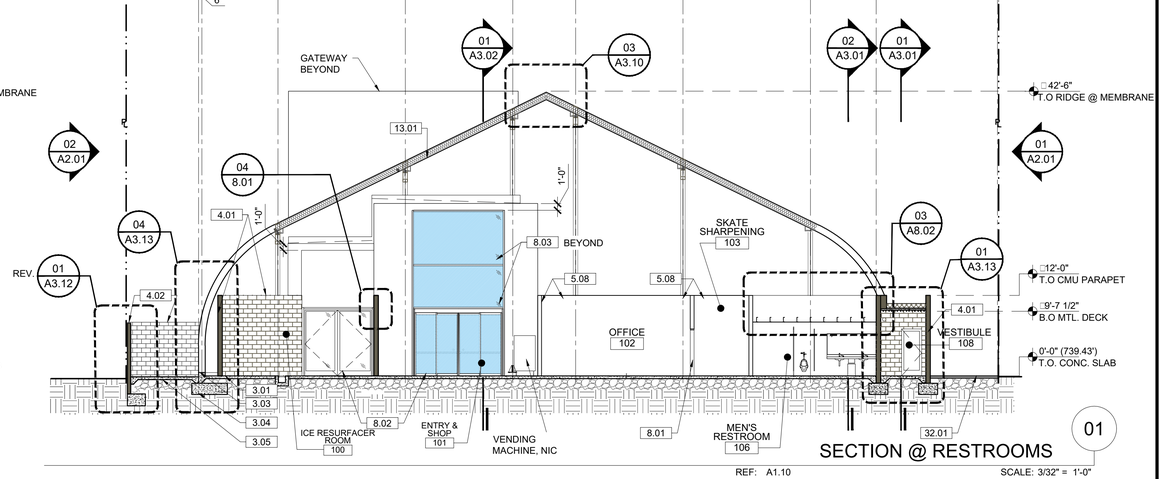
Sheet Version 4.0

Z:\B□S ARCHITECTURE\019 JOBS\01935.0 CITY OF LA-RESEDA ICE HOCKEY ROLLER RINK\01935.0 1.CURRENT DRAWINGS_24X36\01935.0_A201_24X36.DWG 12/3/2021 9:15 AM









KEYNOTES

NOTE: ITEMS IDENTIFIED ARE TYPICAL TO ALL LIKE ITEMS UNLESS NOTED OTHERWISE.

01 - GENERAL REQUIREMENTS
02 - NOT USED

03 - CONCRETE
3.01 CONC. SLAB ON GRADE PER STRUCT'L.
3.02 CONC. O/MTL. DECK PER STRUCT'L.
3.03 CONC. CURB
3.04 CONC. FOOTING PER STRUCT'L.
3.05 CONC. PAVING PER CIVIL DWGS.
3.06 CONC. SIDEWALK PER CIVIL DWGS.
3.07 CONC. PAD

04 - MASONRY
4.01 CMU BLDNG. WALL
4.02 CMU SITE WALL W/ 2" CMU CAP.

05 - METALS
5.01 STL. COLUMN PER STRUCT'L. PTD.
5.02 STL. BEAM PER STRUCT'L. PTD.
5.03 HSS POST PER STRUCT'L. PTD.
5.04 HSS BEAM PER STRUCT'L. PTD.
5.05 MEMBRANE STRUCTURE I BEAM.
5.06 MTL. DECK.
5.07 MTL. GUARD RAILING.
5.08 MTL. STUD WALL.

06 - WOOD AND PLASTICS

07 - THERMAL & MOISTURE PROTECTION
7.01 W.P. MEMBRANE PER DETL. & SPECS.
7.02 SINGLE PLY PVC ROOFING PER SPECS.
7.03 R-21 RIGID INSULATION @ WALLS.
7.04 UNDERSLAB MOISTURE VAPOR BARRIER
7.05 ROOF DRAIN AND OVERFLOW.
7.06 CLEAR WATER-REPELLENT GRAFITTI COATING AT CMU WALL. (ALL EXPOSED SURFACES).
7.07 BATT INSULATION.

08 - OPENINGS (SEE DOOR/WINDOW SCHED)
8.01 STL. DOOR. & FRAME, PAINTED.
8.02 CLR. ANODIZED ALUM. STOREFRONT DOOR.
8.03 CLR. ANODIZED ALUM. STOREFRONT WINDOW.
8.04 DOOR HARDWARE SET PER SCHED.
8.05 EXTERIOR WALL LOUVER.
8.06 EXTERIOR WALL VENT WITH CAP.
8.07 ROLLING STL. DOOR & FRAME.
8.08 ICE RINK GATES
8.09 OVERHEAD GLASS DOOR.
8.10 ACCESS PANEL, COLOR TO MATCH ADJACENT MATERIAL.
8.11 ROOF ACCESS HATCH.

09 - FINISHES (SEE FIN. SCHED)
9.01 5/8" TYPE 'X' GYP. BD., PROVIDE 'WET RATED' AT BATHROOMS. PAINT.
9.02 CONC. FLR. SEAL PER FIN. SCHED.
9.03 RUBBER FLR. PER SPECS.
9.04 PAINT PER SPECS.
9.05 REVEAL PER DETAILS.
9.06 GRAFITTI COATING, TYP. @ ALL EXTERIOR SOLID WALLS.
9.07 GLAZED FINISH ON CMU.
9.08 CERAMIC TILE.

10 - SPECIALTIES
10.01 MIRROR PER SPECS.
10.02 SIGNAGE.
10.03 TOILET PAPER ROLL HOLDER PER ACCESSORY SCHED.
10.04 GRAB BAR.
10.05 COAT HOOK.
10.06 WASTE RECEPTACLE.
10.07 FOLDING SHOWER SEAT.
10.08 SHOWER ROD.
10.09 SHELF.
10.10 NET'S. NIC
10.11 FIRE EXTINGUISHER. RECESSED CABINET
10.12 TOILET SEAT COVER DISPENSER.
10.13 PAPER TOWEL DISPENSER.
10.14 BATHROOM PARTITION W/ ROBE HOOK @ EA. DOOR

11 - EQUIPMENT/APPLIANCES (SEE EQMT. SCHED)

12 - FURNISHINGS
12.01 BICYCLE RACKS FOR SHORT-TERM BIKE PARKING.
12.02 DASHERBOARDS. NIC.
12.03 BENCH. NIC.
12.04 BLEACHERS. NIC.
12.05 SCOREBOARD. NIC.
12.06 SKATE RACKS. NIC.

13 - SPECIAL CONSTRUCTION
13.01 MEMBRANE STRUCTURE.

14 - CONVEYING EQUIPMENT (NOT USED)

21 - FIRE SUPPRESSION
21.01 FIRE EXTINGUISHER.
21.02 FIRE SPRINKLER HORIZ. MAIN (SEE DIAGRAM)
21.03 FIRE SPRINKLER VALVE ASSEMBLY
21.04 FIRE DEPT. MAIN CONNECTION @ FRONT OF PROJECT. LAFD SHALL APPROVE FINAL LOCATION.
21.05 FIRE SPRINKLER HEAD.

22 - PLUMBING
22.01 WATER CLOSET PER PLUMBING LEGEND
22.02 LAV. SINK & FAUCET. PER PLUMBING LEGEND
22.03 JANITOR MOP SINK.
22.04 PLUMBING VENT PIPE.
22.05 DRINKING FOUNTAIN.
22.06 ULTRA LOW-FLOW TOILET.
22.07 SHOWER HEAD/ CONTROLS.
22.08 SHOWER DRAIN.
22.09 AREA DRAIN.
22.10 HOSE BIB.

23 - HEATING, VENTILATING, AND AIR-CONDITIONING
23.01 HVAC UNIT PER MECH.
23.02 AIR REGISTER WALL MOUNTED.
23.03 CEILING AIR REGISTER.
23.04 MAKE UP AIR LOUVER PER MECH. DWGS
23.05 BATHRM EXHAUST FAN PER SPECS.
23.06 BATHRM EXHAUST DUCT.
23.07 MECH. DUCT.
23.08 MECH. EQUIPMENT.

26 - ELECTRICAL
26.01 ELEC. PANEL PER PLANS & SCHED.
26.02 EXTERIOR LIGHT PER SCHED.
26.03 INTERIOR LIGHT PER SCHED.

27 - COMMUNICATION

28 - ELECTRONIC SAFETY AND SECURITY
28.01 SMOKE ALARM.
28.02 SECURITY CAMERA.
28.03 FIRE ALARM MAIN PANEL.

31 - EARTHWORK
31.01 APPROVED COMPACT FILL PER GEO & SOIL ENGINEER REPORT.

32 - EXTERIOR IMPROVEMENTS
32.01 ASPHALT PAVING PER CIVIL.
32.02 GRAPHICS/PAINT.SEE LAND. DWGS.
32.03 STORMWATER MANAGEMENT PER CIVIL DWGS.
32.04 STL. SECURITY GATE, PTD.
32.05 STL. SECURITY FENCE, PTD.
32.06 EXTERIOR AREA DRAINS.
32.07 BENCH.
32.08 TRENCH DRAIN.
32.09 TREE, SEE LANDSCAPE DWGS.
32.10 PLANTING, SEE LANDSCAPE DWGS.
32.11 (N) CONCRETE SIDEWALK, CURB, GUTTER PER CITY OF LA STANDARDS.
32.12 (N) CONC. APRON & DRIVEWAY CURB CUT PER CITY OF LA STANDARDS.
32.13 EQUIPMENT SCREEN.
32.14 CONC. WALL @ SITE FENCE.

33 - UTILITIES
33.01 WATER METER.
33.02 ELECTRICAL TRANSFORMER W/ BOLLARDS AS REQ'D.
33.03 ELECTRICAL METER.
33.04 POWER POLE.

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

LICENSED ARCHITECT
LAWRENCE SCARPA
C 21812
REN 10/31/2023
STATE OF CALIFORNIA

THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED

BUREAU OF ENGINEERING
VERTICAL CONTROL:
HORIZONTAL CONTROL:
SHEET TITLE: SECTIONS
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

DEPARTMENT OF PUBLIC WORKS
NO. REVISIONS: DATE: BY:
INDEX NO.
CIP NO.

CITY OF LOS ANGELES
GARY LEE MOORE, P.E., ENV SP CITY ENGINEER
DESIGN GROUP: DATE:
ENGINEER:
DESIGNED BY:
DRAWN BY:
CHECKED BY:
APPROVED BY:

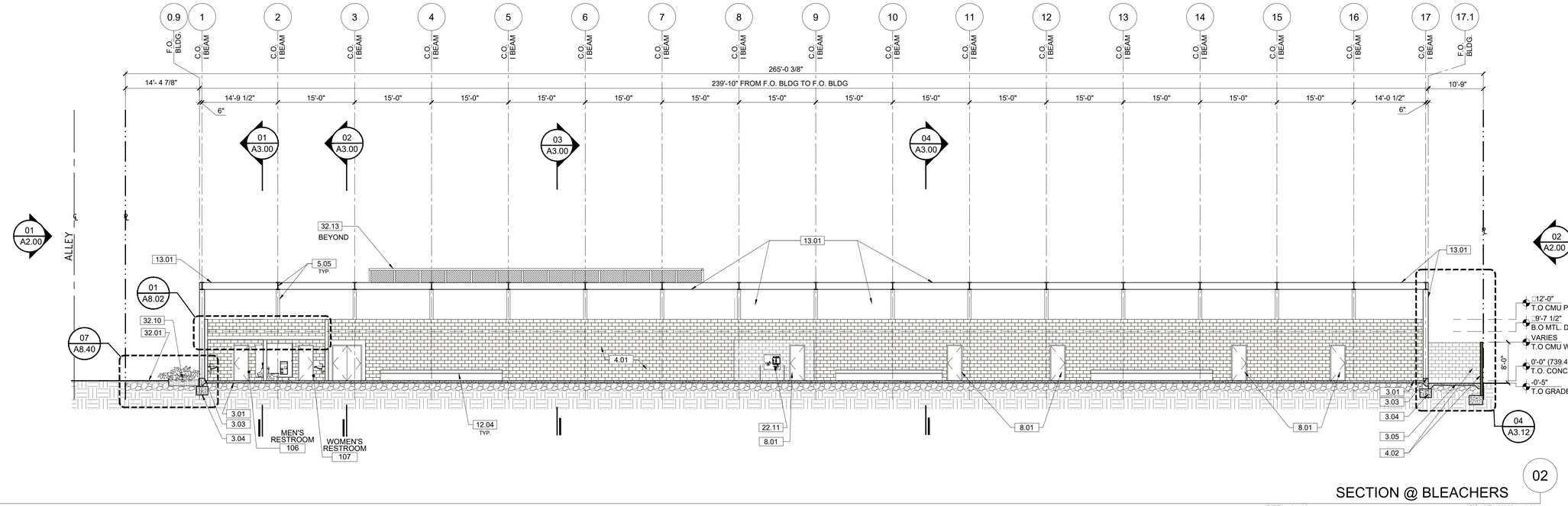
WORK ORDER NO.
E170121B

SHEET NAME
A3.00
SHEET X OF X SHEETS

REVISION DATES (DESIGN STAGE ONLY)

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

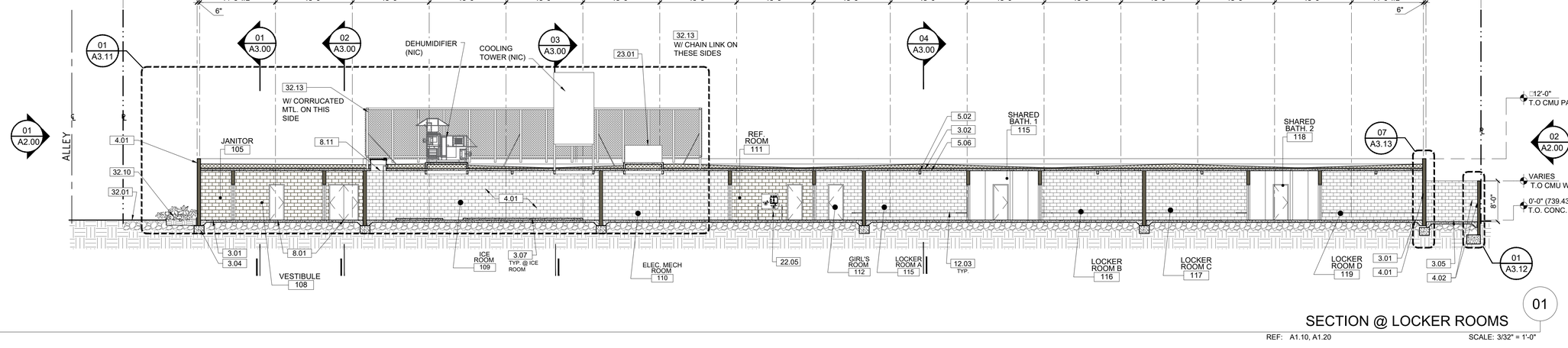
Z:\B□S ARCHITECTURE\019 JOBS\01935.0 CITY OF LA-RESEDA ICE HOCKEY ROLLER RINK\01935.0 1.CURRENT DRAWINGS_24X36\01935.0_A300_24X36.DWG 12/3/2021 9:15 AM



SECTION @ BLEACHERS

02

REF: A1.10 SCALE: 3/32" = 1'-0"



SECTION @ LOCKER ROOMS

01

REF: A1.10, A1.20 SCALE: 3/32" = 1'-0"

KEYNOTES

NOTE: ITEMS IDENTIFIED ARE TYPICAL TO ALL LIKE ITEMS UNLESS NOTED OTHERWISE.

01 - GENERAL REQUIREMENTS
02 - NOT USED

03 - CONCRETE
3.01 CONC. SLAB ON GRADE PER STRUCT'L.
3.02 CONC. O/MTL. DECK PER STRUCT'L.
3.03 CONC. CURB
3.04 CONC. FOOTING PER STRUCT'L.
3.05 CONC. PAVING PER CIVIL DWGS.
3.06 CONC. SIDEWALK PER CIVIL DWGS.
3.07 CONC. PAD

04 - MASONRY
4.01 CMU BLDNG. WALL
4.02 CMU SITE WALL W/ 2" CMU CAP.

05 - METALS
5.01 STL. COLUMN PER STRUCT'L. PTD.
5.02 STL. BEAM PER STRUCT'L. PTD.
5.03 HSS POST PER STRUCT'L. PTD.
5.04 HSS BEAM PER STRUCT'L. PTD.
5.05 MEMBRANE STRUCTURE I BEAM.
5.06 MTL. DECK.
5.07 MTL. GUARD RAILING.
5.08 MTL. STUD WALL.

06 - WOOD AND PLASTICS

07 - THERMAL & MOISTURE PROTECTION
7.01 W.P. MEMBRANE PER DETL. & SPECS.
7.02 SINGLE PLY PVC ROOFING PER SPECS.
7.03 R-21 RIGID INSULATION @ WALLS.
7.04 UNDERSLAB MOISTURE VAPOR BARRIER.
7.05 ROOF DRAIN AND OVERFLOW.
7.06 CLEAR WATER-REPELLENT GRAFITTI COATING AT CMU WALL. (ALL EXPOSED SURFACES).
7.07 BATT INSULATION.

08 - OPENINGS (SEE DOOR/WINDOW SCHED)
8.01 STL. DOOR. & FRAME, PAINTED.
8.02 CLR. ANODIZED ALUM. STOREFRONT DOOR.
8.03 CLR. ANODIZED ALUM. STOREFRONT WINDOW.
8.04 DOOR HARDWARE SET PER SCHED.
8.05 EXTERIOR WALL LOUVER.
8.06 EXTERIOR WALL VENT WITH CAP.
8.07 ROLLING STL. DOOR & FRAME.
8.08 ICE RINK GATES
8.09 OVERHEAD GLASS DOOR.
8.10 ACCESS PANEL, COLOR TO MATCH ADJACENT MATERIAL.
8.11 ROOF ACCESS HATCH.

09 - FINISHES (SEE FIN. SCHED)
9.01 5/8" TYPE 'X' GYP. BD., PROVIDE 'WET RATED' AT BATHROOMS. PAINT.
9.02 CONC. FLR. SEAL PER FIN. SCHED.
9.03 RUBBER FLR. PER SPECS.
9.04 PAINT PER SPECS.
9.05 REVEAL PER DETAILS.
9.06 GRAFITTI COATING, TYP. @ ALL EXTERIOR SOLID WALLS.
9.07 GLAZED FINISH ON CMU.
9.08 CERAMIC TILE.

10 - SPECIALTIES
10.01 MIRROR PER SPECS.
10.02 SIGNAGE.
10.03 TOILET PAPER ROLL HOLDER PER ACCESSORY SCHED.
10.04 GRAB BAR.
10.05 COAT HOOK.
10.06 WASTE RECEPTACLE.
10.07 FOLDING SHOWER SEAT.
10.08 SHOWER ROD.
10.09 SHELF.
10.10 NETTING. NIC
10.11 FIRE EXTINGUISHER. RECESSED CABINET
10.12 TOILET SEAT COVER DISPENSER.
10.13 PAPER TOWEL DISPENSER.
10.14 BATHROOM PARTITION W/ ROBE HOOK @ EA. DOOR

11 - EQUIPMENT/APPLIANCES (SEE EQMT. SCHED)

12 - FURNISHINGS
12.01 BICYCLE RACKS FOR SHORT-TERM BIKE PARKING.
12.02 DASHERBOARDS. NIC.
12.03 BENCH. NIC.
12.04 BLEACHERS. NIC.
12.05 SCOREBOARD. NIC.
12.06 SKATE RACKS. NIC.

13 - SPECIAL CONSTRUCTION
13.01 MEMBRANE STRUCTURE.

14 - CONVEYING EQUIPMENT (NOT USED)

21 - FIRE SUPPRESSION
21.01 FIRE EXTINGUISHER.
21.02 FIRE SPRINKLER HORIZ. MAIN (SEE DIAGRAM)
21.03 FIRE SPRINKLER VALVE ASSEMBLY
21.04 FIRE DEPT. MAIN CONNECTION @ FRONT OF PROJECT. LAFD SHALL APPROVE FINAL LOCATION.
21.05 FIRE SPRINKLER HEAD.

22 - PLUMBING
22.01 WATER CLOSET PER PLUMBING LEGEND
22.02 LAV. SINK & FAUCET. PER PLUMBING LEGEND
22.03 JANITOR MOP SINK.
22.04 PLUMBING VENT PIPE.
22.05 DRINKING FOUNTAIN.
22.06 ULTRA LOW-FLOW TOILET.
22.07 SHOWER HEAD/ CONTROLS.
22.08 SHOWER DRAIN.
22.09 AREA DRAIN.
22.10 HOSE BIB.

23 - HEATING, VENTILATING, AND AIR-CONDITIONING
23.01 HVAC UNIT PER MECH.
23.02 AIR REGISTER WALL MOUNTED.
23.03 CEILING AIR REGISTER.
23.04 MAKE UP AIR LOUVER PER MECH. DWGS
23.05 BATHRM EXHAUST FAN PER SPECS.
23.06 BATHRM EXHAUST DUCT.
23.07 MECH. DUCT.
23.08 MECH. EQUIPMENT.

26 - ELECTRICAL
26.01 ELEC. PANEL PER PLANS & SCHED.
26.02 EXTERIOR LIGHT PER SCHED.
26.03 INTERIOR LIGHT PER SCHED.

27 - COMMUNICATION

28 - ELECTRONIC SAFETY AND SECURITY
28.01 SMOKE ALARM.
28.02 SECURITY CAMERA.
28.03 FIRE ALARM MAIN PANEL.

31 - EARTHWORK
31.01 APPROVED COMPACT FILL PER GEO & SOIL ENGINEER REPORT.

32 - EXTERIOR IMPROVEMENTS
32.01 ASPHALT PAVING PER CIVIL.
32.02 GRAPHICS/PAINT.SEE LAND. DWGS.
32.03 STORMWATER MANAGEMENT PER CIVIL DWGS.
32.04 STL. SECURITY GATE, PTD.
32.05 STL. SECURITY FENCE, PTD.
32.06 EXTERIOR AREA DRAINS.
32.07 BENCH.
32.08 TRENCH DRAIN.
32.09 TREE, SEE LANDSCAPE DWGS.
32.10 PLANTING, SEE LANDSCAPE DWGS.
32.11 (N) CONCRETE SIDEWALK, CURB, GUTTER PER CITY OF LA STANDARDS.
32.12 (N) CONC. APRON & DRIVEWAY CURB CUT PER CITY OF LA STANDARDS.
32.13 EQUIPMENT SCREEN.
32.14 CONC. WALL @ SITE FENCE.

33 - UTILITIES
33.01 WATER METER.
33.02 ELECTRICAL TRANSFORMER W/ BOLLARDS AS REQ'D.
33.03 ELECTRICAL METER.
33.04 POWER POLE.

REVISION DATES (DESIGN STAGE ONLY)

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

Sheet Version 4.0

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED

LICENSED ARCHITECT
LAWRENCE SCARPA
C 21812
REN 10/31/2023
STATE OF CALIFORNIA

BUREAU OF ENGINEERING
VERTICAL CONTROL:
HORIZONTAL CONTROL:
SHEET TITLE: SECTIONS
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

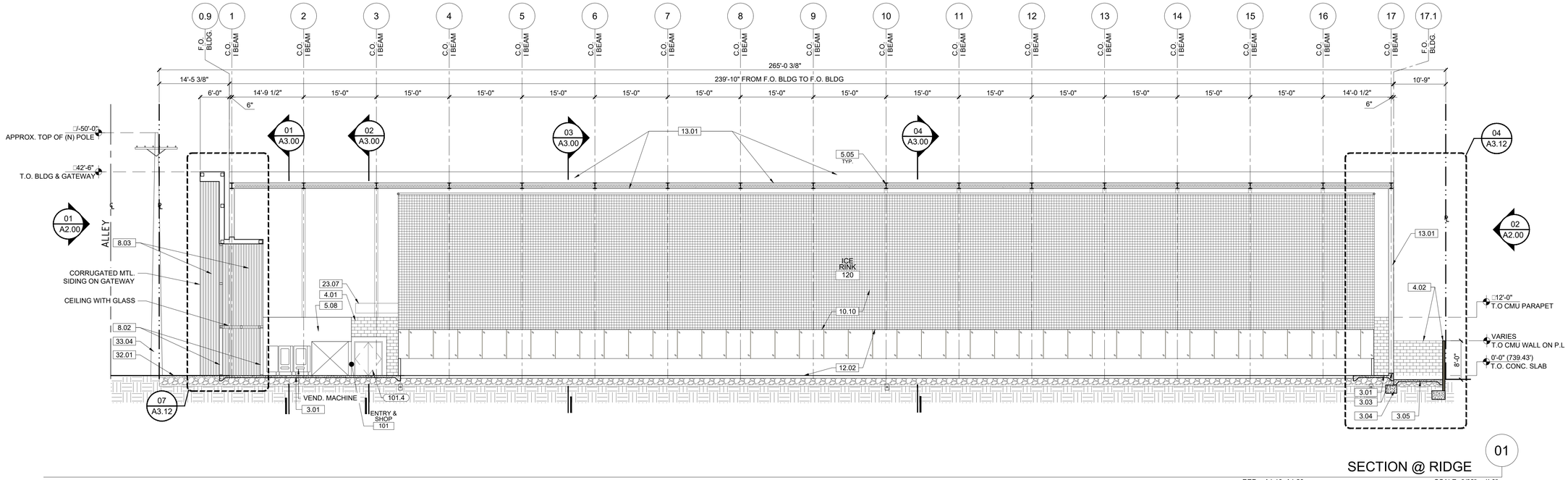
DEPARTMENT OF PUBLIC WORKS
NO. REVISIONS: DATE: BY:
CIP NO.
INDEX NO.

CITY OF LOS ANGELES
GARY LEE MOORE, P.E. ENV SP
DESIGN GROUP
CITY ENGINEER
DATE:
ENGINEER:
DESIGNED BY:
DRAWN BY:
CHECKED BY:
APPROVED BY:

WORK ORDER NO.
E170121B

SHEET NAME
A3.01
SHEET X OF X SHEETS

Z:\B□S ARCHITECTURE\019 JOBS\01935.0 CITY OF LA-RESEDA ICE HOCKEY ROLLER RINK\01935.0 1.CURRENT DRAWINGS_24X36\01935.0_A301_24X36.DWG 12/3/2021 9:15 AM



SECTION @ RIDGE 01

REF: A1.10, A1.20 SCALE: 3/32" = 1'-0"

KEYNOTES

NOTE: ITEMS IDENTIFIED ARE TYPICAL TO ALL LIKE ITEMS UNLESS NOTED OTHERWISE.

01 - GENERAL REQUIREMENTS
02 - NOT USED

03 - CONCRETE
3.01 CONC. SLAB ON GRADE PER STRUCT'L.
3.02 CONC. O/MTL. DECK PER STRUCT'L.
3.03 CONC. CURB
3.04 CONC. FOOTING PER STRUCT'L.
3.05 CONC. PAVING PER CIVIL DWGS.
3.06 CONC. SIDEWALK PER CIVIL DWGS.
3.07 CONC. PAD

04 - MASONRY
4.01 CMU BLDNG. WALL
4.02 CMU SITE WALL W/ 2" CMU CAP.

05 - METALS
5.01 STL. COLUMN PER STRUCT'L. PTD.
5.02 STL. BEAM PER STRUCT'L. PTD.
5.03 HSS POST PER STRUCT'L. PTD.
5.04 HSS BEAM PER STRUCT'L. PTD.
5.05 MEMBRANE STRUCTURE I BEAM.
5.06 MTL. DECK.
5.07 MTL. GUARD RAILING.
5.08 MTL. STUD WALL.

06 - WOOD AND PLASTICS

07 - THERMAL & MOISTURE PROTECTION
7.01 W.P. MEMBRANE PER DETL. & SPECS.
7.02 SINGLE PLY PVC ROOFING PER SPECS.
7.03 R-21 RIGID INSULATION @ WALLS.
7.04 UNDERSLAB MOISTURE VAPOR BARRIER.
7.05 ROOF DRAIN AND OVERFLOW.
7.06 CLEAR WATER-REPELLENT GRAFITTI COATING AT CMU WALL. (ALL EXPOSED SURFACES).
7.07 BATT INSULATION.

08 - OPENINGS (SEE DOOR/WINDOW SCHED)
8.01 STL. DOOR. & FRAME, PAINTED.
8.02 CLR. ANODIZED ALUM. STOREFRONT DOOR.
8.03 CLR. ANODIZED ALUM. STOREFRONT WINDOW.
8.04 DOOR HARDWARE SET PER SCHED.
8.05 EXTERIOR WALL LOUVER.
8.06 EXTERIOR WALL VENT WITH CAP.
8.07 ROLLING STL. DOOR & FRAME.
8.08 ICE RINK GATES
8.09 OVERHEAD GLASS DOOR.
8.10 ACCESS PANEL, COLOR TO MATCH ADJACENT MATERIAL.
8.11 ROOF ACCESS HATCH.

09 - FINISHES (SEE FIN. SCHED)
9.01 5/8" TYPE 'X' GYP. BD., PROVIDE 'WET RATED' AT BATHROOMS. PAINT.
9.02 CONC. FLR. SEAL PER FIN. SCHED.
9.03 RUBBER FLR. PER SPECS.
9.04 PAINT PER SPECS.
9.05 REVEAL PER DETAILS.
9.06 GRAFITTI COATING, TYP. @ ALL EXTERIOR SOLID WALLS.
9.07 GLAZED FINISH ON CMU.
9.08 CERAMIC TILE.

10 - SPECIALTIES
10.01 MIRROR PER SPECS.
10.02 SIGNAGE.
10.03 TOILET PAPER ROLL HOLDER PER ACCESSORY SCHED.
10.04 GRAB BAR.
10.05 COAT HOOK.
10.06 WASTE RECEPTACLE.
10.07 FOLDING SHOWER SEAT.
10.08 SHOWER ROD.
10.09 SHELF.
10.10 NETTING. NIC
10.11 FIRE EXTINGUISHER. RECESSED CABINET
10.12 TOILET SEAT COVER DISPENSER.
10.13 PAPER TOWEL DISPENSER.
10.14 BATHROOM PARTITION W/ ROBE HOOK @ EA. DOOR

11 - EQUIPMENT/APPLIANCES (SEE EQMT. SCHED)

12 - FURNISHINGS
12.01 BICYCLE RACKS FOR SHORT-TERM BIKE PARKING.
12.02 DASHERBOARDS. NIC.
12.03 BENCH. NIC.
12.04 BLEACHERS. NIC.
12.05 SCOREBOARD. NIC.
12.06 SKATE RACKS. NIC.

13 - SPECIAL CONSTRUCTION
13.01 MEMBRANE STRUCTURE.

14 - CONVEYING EQUIPMENT (NOT USED)

21 - FIRE SUPPRESSION
21.01 FIRE EXTINGUISHER.
21.02 FIRE SPRINKLER HORIZ. MAIN (SEE DIAGRAM)
21.03 FIRE SPRINKLER VALVE ASSEMBLY
21.04 FIRE DEPT. MAIN CONNECTION @ FRONT OF PROJECT. LAFD SHALL APPROVE FINAL LOCATION.
21.05 FIRE SPRINKLER HEAD.

22 - PLUMBING
22.01 WATER CLOSET PER PLUMBING LEGEND
22.02 LAV. SINK & FAUCET. PER PLUMBING LEGEND
22.03 JANITOR MOP SINK.
22.04 PLUMBING VENT PIPE.
22.05 DRINKING FOUNTAIN.
22.06 ULTRA LOW-FLOW TOILET.
22.07 SHOWER HEAD/ CONTROLS.
22.08 SHOWER DRAIN.
22.09 AREA DRAIN.
22.10 HOSE BIB.

23 - HEATING, VENTILATING, AND AIR-CONDITIONING
23.01 HVAC UNIT PER MECH.
23.02 AIR REGISTER WALL MOUNTED.
23.03 CEILING AIR REGISTER.
23.04 MAKE UP AIR LOUVER PER MECH. DWGS
23.05 BATHRM EXHAUST FAN PER SPECS.
23.06 BATHRM EXHAUST DUCT.
23.07 MECH. DUCT.
23.08 MECH. EQUIPMENT.

26 - ELECTRICAL
26.01 ELEC. PANEL PER PLANS & SCHED.
26.02 EXTERIOR LIGHT PER SCHED.
26.03 INTERIOR LIGHT PER SCHED.

27 - COMMUNICATION

28 - ELECTRONIC SAFETY AND SECURITY
28.01 SMOKE ALARM.
28.02 SECURITY CAMERA.
28.03 FIRE ALARM MAIN PANEL.

31 - EARTHWORK
31.01 APPROVED COMPACT FILL PER GEO & SOIL ENGINEER REPORT.

32 - EXTERIOR IMPROVEMENTS
32.01 ASPHALT PAVING PER CIVIL.
32.02 GRAPHICS/PAINT.SEE LAND. DWGS.
32.03 STORMWATER MANAGEMENT PER CIVIL DWGS.
32.04 STL. SECURITY GATE, PTD.
32.05 STL. SECURITY FENCE, PTD.
32.06 EXTERIOR AREA DRAINS.
32.07 BENCH.
32.08 TRENCH DRAIN.
32.09 TREE, SEE LANDSCAPE DWGS.
32.10 PLANTING, SEE LANDSCAPE DWGS.
32.11 (N) CONCRETE SIDEWALK, CURB, GUTTER PER CITY OF LA STANDARDS.
32.12 (N) CONC. APRON & DRIVEWAY CURB CUT PER CITY OF LA STANDARDS.
32.13 EQUIPMENT SCREEN.
32.14 CONC. WALL @ SITE FENCE.

33 - UTILITIES
33.01 WATER METER.
33.02 ELECTRICAL TRANSFORMER W/ BOLLARDS AS REQ'D.
33.03 ELECTRICAL METER.
33.04 POWER POLE.

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REVISION DATES (DESIGN STAGE ONLY)

Sheet Version 4.0

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

LICENSED ARCHITECT
LAWRENCE SCARPA
C 21812
REN 10/31/2023
STATE OF CALIFORNIA

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED •

BUREAU OF ENGINEERING
VERTICAL CONTROL:
HORIZONTAL CONTROL:
SHEET TITLE: SECTIONS
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

DEPARTMENT OF PUBLIC WORKS
BY:
DATE:
NO. REVISIONS:

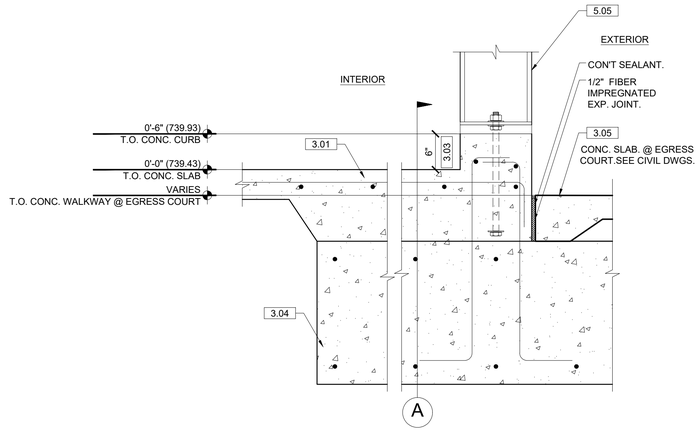
CIP NO.
INDEX NO.

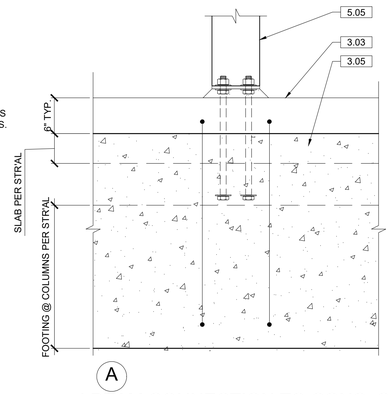
CITY OF LOS ANGELES
GARY LEE MOORE, P.E. ENV SP
DESIGN GROUP
ENGINEER:
DESIGNED BY:
DRAWN BY:
CHECKED BY:
APPROVED BY:
CITY ENGINEER
DATE:

WORK ORDER NO.
E170121B

SHEET NAME
A3.02
SHEET X OF X SHEETS

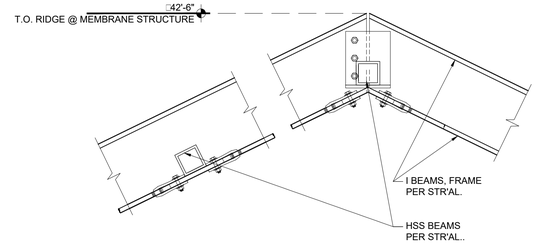
Z:\B□S ARCHITECTURE\019 JOBS\01935.0 CITY OF LA-RESEDA ICE HOCKEY ROLLER RINK\01935.0 1.CURRENT DRAWINGS_24X36\01935.0_A302_24X36.DWG 12/3/2021 9:16 AM





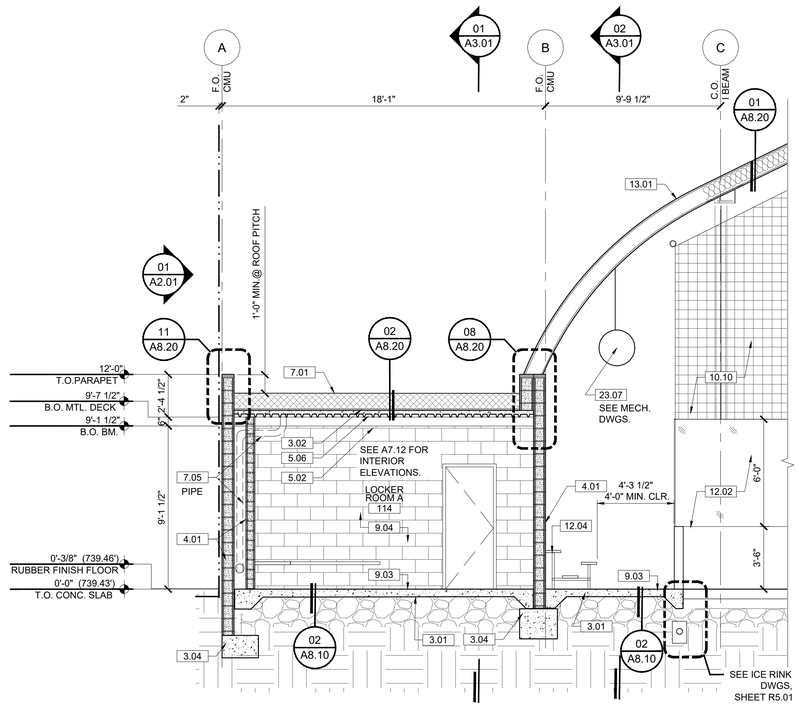
I BEAM CONNECTION TO CONC. CURB 06

REF: 01/ A3.10, STRUCTURAL DWGS SCALE: 1" = 1'-0"



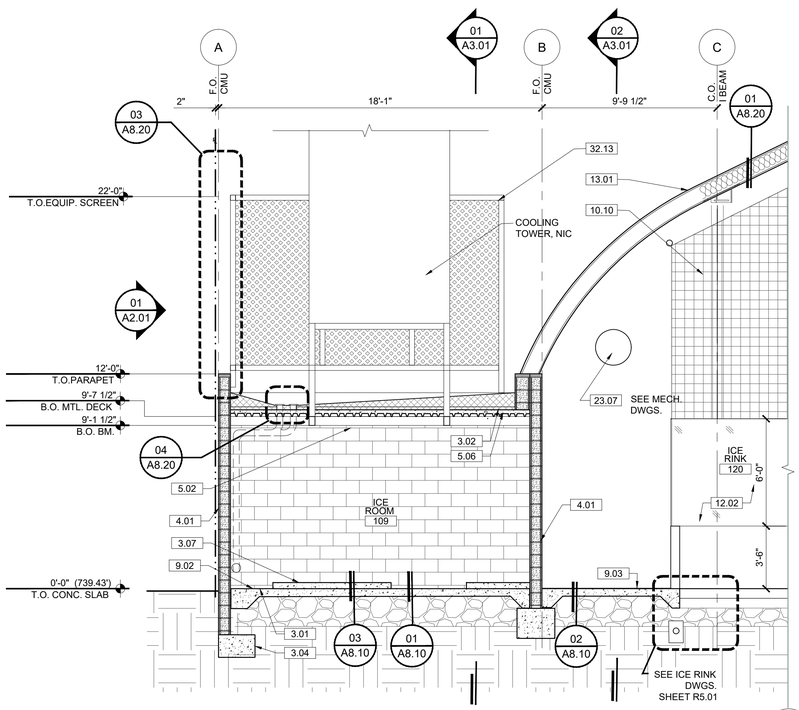
DETAIL @ MEMBRANE RIDGE 03

REF: A3.10, STRUCTURAL DWGS SCALE: 1" = 1'-0"



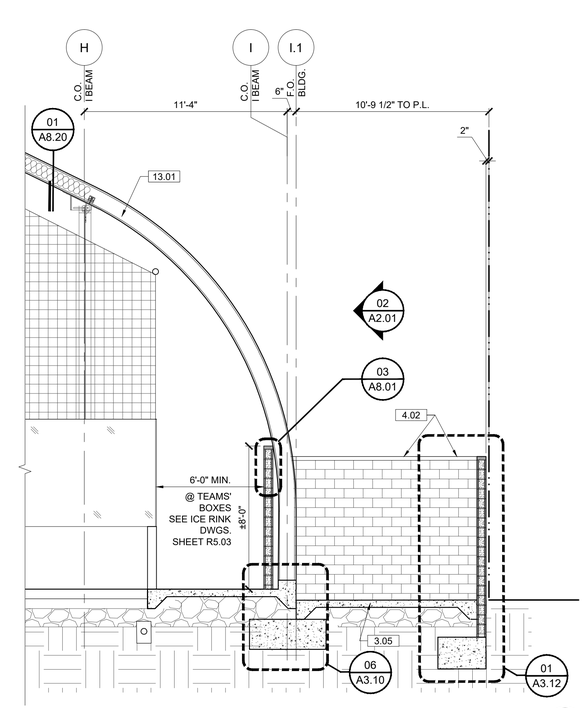
ENLARGED SECTION @ LOCKER ROOM 07

REF: A3.10 SCALE: 1/4" = 1'-0"



ENLARGED SECTION @ REF. ROOM 04

REF: A3.10 SCALE: 1/4" = 1'-0"



ENLARGED SECTION @ EGRESS COURT 01

REF: A3.10 SCALE: 1/4" = 1'-0"

KEYNOTES

NOTE: ITEMS IDENTIFIED ARE TYPICAL TO ALL LIKE ITEMS UNLESS NOTED OTHERWISE.

01 - GENERAL REQUIREMENTS
02 - NOT USED

03 - CONCRETE
3.01 CONC. SLAB ON GRADE PER STRUCT'L.
3.02 CONC. O/MTL. DECK PER STRUCT'L.
3.03 CONC. CURB
3.04 CONC. FOOTING PER STRUCT'L.
3.05 CONC. PAVING PER CIVIL DWGS.
3.06 CONC. SIDEWALK PER CIVIL DWGS.
3.07 CONC. PAD

04 - MASONRY
4.01 CMU BLDNG. WALL
4.02 CMU SITE WALL W/ 2" CMU CAP.

05 - METALS
5.01 STL. COLUMN PER STRUCT'L. PTD.
5.02 STL. BEAM PER STRUCT'L. PTD.
5.03 HSS POST PER STRUCT'L. PTD.
5.04 HSS BEAM PER STRUCT'L. PTD.
5.05 MEMBRANE STRUCTURE I BEAM.
5.06 MTL. DECK.
5.07 MTL. GUARD RAILING.
5.08 MTL. STUD WALL.

06 - WOOD AND PLASTICS

07 - THERMAL & MOISTURE PROTECTION
7.01 W.P. MEMBRANE PER DETL. & SPECS.
7.02 SINGLE PLY PVC ROOFING PER SPECS.
7.03 R-21 RIGID INSULATION @ WALLS.
7.04 UNDERSLAB MOISTURE VAPOR BARRIER.
7.05 ROOF DRAIN AND OVERFLOW.
7.06 CLEAR WATER-REPELLENT GRAFITTI COATING AT CMU WALL. (ALL EXPOSED SURFACES).
7.07 BATT INSULATION.

08 - OPENINGS (SEE DOOR/WINDOW SCHED)
8.01 STL. DOOR. & FRAME, PAINTED.
8.02 CLR. ANODIZED ALUM. STOREFRONT DOOR.
8.03 CLR. ANODIZED ALUM. STOREFRONT WINDOW.
8.04 DOOR HARDWARE SET PER SCHED.
8.05 EXTERIOR WALL LOUVER.
8.06 EXTERIOR WALL VENT WITH CAP.
8.07 ROLLING STL. DOOR & FRAME.
8.08 ICE RINK GATES.
8.09 OVERHEAD GLASS DOOR.
8.10 ACCESS PANEL, COLOR TO MATCH ADJACENT MATERIAL.
8.11 ROOF ACCESS HATCH.

09 - FINISHES (SEE FIN. SCHED)
9.01 5/8" TYPE 'X' GYP. BD., PROVIDE 'WET RATED' AT BATHROOMS. PAINT.
9.02 CONC. FLR. SEAL PER FIN. SCHED.
9.03 RUBBER FLR. PER SPECS.
9.04 PAINT PER SPECS.
9.05 REVEAL PER DETAILS.
9.06 GRAFITTI COATING, TYP. @ ALL EXTERIOR SOLID WALLS.
9.07 GLAZED FINISH ON CMU.
9.08 CERAMIC TILE.

10 - SPECIALTIES
10.01 MIRROR PER SPECS.
10.02 SIGNAGE.
10.03 TOILET PAPER ROLL HOLDER PER ACCESSORY SCHED.
10.04 GRAB BAR.
10.05 COAT HOOK.
10.06 WASTE RECEPTACLE.
10.07 FOLDING SHOWER SEAT.
10.08 SHOWER ROD.
10.09 SHELF.
10.10 NETTING. NIC
10.11 FIRE EXTINGUISHER. RECESSED CABINET
10.12 TOILET SEAT COVER DISPENSER.
10.13 PAPER TOWEL DISPENSER.
10.14 BATHROOM PARTITION W/ ROBE HOOK @ EA. DOOR

11 - EQUIPMENT/APPLIANCES (SEE EQMT. SCHED)

12 - FURNISHINGS
12.01 BICYCLE RACKS FOR SHORT-TERM BIKE PARKING.
12.02 DASHERBOARDS. NIC.
12.03 BENCH. NIC.
12.04 BLEACHERS. NIC.
12.05 SCOREBOARD. NIC.
12.06 SKATE RACKS. NIC.

13 - SPECIAL CONSTRUCTION
13.01 MEMBRANE STRUCTURE.

14 - CONVEYING EQUIPMENT (NOT USED)

21 - FIRE SUPPRESSION
21.01 FIRE EXTINGUISHER.
21.02 FIRE SPRINKLER HORIZ. MAIN (SEE DIAGRAM)
21.03 FIRE SPRINKLER VALVE ASSEMBLY
21.04 FIRE DEPT. MAIN CONNECTION @ FRONT OF PROJECT. LAFD SHALL APPROVE FINAL LOCATION.
21.05 FIRE SPRINKLER HEAD.

22 - PLUMBING
22.01 WATER CLOSET PER PLUMBING LEGEND
22.02 LAV. SINK & FAUCET. PER PLUMBING LEGEND
22.03 JANITOR MOP SINK.
22.04 PLUMBING VENT PIPE.
22.05 DRINKING FOUNTAIN.
22.06 ULTRA LOW-FLOW TOILET.
22.07 SHOWER HEAD/ CONTROLS.
22.08 SHOWER DRAIN.
22.09 AREA DRAIN.
22.10 HOSE BIB.

23 - HEATING, VENTILATING, AND AIR-CONDITIONING
23.01 HVAC UNIT PER MECH.
23.02 AIR REGISTER WALL MOUNTED.
23.03 CEILING AIR REGISTER.
23.04 MAKE UP AIR LOUVER PER MECH. DWGS
23.05 BATHRM EXHAUST FAN PER SPECS.
23.06 BATHRM EXHAUST DUCT.
23.07 MECH. DUCT.
23.08 MECH. EQUIPMENT.

26 - ELECTRICAL
26.01 ELEC. PANEL PER PLANS & SCHED.
26.02 EXTERIOR LIGHT PER SCHED.
26.03 INTERIOR LIGHT PER SCHED.

27 - COMMUNICATION

28 - ELECTRONIC SAFETY AND SECURITY
28.01 SMOKE ALARM.
28.02 SECURITY CAMERA.
28.03 FIRE ALARM MAIN PANEL.

31 - EARTHWORK
31.01 APPROVED COMPACT FILL PER GEO & SOIL ENGINEER REPORT.

32 - EXTERIOR IMPROVEMENTS
32.01 ASPHALT PAVING PER CIVIL.
32.02 GRAPHICS/PAINT.SEE LAND. DWGS.
32.03 STORMWATER MANAGEMENT PER CIVIL DWGS.
32.04 STL. SECURITY GATE, PTD.
32.05 STL. SECURITY FENCE, PTD.
32.06 EXTERIOR AREA DRAINS.
32.07 BENCH.
32.08 TRENCH DRAIN.
32.09 TREE, SEE LANDSCAPE DWGS.
32.10 PLANTING, SEE LANDSCAPE DWGS.
32.11 (N) CONCRETE SIDEWALK, CURB, GUTTER PER CITY OF LA STANDARDS.
32.12 (N) CONC. APRON & DRIVEWAY CURB CUT PER CITY OF LA STANDARDS.
32.13 EQUIPMENT SCREEN.
32.14 CONC. WALL @ SITE FENCE.

33 - UTILITIES
33.01 WATER METER.
33.02 ELECTRICAL TRANSFORMER W/ BOLLARDS AS REQ'D.
33.03 ELECTRICAL METER.
33.04 POWER POLE.

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REVISION DATES (DESIGN STAGE ONLY)

Sheet Version 4.0

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

LICENSED ARCHITECT LAWRENCE SCARPA C 21812 REN 10/31/2023 STATE OF CALIFORNIA

THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED

DEPARTMENT OF PUBLIC WORKS
BUREAU OF ENGINEERING

VERTICAL CONTROL:
HORIZONTAL CONTROL:
SHEET TITLE: ENLARGED SECTIONS
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

NO.	REVISIONS:	DATE:	BY:

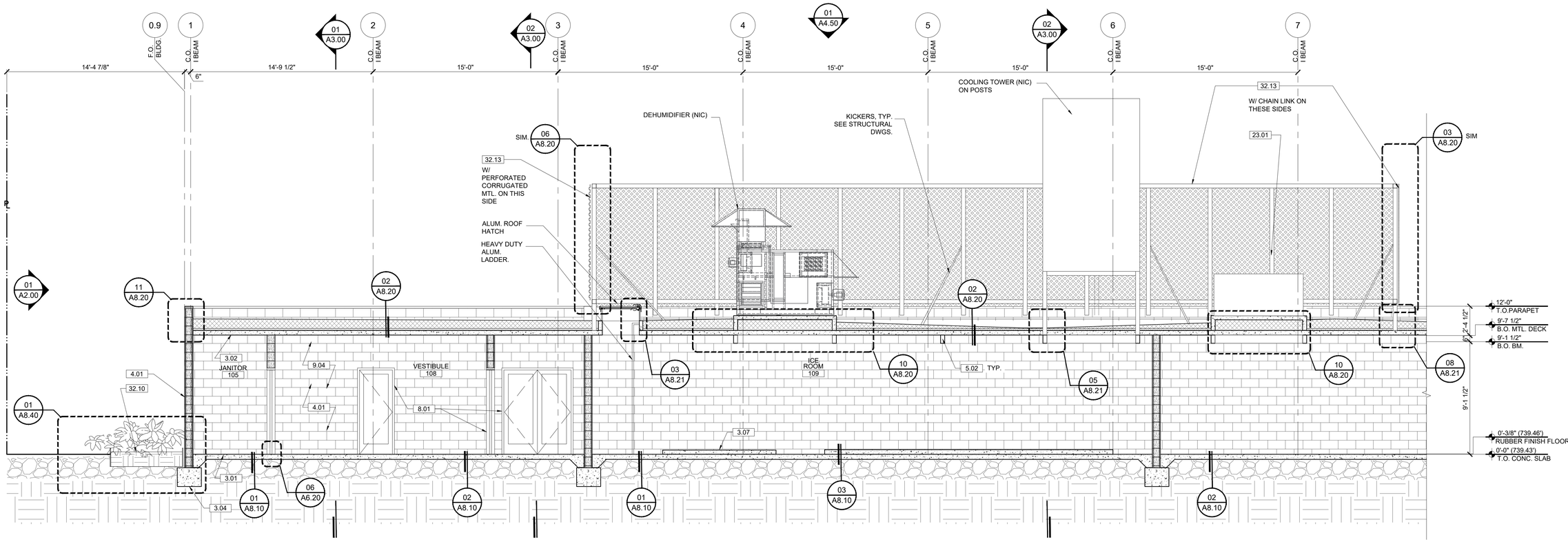
CIP NO.
INDEX NO.

CITY OF LOS ANGELES
CITY ENGINEER
GARY LEE MOORE, P.E., ENV SP
DESIGN GROUP:
DATE:
ENGINEER:
DESIGNED BY:
DRAWN BY:
CHECKED BY:
APPROVED BY:

WORK ORDER NO.
E170121B

SHEET NAME
A3.10
SHEET X OF X SHEETS

Z:\B□S ARCHITECTURE\019 JOBS\01935.0 CITY OF LA-RESEDA ICE HOCKEY ROLLER RINK\01935.0 1.CURRENT DRAWINGS_24X36\01935.0_A310_24X36.DWG 12/3/2021 9:16 AM



01 ENLARGED SECTION @ MECHANICAL ROOF

REF: A3.01, A4.50

SCALE: 1/4" = 1'-0"

KEYNOTES

NOTE: ITEMS IDENTIFIED ARE TYPICAL TO ALL LIKE ITEMS UNLESS NOTED OTHERWISE.

01 - GENERAL REQUIREMENTS

02 - NOT USED

03 - CONCRETE

3.01 CONC. SLAB ON GRADE PER STRUCT'L.
3.02 CONC. O/MTL. DECK PER STRUCT'L.
3.03 CONC. CURB
3.04 CONC. FOOTING PER STRUCT'L.
3.05 CONC. PAVING PER CIVIL DWGS.
3.06 CONC. SIDEWALK PER CIVIL DWGS.
3.07 CONC. PAD

04 - MASONRY

4.01 CMU BLDNG. WALL
4.02 CMU SITE WALL W/ 2" CMU CAP.

05 - METALS

5.01 STL. COLUMN PER STRUCT'L. PTD.
5.02 STL. BEAM PER STRUCT'L. PTD.
5.03 HSS POST PER STRUCT'L. PTD.
5.04 HSS BEAM PER STRUCT'L. PTD.
5.05 MEMBRANE STRUCTURE I BEAM.
5.06 MTL. DECK.
5.07 MTL. GUARD RAILING.
5.08 MTL. STUD WALL.

06 - WOOD AND PLASTICS

07 - THERMAL & MOISTURE PROTECTION

7.01 W.P. MEMBRANE PER DETL. & SPECS.
7.02 SINGLE PLY PVC ROOFING PER SPECS.
7.03 R-21 RIGID INSULATION @ WALLS.
7.04 UNDERSLAB MOISTURE VAPOR BARRIER.
7.05 ROOF DRAIN AND OVERFLOW.
7.06 CLEAR WATER-REPELLENT GRAFITTI COATING AT CMU WALL. (ALL EXPOSED SURFACES).
7.07 BATT INSULATION.

08 - OPENINGS (SEE DOOR/WINDOW SCHED)

8.01 STL. DOOR. & FRAME, PAINTED.
8.02 CLR. ANODIZED ALUM. STOREFRONT DOOR.
8.03 CLR. ANODIZED ALUM. STOREFRONT WINDOW.
8.04 DOOR HARDWARE SET PER SCHED.
8.05 EXTERIOR WALL LOUVER.
8.06 EXTERIOR WALL VENT WITH CAP.
8.07 ROLLING STL. DOOR & FRAME.
8.08 ICE RINK GATES
8.09 OVERHEAD GLASS DOOR.
8.10 ACCESS PANEL, COLOR TO MATCH ADJACENT MATERIAL.
8.11 ROOF ACCESS HATCH.

09 - FINISHES (SEE FIN. SCHED)

9.01 5/8" TYPE 'X' GYP. BD., PROVIDE 'WET RATED' AT BATHROOMS. PAINT.
9.02 CONC. FLR. SEAL PER FIN. SCHED.
9.03 RUBBER FLR. PER SPECS.
9.04 PAINT PER SPECS.
9.05 REVEAL PER DETAILS.
9.06 GRAFITTI COATING, TYP. @ ALL EXTERIOR SOLID WALLS.
9.07 GLAZED FINISH ON CMU.
9.08 CERAMIC TILE.

10 - SPECIALTIES

10.01 MIRROR PER SPECS.
10.02 SIGNAGE.
10.03 TOILET PAPER ROLL HOLDER PER ACCESSORY SCHED.
10.04 GRAB BAR.
10.05 COAT HOOK.
10.06 WASTE RECEPTACLE.
10.07 FOLDING SHOWER SEAT.
10.08 SHOWER ROD.
10.09 SHELF.
10.10 NETTING. NIC
10.11 FIRE EXTINGUISHER. RECESSED CABINET
10.12 TOILET SEAT COVER DISPENSER.
10.13 PAPER TOWEL DISPENSER.
10.14 BATHROOM PARTITION W/ ROBE HOOK @ EA. DOOR

11 - EQUIPMENT/APPLIANCES (SEE EQMT. SCHED)

12 - FURNISHINGS

12.01 BICYCLE RACKS FOR SHORT-TERM BIKE PARKING.
12.02 DASHERBOARDS. NIC.
12.03 BENCH. NIC.
12.04 BLEACHERS. NIC.
12.05 SCOREBOARD. NIC.
12.06 SKATE RACKS. NIC.

13 - SPECIAL CONSTRUCTION

13.01 MEMBRANE STRUCTURE.

14 - CONVEYING EQUIPMENT (NOT USED)

21 - FIRE SUPPRESSION

21.01 FIRE EXTINGUISHER.
21.02 FIRE SPRINKLER HORIZ. MAIN (SEE DIAGRAM)
21.03 FIRE SPRINKLER VALVE ASSEMBLY
21.04 FIRE DEPT. MAIN CONNECTION @ FRONT OF PROJECT. LAFD SHALL APPROVE FINAL LOCATION.
21.05 FIRE SPRINKLER HEAD.

22 - PLUMBING

22.01 WATER CLOSET PER PLUMBING LEGEND
22.02 LAV. SINK & FAUCET. PER PLUMBING LEGEND
22.03 JANITOR MOP SINK.
22.04 PLUMBING VENT PIPE.
22.05 DRINKING FOUNTAIN.
22.06 ULTRA LOW-FLOW TOILET.
22.07 SHOWER HEAD/ CONTROLS.
22.08 SHOWER DRAIN.
22.09 AREA DRAIN.
22.10 HOSE BIB.

23 - HEATING, VENTILATING, AND AIR-CONDITIONING

23.01 HVAC UNIT PER MECH.
23.02 AIR REGISTER WALL MOUNTED.
23.03 CEILING AIR REGISTER.
23.04 MAKE UP AIR LOUVER PER MECH. DWGS
23.05 BATHRM EXHAUST FAN PER SPECS.
23.06 BATHRM EXHAUST DUCT.
23.07 MECH. DUCT.
23.08 MECH. EQUIPMENT.

26 - ELECTRICAL

26.01 ELEC. PANEL PER PLANS & SCHED.
26.02 EXTERIOR LIGHT PER SCHED.
26.03 INTERIOR LIGHT PER SCHED.

27 - COMMUNICATION

28 - ELECTRONIC SAFETY AND SECURITY

28.01 SMOKE ALARM.
28.02 SECURITY CAMERA.
28.03 FIRE ALARM MAIN PANEL.

31 - EARTHWORK

31.01 APPROVED COMPACT FILL PER GEO & SOIL ENGINEER REPORT.

32 - EXTERIOR IMPROVEMENTS

32.01 ASPHALT PAVING PER CIVIL.
32.02 GRAPHICS/PAINT.SEE LAND. DWGS.
32.03 STORMWATER MANAGEMENT PER CIVIL DWGS.
32.04 STL. SECURITY GATE, PTD.
32.05 STL. SECURITY FENCE, PTD.
32.06 EXTERIOR AREA DRAINS.
32.07 BENCH.
32.08 TRENCH DRAIN.
32.09 TREE, SEE LANDSCAPE DWGS.
32.10 PLANTING, SEE LANDSCAPE DWGS.
32.11 (N) CONCRETE SIDEWALK, CURB, GUTTER PER CITY OF LA STANDARDS.
32.12 (N) CONC. APRON & DRIVEWAY CURB CUT PER CITY OF LA STANDARDS.
32.13 EQUIPMENT SCREEN.
32.14 CONC. WALL @ SITE FENCE.

33 - UTILITIES

33.01 WATER METER.
33.02 ELECTRICAL TRANSFORMER W/ BOLLARDS AS REQ'D.
33.03 ELECTRICAL METER.
33.04 POWER POLE.

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

LICENSED ARCHITECT
LAWRENCE SCARPA
C 21812
REN 10/31/2023
STATE OF CALIFORNIA

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED •

BUREAU OF ENGINEERING
VERTICAL CONTROL:
HORIZONTAL CONTROL:
SHEET TITLE: ENLARGED SECTIONS
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

DEPARTMENT OF PUBLIC WORKS
NO. REVISIONS: DATE: BY:
CIP NO.
INDEX NO.

CITY OF LOS ANGELES
CITY ENGINEER
GARY LEE MOORE, P.E., ENV SP
DESIGN GROUP
DATE:
ENGINEER:
DESIGNED BY:
DRAWN BY:
CHECKED BY:
APPROVED BY:

WORK ORDER NO.
E170121B

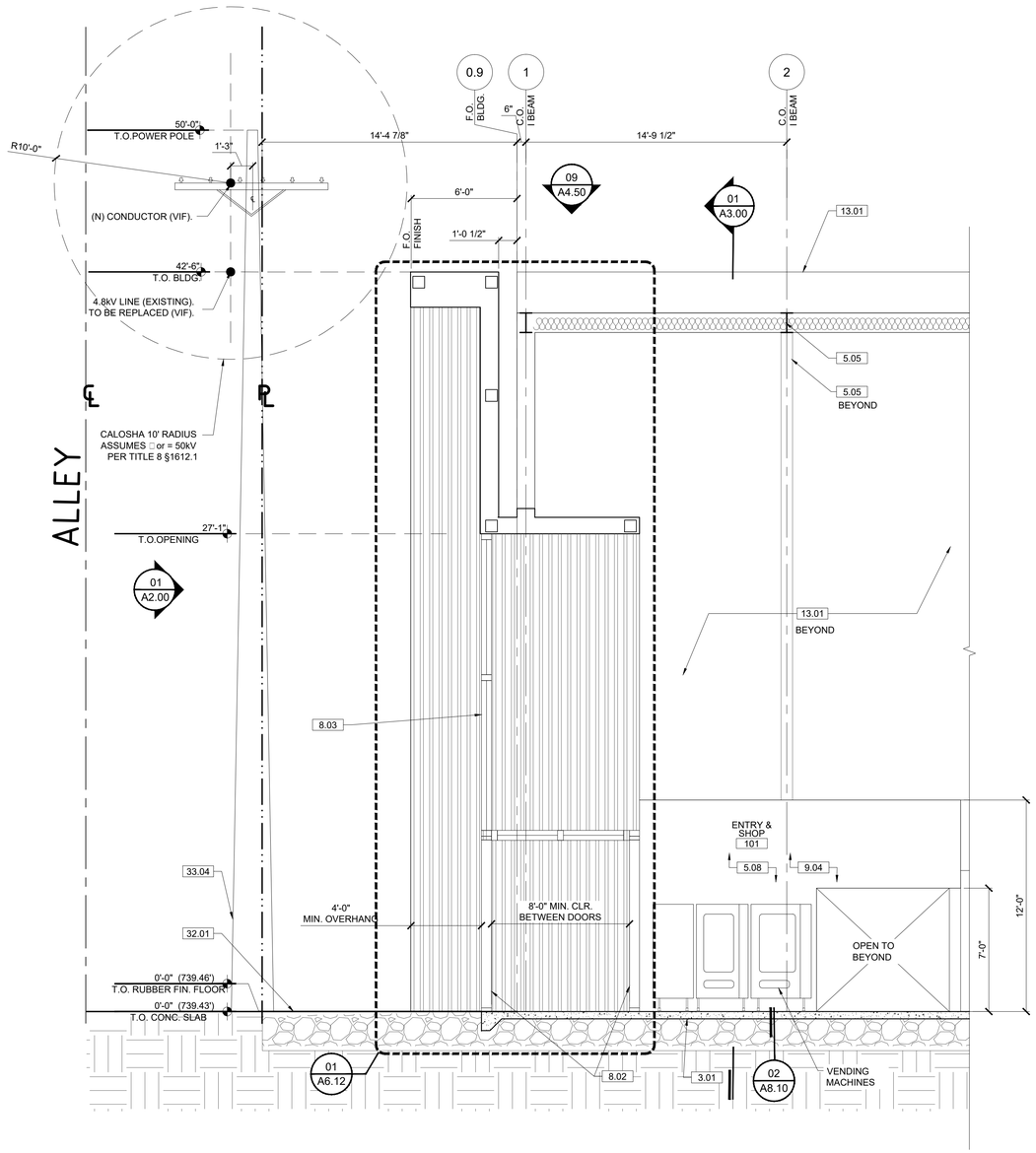
SHEET NAME
A3.11
SHEET X OF X SHEETS

REVISION DATES (DESIGN STAGE ONLY)

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

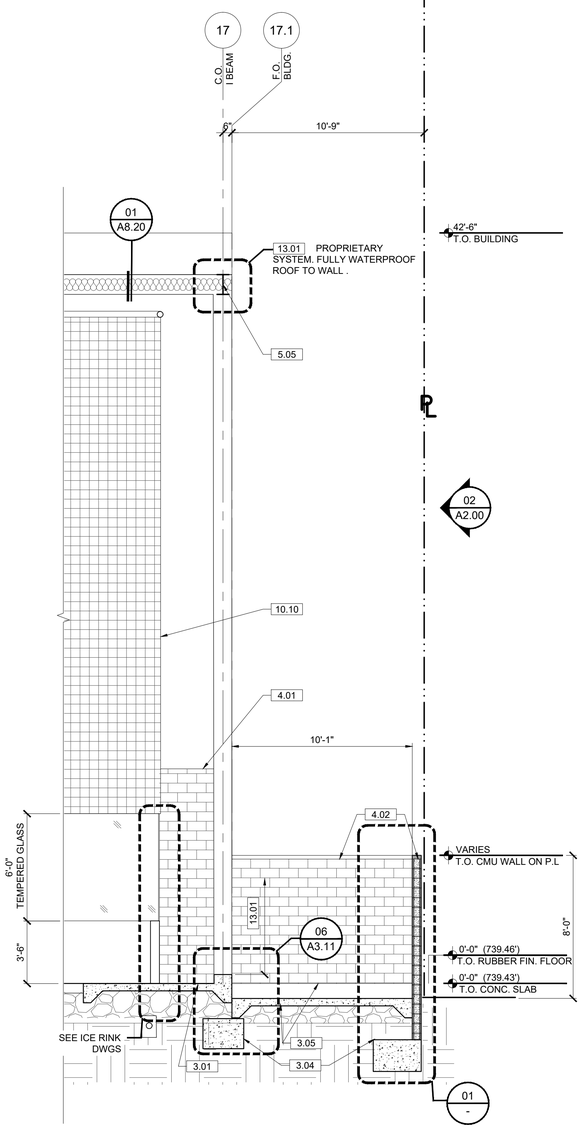
Sheet Version 4.0

Z:\B□S ARCHITECTURE\019 JOBS\01935.0 CITY OF LA-RESEDA ICE HOCKEY ROLLER RINK\01935.0 1.CURRENT DRAWINGS_24X36\09135.0_A311_24X36.DWG 12/3/2021 9:17 AM



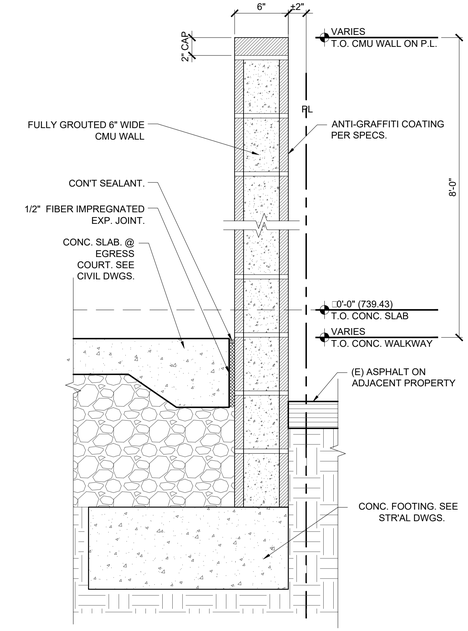
ENLARGED SECTION @ GATEWAY 07

REF: A3.02 SCALE: 1/4" = 1'-0"



ENLARGED SECTION @ EGRESS COURT 04

REF: A3.02 SCALE: 1/4" = 1'-0"



TYP. CMU WALL ON P.L 01

REF: 04/- SCALE: 1 1/2"=1'-0"

KEYNOTES

NOTE: ITEMS IDENTIFIED ARE TYPICAL TO ALL LIKE ITEMS UNLESS NOTED OTHERWISE.

01 - GENERAL REQUIREMENTS
02 - NOT USED

03 - CONCRETE
3.01 CONC. SLAB ON GRADE PER STRUCT'L.
3.02 CONC. O/MTL. DECK PER STRUCT'L.
3.03 CONC. CURB
3.04 CONC. FOOTING PER STRUCT'L.
3.05 CONC. PAVING PER CIVIL DWGS.
3.06 CONC. SIDEWALK PER CIVIL DWGS.
3.07 CONC. PAD

04 - MASONRY
4.01 CMU BLDNG. WALL
4.02 CMU SITE WALL W/ 2" CMU CAP.

05 - METALS
5.01 STL. COLUMN PER STRUCT'L. PTD.
5.02 STL. BEAM PER STRUCT'L. PTD.
5.03 HSS POST PER STRUCT'L. PTD.
5.04 HSS BEAM PER STRUCT'L. PTD.
5.05 MEMBRANE STRUCTURE I BEAM.
5.06 MTL. DECK.
5.07 MTL. GUARD RAILING.
5.08 MTL. STUD WALL.

06 - WOOD AND PLASTICS

07 - THERMAL & MOISTURE PROTECTION
7.01 W.P. MEMBRANE PER DETL. & SPECS.
7.02 SINGLE PLY PVC ROOFING PER SPECS.
7.03 R-21 RIGID INSULATION @ WALLS.
7.04 UNDERSLAB MOISTURE VAPOR BARRIER.
7.05 ROOF DRAIN AND OVERFLOW.
7.06 CLEAR WATER-REPELLENT GRAFITTI COATING AT CMU WALL. (ALL EXPOSED SURFACES).
7.07 BATT INSULATION.

08 - OPENINGS (SEE DOOR/WINDOW SCHED)
8.01 STL. DOOR. & FRAME, PAINTED.
8.02 CLR. ANODIZED ALUM. STOREFRONT DOOR.
8.03 CLR. ANODIZED ALUM. STOREFRONT WINDOW.
8.04 DOOR HARDWARE SET PER SCHED.
8.05 EXTERIOR WALL LOUVER.
8.06 EXTERIOR WALL VENT WITH CAP.
8.07 ROLLING STL. DOOR & FRAME.
8.08 ICE RINK GATES
8.09 OVERHEAD GLASS DOOR.
8.10 ACCESS PANEL, COLOR TO MATCH ADJACENT MATERIAL.
8.11 ROOF ACCESS HATCH.

09 - FINISHES (SEE FIN. SCHED)
9.01 5/8" TYPE 'X' GYP. BD., PROVIDE 'WET RATED' AT BATHROOMS. PAINT.
9.02 CONC. FLR. SEAL PER FIN. SCHED.
9.03 RUBBER FLR. PER SPECS.
9.04 PAINT PER SPECS.
9.05 REVEAL PER DETAILS.
9.06 GRAFITTI COATING, TYP. @ ALL EXTERIOR SOLID WALLS.
9.07 GLAZED FINISH ON CMU.
9.08 CERAMIC TILE.

10 - SPECIALTIES
10.01 MIRROR PER SPECS.
10.02 SIGNAGE.
10.03 TOILET PAPER ROLL HOLDER PER ACCESSORY SCHED.
10.04 GRAB BAR.
10.05 COAT HOOK.
10.06 WASTE RECEPTACLE.
10.07 FOLDING SHOWER SEAT.
10.08 SHOWER ROD.
10.09 SHELF.
10.10 NETTING. NIC
10.11 FIRE EXTINGUISHER. RECESSED CABINET
10.12 TOILET SEAT COVER DISPENSER.
10.13 PAPER TOWEL DISPENSER.
10.14 BATHROOM PARTITION W/ ROBE HOOK @ EA. DOOR

11 - EQUIPMENT/APPLIANCES (SEE EQMT. SCHED)

12 - FURNISHINGS
12.01 BICYCLE RACKS FOR SHORT-TERM BIKE PARKING.
12.02 DASHERBOARDS. NIC.
12.03 BENCH. NIC.
12.04 BLEACHERS. NIC.
12.05 SCOREBOARD. NIC.
12.06 SKATE RACKS. NIC.

13 - SPECIAL CONSTRUCTION
13.01 MEMBRANE STRUCTURE.

14 - CONVEYING EQUIPMENT (NOT USED)

21 - FIRE SUPPRESSION
21.01 FIRE EXTINGUISHER.
21.02 FIRE SPRINKLER HORIZ. MAIN (SEE DIAGRAM)
21.03 FIRE SPRINKLER VALVE ASSEMBLY
21.04 FIRE DEPT. MAIN CONNECTION @ FRONT OF PROJECT. LAFD SHALL APPROVE FINAL LOCATION.
21.05 FIRE SPRINKLER HEAD.

22 - PLUMBING
22.01 WATER CLOSET PER PLUMBING LEGEND
22.02 LAV. SINK & FAUCET. PER PLUMBING LEGEND
22.03 JANITOR MOP SINK.
22.04 PLUMBING VENT PIPE.
22.05 DRINKING FOUNTAIN.
22.06 ULTRA LOW-FLOW TOILET.
22.07 SHOWER HEAD/ CONTROLS.
22.08 SHOWER DRAIN.
22.09 AREA DRAIN.
22.10 HOSE BIB.

23 - HEATING, VENTILATING, AND AIR-CONDITIONING
23.01 HVAC UNIT PER MECH.
23.02 AIR REGISTER WALL MOUNTED.
23.03 CEILING AIR REGISTER.
23.04 MAKE UP AIR LOUVER PER MECH. DWGS
23.05 BATHRM EXHAUST FAN PER SPECS.
23.06 BATHRM EXHAUST DUCT.
23.07 MECH. DUCT.
23.08 MECH. EQUIPMENT.

26 - ELECTRICAL
26.01 ELEC. PANEL PER PLANS & SCHED.
26.02 EXTERIOR LIGHT PER SCHED.
26.03 INTERIOR LIGHT PER SCHED.

27 - COMMUNICATION

28 - ELECTRONIC SAFETY AND SECURITY
28.01 SMOKE ALARM.
28.02 SECURITY CAMERA.
28.03 FIRE ALARM MAIN PANEL.

31 - EARTHWORK
31.01 APPROVED COMPACT FILL PER GEO & SOIL ENGINEER REPORT.

32 - EXTERIOR IMPROVEMENTS
32.01 ASPHALT PAVING PER CIVIL.
32.02 GRAPHICS/PAINT.SEE LAND. DWGS.
32.03 STORMWATER MANAGEMENT PER CIVIL DWGS.
32.04 STL. SECURITY GATE, PTD.
32.05 STL. SECURITY FENCE, PTD.
32.06 EXTERIOR AREA DRAINS.
32.07 BENCH.
32.08 TRENCH DRAIN.
32.09 TREE, SEE LANDSCAPE DWGS.
32.10 PLANTING, SEE LANDSCAPE DWGS.
32.11 (N) CONCRETE SIDEWALK, CURB, GUTTER PER CITY OF LA STANDARDS.
32.12 (N) CONC. APRON & DRIVEWAY CURB CUT PER CITY OF LA STANDARDS.
32.13 EQUIPMENT SCREEN.
32.14 CONC. WALL @ SITE FENCE.

33 - UTILITIES
33.01 WATER METER.
33.02 ELECTRICAL TRANSFORMER W/ BOLLARDS AS REQ'D.
33.03 ELECTRICAL METER.
33.04 POWER POLE.

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

LICENSED ARCHITECT
LAWRENCE SCARPA
C 21812
REN 10/31/2023
STATE OF CALIFORNIA

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED

BUREAU OF ENGINEERING
VERTICAL CONTROL:
HORIZONTAL CONTROL:
SHEET TITLE: ENLARGED SECTIONS
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

DEPARTMENT OF PUBLIC WORKS
NO. REVISIONS: DATE: BY:
CIP NO.
INDEX NO.

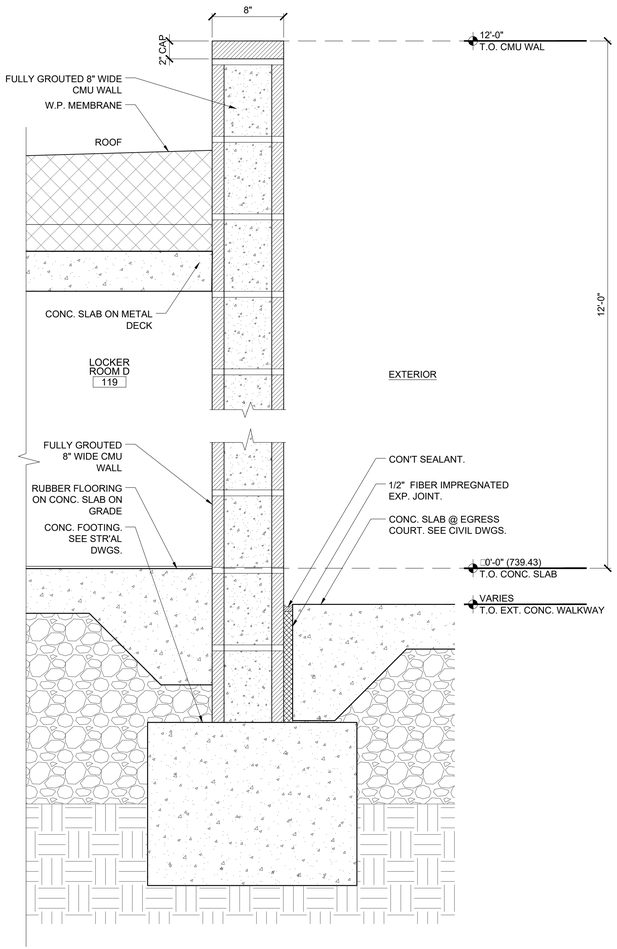
CITY OF LOS ANGELES
GARY LEE MOORE, P.E. ENV SP
DESIGN GROUP
ENGINEER:
DESIGNED BY:
DRAWN BY:
CHECKED BY:
APPROVED BY:
CITY ENGINEER DATE:

WORK ORDER NO.
E170121B

SHEET NAME
A3.12
SHEET X OF X SHEETS

REVISION DATES (DESIGN STAGE ONLY)

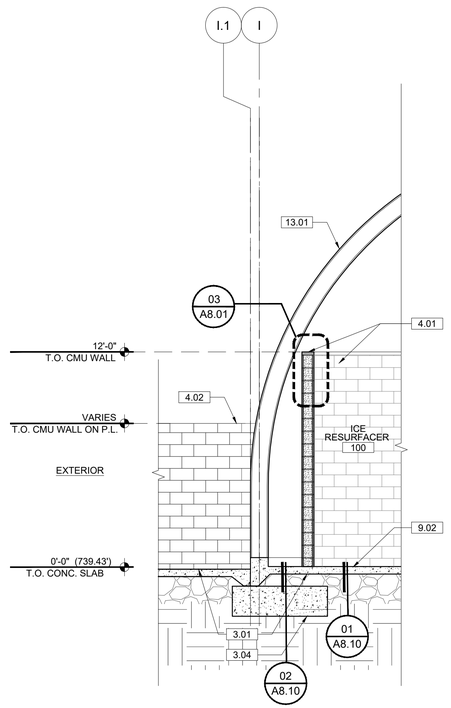
THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.



ENLARGED SECTION @ EXTERIOR CMU WALL

07

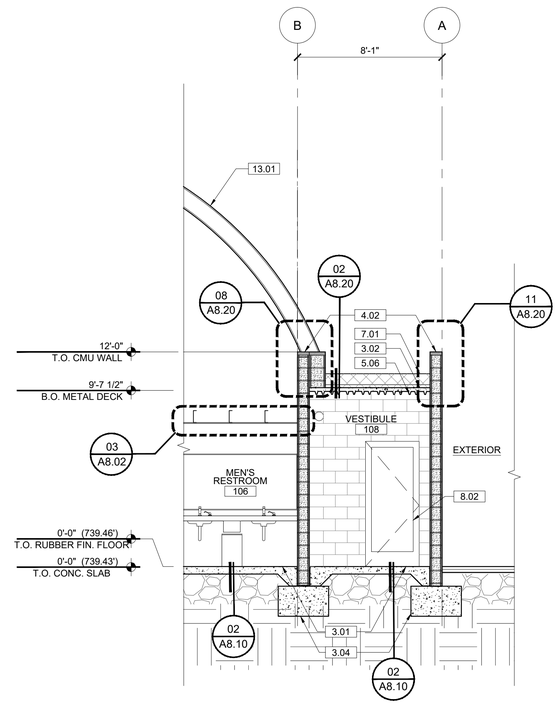
REF: 01/A3.01 SCALE: 1-1/2"=1'-0"



ENLARGED SECTION @ ICE RESURFACER ROOM

04

REF: 01/A3.00 SCALE: 1/4"=1'-0"



ENLARGED SECTION @ VESTIBULE

01

REF: 01/A3.00 SCALE: 1/4"=1'-0"

KEYNOTES

NOTE: ITEMS IDENTIFIED ARE TYPICAL TO ALL LIKE ITEMS UNLESS NOTED OTHERWISE.

01 - GENERAL REQUIREMENTS
02 - NOT USED

03 - CONCRETE
3.01 CONC. SLAB ON GRADE PER STRUCT'L.
3.02 CONC. O/MTL. DECK PER STRUCT'L.
3.03 CONC. CURB
3.04 CONC. FOOTING PER STRUCT'L.
3.05 CONC. PAVING PER CIVIL DWGS.
3.06 CONC. SIDEWALK PER CIVIL DWGS.
3.07 CONC. PAD

04 - MASONRY
4.01 CMU BLDNG. WALL
4.02 CMU SITE WALL W/ 2" CMU CAP.

05 - METALS
5.01 STL. COLUMN PER STRUCT'L. PTD.
5.02 STL. BEAM PER STRUCT'L. PTD.
5.03 HSS POST PER STRUCT'L. PTD.
5.04 HSS BEAM PER STRUCT'L. PTD.
5.05 MEMBRANE STRUCTURE I BEAM.
5.06 MTL. DECK.
5.07 MTL. GUARD RAILING.
5.08 MTL. STUD WALL.

06 - WOOD AND PLASTICS

07 - THERMAL & MOISTURE PROTECTION
7.01 W.P. MEMBRANE PER DETL. & SPECS.
7.02 SINGLE PLY PVC ROOFING PER SPECS.
7.03 R-21 RIGID INSULATION @ WALLS.
7.04 UNDERSLAB MOISTURE VAPOR BARRIER.
7.05 ROOF DRAIN AND OVERFLOW.
7.06 CLEAR WATER-REPELLENT GRAFITTI COATING AT CMU WALL. (ALL EXPOSED SURFACES).
7.07 BATT INSULATION.

08 - OPENINGS (SEE DOOR/WINDOW SCHED)
8.01 STL. DOOR. & FRAME, PAINTED.
8.02 CLR. ANODIZED ALUM. STOREFRONT DOOR.
8.03 CLR. ANODIZED ALUM. STOREFRONT WINDOW.
8.04 DOOR HARDWARE SET PER SCHED.
8.05 EXTERIOR WALL LOUVER.
8.06 EXTERIOR WALL VENT WITH CAP.
8.07 ROLLING STL. DOOR & FRAME.
8.08 ICE RINK GATES
8.09 OVERHEAD GLASS DOOR.
8.10 ACCESS PANEL, COLOR TO MATCH ADJACENT MATERIAL.
8.11 ROOF ACCESS HATCH.

09 - FINISHES (SEE FIN. SCHED)
9.01 5/8" TYPE 'X' GYP. BD., PROVIDE 'WET RATED' AT BATHROOMS. PAINT.
9.02 CONC. FLR. SEAL PER FIN. SCHED.
9.03 RUBBER FLR. PER SPECS.
9.04 PAINT PER SPECS.
9.05 REVEAL PER DETAILS.
9.06 GRAFITTI COATING, TYP. @ ALL EXTERIOR SOLID WALLS.
9.07 GLAZED FINISH ON CMU.
9.08 CERAMIC TILE.

10 - SPECIALTIES
10.01 MIRROR PER SPECS.
10.02 SIGNAGE.
10.03 TOILET PAPER ROLL HOLDER PER ACCESSORY SCHED.
10.04 GRAB BAR.
10.05 COAT HOOK.
10.06 WASTE RECEPTACLE.
10.07 FOLDING SHOWER SEAT.
10.08 SHOWER ROD.
10.09 SHELF.
10.10 NETTING. NIC
10.11 FIRE EXTINGUISHER. RECESSED CABINET
10.12 TOILET SEAT COVER DISPENSER.
10.13 PAPER TOWEL DISPENSER.
10.14 BATHROOM PARTITION W/ ROBE HOOK @ EA. DOOR

11 - EQUIPMENT/APPLIANCES (SEE EQMT. SCHED)

12 - FURNISHINGS
12.01 BICYCLE RACKS FOR SHORT-TERM BIKE PARKING.
12.02 DASHERBOARDS. NIC.
12.03 BENCH. NIC.
12.04 BLEACHERS. NIC.
12.05 SCOREBOARD. NIC.
12.06 SKATE RACKS. NIC.

13 - SPECIAL CONSTRUCTION
13.01 MEMBRANE STRUCTURE.

14 - CONVEYING EQUIPMENT (NOT USED)

21 - FIRE SUPPRESSION
21.01 FIRE EXTINGUISHER.
21.02 FIRE SPRINKLER HORIZ. MAIN (SEE DIAGRAM)
21.03 FIRE SPRINKLER VALVE ASSEMBLY
21.04 FIRE DEPT. MAIN CONNECTION @ FRONT OF PROJECT. LAFD SHALL APPROVE FINAL LOCATION.
21.05 FIRE SPRINKLER HEAD.

22 - PLUMBING
22.01 WATER CLOSET PER PLUMBING LEGEND
22.02 LAV. SINK & FAUCET. PER PLUMBING LEGEND
22.03 JANITOR MOP SINK.
22.04 PLUMBING VENT PIPE.
22.05 DRINKING FOUNTAIN.
22.06 ULTRA LOW-FLOW TOILET.
22.07 SHOWER HEAD/ CONTROLS.
22.08 SHOWER DRAIN.
22.09 AREA DRAIN.
22.10 HOSE BIB.

23 - HEATING, VENTILATING, AND AIR-CONDITIONING
23.01 HVAC UNIT PER MECH.
23.02 AIR REGISTER WALL MOUNTED.
23.03 CEILING AIR REGISTER.
23.04 MAKE UP AIR LOUVER PER MECH. DWGS
23.05 BATHRM EXHAUST FAN PER SPECS.
23.06 BATHRM EXHAUST DUCT.
23.07 MECH. DUCT.
23.08 MECH. EQUIPMENT.

26 - ELECTRICAL
26.01 ELEC. PANEL PER PLANS & SCHED.
26.02 EXTERIOR LIGHT PER SCHED.
26.03 INTERIOR LIGHT PER SCHED.

27 - COMMUNICATION

28 - ELECTRONIC SAFETY AND SECURITY
28.01 SMOKE ALARM.
28.02 SECURITY CAMERA.
28.03 FIRE ALARM MAIN PANEL.

31 - EARTHWORK
31.01 APPROVED COMPACT FILL PER GEO & SOIL ENGINEER REPORT.

32 - EXTERIOR IMPROVEMENTS
32.01 ASPHALT PAVING PER CIVIL.
32.02 GRAPHICS/PAINT.SEE LAND. DWGS.
32.03 STORMWATER MANAGEMENT PER CIVIL DWGS.
32.04 STL. SECURITY GATE, PTD.
32.05 STL. SECURITY FENCE, PTD.
32.06 EXTERIOR AREA DRAINS.
32.07 BENCH.
32.08 TRENCH DRAIN.
32.09 TREE, SEE LANDSCAPE DWGS.
32.10 PLANTING, SEE LANDSCAPE DWGS.
32.11 (N) CONCRETE SIDEWALK, CURB, GUTTER PER CITY OF LA STANDARDS.
32.12 (N) CONC. APRON & DRIVEWAY CURB CUT PER CITY OF LA STANDARDS.
32.13 EQUIPMENT SCREEN.
32.14 CONC. WALL @ SITE FENCE.

33 - UTILITIES
33.01 WATER METER.
33.02 ELECTRICAL TRANSFORMER W/ BOLLARDS AS REQ'D.
33.03 ELECTRICAL METER.
33.04 POWER POLE.

REVISION DATES (DESIGN STAGE ONLY)

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

LICENSED ARCHITECT
LAWRENCE SCARPA
C 21812
REN 10/31/2023
STATE OF CALIFORNIA

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED •

DEPARTMENT OF PUBLIC WORKS
BUREAU OF ENGINEERING

VERTICAL CONTROL:
HORIZONTAL CONTROL:

SHEET TITLE: ENLARGED SECTIONS

PROJECT: RESEDA SKATE FACILITY

ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

NO.	REVISIONS:	DATE:	BY:

CIP NO.

INDEX NO.

CITY OF LOS ANGELES

CITY ENGINEER DATE:

GARY LEE MOORE, P.E. ENV SP

DESIGN GROUP

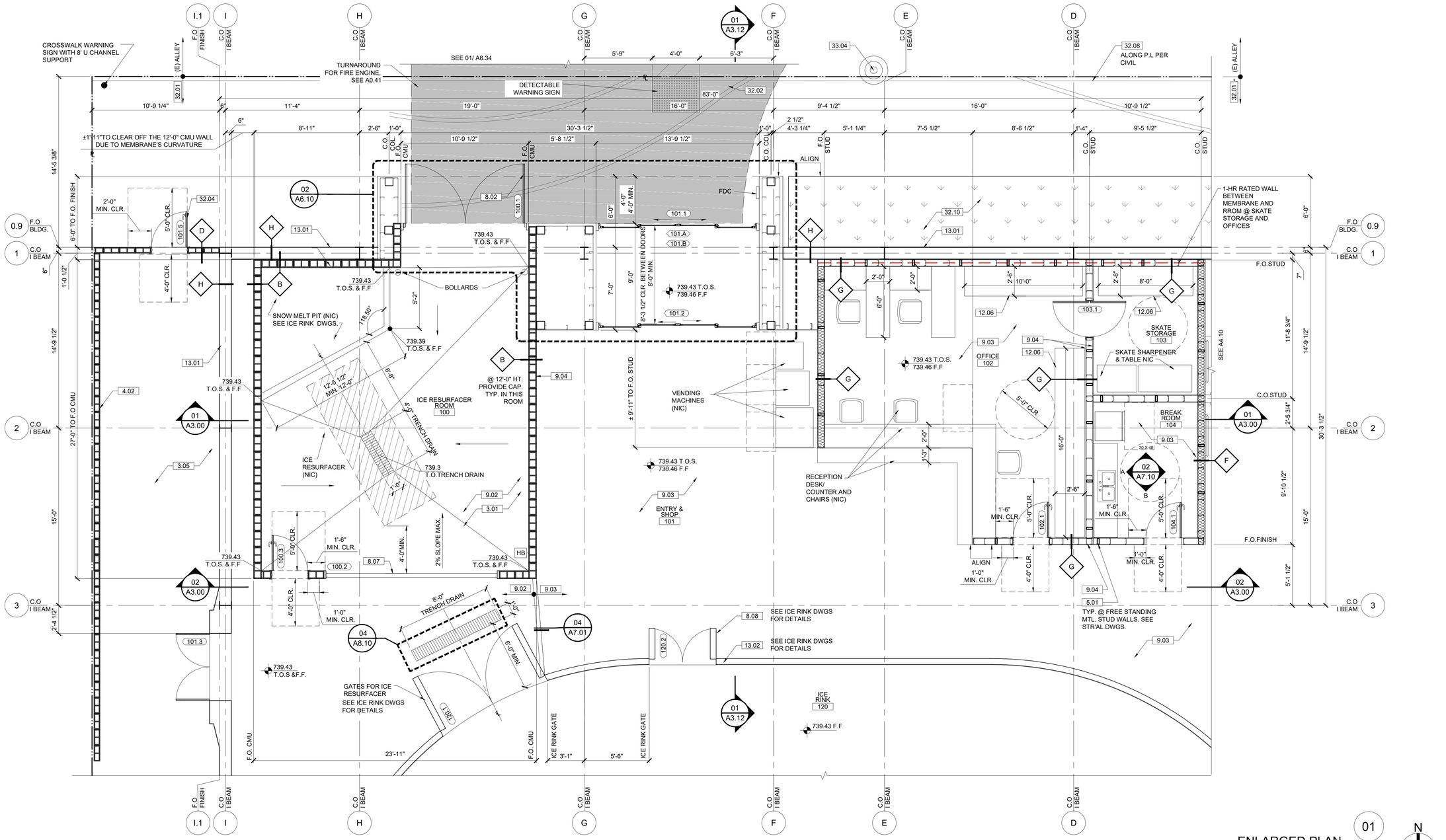
ENGINEER:
DESIGNED BY:
DRAWN BY:
CHECKED BY:
APPROVED BY:

WORK ORDER NO.
E170121B

SHEET NAME
A3.13
SHEET X OF X SHEETS

Sheet Version 4.0

Z:\B□S ARCHITECTURE\019 JOBS\01935.0 CITY OF LA-RESEDA ICE HOCKEY ROLLER RINK\01935.0 1.CURRENT DRAWINGS_24X36\01935.0_A313_24X36.DWG 12/3/2021 9:18 AM



KEYNOTES

NOTE: ITEMS IDENTIFIED ARE TYPICAL TO ALL LIKE ITEMS UNLESS NOTED OTHERWISE.

01 - GENERAL REQUIREMENTS
02 - NOT USED

03 - CONCRETE
3.01 CONC. SLAB ON GRADE PER STRUCT'L.
3.02 CONC. O/MTL. DECK PER STRUCT'L.
3.03 CONC. CURB
3.04 CONC. FOOTING PER STRUCT'L.
3.05 CONC. PAVING PER CIVIL DWGS.
3.06 CONC. SIDEWALK PER CIVIL DWGS.
3.07 CONC. PAD

04 - MASONRY
4.01 CMU BLDNG. WALL
4.02 CMU SITE WALL W/ 2" CMU CAP.

05 - METALS
5.01 STL. COLUMN PER STRUCT'L. PTD.
5.02 STL. BEAM PER STRUCT'L. PTD.
5.03 HSS POST PER STRUCT'L. PTD.
5.04 HSS BEAM PER STRUCT'L. PTD.
5.05 MEMBRANE STRUCTURE I BEAM.
5.06 MTL. DECK.
5.07 MTL. GUARD RAILING.
5.08 MTL. STUD WALL.

06 - WOOD AND PLASTICS

07 - THERMAL & MOISTURE PROTECTION
7.01 W.P. MEMBRANE PER DETL. & SPECS.
7.02 SINGLE PLY PVC ROOFING PER SPECS.
7.03 R-21 RIGID INSULATION @ WALLS.
7.04 UNDERSLAB MOISTURE VAPOR BARRIER.
7.05 ROOF DRAIN AND OVERFLOW.
7.06 CLEAR WATER-REPELLENT GRAFITTI COATING AT CMU WALL. (ALL EXPOSED SURFACES).
7.07 BATT INSULATION.

08 - OPENINGS (SEE DOOR/WINDOW SCHED)
8.01 STL. DOOR. & FRAME, PAINTED.
8.02 CLR. ANODIZED ALUM. STOREFRONT DOOR.
8.03 CLR. ANODIZED ALUM. STOREFRONT WINDOW.
8.04 DOOR HARDWARE SET PER SCHED.
8.05 EXTERIOR WALL LOUVER.
8.06 EXTERIOR WALL VENT WITH CAP.
8.07 ROLLING STL. DOOR & FRAME.
8.08 ICE RINK GATES
8.09 OVERHEAD GLASS DOOR.
8.10 ACCESS PANEL, COLOR TO MATCH ADJACENT MATERIAL.
8.11 ROOF ACCESS HATCH.

09 - FINISHES (SEE FIN. SCHED)
9.01 5/8" TYPE 'X' GYP. BD., PROVIDE 'WET RATED' AT BATHROOMS. PAINT.
9.02 CONC. FLR. SEAL PER FIN. SCHED.
9.03 RUBBER FLR. PER SPECS.
9.04 PAINT PER SPECS.
9.05 REVEAL PER DETAILS.
9.06 GRAFITTI COATING, TYP. @ ALL EXTERIOR SOLID WALLS.
9.07 GLAZED FINISH ON CMU.
9.08 CERAMIC TILE.

10 - SPECIALTIES
10.01 MIRROR PER SPECS.
10.02 SIGNAGE.
10.03 TOILET PAPER ROLL HOLDER PER ACCESSORY SCHED.
10.04 GRAB BAR.
10.05 COAT HOOK.
10.06 WASTE RECEPTACLE.
10.07 FOLDING SHOWER SEAT.
10.08 SHOWER ROD.
10.09 SHELF.
10.10 NETTING. NIC
10.11 FIRE EXTINGUISHER. RECESSED CABINET
10.12 TOILET SEAT COVER DISPENSER.
10.13 PAPER TOWEL DISPENSER.
10.14 BATHROOM PARTITION W/ ROBE HOOK @ EA. DOOR

11 - EQUIPMENT/APPLIANCES (SEE EQMT. SCHED)

12 - FURNISHINGS
12.01 BICYCLE RACKS FOR SHORT-TERM BIKE PARKING.
12.02 DASHERBOARDS. NIC.
12.03 BENCH. NIC.
12.04 BLEACHERS. NIC.
12.05 SCOREBOARD. NIC.
12.06 SKATE RACKS. NIC.

13 - SPECIAL CONSTRUCTION
13.01 MEMBRANE STRUCTURE.

14 - CONVEYING EQUIPMENT (NOT USED)

21 - FIRE SUPPRESSION
21.01 FIRE EXTINGUISHER.
21.02 FIRE SPRINKLER HORIZ. MAIN (SEE DIAGRAM)
21.03 FIRE SPRINKLER VALVE ASSEMBLY
21.04 FIRE DEPT. MAIN CONNECTION @ FRONT OF PROJECT. LAFD SHALL APPROVE FINAL LOCATION.
21.05 FIRE SPRINKLER HEAD.

22 - PLUMBING
22.01 WATER CLOSET PER PLUMBING LEGEND
22.02 LAV. SINK & FAUCET. PER PLUMBING LEGEND
22.03 JANITOR MOP SINK.
22.04 PLUMBING VENT PIPE.
22.05 DRINKING FOUNTAIN.
22.06 ULTRA LOW-FLOW TOILET.
22.07 SHOWER HEAD/ CONTROLS.
22.08 SHOWER DRAIN.
22.09 AREA DRAIN.
22.10 HOSE BIB.

23 - HEATING, VENTILATING, AND AIR-CONDITIONING
23.01 HVAC UNIT PER MECH.
23.02 AIR REGISTER WALL MOUNTED.
23.03 CEILING AIR REGISTER.
23.04 MAKE UP AIR LOUVER PER MECH. DWGS
23.05 BATHRM EXHAUST FAN PER SPECS.
23.06 BATHRM EXHAUST DUCT.
23.07 MECH. DUCT.
23.08 MECH. EQUIPMENT.

26 - ELECTRICAL
26.01 ELEC. PANEL PER PLANS & SCHED.
26.02 EXTERIOR LIGHT PER SCHED.
26.03 INTERIOR LIGHT PER SCHED.

27 - COMMUNICATION

28 - ELECTRONIC SAFETY AND SECURITY
28.01 SMOKE ALARM.
28.02 SECURITY CAMERA.
28.03 FIRE ALARM MAIN PANEL.

31 - EARTHWORK
31.01 APPROVED COMPACT FILL PER GEO & SOIL ENGINEER REPORT.

32 - EXTERIOR IMPROVEMENTS
32.01 ASPHALT PAVING PER CIVIL.
32.02 GRAPHICS/PAINT.SEE LAND. DWGS.
32.03 STORMWATER MANAGEMENT PER CIVIL DWGS.
32.04 STL. SECURITY GATE, PTD.
32.05 STL. SECURITY FENCE, PTD.
32.06 EXTERIOR AREA DRAINS.
32.07 BENCH.
32.08 TRENCH DRAIN.
32.09 TREE, SEE LANDSCAPE DWGS.
32.10 PLANTING, SEE LANDSCAPE DWGS.
32.11 (N) CONCRETE SIDEWALK, CURB, GUTTER PER CITY OF LA STANDARDS.
32.12 (N) CONC. APRON & DRIVEWAY CURB CUT PER CITY OF LA STANDARDS.
32.13 EQUIPMENT SCREEN.
32.14 CONC. WALL @ SITE FENCE.

33 - UTILITIES
33.01 WATER METER.
33.02 ELECTRICAL TRANSFORMER W/ BOLLARDS AS REQ'D.
33.03 ELECTRICAL METER.
33.04 POWER POLE.

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

LICENSED ARCHITECT
LAWRENCE SCARPA
C 21812
REN 10/31/2023
STATE OF CALIFORNIA

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED

DEPARTMENT OF PUBLIC WORKS
BUREAU OF ENGINEERING

VERTICAL CONTROL:
HORIZONTAL CONTROL:
SHEET TITLE: ENLARGED PLAN
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

NO.	REVISIONS:	DATE:	BY:

INDEX NO.

CIP NO.

CITY OF LOS ANGELES

CITY ENGINEER
GARY LEE MOORE, P.E. ENV SP
DESIGN GROUP
DATE:

	ENGINEER:	DESIGNED BY:	DRAWN BY:	CHECKED BY:	APPROVED BY:

WORK ORDER NO.
E170121B

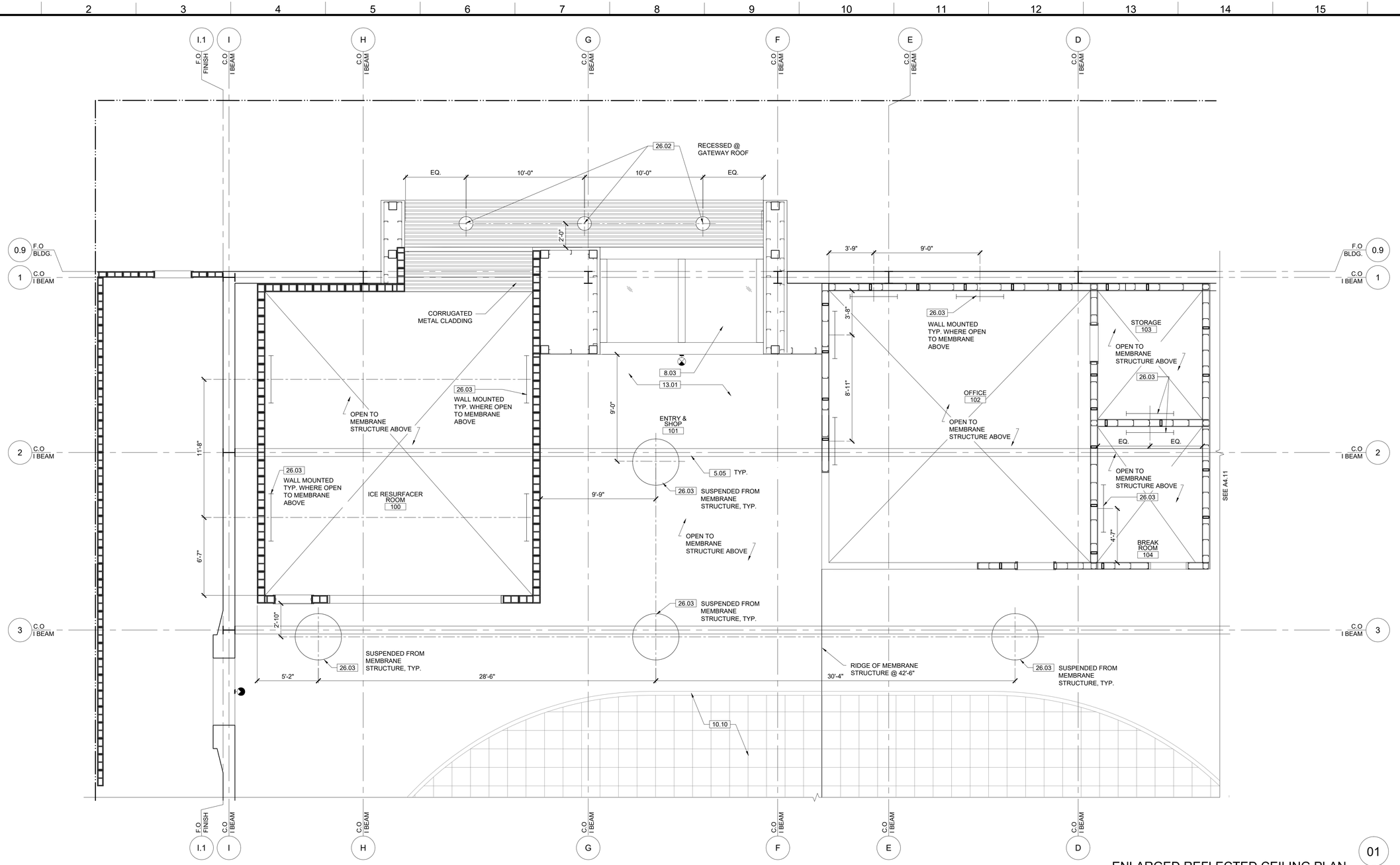
SHEET NAME
A4.00
SHEET X OF X SHEETS

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REVISION DATES (DESIGN STAGE ONLY)

Sheet Version 4.0

Z:\B□S ARCHITECTURE\019 JOBS\01935.0 CITY OF LA-RESEDA ICE HOCKEY ROLLER RINK\01935.0 1.CURRENT DRAWINGS_24X36\01935.0_A400_24X36.DWG 12/3/2021 9:18 AM



ENLARGED REFLECTED CEILING PLAN

REF: A1.12, A4.00 SCALE: 1/4" = 1'-0"

01

KEYNOTES

NOTE: ITEMS IDENTIFIED ARE TYPICAL TO ALL LIKE ITEMS UNLESS NOTED OTHERWISE.

01 - GENERAL REQUIREMENTS
02 - NOT USED

03 - CONCRETE
3.01 CONC. SLAB ON GRADE PER STRUCT'L.
3.02 CONC. O/MTL. DECK PER STRUCT'L.
3.03 CONC. CURB
3.04 CONC. FOOTING PER STRUCT'L.
3.05 CONC. PAVING PER CIVIL DWGS.
3.06 CONC. SIDEWALK PER CIVIL DWGS.
3.07 CONC. PAD

04 - MASONRY
4.01 CMU BLDNG. WALL
4.02 CMU SITE WALL W/ 2" CMU CAP.

05 - METALS
5.01 STL. COLUMN PER STRUCT'L. PTD.
5.02 STL. BEAM PER STRUCT'L. PTD.
5.03 HSS POST PER STRUCT'L. PTD.
5.04 HSS BEAM PER STRUCT'L. PTD.
5.05 MEMBRANE STRUCTURE I BEAM.
5.06 MTL. DECK.
5.07 MTL. GUARD RAILING.
5.08 MTL. STUD WALL.

06 - WOOD AND PLASTICS

07 - THERMAL & MOISTURE PROTECTION
7.01 W.P. MEMBRANE PER DETL & SPECS.
7.02 SINGLE PLY PVC ROOFING PER SPECS.
7.03 R-21 RIGID INSULATION @ WALLS.
7.04 UNDERSLAB MOISTURE VAPOR BARRIER
7.05 ROOF DRAIN AND OVERFLOW.
7.06 CLEAR WATER-REPELLENT GRAFITTI COATING AT CMU WALL. (ALL EXPOSED SURFACES).
7.07 BATT INSULATION.

08 - OPENINGS (SEE DOOR/WINDOW SCHED)
8.01 STL. DOOR. & FRAME, PAINTED.
8.02 CLR. ANODIZED ALUM. STOREFRONT DOOR.
8.03 CLR. ANODIZED ALUM. STOREFRONT WINDOW.
8.04 DOOR HARDWARE SET PER SCHED.
8.05 EXTERIOR WALL LOUVER.
8.06 EXTERIOR WALL VENT WITH CAP.
8.07 ROLLING STL. DOOR & FRAME.
8.08 ICE RINK GATES
8.09 OVERHEAD GLASS DOOR.
8.10 ACCESS PANEL, COLOR TO MATCH ADJACENT MATERIAL.
8.11 ROOF ACCESS HATCH.

09 - FINISHES (SEE FIN. SCHED)
9.01 5/8" TYPE 'X' GYP. BD., PROVIDE 'WET RATED' AT BATHROOMS. PAINT.
9.02 CONC. FLR. SEAL PER FIN. SCHED.
9.03 RUBBER FLR. PER SPECS.
9.04 PAINT PER SPECS.
9.05 REVEAL PER DETAILS.
9.06 GRAFITTI COATING, TYP. @ ALL EXTERIOR SOLID WALLS.
9.07 GLAZED FINISH ON CMU.
9.08 CERAMIC TILE.

10 - SPECIALTIES
10.01 MIRROR PER SPECS.
10.02 SIGNAGE.
10.03 TOILET PAPER ROLL HOLDER PER ACCESSORY SCHED.
10.04 GRAB BAR.
10.05 COAT HOOK.
10.06 WASTE RECEPTACLE.
10.07 FOLDING SHOWER SEAT.
10.08 SHOWER ROD.
10.09 SHELF.
10.10 NETTING. NIC
10.11 FIRE EXTINGUISHER. RECESSED CABINET
10.12 TOILET SEAT COVER DISPENSER.
10.13 PAPER TOWEL DISPENSER.
10.14 BATHROOM PARTITION W/ ROBE HOOK @ EA. DOOR

11 - EQUIPMENT/APPLIANCES (SEE EQMT. SCHED)

12 - FURNISHINGS
12.01 BICYCLE RACKS FOR SHORT-TERM BIKE PARKING.
12.02 DASHERBOARDS. NIC.
12.03 BENCH. NIC.
12.04 BLEACHERS. NIC.
12.05 SCOREBOARD. NIC.
12.06 SKATE RACKS. NIC.

13 - SPECIAL CONSTRUCTION
13.01 MEMBRANE STRUCTURE.

14 - CONVEYING EQUIPMENT (NOT USED)

21 - FIRE SUPPRESSION
21.01 FIRE EXTINGUISHER.
21.02 FIRE SPRINKLER HORIZ. MAIN (SEE DIAGRAM)
21.03 FIRE SPRINKLER VALVE ASSEMBLY
21.04 FIRE DEPT. MAIN CONNECTION @ FRONT OF PROJECT. LAFD SHALL APPROVE FINAL LOCATION.
21.05 FIRE SPRINKLER HEAD.

22 - PLUMBING
22.01 WATER CLOSET PER PLUMBING LEGEND
22.02 LAV. SINK & FAUCET. PER PLUMBING LEGEND
22.03 JANITOR MOP SINK.
22.04 PLUMBING VENT PIPE.
22.05 DRINKING FOUNTAIN.
22.06 ULTRA LOW-FLOW TOILET.
22.07 SHOWER HEAD/ CONTROLS.
22.08 SHOWER DRAIN.
22.09 AREA DRAIN.
22.10 HOSE BIB.

23 - HEATING, VENTILATING, AND AIR-CONDITIONING
23.01 HVAC UNIT PER MECH.
23.02 AIR REGISTER WALL MOUNTED.
23.03 CEILING AIR REGISTER.
23.04 MAKE UP AIR LOUVER PER MECH. DWGS
23.05 BATHRM EXHAUST FAN PER SPECS.
23.06 BATHRM EXHAUST DUCT.
23.07 MECH. DUCT.
23.08 MECH. EQUIPMENT.

26 - ELECTRICAL
26.01 ELEC. PANEL PER PLANS & SCHED.
26.02 EXTERIOR LIGHT PER SCHED.
26.03 INTERIOR LIGHT PER SCHED.

27 - COMMUNICATION

28 - ELECTRONIC SAFETY AND SECURITY
28.01 SMOKE ALARM.
28.02 SECURITY CAMERA.
28.03 FIRE ALARM MAIN PANEL.

31 - EARTHWORK
31.01 APPROVED COMPACT FILL PER GEO & SOIL ENGINEER REPORT.

32 - EXTERIOR IMPROVEMENTS
32.01 ASPHALT PAVING PER CIVIL.
32.02 GRAPHICS/PAINT.SEE LAND. DWGS.
32.03 STORMWATER MANAGEMENT PER CIVIL DWGS.
32.04 STL. SECURITY GATE, PTD.
32.05 STL. SECURITY FENCE, PTD.
32.06 EXTERIOR AREA DRAINS.
32.07 BENCH.
32.08 TRENCH DRAIN.
32.09 TREE, SEE LANDSCAPE DWGS.
32.10 PLANTING, SEE LANDSCAPE DWGS.
32.11 (N) CONCRETE SIDEWALK, CURB, GUTTER PER CITY OF LA STANDARDS.
32.12 (N) CONC. APRON & DRIVEWAY CURB CUT PER CITY OF LA STANDARDS.
32.13 EQUIPMENT SCREEN.
32.14 CONC. WALL @ SITE FENCE.

33 - UTILITIES
33.01 WATER METER.
33.02 ELECTRICAL TRANSFORMER W/ BOLLARDS AS REQ'D.
33.03 ELECTRICAL METER.
33.04 POWER POLE.

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

LICENSED ARCHITECT
LAWRENCE SCARPA
C 21812
REN 10/31/2023
STATE OF CALIFORNIA

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED

BUREAU OF ENGINEERING
VERTICAL CONTROL:
HORIZONTAL CONTROL:
SHEET TITLE: ENLARGED RCP
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

DEPARTMENT OF PUBLIC WORKS
NO. REVISIONS: DATE: BY:
CIP NO.
INDEX NO.

CITY OF LOS ANGELES
CITY ENGINEER
GARY LEE MOORE, P.E., ENV SP
DATE:
DESIGN GROUP
ENGINEER:
DESIGNED BY:
DRAWN BY:
CHECKED BY:
APPROVED BY:

WORK ORDER NO.
E170121B

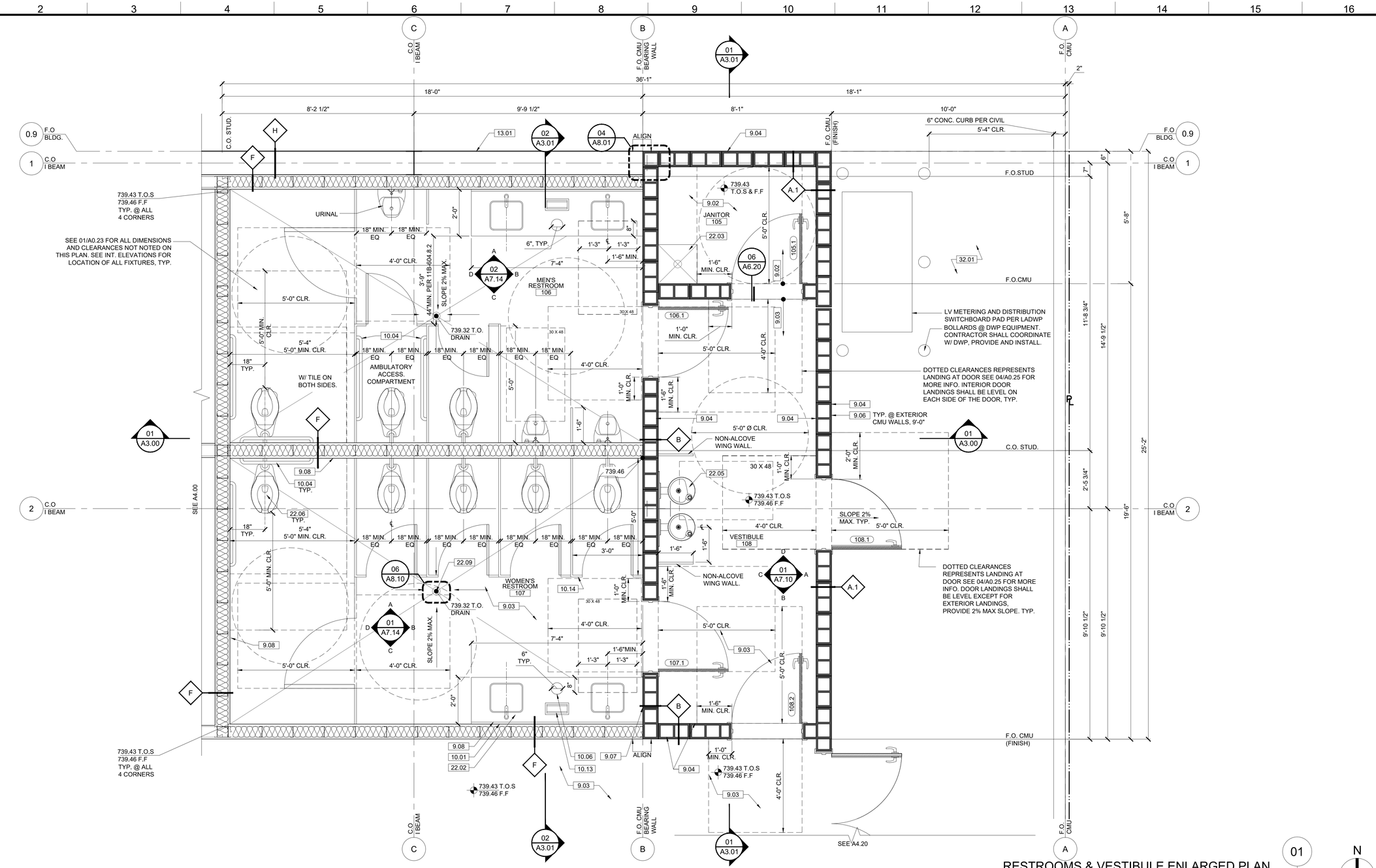
SHEET NAME
A4.01
SHEET X OF X SHEETS

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REVISION DATES (DESIGN STAGE ONLY)

Sheet Version 4.0

Z:\B□S ARCHITECTURE\019 JOBS\01935.0 CITY OF LA-RESEDA ICE HOCKEY ROLLER RINK\01935.0 1.CURRENT DRAWINGS_24X36\01935.0_A401_24X36.DWG 12/3/2021 9:19 AM



RESTROOMS & VESTIBULE ENLARGED PLAN

01

REF: A1.10, A1.10A, A1.11, A4.11, A7.10 SCALE: 1/2" = 1'-0"

N

KEYNOTES

NOTE: ITEMS IDENTIFIED ARE TYPICAL TO ALL LIKE ITEMS UNLESS NOTED OTHERWISE.

01 - GENERAL REQUIREMENTS
02 - NOT USED

03 - CONCRETE
3.01 CONC. SLAB ON GRADE PER STRUCT'L.
3.02 CONC. O/MTL. DECK PER STRUCT'L.
3.03 CONC. CURB
3.04 CONC. FOOTING PER STRUCT'L.
3.05 CONC. PAVING PER CIVIL DWGS.
3.06 CONC. SIDEWALK PER CIVIL DWGS.
3.07 CONC. PAD

04 - MASONRY
4.01 CMU BLDNG. WALL
4.02 CMU SITE WALL W/ 2" CMU CAP.

05 - METALS
5.01 STL. COLUMN PER STRUCT'L. PTD.
5.02 STL. BEAM PER STRUCT'L. PTD.
5.03 HSS POST PER STRUCT'L. PTD.
5.04 HSS BEAM PER STRUCT'L. PTD.
5.05 MEMBRANE STRUCTURE I BEAM.
5.06 MTL. DECK.
5.07 MTL. GUARD RAILING.
5.08 MTL. STUD WALL.

06 - WOOD AND PLASTICS

07 - THERMAL & MOISTURE PROTECTION
7.01 W.P. MEMBRANE PER DETL. & SPECS.
7.02 SINGLE PLY PVC ROOFING PER SPECS.
7.03 R-21 RIGID INSULATION @ WALLS.
7.04 UNDERSLAB MOISTURE VAPOR BARRIER.
7.05 ROOF DRAIN AND OVERFLOW.
7.06 CLEAR WATER-REPELLENT GRAFITTI COATING AT CMU WALL. (ALL EXPOSED SURFACES).
7.07 BATT INSULATION.

08 - OPENINGS (SEE DOOR/WINDOW SCHED)
8.01 STL. DOOR. & FRAME, PAINTED.
8.02 CLR. ANODIZED ALUM. STOREFRONT DOOR.
8.03 CLR. ANODIZED ALUM. STOREFRONT WINDOW.
8.04 DOOR HARDWARE SET PER SCHED.
8.05 EXTERIOR WALL LOUVER.
8.06 EXTERIOR WALL VENT WITH CAP.
8.07 ROLLING STL. DOOR & FRAME.
8.08 ICE RINK GATES
8.09 OVERHEAD GLASS DOOR.
8.10 ACCESS PANEL, COLOR TO MATCH ADJACENT MATERIAL.
8.11 ROOF ACCESS HATCH.

09 - FINISHES (SEE FIN. SCHED)
9.01 5/8" TYPE 'X' GYP. BD., PROVIDE 'WET RATED' AT BATHROOMS. PAINT.
9.02 CONC. FLR. SEAL PER FIN. SCHED.
9.03 RUBBER FLR. PER SPECS.
9.04 PAINT PER SPECS.
9.05 REVEAL PER DETAILS.
9.06 GRAFITTI COATING, TYP. @ ALL EXTERIOR SOLID WALLS.
9.07 GLAZED FINISH ON CMU.
9.08 CERAMIC TILE.

10 - SPECIALTIES
10.01 MIRROR PER SPECS.
10.02 SIGNAGE.
10.03 TOILET PAPER ROLL HOLDER PER ACCESSORY SCHED.
10.04 GRAB BAR.
10.05 COAT HOOK.
10.06 WASTE RECEPTACLE.
10.07 FOLDING SHOWER SEAT.
10.08 SHOWER ROD.
10.09 SHELF.
10.10 NETTING. NIC
10.11 FIRE EXTINGUISHER. RECESSED CABINET
10.12 TOILET SEAT COVER DISPENSER.
10.13 PAPER TOWEL DISPENSER.
10.14 BATHROOM PARTITION W/ ROBE HOOK @ EA. DOOR

11 - EQUIPMENT/APPLIANCES (SEE EQMT. SCHED)

12 - FURNISHINGS
12.01 BICYCLE RACKS FOR SHORT-TERM BIKE PARKING.
12.02 DASHERBOARDS. NIC.
12.03 BENCH. NIC.
12.04 BLEACHERS. NIC.
12.05 SCOREBOARD. NIC.
12.06 SKATE RACKS. NIC.

13 - SPECIAL CONSTRUCTION
13.01 MEMBRANE STRUCTURE.

14 - CONVEYING EQUIPMENT (NOT USED)

21 - FIRE SUPPRESSION
21.01 FIRE EXTINGUISHER.
21.02 FIRE SPRINKLER HORIZ. MAIN (SEE DIAGRAM)
21.03 FIRE SPRINKLER VALVE ASSEMBLY
21.04 FIRE DEPT. MAIN CONNECTION @ FRONT OF PROJECT. LAFD SHALL APPROVE FINAL LOCATION.
21.05 FIRE SPRINKLER HEAD.

22 - PLUMBING
22.01 WATER CLOSET PER PLUMBING LEGEND
22.02 LAV. SINK & FAUCET. PER PLUMBING LEGEND
22.03 JANITOR MOP SINK.
22.04 PLUMBING VENT PIPE.
22.05 DRINKING FOUNTAIN.
22.06 ULTRA LOW-FLOW TOILET.
22.07 SHOWER HEAD/ CONTROLS.
22.08 SHOWER DRAIN.
22.09 AREA DRAIN.
22.10 HOSE BIB.

23 - HEATING, VENTILATING, AND AIR-CONDITIONING
23.01 HVAC UNIT PER MECH.
23.02 AIR REGISTER WALL MOUNTED.
23.03 CEILING AIR REGISTER.
23.04 MAKE UP AIR LOUVER PER MECH. DWGS
23.05 BATHRM EXHAUST FAN PER SPECS.
23.06 BATHRM EXHAUST DUCT.
23.07 MECH. DUCT.
23.08 MECH. EQUIPMENT.

26 - ELECTRICAL
26.01 ELEC. PANEL PER PLANS & SCHED.
26.02 EXTERIOR LIGHT PER SCHED.
26.03 INTERIOR LIGHT PER SCHED.

27 - COMMUNICATION

28 - ELECTRONIC SAFETY AND SECURITY
28.01 SMOKE ALARM.
28.02 SECURITY CAMERA.
28.03 FIRE ALARM MAIN PANEL.

31 - EARTHWORK
31.01 APPROVED COMPACT FILL PER GEO & SOIL ENGINEER REPORT.

32 - EXTERIOR IMPROVEMENTS
32.01 ASPHALT PAVING PER CIVIL.
32.02 GRAPHICS/PAINT.SEE LAND. DWGS.
32.03 STORMWATER MANAGEMENT PER CIVIL DWGS.
32.04 STL. SECURITY GATE, PTD.
32.05 STL. SECURITY FENCE, PTD.
32.06 EXTERIOR AREA DRAINS.
32.07 BENCH.
32.08 TRENCH DRAIN.
32.09 TREE, SEE LANDSCAPE DWGS.
32.10 PLANTING, SEE LANDSCAPE DWGS.
32.11 (N) CONCRETE SIDEWALK, CURB, GUTTER PER CITY OF LA STANDARDS.
32.12 (N) CONC. APRON & DRIVEWAY CURB CUT PER CITY OF LA STANDARDS.
32.13 EQUIPMENT SCREEN.
32.14 CONC. WALL @ SITE FENCE.

33 - UTILITIES
33.01 WATER METER.
33.02 ELECTRICAL TRANSFORMER W/ BOLLARDS AS REQ'D.
33.03 ELECTRICAL METER.
33.04 POWER POLE.

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

LICENSED ARCHITECT
LAWRENCE SQUARZ
C 21812
REN 10/31/2023
STATE OF CALIFORNIA

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED •

DEPARTMENT OF PUBLIC WORKS
BUREAU OF ENGINEERING

VERTICAL CONTROL:
HORIZONTAL CONTROL:
SHEET TITLE: ENLARGED PLAN
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

NO.	REVISIONS:	DATE:	BY:

INDEX NO.

CIP NO.

CITY OF LOS ANGELES
CITY ENGINEER
GARY LEE MOORE, P.E. ENV SP
DESIGN GROUP
DATE:
ENGINEER:
DESIGNED BY:
DRAWN BY:
CHECKED BY:
APPROVED BY:

WORK ORDER NO.
E170121B

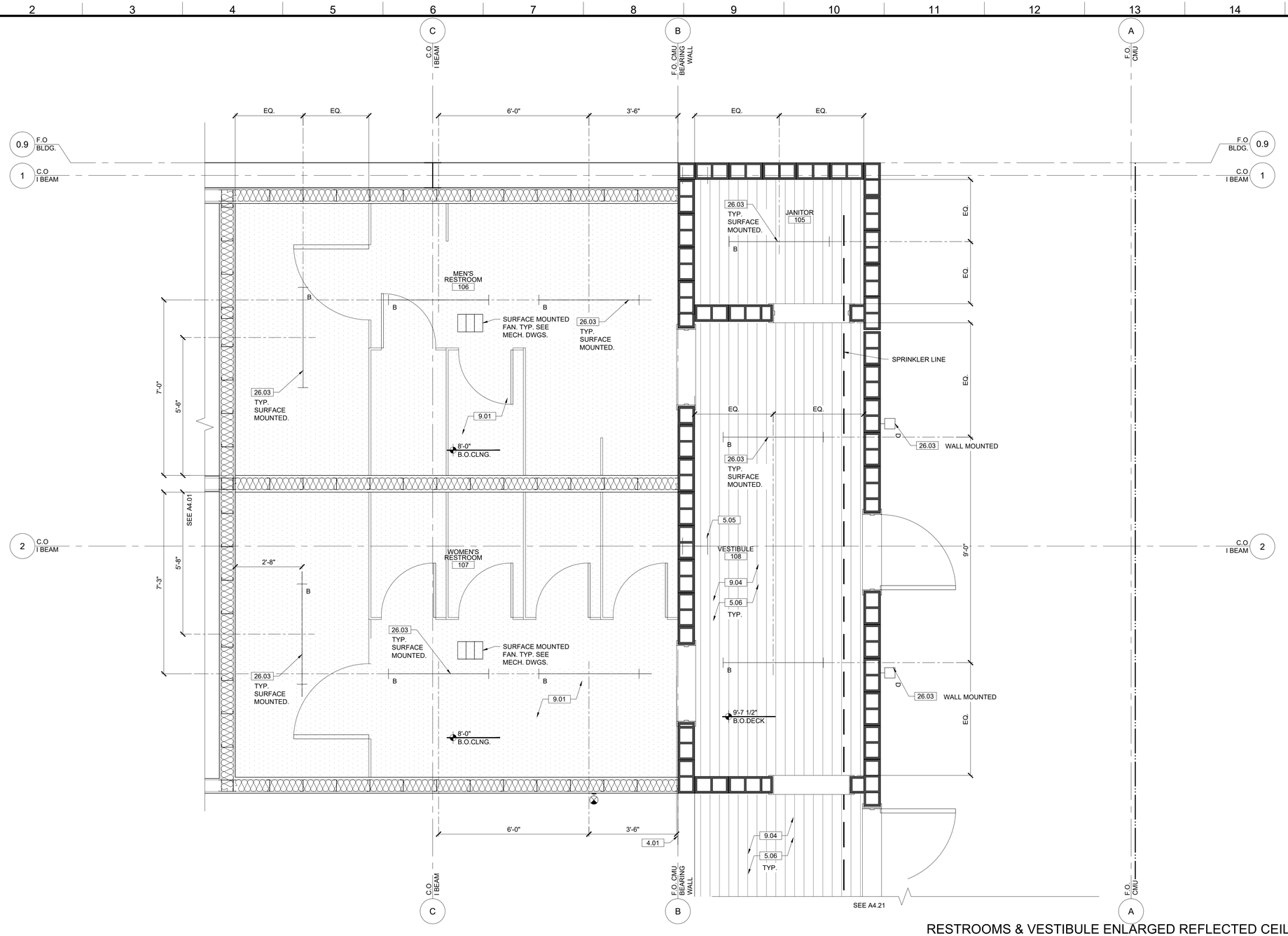
SHEET NAME
A4.10
SHEET X OF X SHEETS

REVISION DATES (DESIGN STAGE ONLY)

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

Sheet Version 4.0

Z:\B□S ARCHITECTURE\019 JOBS\01935.0 CITY OF LA-RESEDA ICE HOCKEY ROLLER RINK\01935.0 1.CURRENT DRAWINGS_24X36\01935.0_A410_24X36.DWG 12/3/2021 9:19 AM



RESTROOMS & VESTIBULE ENLARGED REFLECTED CEILING PLAN

REF: A1.12 , A4.10

01

SCALE: 1/2" = 1'-0"

N

KEYNOTES

NOTE: ITEMS IDENTIFIED ARE TYPICAL TO ALL LIKE ITEMS UNLESS NOTED OTHERWISE.

01 - GENERAL REQUIREMENTS
02 - NOT USED

03 - CONCRETE
3.01 CONC. SLAB ON GRADE PER STRUCT'L.
3.02 CONC. O/MTL. DECK PER STRUCT'L.
3.03 CONC. CURB
3.04 CONC. FOOTING PER STRUCT'L.
3.05 CONC. PAVING PER CIVIL DWGS.
3.06 CONC. SIDEWALK PER CIVIL DWGS.
3.07 CONC. PAD

04 - MASONRY
4.01 CMU BLDNG. WALL
4.02 CMU SITE WALL W/ 2" CMU CAP.

05 - METALS
5.01 STL. COLUMN PER STRUCT'L. PTD.
5.02 STL. BEAM PER STRUCT'L. PTD.
5.03 HSS POST PER STRUCT'L. PTD.
5.04 HSS BEAM PER STRUCT'L. PTD.
5.05 MEMBRANE STRUCTURE I BEAM.
5.06 MTL. DECK.
5.07 MTL. GUARD RAILING.
5.08 MTL. STUD WALL.

06 - WOOD AND PLASTICS

07 - THERMAL & MOISTURE PROTECTION
7.01 W.P. MEMBRANE PER DETL. & SPECS.
7.02 SINGLE PLY PVC ROOFING PER SPECS.
7.03 R-21 RIGID INSULATION @ WALLS.
7.04 UNDERSLAB MOISTURE VAPOR BARRIER.
7.05 ROOF DRAIN AND OVERFLOW.
7.06 CLEAR WATER-REPELLENT GRAFITTI COATING AT CMU WALL. (ALL EXPOSED SURFACES).
7.07 BATT INSULATION.

08 - OPENINGS (SEE DOOR/WINDOW SCHED)
8.01 STL. DOOR. & FRAME, PAINTED.
8.02 CLR. ANODIZED ALUM. STOREFRONT DOOR.
8.03 CLR. ANODIZED ALUM. STOREFRONT WINDOW.
8.04 DOOR HARDWARE SET PER SCHED.
8.05 EXTERIOR WALL LOUVER.
8.06 EXTERIOR WALL VENT WITH CAP.
8.07 ROLLING STL. DOOR & FRAME.
8.08 ICE RINK GATES
8.09 OVERHEAD GLASS DOOR.
8.10 ACCESS PANEL, COLOR TO MATCH ADJACENT MATERIAL.
8.11 ROOF ACCESS HATCH.

09 - FINISHES (SEE FIN. SCHED)
9.01 5/8" TYPE 'X' GYP. BD., PROVIDE 'WET RATED' AT BATHROOMS, PAINT.
9.02 CONC. FLR. SEAL PER FIN. SCHED.
9.03 RUBBER FLR. PER SPECS.
9.04 PAINT PER SPECS.
9.05 REVEAL PER DETAILS.
9.06 GRAFITTI COATING, TYP. @ ALL EXTERIOR SOLID WALLS.
9.07 GLAZED FINISH ON CMU.
9.08 CERAMIC TILE.

10 - SPECIALTIES
10.01 MIRROR PER SPECS.
10.02 SIGNAGE.
10.03 TOILET PAPER ROLL HOLDER PER ACCESSORY SCHED.
10.04 GRAB BAR.
10.05 COAT HOOK.
10.06 WASTE RECEPTACLE.
10.07 FOLDING SHOWER SEAT.
10.08 SHOWER ROD.
10.09 SHELF.
10.10 NETTING. NIC
10.11 FIRE EXTINGUISHER. RECESSED CABINET
10.12 TOILET SEAT COVER DISPENSER.
10.13 PAPER TOWEL DISPENSER.
10.14 BATHROOM PARTITION W/ ROBE HOOK @ EA. DOOR

11 - EQUIPMENT/APPLIANCES (SEE EQMT. SCHED)

12 - FURNISHINGS
12.01 BICYCLE RACKS FOR SHORT-TERM BIKE PARKING.
12.02 DASHERBOARDS. NIC.
12.03 BENCH. NIC.
12.04 BLEACHERS. NIC.
12.05 SCOREBOARD. NIC.
12.06 SKATE RACKS. NIC.

13 - SPECIAL CONSTRUCTION
13.01 MEMBRANE STRUCTURE.

14 - CONVEYING EQUIPMENT (NOT USED)

21 - FIRE SUPPRESSION
21.01 FIRE EXTINGUISHER.
21.02 FIRE SPRINKLER HORIZ. MAIN (SEE DIAGRAM)
21.03 FIRE SPRINKLER VALVE ASSEMBLY
21.04 FIRE DEPT. MAIN CONNECTION @ FRONT OF PROJECT. LAFD SHALL APPROVE FINAL LOCATION.
21.05 FIRE SPRINKLER HEAD.

22 - PLUMBING
22.01 WATER CLOSET PER PLUMBING LEGEND
22.02 LAV. SINK & FAUCET. PER PLUMBING LEGEND
22.03 JANITOR MOP SINK.
22.04 PLUMBING VENT PIPE.
22.05 DRINKING FOUNTAIN.
22.06 ULTRA LOW-FLOW TOILET.
22.07 SHOWER HEAD/ CONTROLS.
22.08 SHOWER DRAIN.
22.09 AREA DRAIN.
22.10 HOSE BIB.

23 - HEATING, VENTILATING, AND AIR-CONDITIONING
23.01 HVAC UNIT PER MECH.
23.02 AIR REGISTER WALL MOUNTED.
23.03 CEILING AIR REGISTER.
23.04 MAKE UP AIR LOUVER PER MECH. DWGS
23.05 BATHRM EXHAUST FAN PER SPECS.
23.06 BATHRM EXHAUST DUCT.
23.07 MECH. DUCT.
23.08 MECH. EQUIPMENT.

26 - ELECTRICAL
26.01 ELEC. PANEL PER PLANS & SCHED.
26.02 EXTERIOR LIGHT PER SCHED.
26.03 INTERIOR LIGHT PER SCHED.

27 - COMMUNICATION

28 - ELECTRONIC SAFETY AND SECURITY
28.01 SMOKE ALARM.
28.02 SECURITY CAMERA.
28.03 FIRE ALARM MAIN PANEL.

31 - EARTHWORK
31.01 APPROVED COMPACT FILL PER GEO & SOIL ENGINEER REPORT.

32 - EXTERIOR IMPROVEMENTS
32.01 ASPHALT PAVING PER CIVIL.
32.02 GRAPHICS/PAINT.SEE LAND. DWGS.
32.03 STORMWATER MANAGEMENT PER CIVIL DWGS.
32.04 STL. SECURITY GATE. PTD.
32.05 STL. SECURITY FENCE. PTD.
32.06 EXTERIOR AREA DRAINS.
32.07 BENCH.
32.08 TRENCH DRAIN.
32.09 TREE, SEE LANDSCAPE DWGS.
32.10 PLANTING, SEE LANDSCAPE DWGS.
32.11 (N) CONCRETE SIDEWALK, CURB, GUTTER PER CITY OF LA STANDARDS.
32.12 (N) CONC. APRON & DRIVEWAY CURB CUT PER CITY OF LA STANDARDS.
32.13 EQUIPMENT SCREEN.
32.14 CONC. WALL @ SITE FENCE.

33 - UTILITIES
33.01 WATER METER.
33.02 ELECTRICAL TRANSFORMER W/ BOLLARDS AS REQ'D.
33.03 ELECTRICAL METER.
33.04 POWER POLE.

REVISION DATES (DESIGN STAGE ONLY)

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

Sheet Version 4.0

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED

LICENSED ARCHITECT
LAWRENCE SUARA
C 21812
REN 10/31/2023
STATE OF CALIFORNIA

DEPARTMENT OF PUBLIC WORKS
BUREAU OF ENGINEERING

NO. | REVISIONS: | DATE: | BY:

VERTICAL CONTROL:
HORIZONTAL CONTROL:

SHEET TITLE: ENLARGED RCP

PROJECT: RESEDA SKATE FACILITY

ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

CIP NO.

INDEX NO.

CITY OF LOS ANGELES

CITY ENGINEER | DATE:

GARY LEE MOORE, P.E., ENV SP

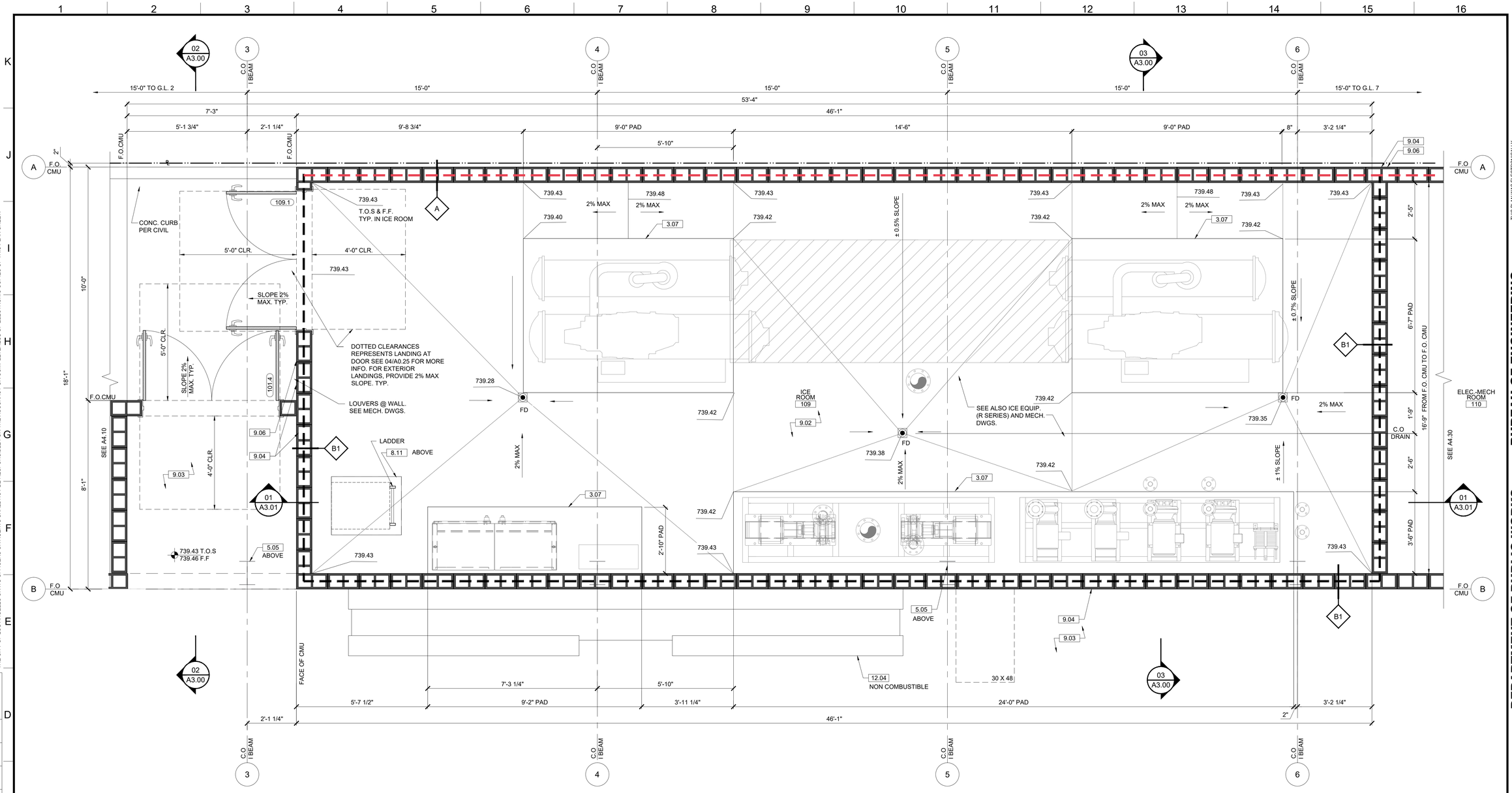
DESIGN GROUP

ENGINEER:
DESIGNED BY:
DRAWN BY:
CHECKED BY:
APPROVED BY:

WORK ORDER NO.
E170121B

SHEET NAME
A4.11
SHEET X OF X SHEETS

Z:\B□S ARCHITECTURE\019 JOBS\01935.0 CITY OF LA-RESEDA ICE HOCKEY ROLLER RINK\01935.0 1.CURRENT DRAWINGS_24X36\01935.0_A411_24X36.DWG 12/3/2021 9:19 AM



ICE ROOM ENLARGED PLAN 01

REF: A1.10, A4.21 SCALE: 1/2" = 1'-0"

N

KEYNOTES

NOTE: ITEMS IDENTIFIED ARE TYPICAL TO ALL LIKE ITEMS UNLESS NOTED OTHERWISE.

01 - GENERAL REQUIREMENTS
02 - NOT USED

03 - CONCRETE
3.01 CONC. SLAB ON GRADE PER STRUCT'L.
3.02 CONC. O/MTL. DECK PER STRUCT'L.
3.03 CONC. CURB
3.04 CONC. FOOTING PER STRUCT'L.
3.05 CONC. PAVING PER CIVIL DWGS.
3.06 CONC. SIDEWALK PER CIVIL DWGS.
3.07 CONC. PAD

04 - MASONRY
4.01 CMU BLDNG. WALL
4.02 CMU SITE WALL W/ 2" CMU CAP.

05 - METALS
5.01 STL. COLUMN PER STRUCT'L. PTD.
5.02 STL. BEAM PER STRUCT'L. PTD.
5.03 HSS POST PER STRUCT'L. PTD.
5.04 HSS BEAM PER STRUCT'L. PTD.
5.05 MEMBRANE STRUCTURE I BEAM.
5.06 MTL. DECK.
5.07 MTL. GUARD RAILING.
5.08 MTL. STUD WALL.

06 - WOOD AND PLASTICS

07 - THERMAL & MOISTURE PROTECTION
7.01 W.P. MEMBRANE PER DETL. & SPECS.
7.02 SINGLE PLY PVC ROOFING PER SPECS.
7.03 R-21 RIGID INSULATION @ WALLS.
7.04 UNDERSLAB MOISTURE VAPOR BARRIER.
7.05 ROOF DRAIN AND OVERFLOW.
7.06 CLEAR WATER-REPELLENT GRAFITTI COATING AT CMU WALL. (ALL EXPOSED SURFACES).
7.07 BATT INSULATION.

08 - OPENINGS (SEE DOOR/WINDOW SCHED)
8.01 STL. DOOR. & FRAME, PAINTED.
8.02 CLR. ANODIZED ALUM. STOREFRONT DOOR.
8.03 CLR. ANODIZED ALUM. STOREFRONT WINDOW.
8.04 DOOR HARDWARE SET PER SCHED.
8.05 EXTERIOR WALL LOUVER.
8.06 EXTERIOR WALL VENT WITH CAP.
8.07 ROLLING STL. DOOR & FRAME.
8.08 ICE RINK GATES
8.09 OVERHEAD GLASS DOOR.
8.10 ACCESS PANEL, COLOR TO MATCH ADJACENT MATERIAL.
8.11 ROOF ACCESS HATCH.

09 - FINISHES (SEE FIN. SCHED)
9.01 5/8" TYPE 'X' GYP. BD., PROVIDE 'WET RATED' AT BATHROOMS. PAINT.
9.02 CONC. FLR. SEAL PER FIN. SCHED.
9.03 RUBBER FLR. PER SPECS.
9.04 PAINT PER SPECS.
9.05 REVEAL PER DETAILS.
9.06 GRAFITTI COATING, TYP. @ ALL EXTERIOR SOLID WALLS.
9.07 GLAZED FINISH ON CMU.
9.08 CERAMIC TILE.

10 - SPECIALTIES
10.01 MIRROR PER SPECS.
10.02 SIGNAGE.
10.03 TOILET PAPER ROLL HOLDER PER ACCESSORY SCHED.
10.04 GRAB BAR.
10.05 COAT HOOK.
10.06 WASTE RECEPTACLE.
10.07 FOLDING SHOWER SEAT.
10.08 SHOWER ROD.
10.09 SHELF.
10.10 NETTING. NIC
10.11 FIRE EXTINGUISHER. RECESSED CABINET
10.12 TOILET SEAT COVER DISPENSER.
10.13 PAPER TOWEL DISPENSER.
10.14 BATHROOM PARTITION W/ ROBE HOOK @ EA. DOOR

11 - EQUIPMENT/APPLIANCES (SEE EQMT. SCHED)

12 - FURNISHINGS
12.01 BICYCLE RACKS FOR SHORT-TERM BIKE PARKING.
12.02 DASHERBOARDS. NIC.
12.03 BENCH. NIC.
12.04 BLEACHERS. NIC.
12.05 SCOREBOARD. NIC.
12.06 SKATE RACKS. NIC.

13 - SPECIAL CONSTRUCTION
13.01 MEMBRANE STRUCTURE.

14 - CONVEYING EQUIPMENT (NOT USED)

21 - FIRE SUPPRESSION
21.01 FIRE EXTINGUISHER.
21.02 FIRE SPRINKLER HORIZ. MAIN (SEE DIAGRAM)
21.03 FIRE SPRINKLER VALVE ASSEMBLY
21.04 FIRE DEPT. MAIN CONNECTION @ FRONT OF PROJECT. LAFD SHALL APPROVE FINAL LOCATION.
21.05 FIRE SPRINKLER HEAD.

22 - PLUMBING
22.01 WATER CLOSET PER PLUMBING LEGEND
22.02 LAV. SINK & FAUCET. PER PLUMBING LEGEND
22.03 JANITOR MOP SINK.
22.04 PLUMBING VENT PIPE.
22.05 DRINKING FOUNTAIN.
22.06 ULTRA LOW-FLOW TOILET.
22.07 SHOWER HEAD/ CONTROLS.
22.08 SHOWER DRAIN.
22.09 AREA DRAIN.
22.10 HOSE BIB.

23 - HEATING, VENTILATING, AND AIR-CONDITIONING
23.01 HVAC UNIT PER MECH.
23.02 AIR REGISTER WALL MOUNTED.
23.03 CEILING AIR REGISTER.
23.04 MAKE UP AIR LOUVER PER MECH. DWGS
23.05 BATHRM EXHAUST FAN PER SPECS.
23.06 BATHRM EXHAUST DUCT.
23.07 MECH. DUCT.
23.08 MECH. EQUIPMENT.

26 - ELECTRICAL
26.01 ELEC. PANEL PER PLANS & SCHED.
26.02 EXTERIOR LIGHT PER SCHED.
26.03 INTERIOR LIGHT PER SCHED.

27 - COMMUNICATION

28 - ELECTRONIC SAFETY AND SECURITY
28.01 SMOKE ALARM.
28.02 SECURITY CAMERA.
28.03 FIRE ALARM MAIN PANEL.

31 - EARTHWORK
31.01 APPROVED COMPACT FILL PER GEO & SOIL ENGINEER REPORT.

32 - EXTERIOR IMPROVEMENTS
32.01 ASPHALT PAVING PER CIVIL.
32.02 GRAPHICS/PAINT.SEE LAND. DWGS.
32.03 STORMWATER MANAGEMENT PER CIVIL DWGS.
32.04 STL. SECURITY GATE, PTD.
32.05 STL. SECURITY FENCE, PTD.
32.06 EXTERIOR AREA DRAINS.
32.07 BENCH.
32.08 TRENCH DRAIN.
32.09 TREE, SEE LANDSCAPE DWGS.
32.10 PLANTING, SEE LANDSCAPE DWGS.
32.11 (N) CONCRETE SIDEWALK, CURB, GUTTER PER CITY OF LA STANDARDS.
32.12 (N) CONC. APRON & DRIVEWAY CURB CUT PER CITY OF LA STANDARDS.
32.13 EQUIPMENT SCREEN.
32.14 CONC. WALL @ SITE FENCE.

33 - UTILITIES
33.01 WATER METER.
33.02 ELECTRICAL TRANSFORMER W/ BOLLARDS AS REQ'D.
33.03 ELECTRICAL METER.
33.04 POWER POLE.

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REVISION DATES (DESIGN STAGE ONLY)

Sheet Version 4.0

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

LICENSED ARCHITECT
LAWRENCE SCARPA
C 21812
REN 10/31/2023
STATE OF CALIFORNIA

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED •

DEPARTMENT OF PUBLIC WORKS
BUREAU OF ENGINEERING

VERTICAL CONTROL:
HORIZONTAL CONTROL:

SHEET TITLE: ENLARGED PLAN

PROJECT: RESEDA SKATE FACILITY

ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

NO.	REVISIONS:	DATE:	BY:

CIP NO.

INDEX NO.

CITY OF LOS ANGELES
GARY LEE MOORE, P.E. ENV SP
CITY ENGINEER

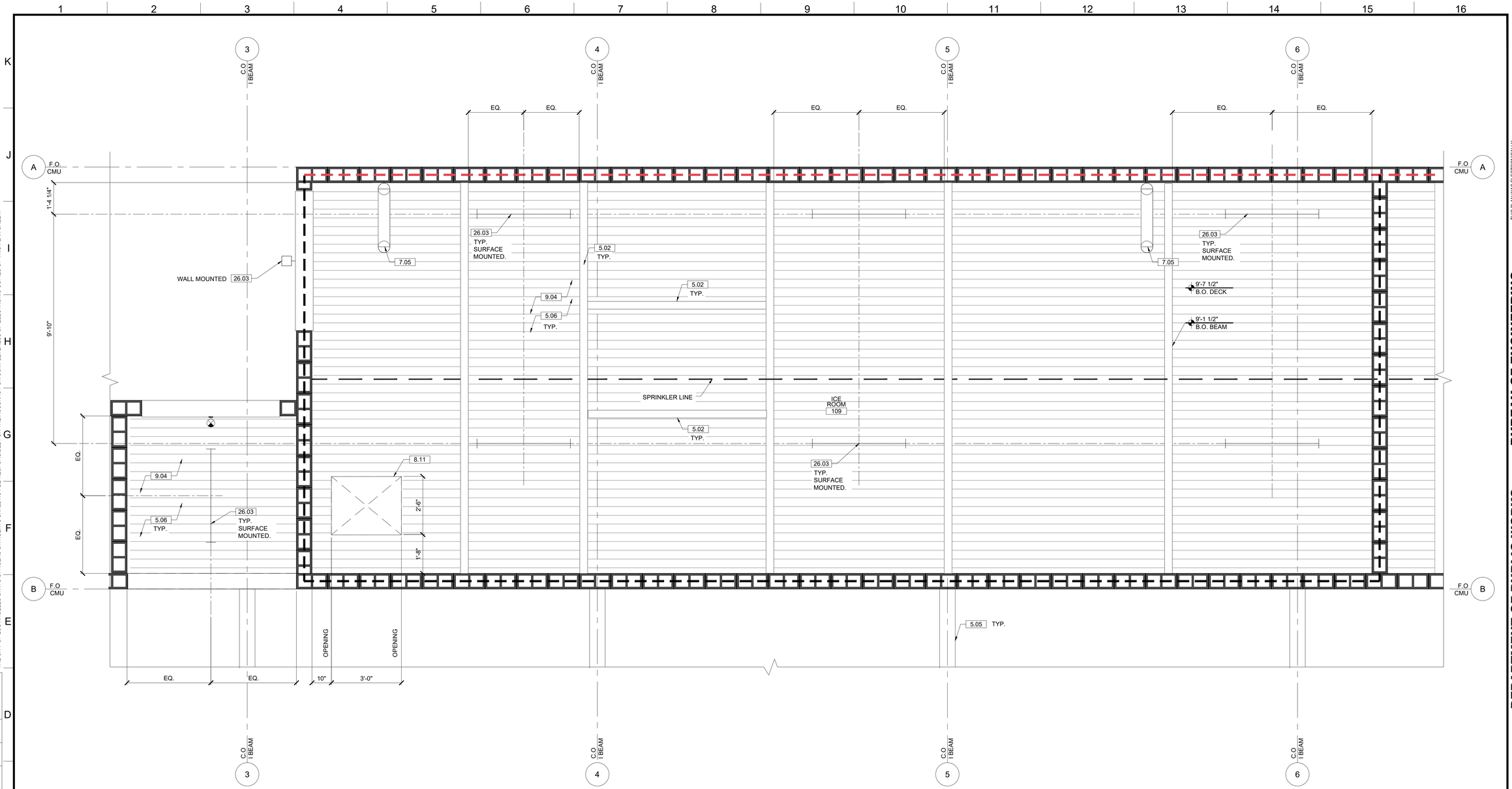
DESIGN GROUP:

	DATE:
ENGINEER:	
DESIGNED BY:	
DRAWN BY:	
CHECKED BY:	
APPROVED BY:	

WORK ORDER NO.
E170121B

SHEET NAME
A4.20
SHEET X OF X SHEETS

Z:\B□S ARCHITECTURE\019 JOBS\01935.0 CITY OF LA-RESEDA ICE HOCKEY ROLLER RINK\01935.0 1.CURRENT DRAWINGS_24X36\01935.0_A420_24X36.DWG 12/3/2021 9:20 AM



ICE ROOM ENLARGED REFLECTED CEILING PLAN

01

REF: A1.12, A4.20

SCALE: 1/2" = 1'-0"

N

KEYNOTES

NOTE: ITEMS IDENTIFIED ARE TYPICAL TO ALL LIKE ITEMS UNLESS NOTED OTHERWISE.

01 - GENERAL REQUIREMENTS
02 - NOT USED

03 - CONCRETE
3.01 CONC. SLAB ON GRADE PER STRUCT'L.
3.02 CONC. O/MTL. DECK PER STRUCT'L.
3.03 CONC. CURB
3.04 CONC. FOOTING PER STRUCT'L.
3.05 CONC. PAVING PER CIVIL DWGS.
3.06 CONC. SIDEWALK PER CIVIL DWGS.
3.07 CONC. PAD

04 - MASONRY
4.01 CMU BLDNG. WALL
4.02 CMU SITE WALL W/ 2" CMU CAP.

05 - METALS
5.01 STL. COLUMN PER STRUCT'L. PTD.
5.02 STL. BEAM PER STRUCT'L. PTD.
5.03 HSS POST PER STRUCT'L. PTD.
5.04 HSS BEAM PER STRUCT'L. PTD.
5.05 MEMBRANE STRUCTURE I BEAM.
5.06 MTL. DECK.
5.07 MTL. GUARD RAILING.
5.08 MTL. STUD WALL.

06 - WOOD AND PLASTICS

07 - THERMAL & MOISTURE PROTECTION
7.01 W.P. MEMBRANE PER DETL. & SPECS.
7.02 SINGLE PLY PVC ROOFING PER SPECS.
7.03 R-21 RIGID INSULATION @ WALLS.
7.04 UNDERSLAB MOISTURE VAPOR BARRIER.
7.05 ROOF DRAIN AND OVERFLOW.
7.06 CLEAR WATER-REPELLENT GRAFITTI COATING AT CMU WALL. (ALL EXPOSED SURFACES).
7.07 BATT INSULATION.

08 - OPENINGS (SEE DOOR/WINDOW SCHED)
8.01 STL. DOOR. & FRAME, PAINTED.
8.02 CLR. ANODIZED ALUM. STOREFRONT DOOR.
8.03 CLR. ANODIZED ALUM. STOREFRONT WINDOW.
8.04 DOOR HARDWARE SET PER SCHED.
8.05 EXTERIOR WALL LOUVER.
8.06 EXTERIOR WALL VENT WITH CAP.
8.07 ROLLING STL. DOOR & FRAME.
8.08 ICE RINK GATES
8.09 OVERHEAD GLASS DOOR.
8.10 ACCESS PANEL, COLOR TO MATCH ADJACENT MATERIAL.
8.11 ROOF ACCESS HATCH.

09 - FINISHES (SEE FIN. SCHED)
9.01 5/8" TYPE 'X' GYP. BD., PROVIDE 'WET RATED' AT BATHROOMS. PAINT.
9.02 CONC. FLR. SEAL PER FIN. SCHED.
9.03 RUBBER FLR. PER SPECS.
9.04 PAINT PER SPECS.
9.05 REVEAL PER DETAILS.
9.06 GRAFITTI COATING, TYP. @ ALL EXTERIOR SOLID WALLS.
9.07 GLAZED FINISH ON CMU.
9.08 CERAMIC TILE.

10 - SPECIALTIES
10.01 MIRROR PER SPECS.
10.02 SIGNAGE.
10.03 TOILET PAPER ROLL HOLDER PER ACCESSORY SCHED.
10.04 GRAB BAR.
10.05 COAT HOOK.
10.06 WASTE RECEPTACLE.
10.07 FOLDING SHOWER SEAT.
10.08 SHOWER ROD.
10.09 SHELF.
10.10 NETTING. NIC
10.11 FIRE EXTINGUISHER. RECESSED CABINET
10.12 TOILET SEAT COVER DISPENSER.
10.13 PAPER TOWEL DISPENSER.
10.14 BATHROOM PARTITION W/ ROBE HOOK @ EA. DOOR

11 - EQUIPMENT/APPLIANCES (SEE EQMT. SCHED)

12 - FURNISHINGS
12.01 BICYCLE RACKS FOR SHORT-TERM BIKE PARKING.
12.02 DASHERBOARDS. NIC.
12.03 BENCH. NIC.
12.04 BLEACHERS. NIC.
12.05 SCOREBOARD. NIC.
12.06 SKATE RACKS. NIC.

13 - SPECIAL CONSTRUCTION
13.01 MEMBRANE STRUCTURE.

14 - CONVEYING EQUIPMENT (NOT USED)

21 - FIRE SUPPRESSION
21.01 FIRE EXTINGUISHER.
21.02 FIRE SPRINKLER HORIZ. MAIN (SEE DIAGRAM)
21.03 FIRE SPRINKLER VALVE ASSEMBLY
21.04 FIRE DEPT. MAIN CONNECTION @ FRONT OF PROJECT. LAFD SHALL APPROVE FINAL LOCATION.
21.05 FIRE SPRINKLER HEAD.

22 - PLUMBING
22.01 WATER CLOSET PER PLUMBING LEGEND
22.02 LAV. SINK & FAUCET. PER PLUMBING LEGEND
22.03 JANITOR MOP SINK.
22.04 PLUMBING VENT PIPE.
22.05 DRINKING FOUNTAIN.
22.06 ULTRA LOW-FLOW TOILET.
22.07 SHOWER HEAD/ CONTROLS.
22.08 SHOWER DRAIN.
22.09 AREA DRAIN.
22.10 HOSE BIB.

23 - HEATING, VENTILATING, AND AIR-CONDITIONING
23.01 HVAC UNIT PER MECH.
23.02 AIR REGISTER WALL MOUNTED.
23.03 CEILING AIR REGISTER.
23.04 MAKE UP AIR LOUVER PER MECH. DWGS
23.05 BATHRM EXHAUST FAN PER SPECS.
23.06 BATHRM EXHAUST DUCT.
23.07 MECH. DUCT.
23.08 MECH. EQUIPMENT.

26 - ELECTRICAL
26.01 ELEC. PANEL PER PLANS & SCHED.
26.02 EXTERIOR LIGHT PER SCHED.
26.03 INTERIOR LIGHT PER SCHED.

27 - COMMUNICATION

28 - ELECTRONIC SAFETY AND SECURITY
28.01 SMOKE ALARM.
28.02 SECURITY CAMERA.
28.03 FIRE ALARM MAIN PANEL.

31 - EARTHWORK
31.01 APPROVED COMPACT FILL PER GEO & SOIL ENGINEER REPORT.

32 - EXTERIOR IMPROVEMENTS
32.01 ASPHALT PAVING PER CIVIL.
32.02 GRAPHICS/PAINT.SEE LAND. DWGS.
32.03 STORMWATER MANAGEMENT PER CIVIL DWGS.
32.04 STL. SECURITY GATE, PTD.
32.05 STL. SECURITY FENCE, PTD.
32.06 EXTERIOR AREA DRAINS.
32.07 BENCH.
32.08 TRENCH DRAIN.
32.09 TREE, SEE LANDSCAPE DWGS.
32.10 PLANTING, SEE LANDSCAPE DWGS.
32.11 (N) CONCRETE SIDEWALK, CURB, GUTTER PER CITY OF LA STANDARDS.
32.12 (N) CONC. APRON & DRIVEWAY CURB CUT PER CITY OF LA STANDARDS.
32.13 EQUIPMENT SCREEN.
32.14 CONC. WALL @ SITE FENCE.

33 - UTILITIES
33.01 WATER METER.
33.02 ELECTRICAL TRANSFORMER W/ BOLLARDS AS REQ'D.
33.03 ELECTRICAL METER.
33.04 POWER POLE.

REVISION DATES (DESIGN STAGE ONLY)

Sheet Version 4.0

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

LICENSED ARCHITECT
LAWRENCE SCARPA
C 21812
REN 10/31/2023
STATE OF CALIFORNIA

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED •

BUREAU OF ENGINEERING
VERTICAL CONTROL:
HORIZONTAL CONTROL:
SHEET TITLE: ENLARGED RCP
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

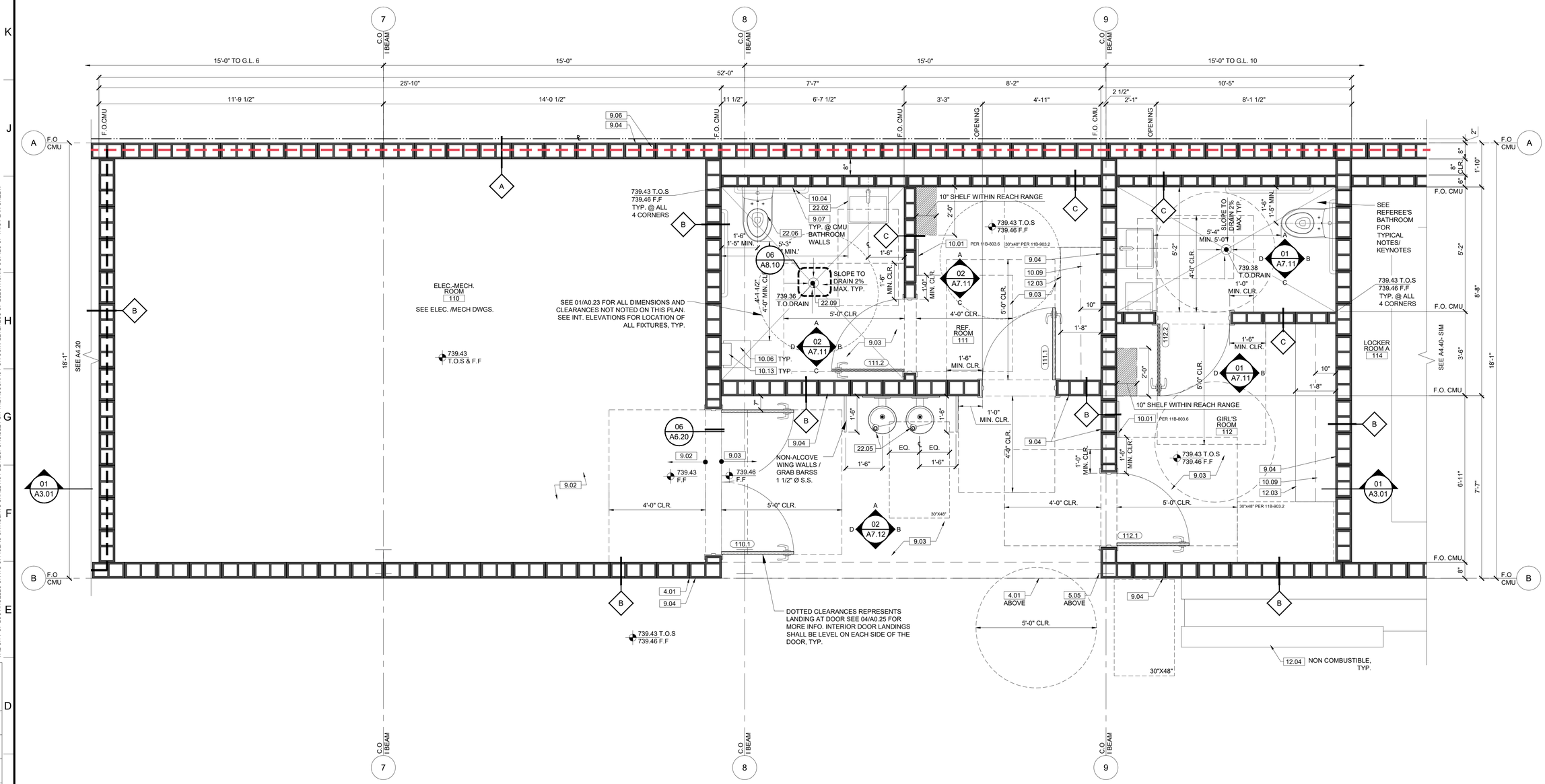
DEPARTMENT OF PUBLIC WORKS
NO. | REVISIONS: | DATE: | BY:
CIP NO.
INDEX NO.

CITY OF LOS ANGELES
GARY LEE MOORE, P.E. ENV SP
DESIGN GROUP
ENGINEER:
DESIGNED BY:
DRAWN BY:
CHECKED BY:
APPROVED BY:
CITY ENGINEER
DATE:

WORK ORDER NO.
E170121B

SHEET NAME
A4.21
SHEET X OF X SHEETS

Z:\B□S ARCHITECTURE\019 JOBS\01935.0 CITY OF LA-RESEDA ICE HOCKEY ROLLER RINK\01935.0 1.CURRENT DRAWINGS_24X36\01935.0_A421_24X36.DWG 12/3/2021 9:20 AM



ELEC., REF & GIRL'S ROOM ENLARGED PLAN

01

REF: A1.10, A1.10A, A4.31, A7.11, A7.12 SCALE: 1/2" = 1'-0"

N

KEYNOTES

NOTE: ITEMS IDENTIFIED ARE TYPICAL TO ALL LIKE ITEMS UNLESS NOTED OTHERWISE.

01 - GENERAL REQUIREMENTS
02 - NOT USED

03 - CONCRETE
3.01 CONC. SLAB ON GRADE PER STRUCT'L.
3.02 CONC. O/MTL. DECK PER STRUCT'L.
3.03 CONC. CURB
3.04 CONC. FOOTING PER STRUCT'L.
3.05 CONC. PAVING PER CIVIL DWGS.
3.06 CONC. SIDEWALK PER CIVIL DWGS.
3.07 CONC. PAD

04 - MASONRY
4.01 CMU BLDNG. WALL
4.02 CMU SITE WALL W/ 2" CMU CAP.

05 - METALS
5.01 STL. COLUMN PER STRUCT'L. PTD.
5.02 STL. BEAM PER STRUCT'L. PTD.
5.03 HSS POST PER STRUCT'L. PTD.
5.04 HSS BEAM PER STRUCT'L. PTD.
5.05 MEMBRANE STRUCTURE I BEAM.
5.06 MTL. DECK.
5.07 MTL. GUARD RAILING.
5.08 MTL. STUD WALL.

06 - WOOD AND PLASTICS

07 - THERMAL & MOISTURE PROTECTION
7.01 W.P. MEMBRANE PER DETL. & SPECS.
7.02 SINGLE PLY PVC ROOFING PER SPECS.
7.03 R-21 RIGID INSULATION @ WALLS.
7.04 UNDERSLAB MOISTURE VAPOR BARRIER.
7.05 ROOF DRAIN AND OVERFLOW.
7.06 CLEAR WATER-REPELLENT GRAFITTI COATING AT CMU WALL. (ALL EXPOSED SURFACES).
7.07 BATT INSULATION.

08 - OPENINGS (SEE DOOR/WINDOW SCHED)
8.01 STL. DOOR. & FRAME, PAINTED.
8.02 CLR. ANODIZED ALUM. STOREFRONT DOOR.
8.03 CLR. ANODIZED ALUM. STOREFRONT WINDOW.
8.04 DOOR HARDWARE SET PER SCHED.
8.05 EXTERIOR WALL LOUVER.
8.06 EXTERIOR WALL VENT WITH CAP.
8.07 ROLLING STL. DOOR & FRAME.
8.08 ICE RINK GATES
8.09 OVERHEAD GLASS DOOR.
8.10 ACCESS PANEL, COLOR TO MATCH ADJACENT MATERIAL.
8.11 ROOF ACCESS HATCH.

09 - FINISHES (SEE FIN. SCHED)
9.01 5/8" TYPE 'X' GYP. BD., PROVIDE 'WET RATED' AT BATHROOMS. PAINT.
9.02 CONC. FLR. SEAL PER FIN. SCHED.
9.03 RUBBER FLR. PER SPECS.
9.04 PAINT PER SPECS.
9.05 REVEAL PER DETAILS.
9.06 GRAFITTI COATING, TYP. @ ALL EXTERIOR SOLID WALLS.
9.07 GLAZED FINISH ON CMU.
9.08 CERAMIC TILE.

10 - SPECIALTIES
10.01 MIRROR PER SPECS.
10.02 SIGNAGE.
10.03 TOILET PAPER ROLL HOLDER PER ACCESSORY SCHED.
10.04 GRAB BAR.
10.05 COAT HOOK.
10.06 WASTE RECEPTACLE.
10.07 FOLDING SHOWER SEAT.
10.08 SHOWER ROD.
10.09 SHELF.
10.10 NETTING. NIC
10.11 FIRE EXTINGUISHER. RECESSED CABINET
10.12 TOILET SEAT COVER DISPENSER.
10.13 PAPER TOWEL DISPENSER.
10.14 BATHROOM PARTITION W/ ROBE HOOK @ EA. DOOR

11 - EQUIPMENT/APPLIANCES (SEE EQMT. SCHED)

12 - FURNISHINGS
12.01 BICYCLE RACKS FOR SHORT-TERM BIKE PARKING.
12.02 DASHERBOARDS. NIC.
12.03 BENCH. NIC.
12.04 BLEACHERS. NIC.
12.05 SCOREBOARD. NIC.
12.06 SKATE RACKS. NIC.

13 - SPECIAL CONSTRUCTION
13.01 MEMBRANE STRUCTURE.

14 - CONVEYING EQUIPMENT (NOT USED)

21 - FIRE SUPPRESSION
21.01 FIRE EXTINGUISHER.
21.02 FIRE SPRINKLER HORIZ. MAIN (SEE DIAGRAM)
21.03 FIRE SPRINKLER VALVE ASSEMBLY
21.04 FIRE DEPT. MAIN CONNECTION @ FRONT OF PROJECT. LAFD SHALL APPROVE FINAL LOCATION.
21.05 FIRE SPRINKLER HEAD.

22 - PLUMBING
22.01 WATER CLOSET PER PLUMBING LEGEND
22.02 LAV. SINK & FAUCET. PER PLUMBING LEGEND
22.03 JANITOR MOP SINK.
22.04 PLUMBING VENT PIPE.
22.05 DRINKING FOUNTAIN.
22.06 ULTRA LOW-FLOW TOILET.
22.07 SHOWER HEAD/ CONTROLS.
22.08 SHOWER DRAIN.
22.09 AREA DRAIN.
22.10 HOSE BIB.

23 - HEATING, VENTILATING, AND AIR-CONDITIONING
23.01 HVAC UNIT PER MECH.
23.02 AIR REGISTER WALL MOUNTED.
23.03 CEILING AIR REGISTER.
23.04 MAKE UP AIR LOUVER PER MECH. DWGS
23.05 BATHRM EXHAUST FAN PER SPECS.
23.06 BATHRM EXHAUST DUCT.
23.07 MECH. DUCT.
23.08 MECH. EQUIPMENT.

26 - ELECTRICAL
26.01 ELEC. PANEL PER PLANS & SCHED.
26.02 EXTERIOR LIGHT PER SCHED.
26.03 INTERIOR LIGHT PER SCHED.

27 - COMMUNICATION

28 - ELECTRONIC SAFETY AND SECURITY
28.01 SMOKE ALARM.
28.02 SECURITY CAMERA.
28.03 FIRE ALARM MAIN PANEL.

31 - EARTHWORK
31.01 APPROVED COMPACT FILL PER GEO & SOIL ENGINEER REPORT.

32 - EXTERIOR IMPROVEMENTS
32.01 ASPHALT PAVING PER CIVIL.
32.02 GRAPHICS/PAINT.SEE LAND. DWGS.
32.03 STORMWATER MANAGEMENT PER CIVIL DWGS.
32.04 STL. SECURITY GATE, PTD.
32.05 STL. SECURITY FENCE, PTD.
32.06 EXTERIOR AREA DRAINS.
32.07 BENCH.
32.08 TRENCH DRAIN.
32.09 TREE, SEE LANDSCAPE DWGS.
32.10 PLANTING, SEE LANDSCAPE DWGS.
32.11 (N) CONCRETE SIDEWALK, CURB, GUTTER PER CITY OF LA STANDARDS.
32.12 (N) CONC. APRON & DRIVEWAY CURB CUT PER CITY OF LA STANDARDS.
32.13 EQUIPMENT SCREEN.
32.14 CONC. WALL @ SITE FENCE.

33 - UTILITIES
33.01 WATER METER.
33.02 ELECTRICAL TRANSFORMER W/ BOLLARDS AS REQ'D.
33.03 ELECTRICAL METER.
33.04 POWER POLE.

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REVISION DATES (DESIGN STAGE ONLY)

Sheet Version 4.0

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

LICENSED ARCHITECT
LAWRENCE SQUARP
C 21812
REN 10/31/2023
STATE OF CALIFORNIA

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED

CITY OF LOS ANGELES
DEPARTMENT OF PUBLIC WORKS
BUREAU OF ENGINEERING

GARY LEE MOORE, P.E. ENV. SP
DESIGN GROUP
ENGINEER:
DESIGNED BY:
DRAWN BY:
CHECKED BY:
APPROVED BY:
CITY ENGINEER
DATE:

NO. REVISIONS: DATE: BY:

VERTICAL CONTROL:
HORIZONTAL CONTROL:

SHEET TITLE: ENLARGED PLAN
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

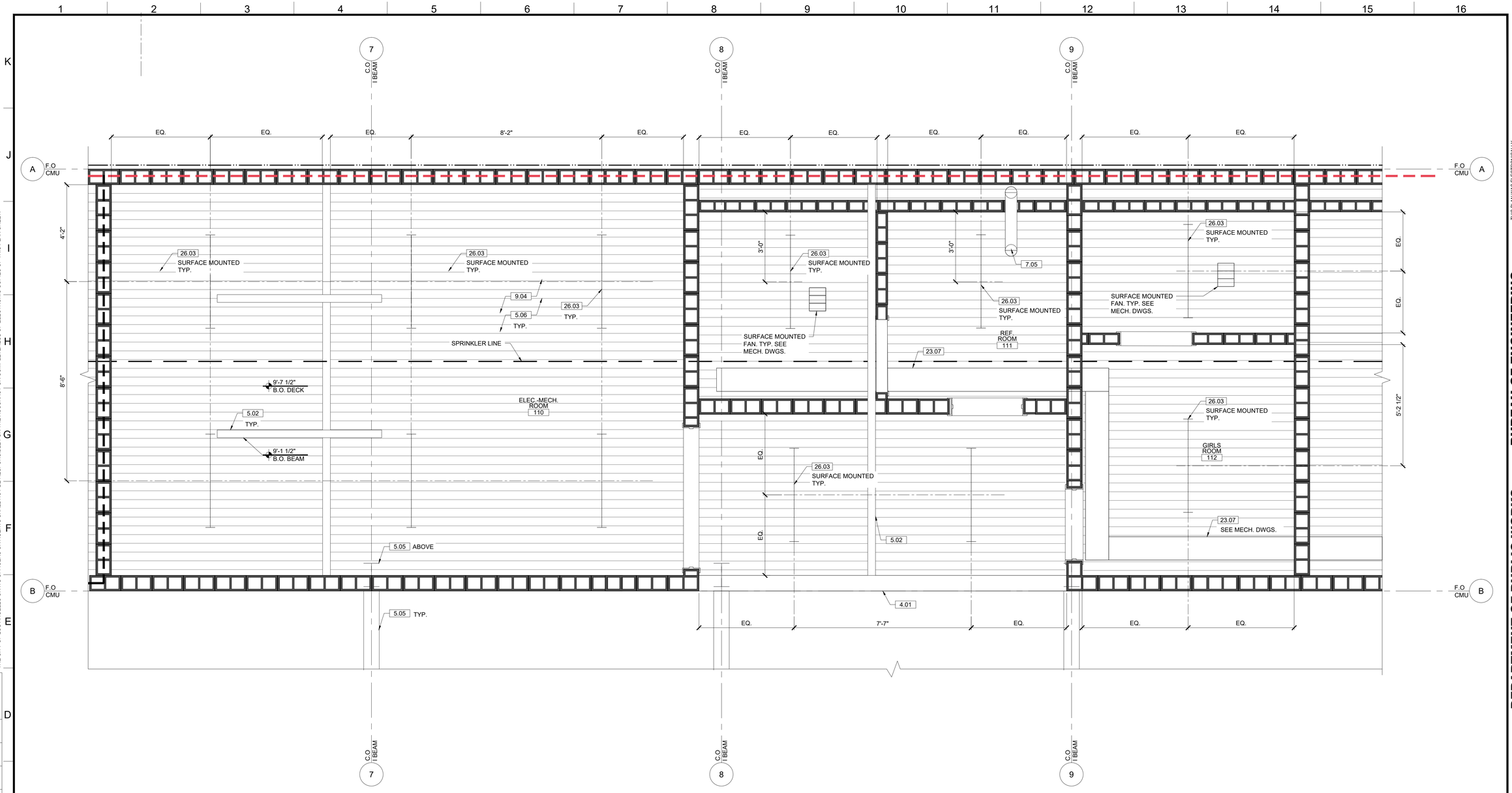
CIP NO.

INDEX NO.

WORK ORDER NO. E170121B

SHEET NAME A4.30
SHEET X OF X SHEETS

Z:\B□S ARCHITECTURE\019 JOBS\01935.0 CITY OF LA-RESEDA ICE HOCKEY ROLLER RINK\01935.0 1.CURRENT DRAWINGS_24X36\01935.0_A430_24X36.DWG 12/3/2021 9:21 AM



ELEC, REF & GIRLS ROOM ENLARGED REFLECTED CEILING PLAN

01

REF: A1.12 , A4.30

SCALE: 1/2" = 1'-0"

N

KEYNOTES

NOTE: ITEMS IDENTIFIED ARE TYPICAL TO ALL LIKE ITEMS UNLESS NOTED OTHERWISE.

01 - GENERAL REQUIREMENTS
02 - NOT USED

03 - CONCRETE
3.01 CONC. SLAB ON GRADE PER STRUCT'L.
3.02 CONC. O/MTL. DECK PER STRUCT'L.
3.03 CONC. CURB
3.04 CONC. FOOTING PER STRUCT'L.
3.05 CONC. PAVING PER CIVIL DWGS.
3.06 CONC. SIDEWALK PER CIVIL DWGS.
3.07 CONC. PAD

04 - MASONRY
4.01 CMU BLDNG. WALL
4.02 CMU SITE WALL W/ 2" CMU CAP.

05 - METALS
5.01 STL. COLUMN PER STRUCT'L. PTD.
5.02 STL. BEAM PER STRUCT'L. PTD.
5.03 HSS POST PER STRUCT'L. PTD.
5.04 HSS BEAM PER STRUCT'L. PTD.
5.05 MEMBRANE STRUCTURE I BEAM.
5.06 MTL. DECK.
5.07 MTL. GUARD RAILING.
5.08 MTL. STUD WALL.

06 - WOOD AND PLASTICS

07 - THERMAL & MOISTURE PROTECTION
7.01 W.P. MEMBRANE PER DETL. & SPECS.
7.02 SINGLE PLY PVC ROOFING PER SPECS.
7.03 R-21 RIGID INSULATION @ WALLS.
7.04 UNDERSLAB MOISTURE VAPOR BARRIER.
7.05 ROOF DRAIN AND OVERFLOW.
7.06 CLEAR WATER-REPELLENT GRAFITTI COATING AT CMU WALL. (ALL EXPOSED SURFACES).
7.07 BATT INSULATION.

08 - OPENINGS (SEE DOOR/WINDOW SCHED)
8.01 STL. DOOR. & FRAME, PAINTED.
8.02 CLR. ANODIZED ALUM. STOREFRONT DOOR.
8.03 CLR. ANODIZED ALUM. STOREFRONT WINDOW.
8.04 DOOR HARDWARE SET PER SCHED.
8.05 EXTERIOR WALL LOUVER.
8.06 EXTERIOR WALL VENT WITH CAP.
8.07 ROLLING STL. DOOR & FRAME.
8.08 ICE RINK GATES
8.09 OVERHEAD GLASS DOOR.
8.10 ACCESS PANEL, COLOR TO MATCH ADJACENT MATERIAL.
8.11 ROOF ACCESS HATCH.

09 - FINISHES (SEE FIN. SCHED)
9.01 5/8" TYPE 'X' GYP. BD., PROVIDE 'WET RATED' AT BATHROOMS. PAINT.
9.02 CONC. FLR. SEAL PER FIN. SCHED.
9.03 RUBBER FLR. PER SPECS.
9.04 PAINT PER SPECS.
9.05 REVEAL PER DETAILS.
9.06 GRAFITTI COATING, TYP. @ ALL EXTERIOR SOLID WALLS.
9.07 GLAZED FINISH ON CMU.
9.08 CERAMIC TILE.

10 - SPECIALTIES
10.01 MIRROR PER SPECS.
10.02 SIGNAGE.
10.03 TOILET PAPER ROLL HOLDER PER ACCESSORY SCHED.
10.04 GRAB BAR.
10.05 COAT HOOK.
10.06 WASTE RECEPTACLE.
10.07 FOLDING SHOWER SEAT.
10.08 SHOWER ROD.
10.09 SHELF.
10.10 NETTING. NIC
10.11 FIRE EXTINGUISHER. RECESSED CABINET.
10.12 TOILET SEAT COVER DISPENSER.
10.13 PAPER TOWEL DISPENSER.
10.14 BATHROOM PARTITION W/ ROBE HOOK @ EA. DOOR

11 - EQUIPMENT/APPLIANCES (SEE EQMT. SCHED)

12 - FURNISHINGS
12.01 BICYCLE RACKS FOR SHORT-TERM BIKE PARKING.
12.02 DASHERBOARDS. NIC.
12.03 BENCH. NIC.
12.04 BLEACHERS. NIC.
12.05 SCOREBOARD. NIC.
12.06 SKATE RACKS. NIC.

13 - SPECIAL CONSTRUCTION
13.01 MEMBRANE STRUCTURE.

14 - CONVEYING EQUIPMENT (NOT USED)

21 - FIRE SUPPRESSION
21.01 FIRE EXTINGUISHER.
21.02 FIRE SPRINKLER HORIZ. MAIN (SEE DIAGRAM)
21.03 FIRE SPRINKLER VALVE ASSEMBLY
21.04 FIRE DEPT. MAIN CONNECTION @ FRONT OF PROJECT. LAFD SHALL APPROVE FINAL LOCATION.
21.05 FIRE SPRINKLER HEAD.

22 - PLUMBING
22.01 WATER CLOSET PER PLUMBING LEGEND
22.02 LAV. SINK & FAUCET. PER PLUMBING LEGEND
22.03 JANITOR MOP SINK.
22.04 PLUMBING VENT PIPE.
22.05 DRINKING FOUNTAIN.
22.06 ULTRA LOW-FLOW TOILET.
22.07 SHOWER HEAD/ CONTROLS.
22.08 SHOWER DRAIN.
22.09 AREA DRAIN.
22.10 HOSE BIB.

23 - HEATING, VENTILATING, AND AIR-CONDITIONING
23.01 HVAC UNIT PER MECH.
23.02 AIR REGISTER WALL MOUNTED.
23.03 CEILING AIR REGISTER.
23.04 MAKE UP AIR LOUVER PER MECH. DWGS
23.05 BATHRM EXHAUST FAN PER SPECS.
23.06 BATHRM EXHAUST DUCT.
23.07 MECH. DUCT.
23.08 MECH. EQUIPMENT.

26 - ELECTRICAL
26.01 ELEC. PANEL PER PLANS & SCHED.
26.02 EXTERIOR LIGHT PER SCHED.
26.03 INTERIOR LIGHT PER SCHED.

27 - COMMUNICATION

28 - ELECTRONIC SAFETY AND SECURITY
28.01 SMOKE ALARM.
28.02 SECURITY CAMERA.
28.03 FIRE ALARM MAIN PANEL.

31 - EARTHWORK
31.01 APPROVED COMPACT FILL PER GEO & SOIL ENGINEER REPORT.

32 - EXTERIOR IMPROVEMENTS
32.01 ASPHALT PAVING PER CIVIL.
32.02 GRAPHICS/PAINT.SEE LAND. DWGS.
32.03 STORMWATER MANAGEMENT PER CIVIL DWGS.
32.04 STL. SECURITY GATE, PTD.
32.05 STL. SECURITY FENCE, PTD.
32.06 EXTERIOR AREA DRAINS.
32.07 BENCH.
32.08 TRENCH DRAIN.
32.09 TREE, SEE LANDSCAPE DWGS.
32.10 PLANTING, SEE LANDSCAPE DWGS.
32.11 (N) CONCRETE SIDEWALK, CURB, GUTTER PER CITY OF LA STANDARDS.
32.12 (N) CONC. APRON & DRIVEWAY CURB CUT PER CITY OF LA STANDARDS.
32.13 EQUIPMENT SCREEN.
32.14 CONC. WALL @ SITE FENCE.

33 - UTILITIES
33.01 WATER METER.
33.02 ELECTRICAL TRANSFORMER W/ BOLLARDS AS REQ'D.
33.03 ELECTRICAL METER.
33.04 POWER POLE.

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REVISION DATES (DESIGN STAGE ONLY)

Sheet Version 4.0

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED

LICENSED ARCHITECT
LAWRENCE SCARPA
C 21812
REN 10/31/2023
STATE OF CALIFORNIA

CITY OF LOS ANGELES
DEPARTMENT OF PUBLIC WORKS
BUREAU OF ENGINEERING

VERTICAL CONTROL:
HORIZONTAL CONTROL:
SHEET TITLE: ENLARGED RCP
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

NO. | REVISIONS: | DATE: | BY:

CIP NO.

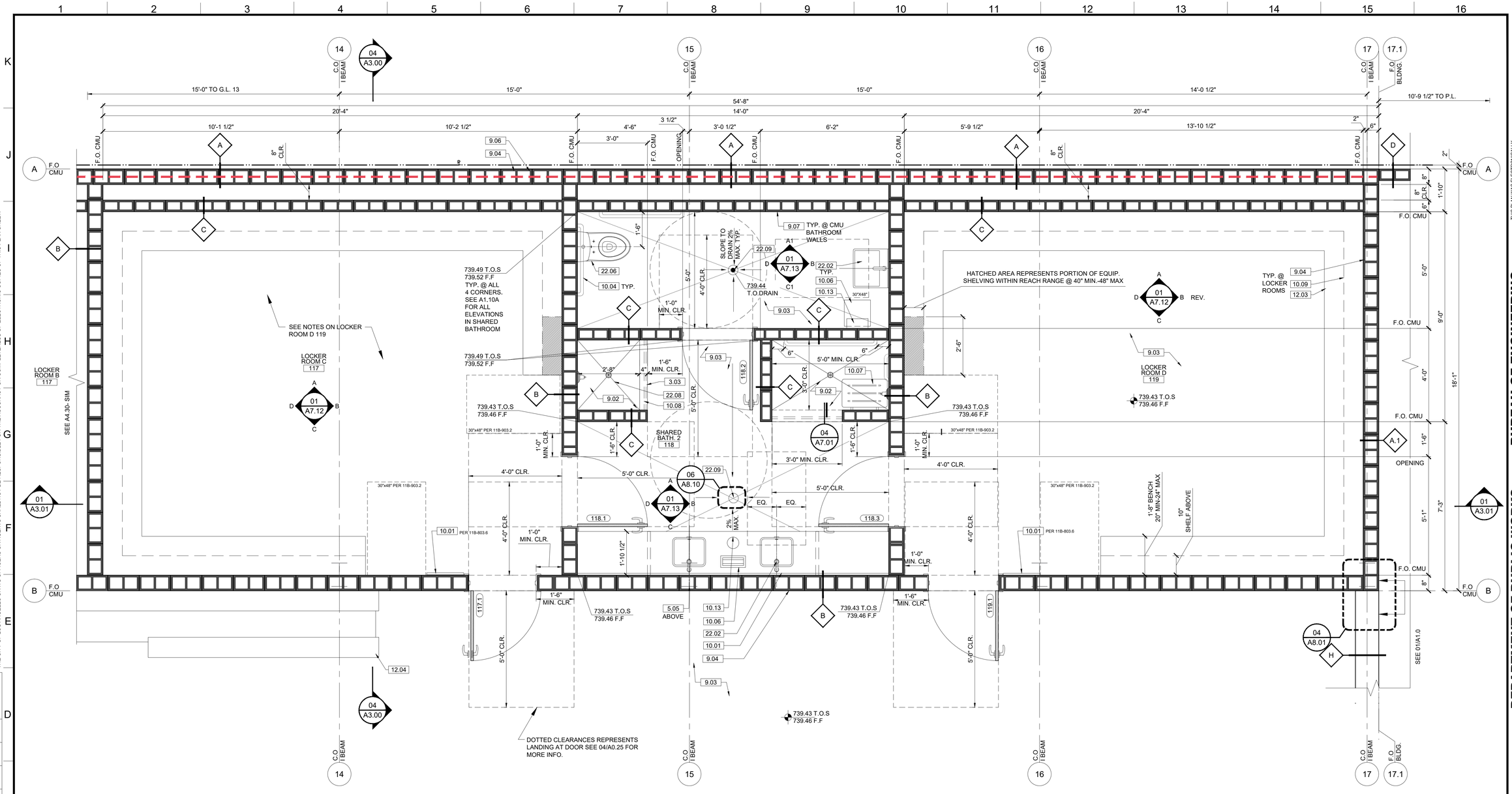
INDEX NO.

CITY ENGINEER | DATE:
GARY LEE MOORE, P.E. ENV SP
DESIGN GROUP
ENGINEER:
DESIGNED BY:
DRAWN BY:
CHECKED BY:
APPROVED BY:

WORK ORDER NO.
E170121B

SHEET NAME
A4.31
SHEET X OF X SHEETS

Z:\B□S ARCHITECTURE\019 JOBS\01935.0 CITY OF LA-RESEDA ICE HOCKEY ROLLER RINK\01935.0 1.CURRENT DRAWINGS_24X36\01935.0_A431_24X36.DWG 12/3/2021 9:21 AM



LOCKER ROOM & SHARED BATHROOM ENLARGED PLAN

01

REF: A1.10 , A1.10A, A4.41, A7.12, A7.13 SCALE: 1/2" = 1'-0"

N

KEYNOTES

NOTE: ITEMS IDENTIFIED ARE TYPICAL TO ALL LIKE ITEMS UNLESS NOTED OTHERWISE.

01 - GENERAL REQUIREMENTS
02 - NOT USED

03 - CONCRETE
3.01 CONC. SLAB ON GRADE PER STRUCT'L.
3.02 CONC. O/MTL. DECK PER STRUCT'L.
3.03 CONC. CURB
3.04 CONC. FOOTING PER STRUCT'L.
3.05 CONC. PAVING PER CIVIL DWGS.
3.06 CONC. SIDEWALK PER CIVIL DWGS.
3.07 CONC. PAD

04 - MASONRY
4.01 CMU BLDNG. WALL
4.02 CMU SITE WALL W/ 2" CMU CAP.

05 - METALS
5.01 STL. COLUMN PER STRUCT'L. PTD.
5.02 STL. BEAM PER STRUCT'L. PTD.
5.03 HSS POST PER STRUCT'L. PTD.
5.04 HSS BEAM PER STRUCT'L. PTD.
5.05 MEMBRANE STRUCTURE I BEAM.
5.06 MTL. DECK.
5.07 MTL. GUARD RAILING.
5.08 MTL. STUD WALL.

06 - WOOD AND PLASTICS

07 - THERMAL & MOISTURE PROTECTION
7.01 W.P. MEMBRANE PER DETL. & SPECS.
7.02 SINGLE PLY PVC ROOFING PER SPECS.
7.03 R-21 RIGID INSULATION @ WALLS.
7.04 UNDERSLAB MOISTURE VAPOR BARRIER.
7.05 ROOF DRAIN AND OVERFLOW.
7.06 CLEAR WATER-REPELLENT GRAFITTI COATING AT CMU WALL. (ALL EXPOSED SURFACES).
7.07 BATT INSULATION.

08 - OPENINGS (SEE DOOR/WINDOW SCHED)
8.01 STL. DOOR. & FRAME, PAINTED.
8.02 CLR. ANODIZED ALUM. STOREFRONT DOOR.
8.03 CLR. ANODIZED ALUM. STOREFRONT WINDOW.
8.04 DOOR HARDWARE SET PER SCHED.
8.05 EXTERIOR WALL LOUVER.
8.06 EXTERIOR WALL VENT WITH CAP.
8.07 ROLLING STL. DOOR & FRAME.
8.08 ICE RINK GATES
8.09 OVERHEAD GLASS DOOR.
8.10 ACCESS PANEL, COLOR TO MATCH ADJACENT MATERIAL.
8.11 ROOF ACCESS HATCH.

09 - FINISHES (SEE FIN. SCHED)
9.01 5/8" TYPE 'X' GYP. BD., PROVIDE 'WET RATED' AT BATHROOMS. PAINT.
9.02 CONC. FLR. SEAL PER FIN. SCHED.
9.03 RUBBER FLR. PER SPECS.
9.04 PAINT PER SPECS.
9.05 REVEAL PER DETAILS.
9.06 GRAFITTI COATING, TYP. @ ALL EXTERIOR SOLID WALLS.
9.07 GLAZED FINISH ON CMU.
9.08 CERAMIC TILE.

10 - SPECIALTIES
10.01 MIRROR PER SPECS.
10.02 SIGNAGE.
10.03 TOILET PAPER ROLL HOLDER PER ACCESSORY SCHED.
10.04 GRAB BAR.
10.05 COAT HOOK.
10.06 WASTE RECEPTACLE.
10.07 FOLDING SHOWER SEAT.
10.08 SHOWER ROD.
10.09 SHELF.
10.10 NETTING. NIC
10.11 FIRE EXTINGUISHER. RECESSED CABINET
10.12 TOILET SEAT COVER DISPENSER.
10.13 PAPER TOWEL DISPENSER.
10.14 BATHROOM PARTITION W/ ROBE HOOK @ EA. DOOR

11 - EQUIPMENT/APPLIANCES (SEE EQMT. SCHED)

12 - FURNISHINGS
12.01 BICYCLE RACKS FOR SHORT-TERM BIKE PARKING.
12.02 DASHERBOARDS. NIC.
12.03 BENCH. NIC.
12.04 BLEACHERS. NIC.
12.05 SCOREBOARD. NIC.
12.06 SKATE RACKS. NIC.

13 - SPECIAL CONSTRUCTION
13.01 MEMBRANE STRUCTURE.

14 - CONVEYING EQUIPMENT (NOT USED)

21 - FIRE SUPPRESSION
21.01 FIRE EXTINGUISHER.
21.02 FIRE SPRINKLER HORIZ. MAIN (SEE DIAGRAM)
21.03 FIRE SPRINKLER VALVE ASSEMBLY
21.04 FIRE DEPT. MAIN CONNECTION @ FRONT OF PROJECT. LAFD SHALL APPROVE FINAL LOCATION.
21.05 FIRE SPRINKLER HEAD.

22 - PLUMBING
22.01 WATER CLOSET PER PLUMBING LEGEND
22.02 LAV. SINK & FAUCET. PER PLUMBING LEGEND
22.03 JANITOR MOP SINK.
22.04 PLUMBING VENT PIPE.
22.05 DRINKING FOUNTAIN.
22.06 ULTRA LOW-FLOW TOILET.
22.07 SHOWER HEAD/ CONTROLS.
22.08 SHOWER DRAIN.
22.09 AREA DRAIN.
22.10 HOSE BIB.

23 - HEATING, VENTILATING, AND AIR-CONDITIONING
23.01 HVAC UNIT PER MECH.
23.02 AIR REGISTER WALL MOUNTED.
23.03 CEILING AIR REGISTER.
23.04 MAKE UP AIR LOUVER PER MECH. DWGS
23.05 BATHRM EXHAUST FAN PER SPECS.
23.06 BATHRM EXHAUST DUCT.
23.07 MECH. DUCT.
23.08 MECH. EQUIPMENT.

26 - ELECTRICAL
26.01 ELEC. PANEL PER PLANS & SCHED.
26.02 EXTERIOR LIGHT PER SCHED.
26.03 INTERIOR LIGHT PER SCHED.

27 - COMMUNICATION

28 - ELECTRONIC SAFETY AND SECURITY
28.01 SMOKE ALARM.
28.02 SECURITY CAMERA.
28.03 FIRE ALARM MAIN PANEL.

31 - EARTHWORK
31.01 APPROVED COMPACT FILL PER GEO & SOIL ENGINEER REPORT.

32 - EXTERIOR IMPROVEMENTS
32.01 ASPHALT PAVING PER CIVIL.
32.02 GRAPHICS/PAINT.SEE LAND. DWGS.
32.03 STORMWATER MANAGEMENT PER CIVIL DWGS.
32.04 STL. SECURITY GATE, PTD.
32.05 STL. SECURITY FENCE, PTD.
32.06 EXTERIOR AREA DRAINS.
32.07 BENCH.
32.08 TRENCH DRAIN.
32.09 TREE, SEE LANDSCAPE DWGS.
32.10 PLANTING, SEE LANDSCAPE DWGS.
32.11 (N) CONCRETE SIDEWALK, CURB, GUTTER PER CITY OF LA STANDARDS.
32.12 (N) CONC. APRON & DRIVEWAY CURB CUT PER CITY OF LA STANDARDS.
32.13 EQUIPMENT SCREEN.
32.14 CONC. WALL @ SITE FENCE.

33 - UTILITIES
33.01 WATER METER.
33.02 ELECTRICAL TRANSFORMER W/ BOLLARDS AS REQ'D.
33.03 ELECTRICAL METER.
33.04 POWER POLE.

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

LICENSED ARCHITECT
LAWRENCE SUARD
C 21812
REN 10/31/2023
STATE OF CALIFORNIA

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED

BUREAU OF ENGINEERING
VERTICAL CONTROL:
HORIZONTAL CONTROL:
SHEET TITLE: ENLARGED PLAN
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

NO.	REVISIONS:	DATE:	BY:

CIP NO.

INDEX NO.

CITY OF LOS ANGELES
DEPARTMENT OF PUBLIC WORKS
CITY ENGINEER
DATE:
GARY LEE MOORE, P.E. ENV SP
DESIGN GROUP
ENGINEER:
DESIGNED BY:
DRAWN BY:
CHECKED BY:
APPROVED BY:

WORK ORDER NO.
E170121B

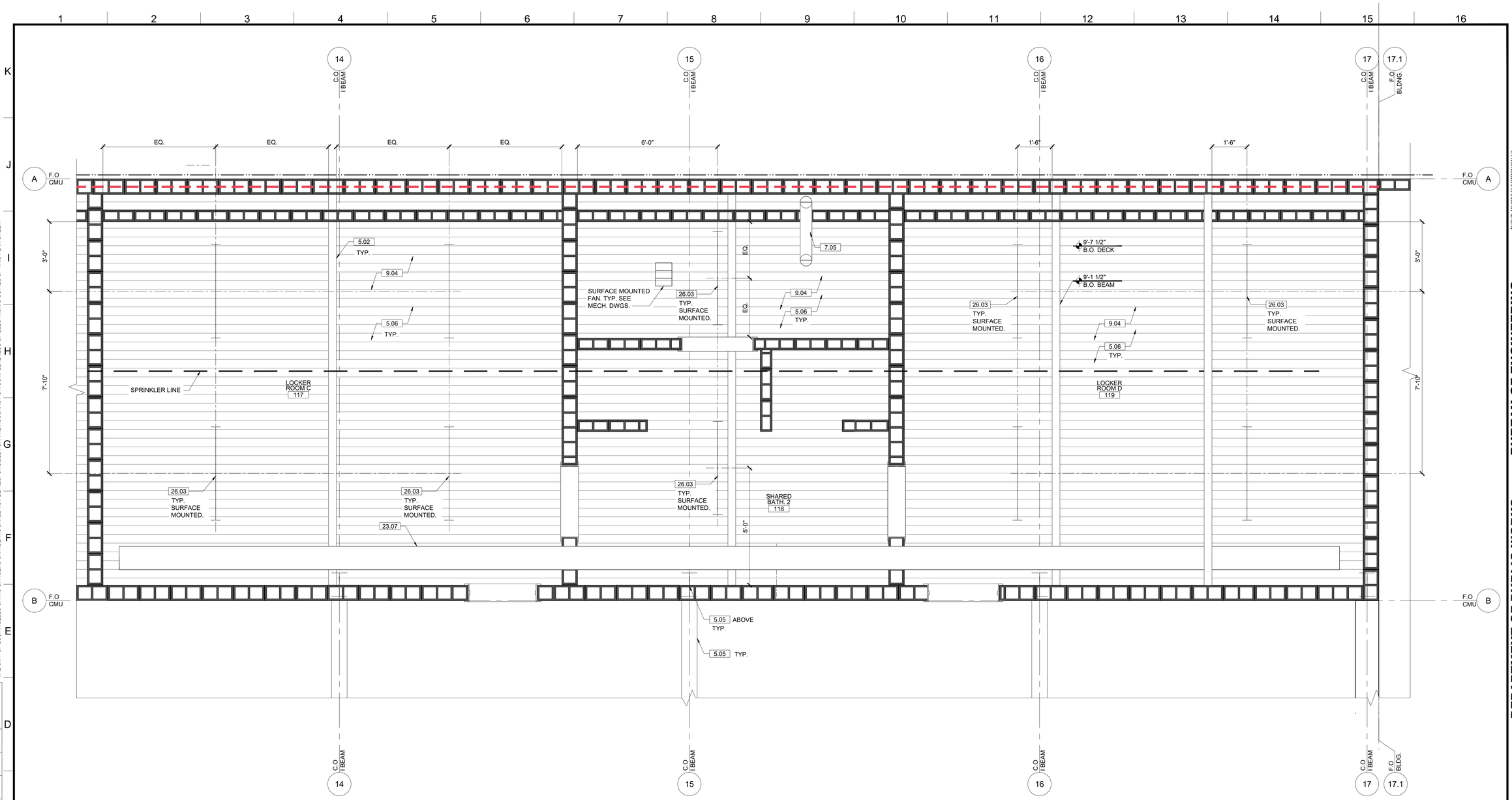
SHEET NAME
A4.40
SHEET X OF X SHEETS

REVISION DATES (DESIGN STAGE ONLY)

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

Sheet Version 4.0

Z:\B□S ARCHITECTURE\019 JOBS\01935.0 CITY OF LA-RESEDA ICE HOCKEY ROLLER RINK\01935.0 1.CURRENT DRAWINGS_24X36\01935.0_A440_24X36.DWG 12/3/2021 9:22 AM



LOCKER ROOM & SHARED BATHROOM ENLARGED REFLECTED CEILING PLAN

01

REF: A1.12 , A4.40

SCALE: 1/2" = 1'-0"

N

KEYNOTES

NOTE: ITEMS IDENTIFIED ARE TYPICAL TO ALL LIKE ITEMS UNLESS NOTED OTHERWISE.

01 - GENERAL REQUIREMENTS
02 - NOT USED

03 - CONCRETE
3.01 CONC. SLAB ON GRADE PER STRUCT'L.
3.02 CONC. O/MTL. DECK PER STRUCT'L.
3.03 CONC. CURB
3.04 CONC. FOOTING PER STRUCT'L.
3.05 CONC. PAVING PER CIVIL DWGS.
3.06 CONC. SIDEWALK PER CIVIL DWGS.
3.07 CONC. PAD

04 - MASONRY
4.01 CMU BLDNG. WALL
4.02 CMU SITE WALL W/ 2" CMU CAP.

05 - METALS
5.01 STL. COLUMN PER STRUCT'L. PTD.
5.02 STL. BEAM PER STRUCT'L. PTD.
5.03 HSS POST PER STRUCT'L. PTD.
5.04 HSS BEAM PER STRUCT'L. PTD.
5.05 MEMBRANE STRUCTURE I BEAM.
5.06 MTL. DECK.
5.07 MTL. GUARD RAILING.
5.08 MTL. STUD WALL.

06 - WOOD AND PLASTICS

07 - THERMAL & MOISTURE PROTECTION
7.01 W.P. MEMBRANE PER DETL. & SPECS.
7.02 SINGLE PLY PVC ROOFING PER SPECS.
7.03 R-21 RIGID INSULATION @ WALLS.
7.04 UNDERSLAB MOISTURE VAPOR BARRIER.
7.05 ROOF DRAIN AND OVERFLOW.
7.06 CLEAR WATER-REPELLENT GRAFITTI COATING AT CMU WALL. (ALL EXPOSED SURFACES).
7.07 BATT INSULATION.

08 - OPENINGS (SEE DOOR/WINDOW SCHED)
8.01 STL. DOOR. & FRAME, PAINTED.
8.02 CLR. ANODIZED ALUM. STOREFRONT DOOR.
8.03 CLR. ANODIZED ALUM. STOREFRONT WINDOW.
8.04 DOOR HARDWARE SET PER SCHED.
8.05 EXTERIOR WALL LOUVER.
8.06 EXTERIOR WALL VENT WITH CAP.
8.07 ROLLING STL. DOOR & FRAME.
8.08 ICE RINK GATES.
8.09 OVERHEAD GLASS DOOR.
8.10 ACCESS PANEL, COLOR TO MATCH ADJACENT MATERIAL.
8.11 ROOF ACCESS HATCH.

09 - FINISHES (SEE FIN. SCHED)
9.01 5/8" TYPE 'X' GYP. BD., PROVIDE 'WET RATED' AT BATHROOMS. PAINT.
9.02 CONC. FLR. SEAL PER FIN. SCHED.
9.03 RUBBER FLR. PER SPECS.
9.04 PAINT PER SPECS.
9.05 REVEAL PER DETAILS.
9.06 GRAFITTI COATING, TYP. @ ALL EXTERIOR SOLID WALLS.
9.07 GLAZED FINISH ON CMU.
9.08 CERAMIC TILE.

10 - SPECIALTIES
10.01 MIRROR PER SPECS.
10.02 SIGNAGE.
10.03 TOILET PAPER ROLL HOLDER PER ACCESSORY SCHED.
10.04 GRAB BAR.
10.05 COAT HOOK.
10.06 WASTE RECEPTACLE.
10.07 FOLDING SHOWER SEAT.
10.08 SHOWER ROD.
10.09 SHELF.
10.10 NETTING. NIC
10.11 FIRE EXTINGUISHER. RECESSED CABINET
10.12 TOILET SEAT COVER DISPENSER.
10.13 PAPER TOWEL DISPENSER.
10.14 BATHROOM PARTITION W/ ROBE HOOK @ EA. DOOR

11 - EQUIPMENT/APPLIANCES (SEE EQMT. SCHED)

12 - FURNISHINGS
12.01 BICYCLE RACKS FOR SHORT-TERM BIKE PARKING.
12.02 DASHERBOARDS. NIC.
12.03 BENCH. NIC.
12.04 BLEACHERS. NIC.
12.05 SCOREBOARD. NIC.
12.06 SKATE RACKS. NIC.

13 - SPECIAL CONSTRUCTION
13.01 MEMBRANE STRUCTURE.

14 - CONVEYING EQUIPMENT (NOT USED)

21 - FIRE SUPPRESSION
21.01 FIRE EXTINGUISHER.
21.02 FIRE SPRINKLER HORIZ. MAIN (SEE DIAGRAM)
21.03 FIRE SPRINKLER VALVE ASSEMBLY
21.04 FIRE DEPT. MAIN CONNECTION @ FRONT OF PROJECT. LAFD SHALL APPROVE FINAL LOCATION.
21.05 FIRE SPRINKLER HEAD.

22 - PLUMBING
22.01 WATER CLOSET PER PLUMBING LEGEND
22.02 LAV. SINK & FAUCET. PER PLUMBING LEGEND
22.03 JANITOR MOP SINK.
22.04 PLUMBING VENT PIPE.
22.05 DRINKING FOUNTAIN.
22.06 ULTRA LOW-FLOW TOILET.
22.07 SHOWER HEAD/ CONTROLS.
22.08 SHOWER DRAIN.
22.09 AREA DRAIN.
22.10 HOSE BIB.

23 - HEATING, VENTILATING, AND AIR-CONDITIONING
23.01 HVAC UNIT PER MECH.
23.02 AIR REGISTER WALL MOUNTED.
23.03 CEILING AIR REGISTER.
23.04 MAKE UP AIR LOUVER PER MECH. DWGS
23.05 BATHRM EXHAUST FAN PER SPECS.
23.06 BATHRM EXHAUST DUCT.
23.07 MECH. DUCT.
23.08 MECH. EQUIPMENT.

26 - ELECTRICAL
26.01 ELEC. PANEL PER PLANS & SCHED.
26.02 EXTERIOR LIGHT PER SCHED.
26.03 INTERIOR LIGHT PER SCHED.

27 - COMMUNICATION

28 - ELECTRONIC SAFETY AND SECURITY
28.01 SMOKE ALARM.
28.02 SECURITY CAMERA.
28.03 FIRE ALARM MAIN PANEL.

31 - EARTHWORK
31.01 APPROVED COMPACT FILL PER GEO & SOIL ENGINEER REPORT.

32 - EXTERIOR IMPROVEMENTS
32.01 ASPHALT PAVING PER CIVIL.
32.02 GRAPHICS/PAINT.SEE LAND. DWGS.
32.03 STORMWATER MANAGEMENT PER CIVIL DWGS.
32.04 STL. SECURITY GATE, PTD.
32.05 STL. SECURITY FENCE, PTD.
32.06 EXTERIOR AREA DRAINS.
32.07 BENCH.
32.08 TRENCH DRAIN.
32.09 TREE, SEE LANDSCAPE DWGS.
32.10 PLANTING, SEE LANDSCAPE DWGS.
32.11 (N) CONCRETE SIDEWALK, CURB, GUTTER PER CITY OF LA STANDARDS.
32.12 (N) CONC. APRON & DRIVEWAY CURB CUT PER CITY OF LA STANDARDS.
32.13 EQUIPMENT SCREEN.
32.14 CONC. WALL @ SITE FENCE.

33 - UTILITIES
33.01 WATER METER.
33.02 ELECTRICAL TRANSFORMER W/ BOLLARDS AS REQ'D.
33.03 ELECTRICAL METER.
33.04 POWER POLE.

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

LICENSED ARCHITECT
LAWRENCE SUARD
C 21812
REN 10/31/2023
STATE OF CALIFORNIA

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED •

BUREAU OF ENGINEERING
VERTICAL CONTROL:
HORIZONTAL CONTROL:
SHEET TITLE: ENLARGED RCP
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

DEPARTMENT OF PUBLIC WORKS
NO. REVISIONS: DATE: BY:
INDEX NO.
CIP NO.

CITY OF LOS ANGELES
GARY LEE MOORE, P.E. ENV SP — CITY ENGINEER
DESIGN GROUP: DATE:
ENGINEER:
DESIGNED BY:
DRAWN BY:
CHECKED BY:
APPROVED BY:

WORK ORDER NO.
E170121B

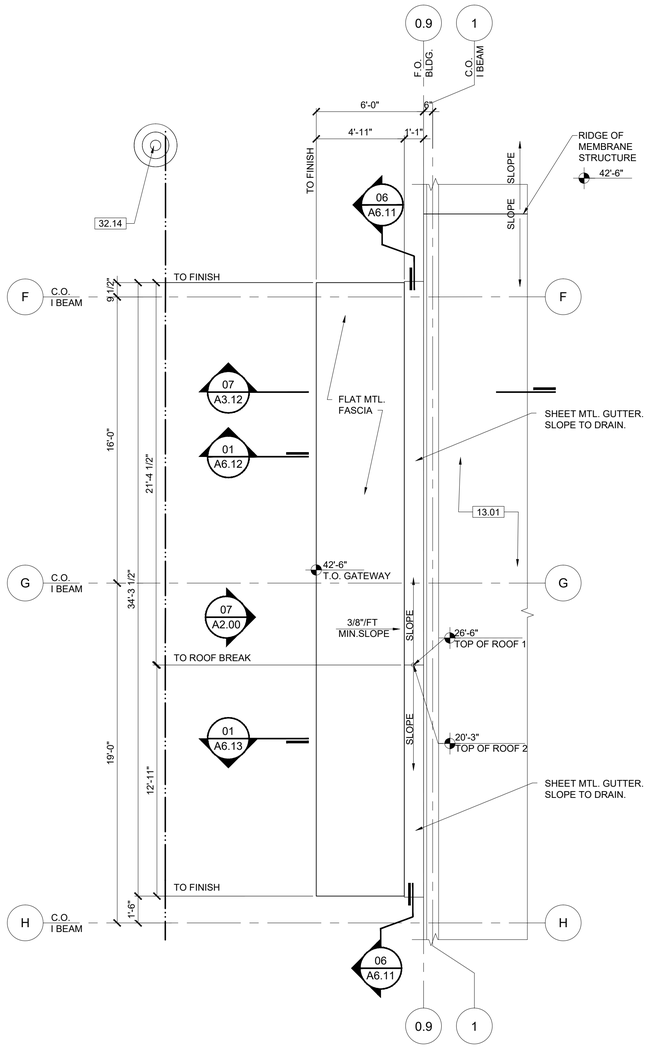
SHEET NAME
A4.41
SHEET X OF X SHEETS

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REVISION DATES (DESIGN STAGE ONLY)

Sheet Version 4.0

Z:\B□S ARCHITECTURE\019 JOBS\01935.0 CITY OF LA-RESEDA ICE HOCKEY ROLLER RINK\01935.0 1.CURRENT DRAWINGS_24X36\01935.0_A441_24X36.DWG 12/3/2021 9:22 AM

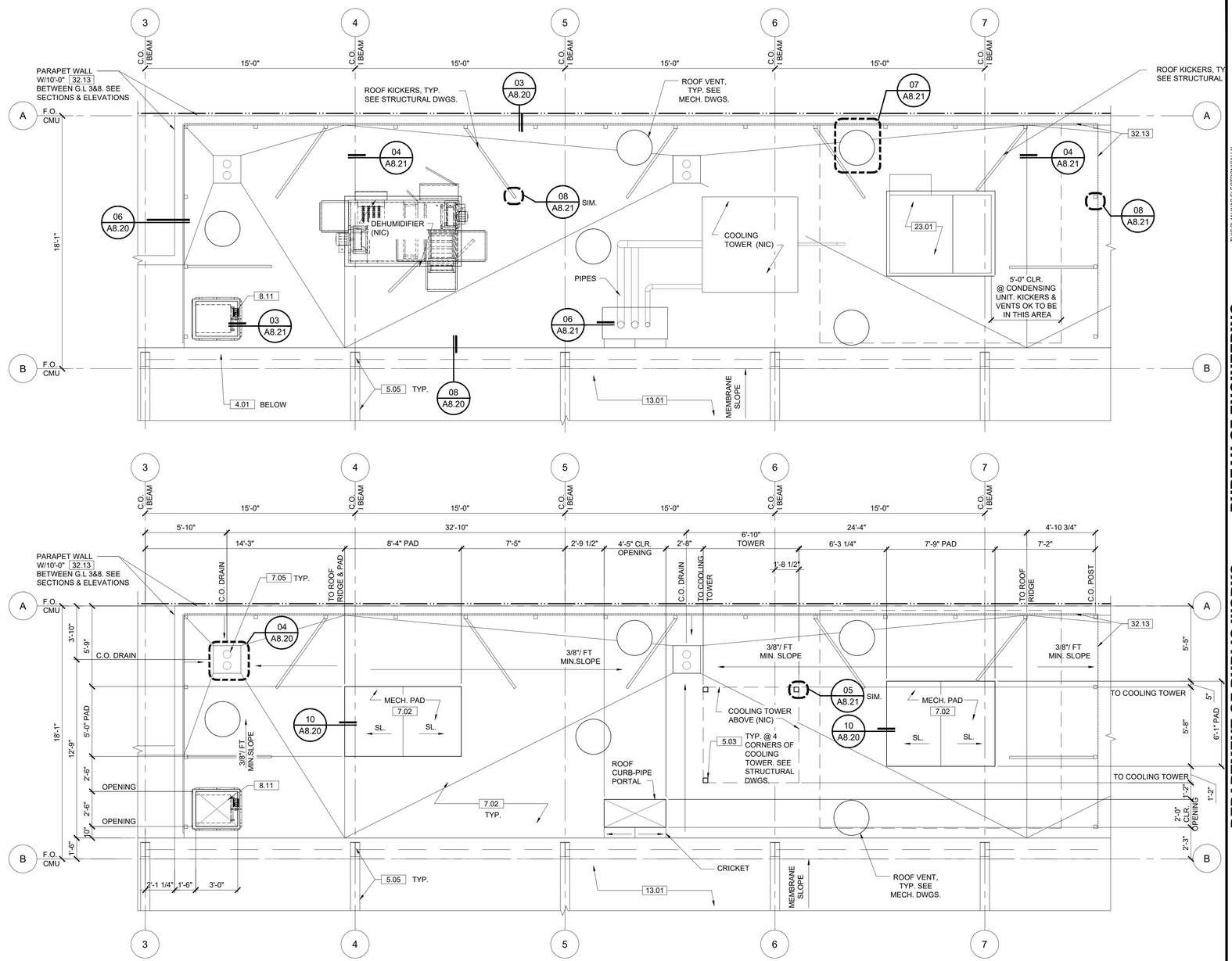


GATEWAY ROOF ENLARGED PLAN

09

REF: A1.20 SCALE: 1/4" = 1'-0"

N



MECHANICAL ROOF DRAINAGE & EQUIPMENT ENLARGED PLAN

01

REF: A1.20, 01/ A3.01, 03/A3.00, 04&07/A3.10, A0.36 SCALE: 1/4" = 1'-0"

N

KEYNOTES

NOTE: ITEMS IDENTIFIED ARE TYPICAL TO ALL LIKE ITEMS UNLESS NOTED OTHERWISE.

01 - GENERAL REQUIREMENTS
02 - NOT USED

03 - CONCRETE
3.01 CONC. SLAB ON GRADE PER STRUCT'L.
3.02 CONC. O/MTL. DECK PER STRUCT'L.
3.03 CONC. CURB
3.04 CONC. FOOTING PER STRUCT'L.
3.05 CONC. PAVING PER CIVIL DWGS.
3.06 CONC. SIDEWALK PER CIVIL DWGS.
3.07 CONC. PAD

04 - MASONRY
4.01 CMU BLDNG. WALL
4.02 CMU SITE WALL W/ 2" CMU CAP.

05 - METALS
5.01 STL. COLUMN PER STRUCT'L. PTD.
5.02 STL. BEAM PER STRUCT'L. PTD.
5.03 HSS POST PER STRUCT'L. PTD.
5.04 HSS BEAM PER STRUCT'L. PTD.
5.05 MEMBRANE STRUCTURE I BEAM.
5.06 MTL. DECK.
5.07 MTL. GUARD RAILING.
5.08 MTL. STUD WALL.

06 - WOOD AND PLASTICS

07 - THERMAL & MOISTURE PROTECTION
7.01 W.P. MEMBRANE PER DETL. & SPECS.
7.02 SINGLE PLY PVC ROOFING PER SPECS.
7.03 R-21 RIGID INSULATION @ WALLS.
7.04 UNDERSLAB MOISTURE VAPOR BARRIER.
7.05 ROOF DRAIN AND OVERFLOW.
7.06 CLEAR WATER-REPELLENT GRAFITTI COATING AT CMU WALL. (ALL EXPOSED SURFACES).
7.07 BATT INSULATION.

08 - OPENINGS (SEE DOOR/WINDOW SCHED)
8.01 STL. DOOR. & FRAME, PAINTED.
8.02 CLR. ANODIZED ALUM. STOREFRONT DOOR.
8.03 CLR. ANODIZED ALUM. STOREFRONT WINDOW.
8.04 DOOR HARDWARE SET PER SCHED.
8.05 EXTERIOR WALL LOUVER.
8.06 EXTERIOR WALL VENT WITH CAP.
8.07 ROLLING STL. DOOR & FRAME.
8.08 ICE RINK GATES
8.09 OVERHEAD GLASS DOOR.
8.10 ACCESS PANEL, COLOR TO MATCH ADJACENT MATERIAL.
8.11 ROOF ACCESS HATCH.

09 - FINISHES (SEE FIN. SCHED)
9.01 5/8" TYPE 'X' GYP. BD., PROVIDE 'WET RATED' AT BATHROOMS. PAINT.
9.02 CONC. FLR. SEAL PER FIN. SCHED.
9.03 RUBBER FLR. PER SPECS.
9.04 PAINT PER SPECS.
9.05 REVEAL PER DETAILS.
9.06 GRAFITTI COATING, TYP. @ ALL EXTERIOR SOLID WALLS.
9.07 GLAZED FINISH ON CMU.
9.08 CERAMIC TILE.

10 - SPECIALTIES
10.01 MIRROR PER SPECS.
10.02 SIGNAGE.
10.03 TOILET PAPER ROLL HOLDER PER ACCESSORY SCHED.
10.04 GRAB BAR.
10.05 COAT HOOK.
10.06 WASTE RECEPTACLE.
10.07 FOLDING SHOWER SEAT.
10.08 SHOWER ROD.
10.09 SHELF.
10.10 NETTING. NIC
10.11 FIRE EXTINGUISHER. RECESSED CABINET
10.12 TOILET SEAT COVER DISPENSER.
10.13 PAPER TOWEL DISPENSER.
10.14 BATHROOM PARTITION W/ ROBE HOOK @ EA. DOOR

11 - EQUIPMENT/APPLIANCES (SEE EQMT. SCHED)

12 - FURNISHINGS
12.01 BICYCLE RACKS FOR SHORT-TERM BIKE PARKING.
12.02 DASHERBOARDS. NIC.
12.03 BENCH. NIC.
12.04 BLEACHERS. NIC.
12.05 SCOREBOARD. NIC.
12.06 SKATE RACKS. NIC.

13 - SPECIAL CONSTRUCTION
13.01 MEMBRANE STRUCTURE.

14 - CONVEYING EQUIPMENT (NOT USED)

21 - FIRE SUPPRESSION
21.01 FIRE EXTINGUISHER.
21.02 FIRE SPRINKLER HORIZ. MAIN (SEE DIAGRAM)
21.03 FIRE SPRINKLER VALVE ASSEMBLY
21.04 FIRE DEPT. MAIN CONNECTION @ FRONT OF PROJECT. LAFD SHALL APPROVE FINAL LOCATION.
21.05 FIRE SPRINKLER HEAD.

22 - PLUMBING
22.01 WATER CLOSET PER PLUMBING LEGEND
22.02 LAV. SINK & FAUCET. PER PLUMBING LEGEND
22.03 JANITOR MOP SINK.
22.04 PLUMBING VENT PIPE.
22.05 DRINKING FOUNTAIN.
22.06 ULTRA LOW-FLOW TOILET.
22.07 SHOWER HEAD/ CONTROLS.
22.08 SHOWER DRAIN.
22.09 AREA DRAIN.
22.10 HOSE BIB.

23 - HEATING, VENTILATING, AND AIR-CONDITIONING
23.01 HVAC UNIT PER MECH.
23.02 AIR REGISTER WALL MOUNTED.
23.03 CEILING AIR REGISTER.
23.04 MAKE UP AIR LOUVER PER MECH. DWGS
23.05 BATHRM EXHAUST FAN PER SPECS.
23.06 BATHRM EXHAUST DUCT.
23.07 MECH. DUCT.
23.08 MECH. EQUIPMENT.

26 - ELECTRICAL
26.01 ELEC. PANEL PER PLANS & SCHED.
26.02 EXTERIOR LIGHT PER SCHED.
26.03 INTERIOR LIGHT PER SCHED.

27 - COMMUNICATION

28 - ELECTRONIC SAFETY AND SECURITY
28.01 SMOKE ALARM.
28.02 SECURITY CAMERA.
28.03 FIRE ALARM MAIN PANEL.

31 - EARTHWORK
31.01 APPROVED COMPACT FILL PER GEO & SOIL ENGINEER REPORT.

32 - EXTERIOR IMPROVEMENTS
32.01 ASPHALT PAVING PER CIVIL.
32.02 GRAPHICS/PAINT.SEE LAND. DWGS.
32.03 STORMWATER MANAGEMENT PER CIVIL DWGS.
32.04 STL. SECURITY GATE, PTD.
32.05 STL. SECURITY FENCE, PTD.
32.06 EXTERIOR AREA DRAINS.
32.07 BENCH.
32.08 TRENCH DRAIN.
32.09 TREE, SEE LANDSCAPE DWGS.
32.10 PLANTING, SEE LANDSCAPE DWGS.
32.11 (N) CONCRETE SIDEWALK, CURB, GUTTER PER CITY OF LA STANDARDS.
32.12 (N) CONC. APRON & DRIVEWAY CURB CUT PER CITY OF LA STANDARDS.
32.13 EQUIPMENT SCREEN.
32.14 CONC. WALL @ SITE FENCE.

33 - UTILITIES
33.01 WATER METER.
33.02 ELECTRICAL TRANSFORMER W/ BOLLARDS AS REQ'D.
33.03 ELECTRICAL METER.
33.04 POWER POLE.

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

LICENSED ARCHITECT
LAWRENCE SCARPA
C 21812
REN 10/31/2023
STATE OF CALIFORNIA

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED •

BUREAU OF ENGINEERING
VERTICAL CONTROL:
HORIZONTAL CONTROL:
SHEET TITLE: ENLARGED PLAN
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

DEPARTMENT OF PUBLIC WORKS
NO. REVISIONS: DATE: BY:
CIP NO.
INDEX NO.

CITY OF LOS ANGELES
GARY LEE MOORE, P.E. ENV SP
DESIGN GROUP
CITY ENGINEER DATE:
ENGINEER:
DESIGNED BY:
DRAWN BY:
CHECKED BY:
APPROVED BY:

WORK ORDER NO.
E170121B

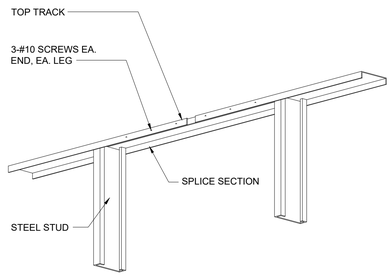
SHEET NAME
A4.50
SHEET X OF X SHEETS

REVISION DATES (DESIGN STAGE ONLY)

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

Sheet Version 4.0

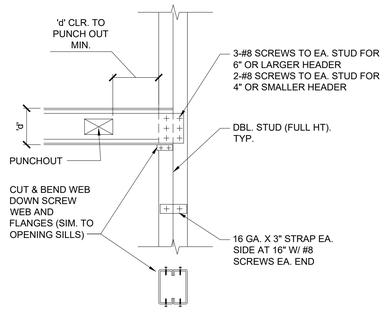
Z:\B□S ARCHITECTURE\019 JOBS\01935.0 CITY OF LA-RESEDA ICE HOCKEY ROLLER RINK\01935.0 1.CURRENT DRAWINGS_24X36\01935.0_A450_24X36.DWG 12/3/2021 9:22 AM



TYP. MTL. STUD TOP TRACK SPLICE & CONNECTION

09

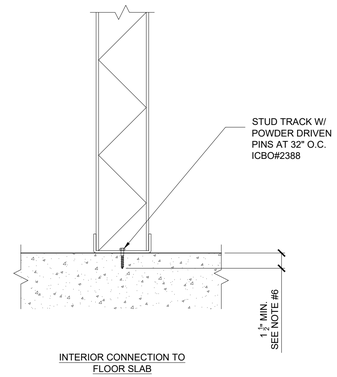
REF: -- SCALE: 1" = 1'-0"



MTL. STUD ELEV. AT JAMB

06

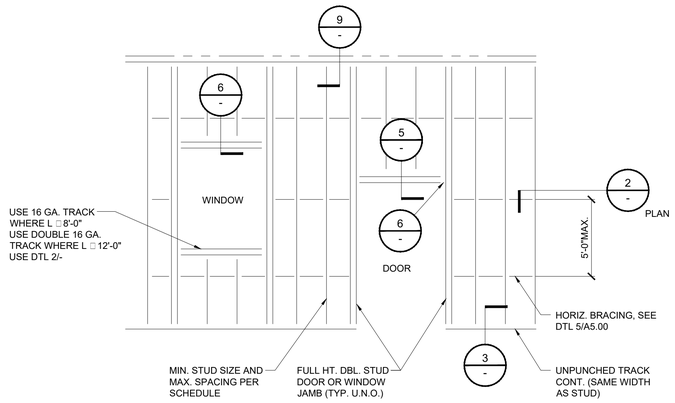
REF: -- SCALE: 1" = 1'-0"



MTL. STUD FLOOR CONNECTIONS

03

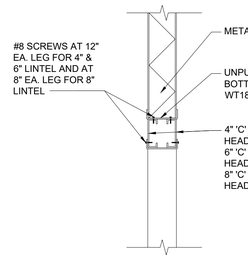
REF: -- SCALE: 1" = 1'-0"



TYP. METAL STUD WALL ELEVATION

08

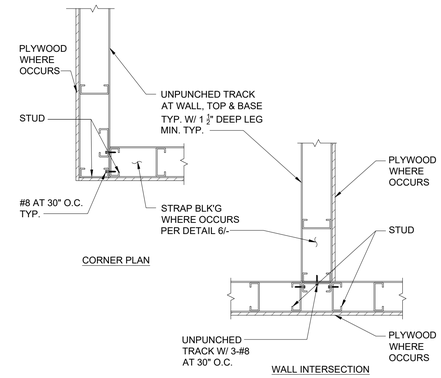
REF: -- SCALE: 1" = 1'-0"



MTL. STUD HEADER SECTION

05

REF: -- SCALE: 1" = 1'-0"



MTL. STUD WALL CONNECTIONS

02

REF: -- SCALE: 1" = 1'-0"

METAL STUD SECTION PROPERTIES
(CODE: CWN)

SECTION	Sxx (in³)	Ixx (in⁴)	SECTION	Sxx (in³)	Ixx (in⁴)
2 1/2" X20 GA.	.165	.206	4" X20 GA.	.305	.609
18 GA.	.209	.261	18 GA.	.388	.777
16 GA.	.255	.318	16 GA.	.477	.954
14 GA.	.309	.386	14 GA.	.582	1.165
3 1/2" X20 GA.	.255	.446	5 1/2" X20 GA.	.471	1.269
18 GA.	.325	.568	18 GA.	.602	1.656
16 GA.	.398	.697	16 GA.	.742	2.040
14 GA.	.485	.849	14 GA.	.910	2.503
3 5/8" X20 GA.	.267	.484	6" X20 GA.	.532	1.597
18 GA.	.340	.617	18 GA.	.681	2.043
16 GA.	.417	.756	16 GA.	.840	2.519
14 GA.	.509	.822	14 GA.	1.031	3.094

DIETRICH, ICBO # 4784P

MAXIMUM SPAN FOR CEILING JOIST INTERIOR STEEL STUDS

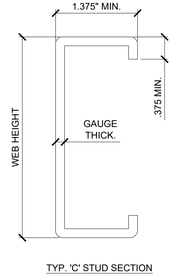
TYPE	GAUGE / SPACING	20	18	16	14	12
STE 20 x4"	12"	13'-4"				
	16"	12'-0"				
STE 20 x6"	12"	17'-6"				
	16"	16'-0"				

DIETRICH, ICBO # 4782

MAXIMUM HEIGHT FOR NON-BEARING INTERIOR STEEL STUDS
(CODE: CWN)

TYPE	GAUGE / SPACING	20	18	16	14
2 1/2"	12"	13'-11"	15'-1"	16'-1"	17'-2"
	16"	12'-8"	13'-8"	14'-8"	15'-7"
	24"	11'-1"	12'-0"	12'-9"	13'-7"
3 1/2"	12"	18'-0"	19'-6"	20'-11"	22'-4"
	16"	16'-4'	17'-9"	19'-0'	20'-3"
	24"	14'-4"	15'-6"	15'-7"	17'-9"
3 5/8"	12"	18'-6"	20'-1"	21'-6"	22'-11"
	16"	16'-10"	18'-3"	19'-6"	20'-3"
	24"	14'-8"	15'-11"	17'-1"	18'-3"
6"	12"	27'-7"	29'-8"	32'-1"	34'-4"
	16"	25'-0'	27'-2"	29'-2"	31'-3"
	24"	21'-10"	23'-9"	25'-6"	27'-3"
8"	12"	34'-10"	37'-10"	40'-7"	43'-7"
	16"	31'-7"	34'-5"	36'-11"	39'-7"
	24"	27'-7"	30'-0"	32'-3"	34'-7"

DIETRICH, ICBO # 4784P



TYP. 'C' STUD SECTION

CEILING JOIST PARTITION SCHEDULE & MTL. "C" STUD SECTION PROPERTIES

04

REF: -- SCALE: 1" = 1'-0"

TYPICAL INTERIOR NON-BEARING METAL STUD DETAILS NOTES:

1. ALL STUD TO TRACK, STUD TO STUD OR TRACK TO TRACK CONNECTIONS MIN. SIZE TEKS SCREWS: NO. 8-18X½" TEKS 2 U.N.O. ON PLANS. FOR 16 GA. AND HEAVIER USE NO. 10-16X¾" TWKS MIN.
2. ALL STEEL STUDS, CHANNELS AND TRACKS TO BE SAME GAUGE U.N.O.
3. STEEL STUDS SHALL NOT BE ERECTED UNTIL AFTER FLOOR SLAB ABOVE HAS BEEN PLACED.
4. SEE SPECIFICATIONS FOR SIZE OF STUDS AND METHOD OF INSTALLATION.
5. STUDS SHALL NOT BE SPLICED EXCEPT AT THE POINT OF LATERAL SUPPORTS.
   - 5.1. WHERE SPLICE IS REQ'D NEST STUDS WITHIN EACH OTHER (12" MIN.) AND SECURE WITH 2-#6 TEKS SCREWS EACH FLANGE AT 1" MAX. FROM END OF EACH PIECE.
6. TRACK FASTENERS (UNLESS NOTED OTHERWISE)
   - 6.1. TYPE: HILTI LOW VELOCITY POWDER DRIVEN FASTENER (DRIVE PINS) (ICBO 1290) PHILLIPS REDHEAD WEDGE ANCHOR (ICBO 1372) (L.A. CITY RR2748)
   - 6.2. POWDER DRIVEN PIN (PDP): 0.145 DIAMETER x 1-1/2" LONG WEDGE ANCHOR: ¼" DIAMETER x 2 -¼" LONG LARR 25889
   - 6.3. SPACING: 32" O.C.MAX. AND 6" MAX. FROM ENDS.
   - 6.4. FASTENERS SHALL NOT BE DRIVEN OR PLACED UNTIL CONCRETE HAS SET 14 DAYS MIN AND SHALL NOT BE PLACED CLOSER THAN 3" TO THE EDGE OF CONCRETE.
7. WHERE APPROVED,WALL FINISH IS PROVIDED FULL HEIGHT BOTH SIDES OF WALL PROVIDE BRIDGING AT MIDHEIGHT OF WALL.
8. WHERE WALL FINISH DOES NOT OCCUR FULL HEIGHT BOTH SIDES OF STUDS REFER TO DETAIL 1/X.XX
9. DO NOT ATTACH TOP OF STUDS TO TOP CONTINUOUS TRACK EXCEPT AS SHOWN ON DETAILS. THE PURPOSE OF THESE DETAILS IS TO ALLOW FOR VERTICAL MOVEMENT DUE TO DEFLECTION. SEE CEILING CONNECTION DETAIL 4B/-.

TYP. INT. NON-BEARING MTL. STUD NOTES

01

REF: -- SCALE: 1" = 1'-0"

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED •

LICENSED ARCHITECT
LAWRENCE SCARPA
C 21812
REN 10/31/2023
STATE OF CALIFORNIA

BUREAU OF ENGINEERING
VERTICAL CONTROL:
HORIZONTAL CONTROL:
SHEET TITLE: METAL STUD DETAILS
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

DEPARTMENT OF PUBLIC WORKS

NO.	REVISIONS	DATE:	BY:

CIP NO.

INDEX NO.

CITY OF LOS ANGELES
CITY ENGINEER
GARY LEE MOORE, P.E. ENV. SP
DESIGN GROUP
DATE:
ENGINEER:
DESIGNED BY:
DRAWN BY:
CHECKED BY:
APPROVED BY:

WORK ORDER NO.
E170121B

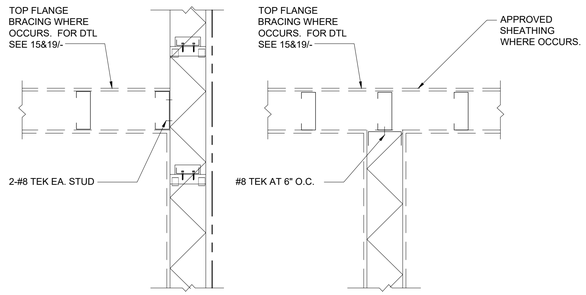
SHEET NAME
A5.00
SHEET X OF X SHEETS

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

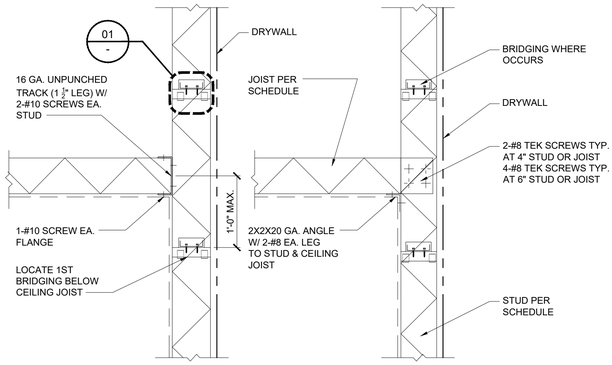
REVISION DATES (DESIGN STAGE ONLY)

Sheet Version 4.0

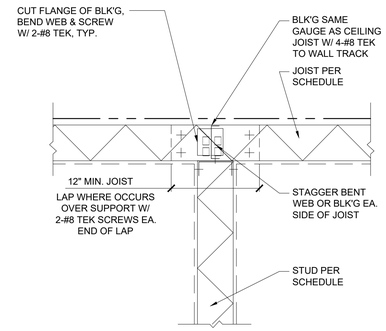
Z:\B□S ARCHITECTURE\019 JOBS\01935.0 CITY OF LA-RESEDA ICE HOCKEY ROLLER RINK\01935.0 1.CURRENT DRAWINGS_24X36\01935.0_A500_24X36.DWG 12/3/2021 9:23 AM



JOISTS PARALLEL TO WALL



JOISTS PERPENDICULAR TO WALL

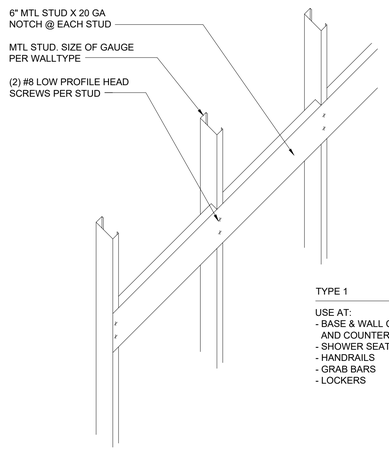


CEILING JOISTS CONTINUOUS OVER WALL

MTL. CLG. JOIST AT STUD WALL CONNECTION

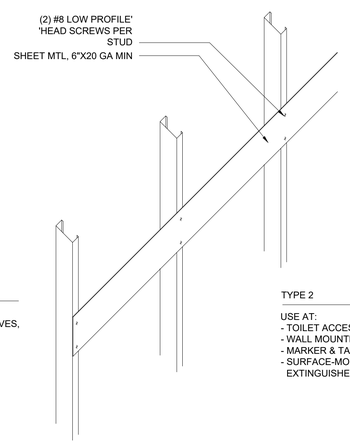
03

REF: -- SCALE: ##########



TYPE 1

USE AT:
- BASE & WALL CABINETS, SHELVES, AND COUNTERS, U.N.O.
- SHOWER SEATS
- HANDRAILS
- GRAB BARS
- LOCKERS



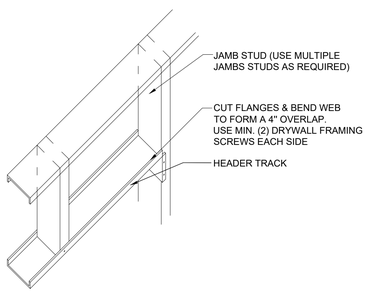
TYPE 2

USE AT:
- TOILET ACCESSORIES
- WALL MOUNTED WALL STOPS
- MARKER & TACK BOARDS
- SURFACE-MOUNTED FIRE EXTINGUISHER

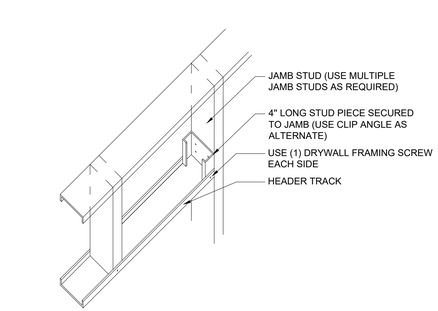
MTL. STUD WALL BACKING PLATES - TYPES 1 & 2

08

REF: -- SCALE: 1" = 1'-0"



OPTION 2

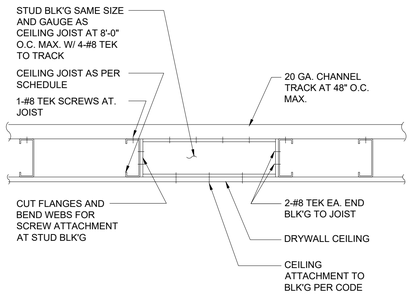


OPTION 1

MTL. STUD WALL AXON AT JAMB AND HEADER

07

REF: -- SCALE: 1" = 1'-0"

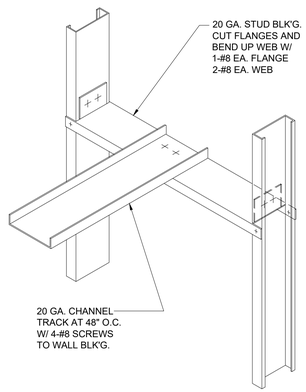


NOTE: BRACING NOT REQ'D WHERE APPROVED CONTINUOUS SHEATHING ATTACHED TO TOP OF JOIST OCCURS. SEE ARCH. DRWGS FOR LOCATION.

TYP. MTL. CLG. JOIST BRACING

05

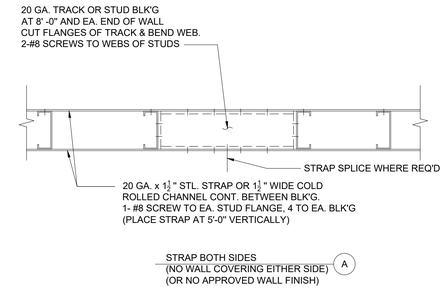
REF: -- SCALE: 1" = 1'-0"



TYP. MTL. END ANCHORAGE OF CHANNEL TRACK

04

REF: -- SCALE: 1" = 1'-0"



NOTE:
BRIDGING OR STRAPING NOT REQ'D WHEN APPROVED WALL COVER OCCURS BOTH SIDES U.N.O. ALSO SEE NOTE #7 ON DETAIL1/XXX

PLAN VIEW

TYP. MTL. STUD INTERMITTENT BRACING

01

REF: -- SCALE: 1" = 1'-0"

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

LICENSED ARCHITECT LAWRENCE SCARPA C 21812 REN 10/31/2023 STATE OF CALIFORNIA

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED •

BUREAU OF ENGINEERING

VERTICAL CONTROL:
HORIZONTAL CONTROL:
SHEET TITLE: METAL STUD DETAILS
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

DEPARTMENT OF PUBLIC WORKS

NO.	REVISIONS:	DATE:	BY:

CIP NO.

INDEX NO.

CITY OF LOS ANGELES

CITY ENGINEER
DATE:
GARY LEE MOORE, P.E. ENV SP
DESIGN GROUP:
ENGINEER:
DESIGNED BY:
DRAWN BY:
CHECKED BY:
APPROVED BY:

WORK ORDER NO.
E170121B

SHEET NAME
A5.01
SHEET X OF X SHEETS

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REVISION DATES (DESIGN STAGE ONLY)

Sheet Version 4.0

Z:\B□S ARCHITECTURE\019 JOBS\01935.0 CITY OF LA-RESEDA ICE HOCKEY ROLLER RINK\01935.0 1.CURRENT DRAWINGS_24X36\01935.0_A501_24X36.DWG 12/3/2021 9:23 AM

DOOR SCHEDULE

DOOR NO.	LOCATION	TYPE	DIMENSIONS WDT	DIMENSIONS HGT	DIMENSIONS THK	MATERIAL	FINISH	FRAME MATERIAL	FRAME FINISH	GLAZING	U- FACT.	S.H.G.C.	RATING	DETAIL SHEET NO. U.O.N. HEAD	DETAIL SHEET NO. U.O.N. THRESH.	DETAIL SHEET NO. U.O.N. JAMB	REMARKS
100.1	ICE RESURFACER ROOM	A	10'-0"	10'-0"	2"	STF/ T. GL	AA	ALUM	AA	1" INSULATED LOW E	-	-	-	01/A6.13	11/A6.13 SIM	02/A6.10	PROVIDE WS. SURFACE CLOSER
100.2	"	B	15'-0"	10'-0"	2"	M	FF	ST	FF	-	-	-	-	12/A6.20	-	15/A6.20	ROLL UP DOOR.
100.3	"	C	3'-0"	7'-0"	1 3/4"	HM	PF	HM	PF	-	-	-	-	08/A6.20	02A/A6.20	07/A6.20	CLOSER.
101.1	ENTRY/LOBBY	D	6'-2"	□/- 9'-5" V.I.F.	1 3/4"	AA/ T. GL	AA	ALUM	AA	1" INSULATED LOW E	0.64	0.28	-	01/A6.12	01/A6.12	02/A6.10	BESAM SL 500 ECODOOR U-FACTOR OR EQUAL AUTOMATIC SLIDING DOOR W/ EMERGENCY BREAKAWAY CAPABILITY FOR EGRESS. HEAD CLOSER.SEE SPECS.
101.2	"	"	"	"	"	"	"	"	"	"	"	"	"	01/A6.12	01/A6.12	02/A6.10	BESAM SL 500 OR EQUAL AUTOMATIC SLIDING DOOR W/ EMERGENCY BREAKAWAY CAPABILITY FOR EGRESS. HEAD CLOSER. SEE SPECS.
101.3	LOBBY	E	6'-0"	7'-0"	1 3/4	HM	PF	HM	PF	-	-	-	-	-	11/A6.20	-	EXIT ONLY. PROVIDE PH. VON DUPRIN 99 SERIES OR EQUAL. HEAD & JAMB DETAILS PER MEMBRANE MANUFACTURER PROPRIETARY SYSTEM,FULLY WATERPROOF.
101.4	"	I	"	"	"	HM/ GL	PF	HM	PF	NOT INSULATED	-	-	-	09/A6.10	10/A6.20	07/A6.20	EXIT ONLY. PROVIDE PH. VON DUPRIN 99 SERIES OR EQUAL
101.5	EXT. GATE	J	3'-0"	7'-0"				HM	PF	-	-	-	-	14/A6.20	-	14/A6.20	EXIT ONLY. PROVIDE PH. VON DUPRIN 99 SERIES OR EQUAL
101.6	LOBBY	C	6'-0"	10'-0"	1 3/4	HM	PF	HM	PF	-	-	-	-	-	11/A6.20	-	EXIT ONLY. PROVIDE PH. VON DUPRIN 99 SERIES OR EQUAL. HEAD & JAMB DETAILS PER MEMBRANE MANUFACTURER PROPRIETARY SYSTEM,FULLY WATERPROOF.
102.1	OFFICE	F	3'-0"	7'-0"	1 3/4"	HM/GL	PF	HM	PF	NOT INSULATED	-	-	-	05/A6.20	02A/A6.20	04/A6.20	CLOSER.
103.1	SKATE SHOP	G	3'-0"	7'-0"	1 3/4"	HM/ GL	PF	HM	PF	NOT INSULATED	-	-	-	05/A6.20	-	04/A6.20	-
104.1	BREAK ROOM	F	3'-0"	7'-0"	1 3/4"	HM/ GL	PF	HM	PF	NOT INSULATED	-	-	-	05/A6.20	02A/A6.20	04/A6.20	CLOSER.
105.1	JANITOR	C	3'-0"	7'-0"	1 3/4"	HM	PF	HM	PF	-	-	-	-	08/A6.20	03/A6.20	07/A6.20	LOUVER PER MECH.
106.1	MEN'S RESTROOM	C	3'-0"	7'-0"	1 3/4"	HM	PF	HM	PF	-	-	-	-	08/A6.20	02A/A6.20	07/A6.20	LOUVER PER MECH. CLOSER.
107.1	WOMEN'S RESTROOM	C	3'-0"	7'-0"	1 3/4"	HM	PF	HM	PF	-	-	-	-	08/A6.20	02A/A6.20	07/A6.20	LOUVER PER MECH. CLOSER.
108.1	VESTIBULE	F	3'-0"	7'-0"	1 3/4	HM/ GL	PF	HM	PF	NOT INSULATED	-	-	-	09/A6.20	10/A6.20	07/A6.20	EXTERIOR DOOR. PROVIDE WS. CLOSER.
109.1	ICE ROOM	H	6'-0"	7'-0"	1 3/4	HM	PF	HM	PF	-	-	-	45 MIN.	09/A6.20	11/A6.20 SIM	07/A6.20	EXTERIOR DOOR. PROVIDE WS. CLOSER.
110.1	MECH/ ELEC. ROOM	H	6'-0"	7'-0"	1 3/4	HM	PF	HM	PF	-	-	-	-	08/A6.20	03/A6.20	07/A6.20	PROVIDE PH. □800AMPS OF ELEC. EQUIPMENT. CLOSER.
111.1	REF. ROOM	C	3'-0"	7'-0"	1 3/4"	HM	PF	HM	PF	-	-	-	-	08/A6.20	02A/A6.20	07/A6.20	CLOSER.
111.2	"	"	"	"	"	"	"	"	"	"	"	"	"	08/A6.20	02A/A6.20	07/A6.20	LOUVER PER MECH. CLOSER.
112.1	GIRL'S ROOM	"	"	"	"	"	"	"	"	"	"	"	"	08/A6.20	02A/A6.20	07/A6.20	CLOSER.
112.2	"	"	"	"	"	"	"	"	"	"	"	"	"	08/A6.20	02A/A6.20	07/A6.20	LOUVER PER MECH. CLOSER.
~~113.1~~	~~MECH. ROOM~~	~~H~~	~~6'-0"~~	~~7'-0"~~	~~1 3/4~~	~~HM~~	~~PF~~	~~HM~~	~~PF~~								
114.1	LOCKER ROOM A	C	3'-0"	7'-0"	1 3/4"	HM	PF	HM	PF	-	-	-	-	08/A6.20	02A/A6.20	07/A6.20	CLOSER.
115.1	SHARED BATH 1	"	"	"	"	"	"	"	"	"	"	"	"	08/A6.20	02A/A6.20	07/A6.20	CLOSER.
115.2	"	"	"	"	"	"	"	"	"	"	"	"	"	08/A6.20	02A/A6.20	07/A6.20	LOUVER PER MECH. CLOSER.
115.3	"	"	"	"	"	"	"	"	"	"	"	"	"	08/A6.20	02A/A6.20	07/A6.20	CLOSER.
116.1	LOCKER ROOM B	"	"	"	"	"	"	"	"	"	"	"	"	08/A6.20	02A/A6.20	07/A6.20	CLOSER.
117.1	LOCKER ROOM C	"	"	"	"	"	"	"	"	"	"	"	"	08/A6.20	02A/A6.20	07/A6.20	CLOSER.
118.1	SHARED BATH 2	"	"	"	"	"	"	"	"	"	"	"	"	08/A6.20	02A/A6.20	07/A6.20	CLOSER.
118.2	"	"	"	"	"	"	"	"	"	"	"	"	"	08/A6.20	02A/A6.20	07/A6.20	LOUVER PER MECH. CLOSER.
118.3	"	"	"	"	"	"	"	"	"	"	"	"	"	08/A6.20	02A/A6.20	07/A6.20	CLOSER.
119.1	LOCKER ROOM D	"	"	"	"	"	"	"	"	"	"	"	"	08/A6.20	02A/A6.20	07/A6.20	CLOSER.
120.1	ICE RINK																ICE RINK GATE-SEE SPECS
120.2	"																ICE RINK GATE. SEE SPECS. GATE SHALL REMAIN OPEN DURING PUBLIC SESSION-PROVIDE SIGN
120.3	"																ICE RINK GATE. SEE SPECS. GATE SHALL REMAIN OPEN DURING PUBLIC SESSION-PROVIDE SIGN
120.4	"																ICE RINK GATE-SEE SPECS
120.5	"																ICE RINK GATE-SEE SPECS

REMARKS					
AA	ANOD. ALUM	PF	PAINT FINISH	SP	SINGLE PANE
GL	GLASS	SF	STAIN FINISH	DP	DOUBLE PANE
HM	HOLLOW METAL	HC	HOLLOW CORE	WS	WEATHER STRIP
WD	WOOD	SC	SOLID CORE	KP	KICK PLATE
FF	FACTORY FINISH	PH	PANIC HARDWARE	M	METAL
LS	LOCK SET	PS	PRESSED STEEL	H	HANDLE
CD	CLOSER DEVICE	STF	STOREFRONT	ST	STEEL TUBE
SD	SMOKE DETECTOR	T	TEMPERED GL		

WINDOW SCHEDULE

WINDOW NO.	TYPE	DIMENSIONS WDT	DIMENSIONS HGT	GLAZING TYPE	GLAZING COLOR	GLAZING TEMPERED	FRAME MATERIAL	FRAME FINISH	SHEET NO. HEAD	SHEET NO. JAMB	SHEET NO. MULLION	SHEET NO. SILL	REMARKS
101.A	A	□/- 13'-5" V.I.F.	□/- 6'-2" V.I.F.	-	-	T	STF	AA	01/A6.12	01/A6.10	-	01/A6.12	CURTAINWALL WINDOW
101.B	A	□/- 13'-5" V.I.F.	□/- 7'-11" V.I.F.	-	-	T	STF	AA	01/A6.12	01/A6.11	-	01/A6.12	CURTAINWALL WINDOW

REMARKS			
STF	STOREFRONT	PF	PAINT FINISH
GL	GLASS	STF	STOREFRONT
WD	WOOD	T	TEMPERED GLASS
FF	FACTORY FINISH	AA	ANODIZED ALUMINUM
DG	DOUBLE GLAZE	CL	CLEAR
SG	SINGLE GLAZE	O	OPERABLE
M	METAL	OB	OBSCURE GLASS
WG	WIRE GLASS	SF	STAIN FINISH

GENERAL NOTES:

1. ALL OUT-SWINGING DOORS SHALL HAVE DRIPS AT THE HEAD, TYPICAL. ALL EXTERIOR DOORS SHALL HAVE CLOSERS TO MEET ENERGY (T24) REQUIREMENTS.

2. ALL FIRE RATED DOORS SHALL BE FIRE RATED PER THE REQUIREMENTS OF CBC 2019 T 716.5.

3. ALL GLAZING TO BE TEMPERED PER THE REQUIREMENTS OF CBC 2019 T 2406.1.5.

4. ALL FIRE RATED WINDOWS AND/OR DOORS SHALL BE GLAZED WITH FIRE RATED GLASS PER THE REQUIREMENTS OF CBC 2019 T 716.6.

5. ALL EXTERIOR DOORS SHALL MEET STC 27 AT A MINIMUM.

6. NON-REMOVABLE HINGE PINS ARE REQUIRED ON ALL OUT-SWINGING DOORS.

7. OMIT.

8. PROVIDE PANIC HARDWARE PER CBC 2019 SECT. 1010.1.10. FOR DOORS SERVING ROOMS OR SPACES WITH AN OCCUPANT LOAD OF 50 OR MORE IN A GROUP 'A' OCCUPANCY. EXCEPTION: A MAIN EXIT OF GROUP 'A' SHALL BE PERMITTED TO BE LOCKING IN ACCORDANCE WITH SECT. 1010.1.9.3, WITH OCC. LOAD OF 300 OR LESS AND A READILY VISIBLE DURABLE SIGN IS POSTED ON THE EGRESS SIDE ON OR ADJACENT TO THE DOOR STATING: "THIS DOOR IS TO REMAIN UNLOCKED WHEN THIS SPACE IS OCCUPIED". THE SIGN SHALL BE IN LETTERS 1 INCH (25 MM) HIGH ON A CONTRASTING BACKGROUND.

9. SUPPLY EXTERIOR RATED DOOR CLOSERS AT ALL SITE GATES. GC SHALL PROVIDE. FORCE SHALL MEET ACCESSIBILITY REQUIREMENTS.

10. PROVIDE 1HR RATED DOORS BETWEEN OCCUPANCY 'B' AND 'S-2' TO MEET OCCUPANCY SEPARATION REQUIREMENTS PER CBC 2019 T 508.4.

11. STORAGE ROOM: IF USE OF STORAGE ROOM MEETS CBC 2019 T 509 "INCIDENTAL USES", PROVIDE RATED DOOR AS REQUIRED BY THAT TABLE.

12. MAXIMUM EFFORT TO OPERATE DOORS SHALL NOT EXCEED 8-1/2" POUNDS FOR EXTERIOR DOORS AND 5 POUNDS FOR INTERIOR DOORS. SUCH PULL OR PUSH EFFORT BEING APPLIED AT RIGHT ANGLES TO HINGED DOOR AND AT THE CENTER PLANE OF SLIDING OR FOLDING DOORS. COMPENSATING DEVICES OR AUTOMATIC DOOR OPERATORS MAY BE UTILIZED TO MEET THE ABOVE STANDARDS. WHEN FIRE DOORS ARE REQUIRED, THE MAXIMUM EFFORT TO OPERATE THE DOOR MAY BE INCREASED TO THE MINIMUM ALLOWABLE BY THE APPROPRIATE ADMINISTRATIVE AUTHORITY, NOT TO EXCEED 15 POUNDS (CBC 2019 1126A.4).

13. IF THE DOOR HAS A CLOSER, THEN THE SWEEP PERIOD OF THE CLOSER SHALL BE ADJUSTED SO THAT FROM AN OPEN POSITION OF 70 DEGREES, THE DOOR WILL TAKE AT LEAST 3 SECONDS TO MOVE TO A POINT 3 INCHES FROM THE LATCH, MEASURED TO THE LANDING EDGE OF THE DOOR (CBC 2019 1126A.4.1).

14. THE TYPE OF LATCH AND LOCK REQUIRED FOR ALL DOORS SHALL BE IN ACCORDANCE WITH CBC 2019 SECT. 1126A.6 AND CH 10 SECT. 1008 (CBC 2019 1126A.5).

15. HAND ACTIVATED DOOR LATCHING, LOCKING AND OPENING HARDWARE SHALL BE CENTERED BETWEEN 34 INCHES (762MM) AND 44 INCHES (1118MM) ABOVE THE FLOOR. LATCHING AND LOCKING DOORS THAT ARE HAND-ACTIVATED AND ON AN ACCESSIBLE ROUTE SHALL BE OPERABLE WITH A SINGLE EFFORT BY LEVER TYPE HARDWARE, PANIC BARS, PUSH-PULL ACTIVATING BARS OR OTHER HARDWARE DESIGNED TO PROVIDE PASSAGE WITHOUT REQUIRING THE ABILITY TO GRASP THE OPENING HARDWARE. LOCKED EXIT DOORS SHALL OPERATE CONSISTENT WITH CBC 2019 SECT. 1126A.4 IN THE DIRECTION OF EGRESS. (CBC 2019 1126A.6).

16. OMIT.

17. ALL STEEL FRAMES SHALL BE CURRIES 'KD' AND FULLY WELDED AT EXTERIOR LOCATIONS.

18. OMIT.

19. DOORS SHALL BE READILY OPENABLE FROM THE EGRESS SIDE WITHOUT THE USE OF A KEY OR SPECIAL KNOWLEDGE OR EFFORT.

20. DOOR HANDLES, PULLS, LATCHES, LOCKS AND OTHER OPERATING DEVICES SHALL BE INSTALLED 34 INCHES MINIMUM AND 48 INCHES MAXIMUM ABOVE THE FINISH FLOOR.

21. LEVER OR LEVEL OF ACTUATED LATCHES OR LOCKS SHALL BE CURVED WITH A RETURN TO WITHIN 1/2" OF THE DOOR OR GATE TO PREVENT CATCHING ON THE CLOTHING OF PERSONS DURING EGRESS (CBC 2019 1126A.6.1).

22. DOOR OPENINGS MUST MEET THE SIZE REQUIREMENTS OF CBC SECTION 2019 CH 11B-404.2.3. PER CBC 2019 CH 11B-404.2.3 CLEAR WIDTH, DOOR OPENINGS SHALL PROVIDE A CLEAR WIDTH OF 32" MINIMUM. CLEAR OPENINGS OF DOORWAYS WITH SINGING DOORS SHALL BE MEASURED BETWEEN THE FACE OF THE DOOR AND THE STOP, WITH THE DOOR OPEN 90 DEGREES. OPENINGS MORE THAN 24" DEEP SHALL PROVIDE A CLEAR OPENING OF 36" MINIMUM. THERE SHALL BE NO PROJECTIONS INTO THE REQUIRED CLEAR OPENING WIDTH LOWER THAN 34" ABOVE THE FINISH FLOOR OR GROUND. PROJECTIONS INTO THE CLEAR OPENING WIDTH BETWEEN 34" AND 80" ABOVE THE FINISH FLOOR OR GROUND SHALL NOT EXCEED 4".

EXCEPTIONS: DOOR CLOSERS AND DOOR STOPS SHALL BE PERMITTED TO BE 78" MINIMUM ABOVE THE FINISH FLOOR OR GROUND.

23. THRESHOLDS AT DOORWAYS SHALL BE 1/2" HIGH MAXIMUM. RAISED THRESHOLDS AND CHANGES IN LEVEL AT DOORWAYS SHALL COMPLY WITH SECTIONS CBC 2019 CH11B-302 AND CH11B-303. THE MAXIMUM 1/2" INCLUDES CHANGES IN LEVEL BETWEEN THE FINISH SURFACE ON EACH SIDE OF THE THRESHOLD.

24.-25. OMIT.

26. PER CBC 2019 CH11B-404.2.10 DOOR AND GATE SURFACES, SWINGING DOOR AND GATE SURFACES WITHIN 10 INCHES OF THE FINISH FLOOR OR GROUND MEASURED VERTICALLY SHALL HAVE A SMOOTH SURFACE ON THE PUSH SIDE EXTENDING THE FULL WIDTH OF THE DOOR OR GATE. PARTS CREATING HORIZONTAL OR VERTICAL JOINTS IN THESE SURFACES SHALL BE WITHIN 1/16" OF THE SAME PLANE AS THE OTHER AND BE FREE OF SHARP OR ABRASIVE EDGES. CAVITIES CREATED BY ADDED KICK PLATES SHALL BE CAPPED.

EXCEPTIONS:
A. TEMPERED GLASS DOORS WITHOUT STILES AND HAVING A BOTTOM RAIL OR SHOE WITH THE TOP LEADING EDGE TAPERED AT 60 DEGREES MINIMUM FROM THE HORIZONTAL SHALL NOT BE REQUIRED TO MEET THE 10 INCH BOTTOM SMOOTH SURFACE HEIGHT REQUIREMENT.
B. DOORS AND GATES THAT DO NOT EXTEND TO WITHIN 10 INCHES OF THE FINISH FLOOR OR GROUND SHALL NOT BE REQUIRED TO COMPLY WITH SECTION 11B404.2.10.

27. PER CBC 2019 CH11B-404.2.4.3 RECESSED DOORS AND GATES, MANEUVERING CLEARANCES FOR FORWARD APPROACH SHALL BE PROVIDED WHEN ANY OBSTRUCTION WITHIN 18 INCHES OF THE LATCH SIDE AT AN INTERIOR DOORWAY, OR WITHIN 24 INCHES OF THE LATCH SIDE OF AN EXTERIOR DOORWAY, PROJECTS MORE THAN 8 INCHES BEYOND THE FACE OF THE DOOR, MEASURED PERPENDICULAR TO THE FACE OF THE DOOR OR GATE.

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

LICENSED ARCHITECT
LAWRENCE SCARPA
C 21812
REN 10/31/2023
STATE OF CALIFORNIA

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED •

DEPARTMENT OF PUBLIC WORKS
BUREAU OF ENGINEERING
VERTICAL CONTROL:
HORIZONTAL CONTROL:
SHEET TITLE: DOOR & WINDOW SCHEDULE
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

NO.	REVISIONS:	DATE:	BY:

CIP NO.

INDEX NO.

CITY OF LOS ANGELES
CITY ENGINEER
GARY LEE MOORE, P.E. ENV SP
DATE:
DESIGN GROUP
ENGINEER:
DESIGNED BY:
DRAWN BY:
CHECKED BY:
APPROVED BY:

WORK ORDER NO.
E170121B

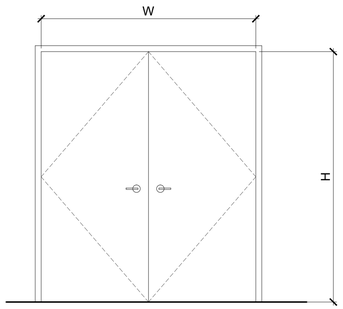
SHEET NAME
A6.00
SHEET X OF X SHEETS

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REVISION DATES (DESIGN STAGE ONLY)

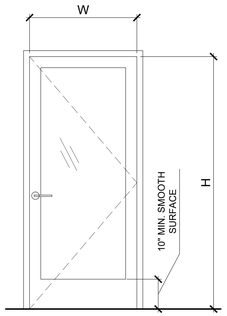
Sheet Version 4.0

Z:\B□S ARCHITECTURE\019 JOBS\01935.0 CITY OF LA-RESEDA ICE HOCKEY ROLLER RINK\01935.0 1.CURRENT DRAWINGS_24X36\01935.0_A600_24X36.DWG 12/3/2021 9:23 AM



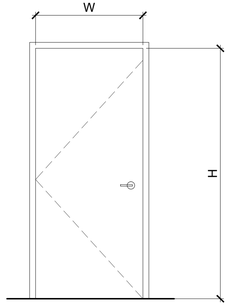
TYPE H

MECH./ ELEC. & ICE ROOM
(PROVIDE LOUVER WHERE
SPECIFIED)



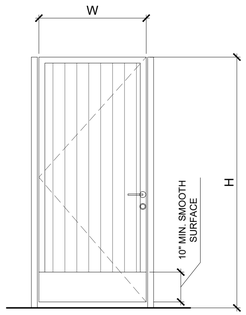
TYPE F

HM DOOR W/ GLAZING



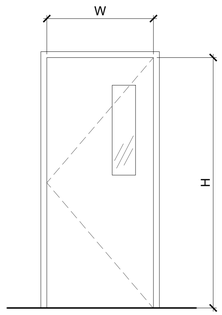
TYPE C

TYP. HM DOOR



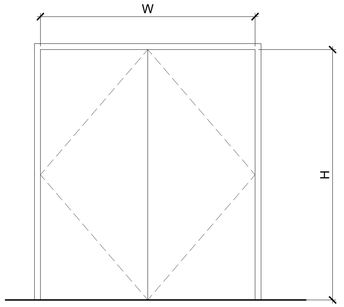
TYPE J

EXT. GATE



TYPE G

HM DOOR W/ VISION LITE

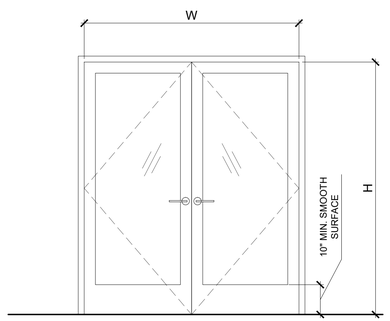


TYPE E

EXTERIOR DOOR @ HOOD

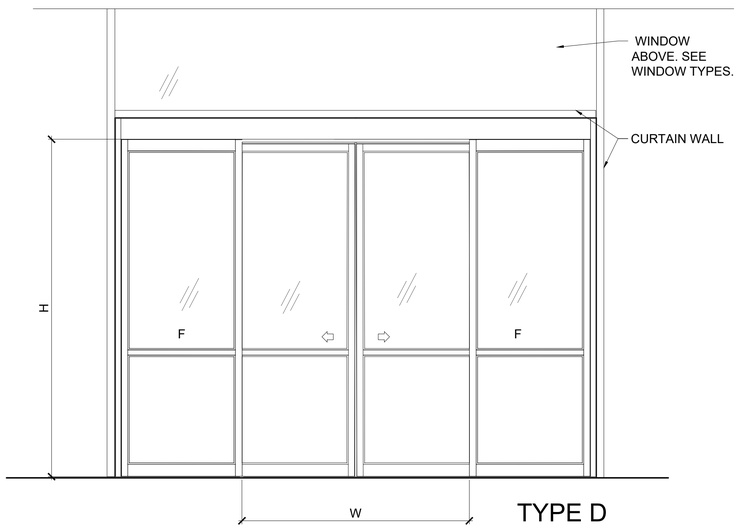
TYPE B

ROLL UP DOOR



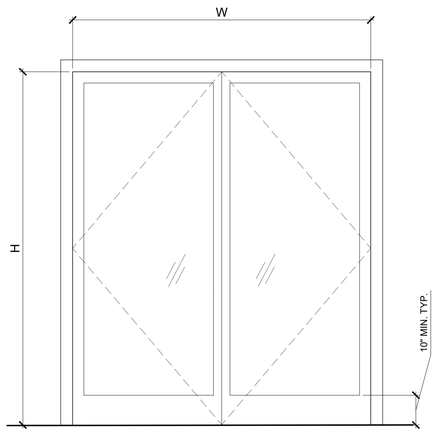
TYPE I

HM DOOR W/ GLAZING



TYPE D

EXTERIOR & INTERIOR SLIDING AUTOMATIC DOOR



TYPE A

EXTERIOR ALUM. STOREFRONT @ ICE RESURFACER
ROOM

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REVISION DATES
(DESIGN STAGE ONLY)

Sheet Version 4.0

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED

LICENSED ARCHITECT
LAWRENCE SCARPA
C 21812
REN 10/31/2023
STATE OF CALIFORNIA

DEPARTMENT OF PUBLIC WORKS
BUREAU OF ENGINEERING

VERTICAL CONTROL:
HORIZONTAL CONTROL:

SHEET TITLE: DOOR TYPES

PROJECT: RESEDA SKATE FACILITY

ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

NO. | REVISIONS: | DATE: | BY:

CIP NO.

INDEX NO.

CITY OF LOS ANGELES

CITY ENGINEER

GARY LEE MOORE, P.E., ENV SP

DESIGN GROUP

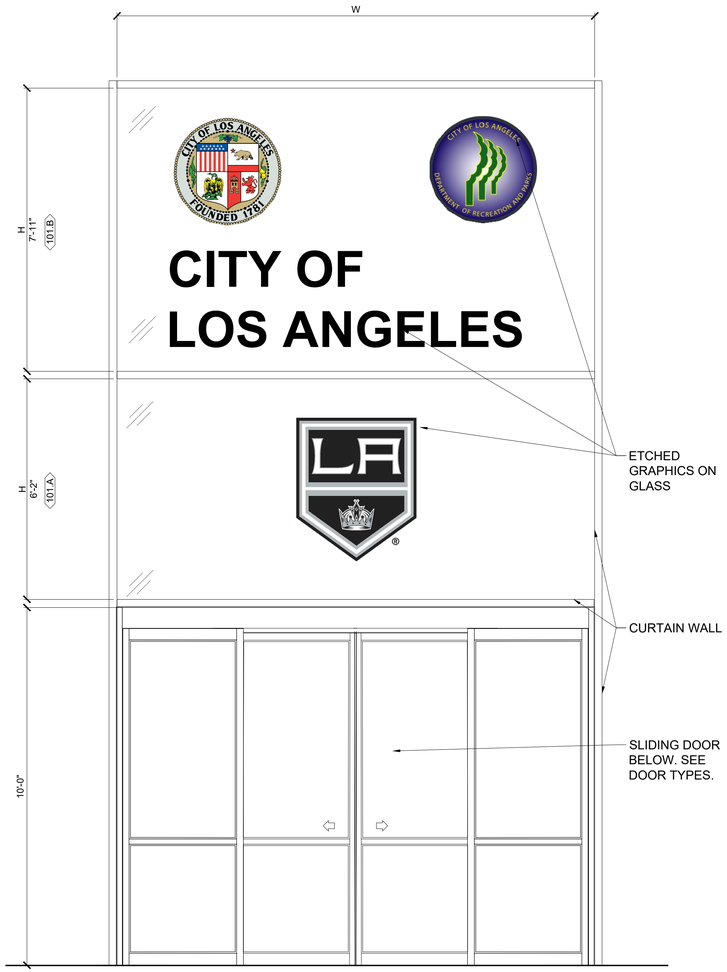
DATE:

ENGINEER:
DESIGNED BY:
DRAWN BY:
CHECKED BY:
APPROVED BY:

WORK ORDER NO.
E170121B

SHEET NAME
A6.01
SHEET X OF X SHEETS

Z:\B□S ARCHITECTURE\019 JOBS\01935.0 CITY OF LA-RESEDA ICE HOCKEY ROLLER RINK\01935.0 1.CURRENT DRAWINGS_24X36\01935.0_A601_24X36.DWG 12/3/2021 9:23 AM



TYPE A

EXTERIOR CURTAINWALL WINDOW

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REVISION DATES (DESIGN STAGE ONLY)

Sheet Version 4.0

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

LICENSED ARCHITECT
LAWRENCE SUARA
C 21812
REN 10/31/2023
STATE OF CALIFORNIA

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED •

BUREAU OF ENGINEERING
VERTICAL CONTROL:
HORIZONTAL CONTROL:
SHEET TITLE: WINDOW TYPES
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

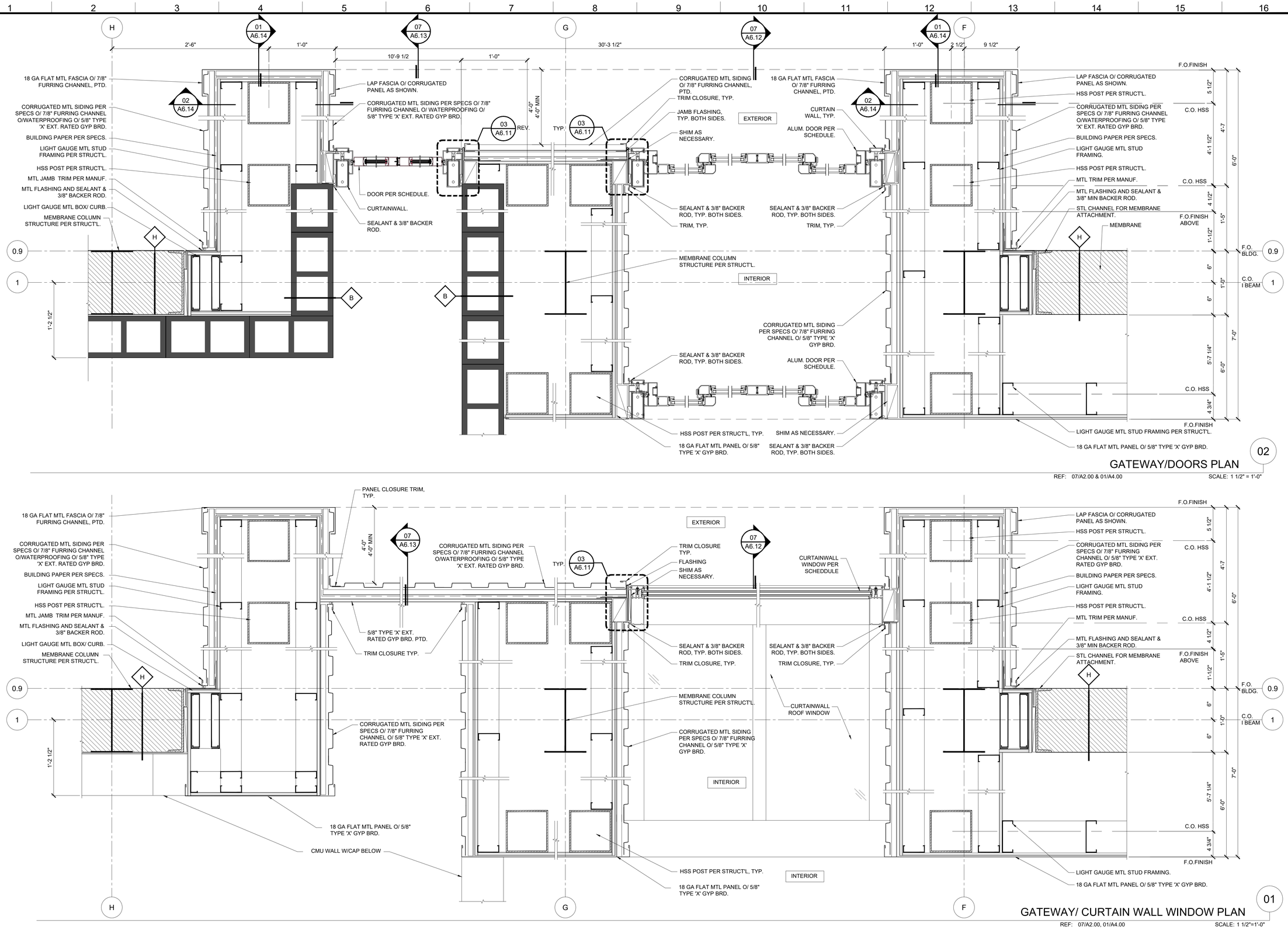
DEPARTMENT OF PUBLIC WORKS
CITY OF LOS ANGELES
NO. | REVISIONS | DATE | BY
CIP NO.
INDEX NO.

CITY ENGINEER
GARY LEE MOORE, P.E., ENV SP
DATE:
DESIGN GROUP
ENGINEER:
DESIGNED BY:
DRAWN BY:
CHECKED BY:
APPROVED BY:

WORK ORDER NO.
E170121B

SHEET NAME
A6.02
SHEET X OF X SHEETS

Z:\B□S ARCHITECTURE\019 JOBS\01935.0 CITY OF LA-RESEDA ICE HOCKEY ROLLER RINK\01935.0 1.CURRENT DRAWINGS_24X36\01935.0_A602_24X36.DWG 12/3/2021 9:23 AM



GATEWAY/DOORS PLAN

REF: 07/A2.00 & 01/A4.00 SCALE: 1 1/2" = 1'-0"

02

GATEWAY/ CURTAIN WALL WINDOW PLAN

REF: 07/A2.00, 01/A4.00 SCALE: 1 1/2"=1'-0"

01

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REVISION DATES (DESIGN STAGE ONLY)

Sheet Version 4.0

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED

LICENSED ARCHITECT
LAWRENCE SCARPA
C 21812
REN 10/31/2023
STATE OF CALIFORNIA

BUREAU OF ENGINEERING

VERTICAL CONTROL:
HORIZONTAL CONTROL:
SHEET TITLE: GATEWAY DETAILS
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

DEPARTMENT OF PUBLIC WORKS

NO.	REVISIONS:	DATE:	BY:

CIP NO.

INDEX NO.

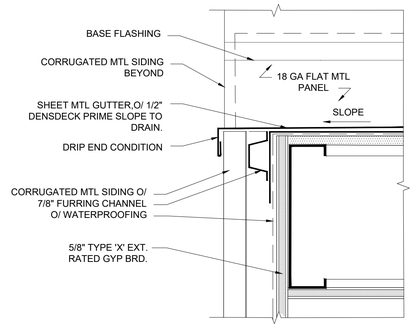
CITY OF LOS ANGELES

CITY ENGINEER
GARY LEE MOORE, P.E., ENV SP
DESIGN GROUP:
DATE:
ENGINEER:
DESIGNED BY:
DRAWN BY:
CHECKED BY:
APPROVED BY:

WORK ORDER NO.
E170121B

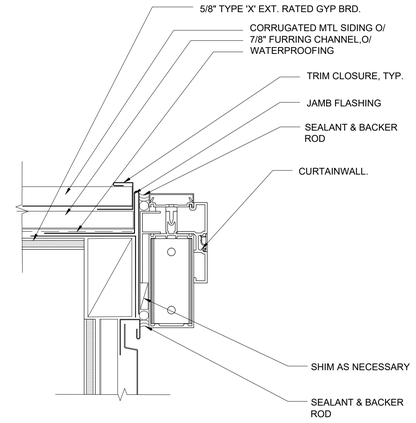
SHEET NAME
A6.10
SHEET X OF X SHEETS

Z:\B□S ARCHITECTURE\019 JOBS\01935.0 CITY OF LA-RESEDA ICE HOCKEY ROLLER RINK\01935.0 1.CURRENT DRAWINGS_24X36\01935.0_A610_24X36.DWG 12/3/2021 9:24 AM



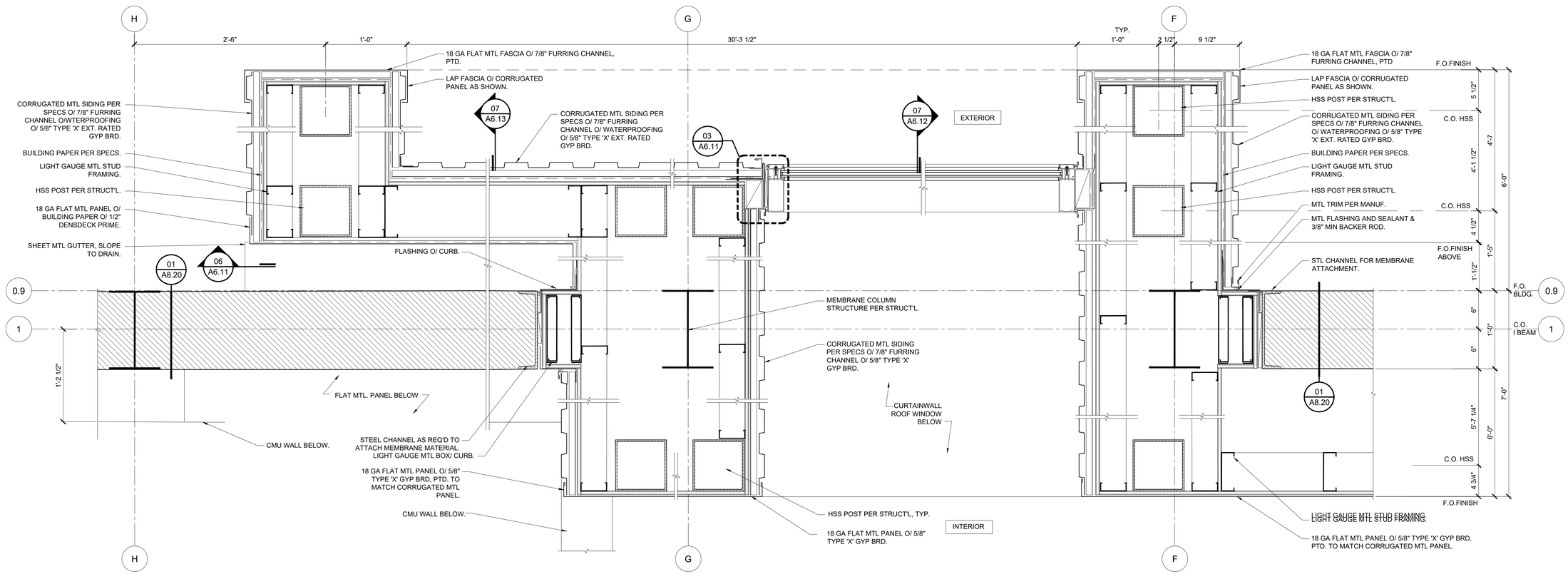
DETAIL @ END OF GUTTER 06

REF: 01/-, A4.50 SCALE: 3" = 1'-0"



JAMB DETAIL @ CURTAINWALL 03

REF: 01/-, A6.10 SCALE: 3" = 1'-0"



GATEWAY CURTAIN WALL WINDOW PLAN 01

REF: 07/A2.00, A4.00, A6.10 SCALE: 1 1/2" = 1'-0"

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REVISION DATES (DESIGN STAGE ONLY)

Sheet Version 4.0

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

LICENSED ARCHITECT
LAWRENCE SCARPA
C 21812
REN 10/31/2023
STATE OF CALIFORNIA

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED •

DEPARTMENT OF PUBLIC WORKS
BUREAU OF ENGINEERING
VERTICAL CONTROL:
HORIZONTAL CONTROL:
SHEET TITLE: GATEWAY DETAILS
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

NO. REVISIONS: DATE: BY:

CIP NO.

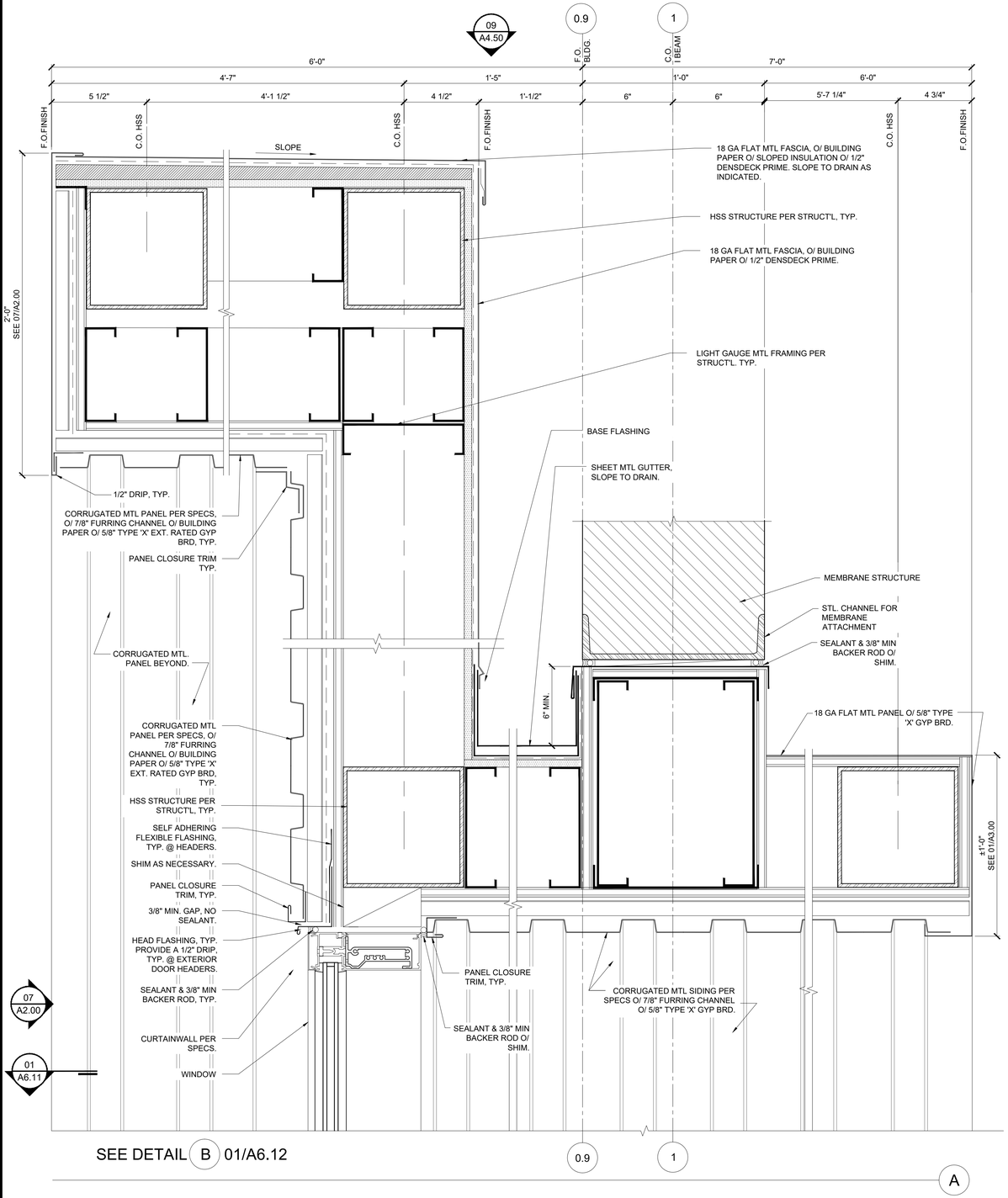
INDEX NO.

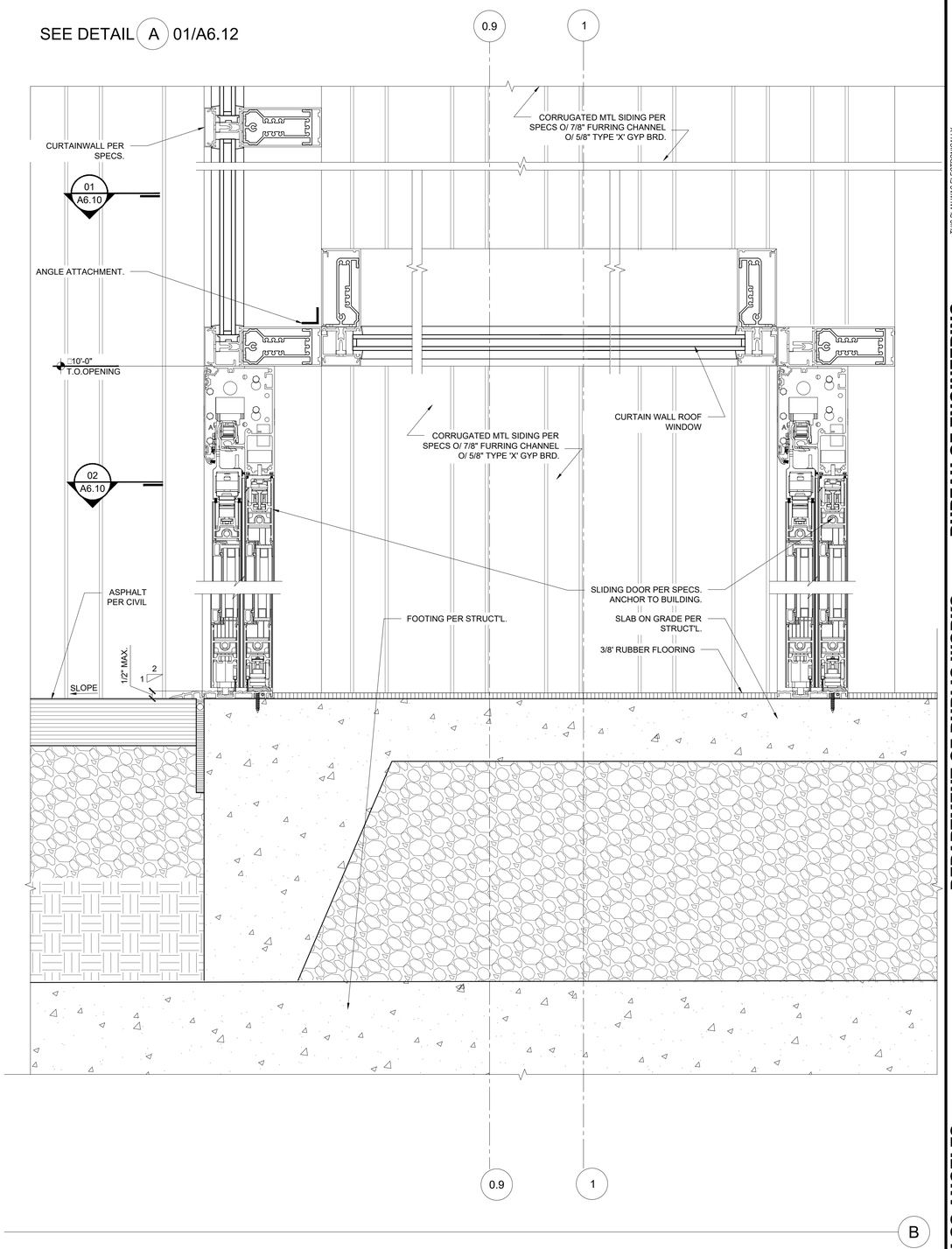
CITY OF LOS ANGELES
GARY LEE MOORE, P.E. ENV SP
CITY ENGINEER
DESIGN GROUP:
DATE:
ENGINEER:
DESIGNED BY:
DRAWN BY:
CHECKED BY:
APPROVED BY:

WORK ORDER NO.
E170121B

SHEET NAME
A6.11
SHEET X OF X SHEETS

Z:\B□S ARCHITECTURE\019 JOBS\01935.0 CITY OF LA-RESEDA ICE HOCKEY ROLLER RINK\01935.0 1.CURRENT DRAWINGS_24X36\01935.0_A611_24X36.DWG 12/3/2021 9:24 AM





01

SECTION @ ENTRY

REF: 07/A2.00, 07/A3.12, A6.10 SCALE: 3" = 1'-0"

REVISION DATES (DESIGN STAGE ONLY)

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

Sheet Version 4.0

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED •

LICENSED ARCHITECT
LAWRENCE SCARPA
C 21812
REN 10/31/2023
STATE OF CALIFORNIA

BUREAU OF ENGINEERING

VERTICAL CONTROL:
HORIZONTAL CONTROL:

SHEET TITLE: GATEWAY DETAILS

PROJECT: RESEDA SKATE FACILITY

ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

DEPARTMENT OF PUBLIC WORKS

NO.	REVISIONS:	DATE:	BY:

CIP NO.

INDEX NO.

CITY OF LOS ANGELES

CITY ENGINEER

GARY LEE MOORE, P.E., ENV SP

DESIGN GROUP

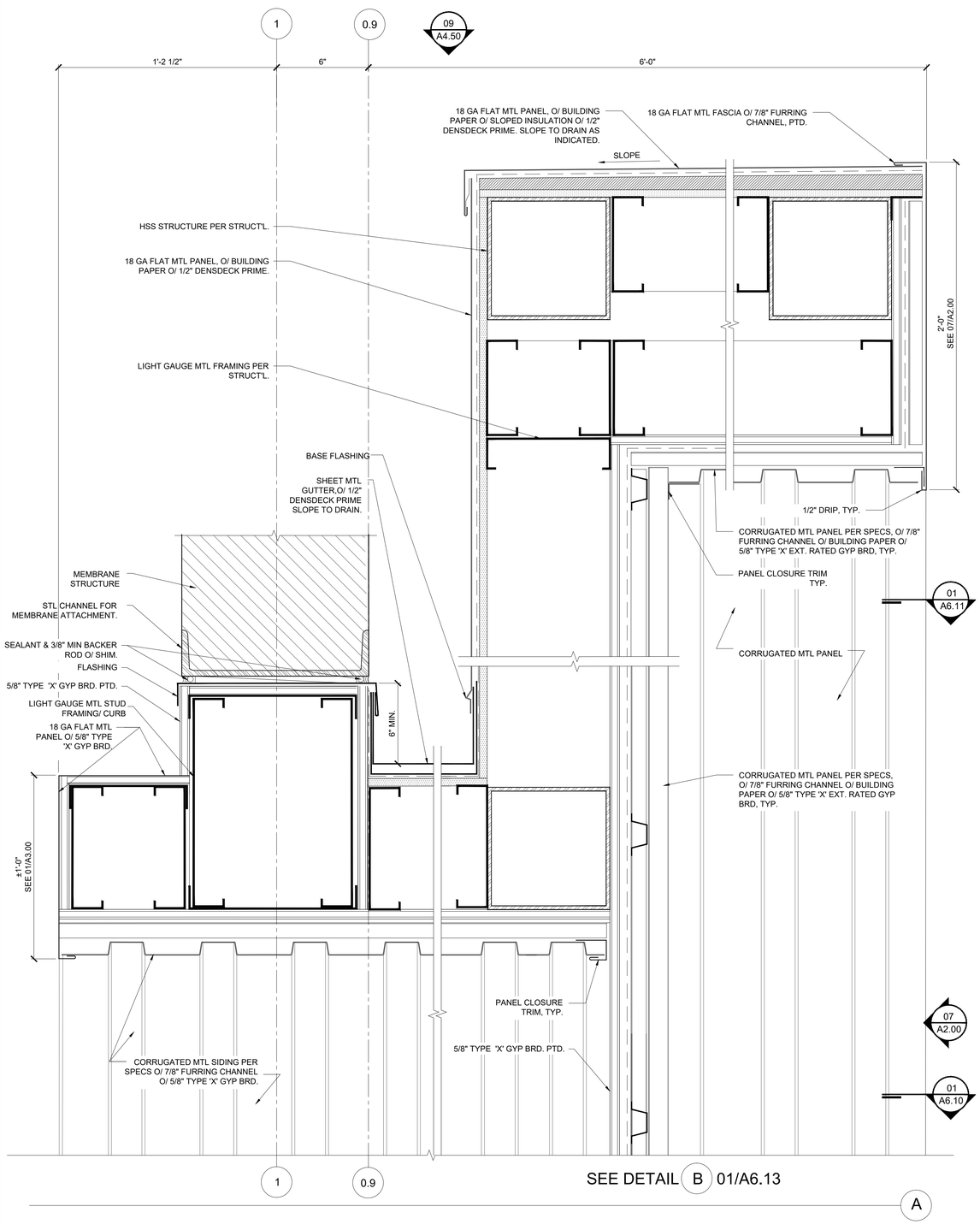
DATE:

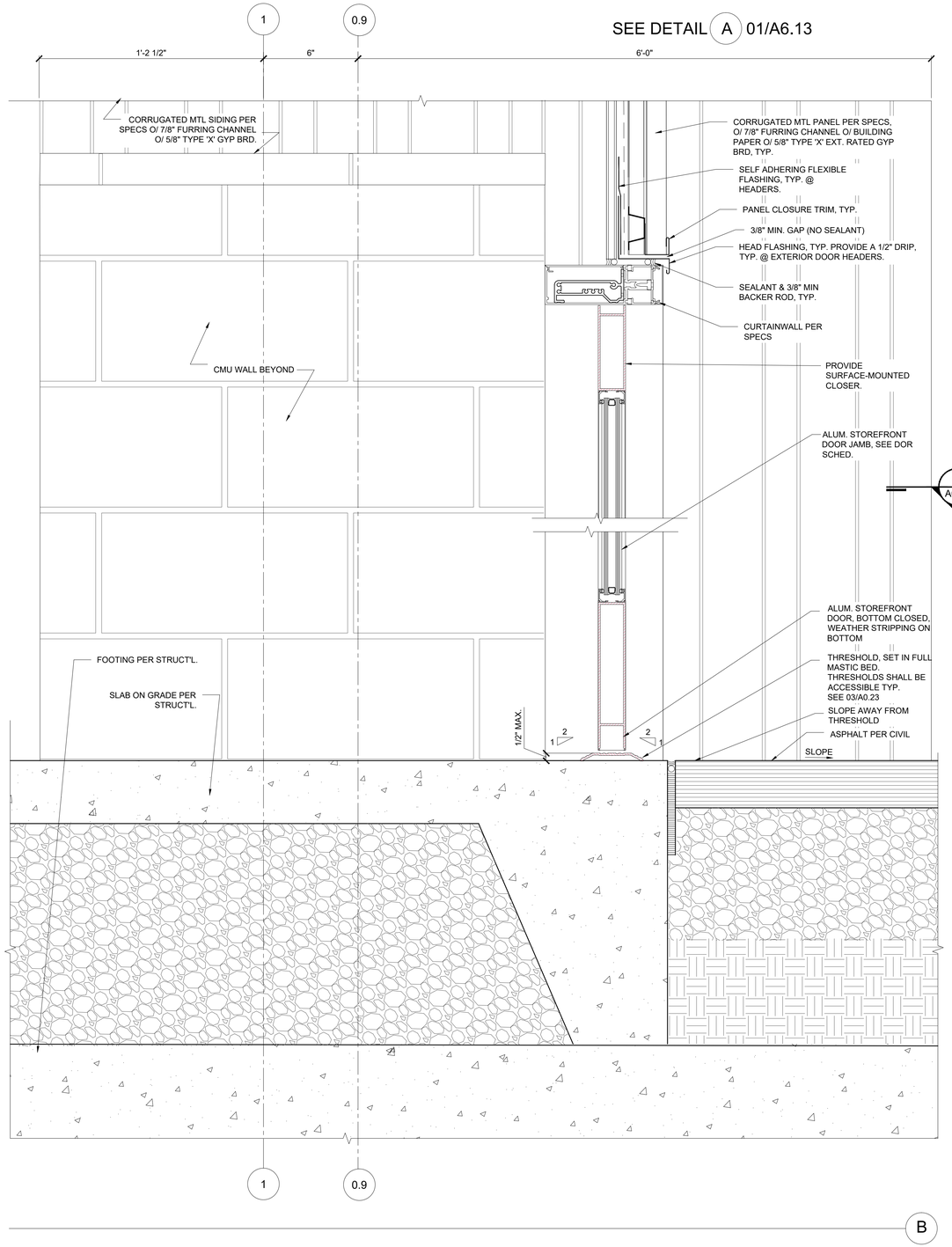
ENGINEER:
DESIGNED BY:
DRAWN BY:
CHECKED BY:
APPROVED BY:

WORK ORDER NO.
E170121B

SHEET NAME
A6.12
SHEET X OF X SHEETS

Z:\B□S ARCHITECTURE\019 JOBS\01935.0 CITY OF LA-RESEDA ICE HOCKEY ROLLER RINK\01935.0 1.CURRENT DRAWINGS_24X36\01935.0_A612_24X36.DWG 12/3/2021 9:24 AM





SECTION @ ICE RESURFACER ROOM & GATEWAY

01

REF: 07/A2.00, A4.00, A6.10, A6.11 SCALE: 3" = 1'-0"

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

LICENSED ARCHITECT
LAWRENCE SUARA
C 21812
REN 10/31/2023
STATE OF CALIFORNIA

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED •

BUREAU OF ENGINEERING

VERTICAL CONTROL:
HORIZONTAL CONTROL:

SHEET TITLE: GATEWAY DETAILS

PROJECT: RESEDA SKATE FACILITY

ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

DEPARTMENT OF PUBLIC WORKS

NO.	REVISIONS:	DATE:	BY:

CIP NO.

INDEX NO.

CITY OF LOS ANGELES

CITY ENGINEER
GARY LEE MOORE, P.E. ENV SP
DESIGN GROUP
DATE:

ENGINEER:
DESIGNED BY:
DRAWN BY:
CHECKED BY:
APPROVED BY:

WORK ORDER NO.
E170121B

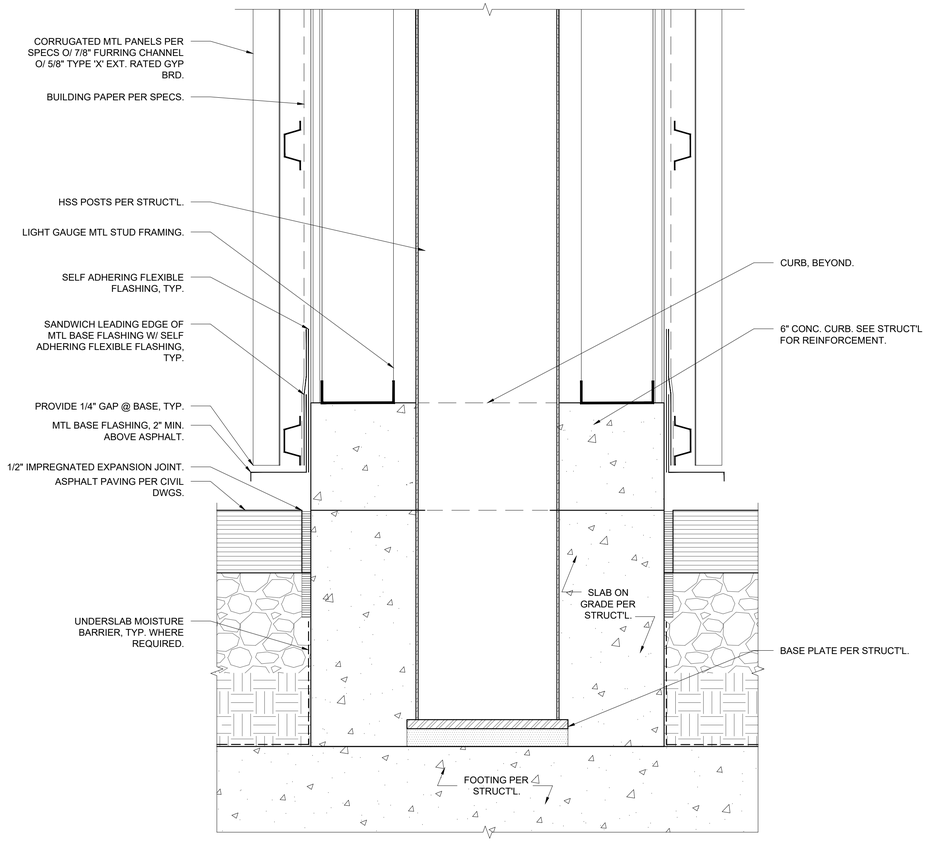
SHEET NAME
A6.13
SHEET X OF X SHEETS

REVISION DATES (DESIGN STAGE ONLY)

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

Sheet Version 4.0

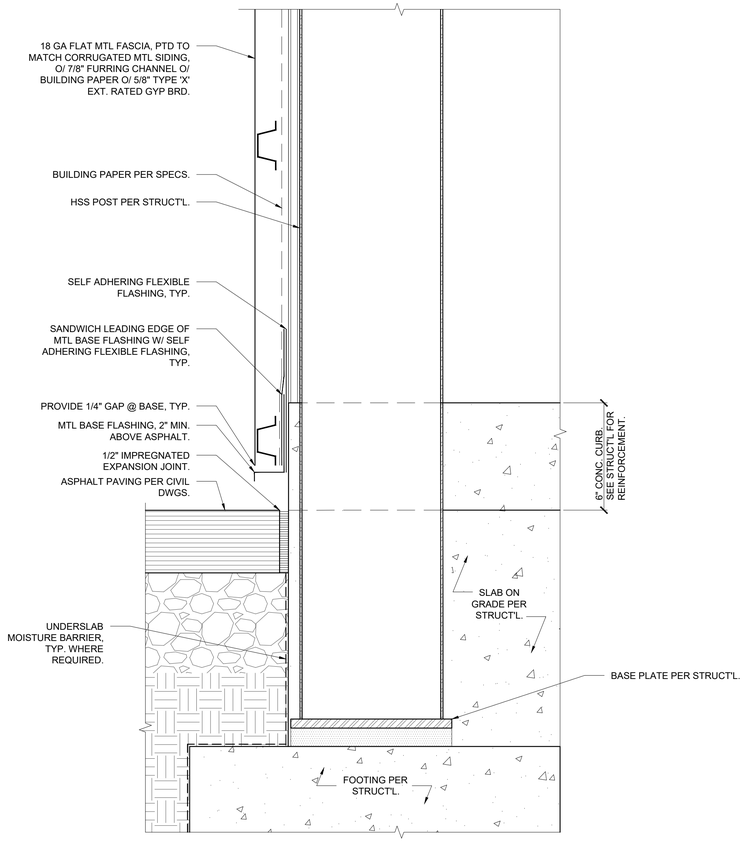
Z:\B□S ARCHITECTURE\019 JOBS\01935.0 CITY OF LA-RESEDA ICE HOCKEY ROLLER RINK\01935.0 1.CURRENT DRAWINGS_24X36\01935.0_A613_24X36.DWG 12/3/2021 9:24 AM



GATEWAY CORRUGATED MTL SIDING @ CONC. CURB DETAIL

04

REF: 07/A2.00, A4.00, A6.10, A6.11 SCALE: 3" = 1'-0"



GATEWAY MTL FASCIA @ CONC. CURB DETAIL

01

REF: 07/A2.00, A4.00, A6.10, A6.11 SCALE: 3" = 1'-0"

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REVISION DATES (DESIGN STAGE ONLY)

Sheet Version 4.0

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

LICENSED ARCHITECT
LAWRENCE SCARPA
C 21812
REN 10/31/2023
STATE OF CALIFORNIA

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED •

DEPARTMENT OF PUBLIC WORKS
BUREAU OF ENGINEERING

VERTICAL CONTROL:
HORIZONTAL CONTROL:
SHEET TITLE: GATEWAY DETAILS
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

NO. | REVISIONS: | DATE: | BY:

CIP NO.

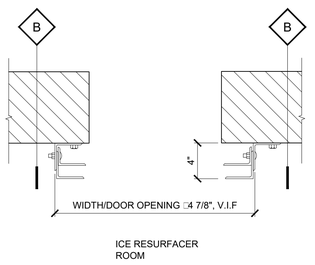
INDEX NO.

CITY OF LOS ANGELES
GARY LEE MOORE, P.E. ENV SP
DESIGN GROUP
ENGINEER:
DESIGNED BY:
DRAWN BY:
CHECKED BY:
APPROVED BY:
CITY ENGINEER
DATE:

WORK ORDER NO.
E170121B

SHEET NAME
A6.14
SHEET X OF X SHEETS

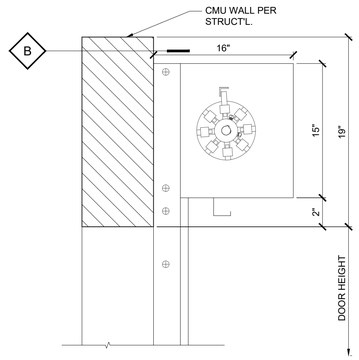
Z:\B□S ARCHITECTURE\019 JOBS\01935.0 CITY OF LA-RESEDA ICE HOCKEY ROLLER RINK\01935.0 1.CURRENT DRAWINGS_24X36\01935.0_A614_24X36.DWG 12/3/2021 9:24 AM



ROLL UP JAMB @ CMU WALL

15

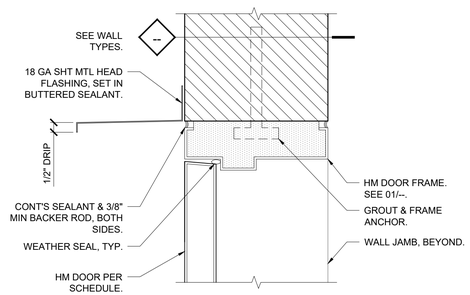
REF: DOOR SCHEDULE SCALE: 1-1/2" = 1'-0"



ROLL UP HEAD @ CMU WALL

12

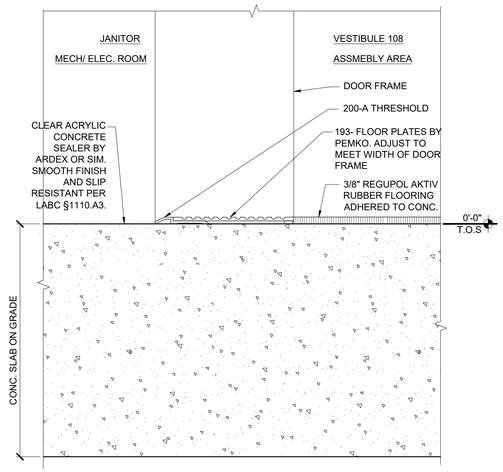
REF: DOOR SCHEDULE SCALE: 1-1/2" = 1'-0"



TYP. EXTERIOR HM HEAD @ CMU WALL

09

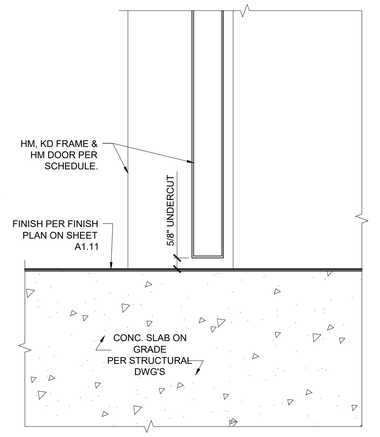
REF: DOOR SCHEDULE, SECTIONS SCALE: 3" = 1'-0"



DOOR THRESHOLD DETAIL

06

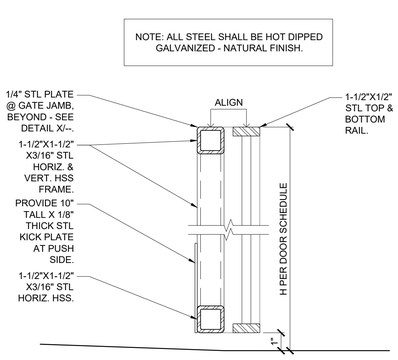
REF: DOOR SCHEDULE SCALE: 3" = 1'-0"



TYP. HM DOOR BOTTOM

03

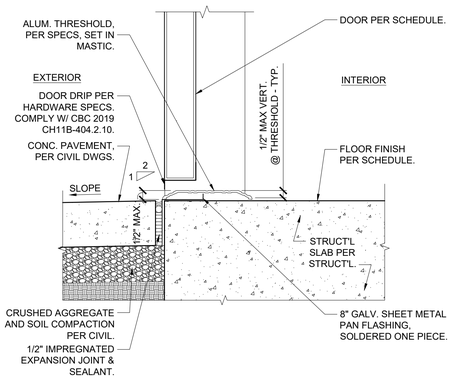
REF: -- SCALE: 3" = 1'-0"



TYP. PICKET GATE SECTION

14

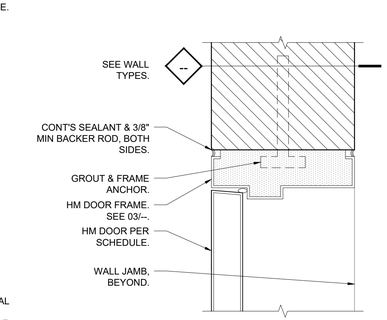
REF: DOOR SCHEDULE, A3.10 SCALE: 3" = 1'-0"



EXT. THRESHOLD @ CONC. PAVEMENT

11

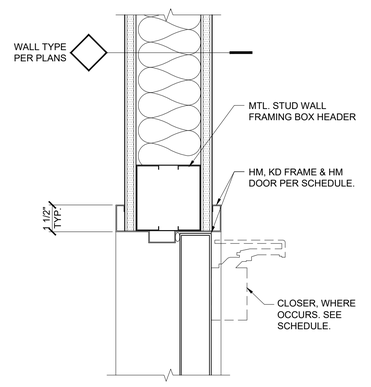
REF: DOOR SCHEDULE, SECTIONS SCALE: 3" = 1'-0"



TYP. HEAD @ CMU WALL

08

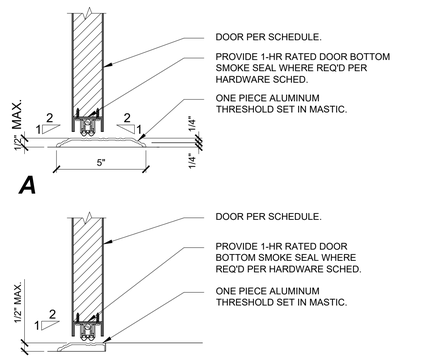
REF: DOOR SCHEDULE, SECTIONS SCALE: 3" = 1'-0"



TYP. HM DOOR HEAD

05

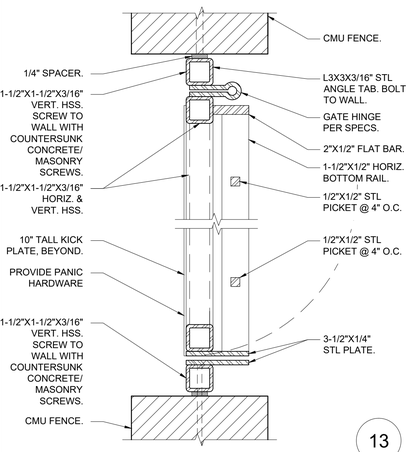
REF: DOOR SCHEDULE, SECTIONS SCALE: 3" = 1'-0"



TYP. DOOR THRESHOLD

02

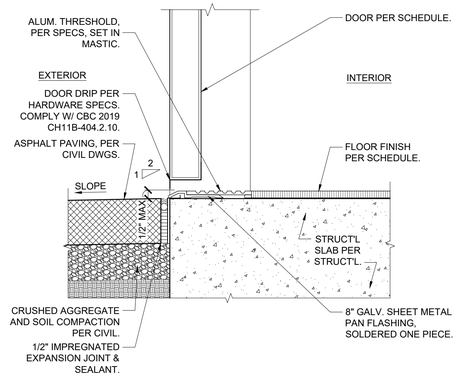
REF: DOOR SCHEDULE SCALE: 3" = 1'-0"



PICKET GATE @ SIDEYARD

13

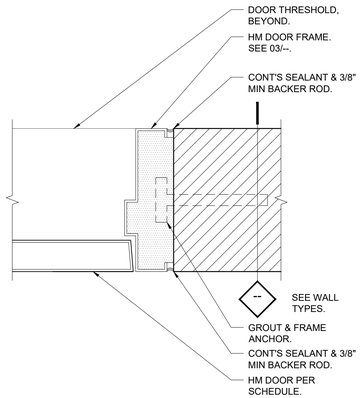
REF: DOOR SCHEDULE, A3.10 SCALE: 3" = 1'-0"



EXT. THRESHOLD @ ASPHALT

10

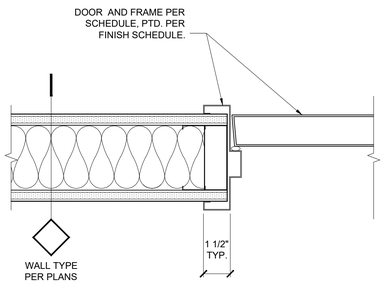
REF: DOOR SCHEDULE, SECTIONS SCALE: 3" = 1'-0"



TYP. JAMB @ CMU WALL

07

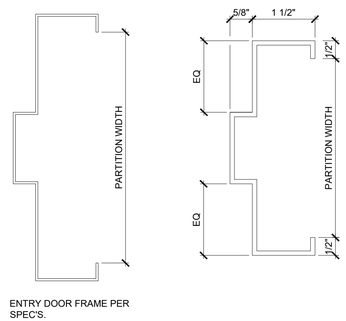
REF: DOOR SCHEDULE, SECTIONS SCALE: 3" = 1'-0"



TYP. HM DOOR JAMB

04

REF: DOOR SCHEDULE, SECTIONS SCALE: 3" = 1'-0"



NOTE: FOR METAL FRAMES SET INTO MASONRY OR CONCRETE, USE 8" WIDTH UNLESS OTHERWISE NOTED. DOOR FRAMES SHALL BE FLUSH-FRAME PROFILE, TYP. FULLY WELD AT ALL EXTERIOR LOCATIONS AND GRIND SMOOTH.

TYP. HM DOOR FRAME

01

REF: -- SCALE: 6" = 1'-0"

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REVISION DATES (DESIGN STAGE ONLY)

Sheet Version 4.0

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

LICENSED ARCHITECT
LAWRENCE SCARPA
C 21812
REN 10/31/2023
STATE OF CALIFORNIA

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED

DEPARTMENT OF PUBLIC WORKS
BUREAU OF ENGINEERING

VERTICAL CONTROL:
HORIZONTAL CONTROL:
SHEET TITLE: DOOR DETAILS
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

NO.	REVISIONS:	DATE:	BY:

CIP NO.

INDEX NO.

CITY OF LOS ANGELES
GARY LEE MOORE, P.E. ENV SP
CITY ENGINEER
DESIGN GROUP
DATE:
ENGINEER:
DESIGNED BY:
DRAWN BY:
CHECKED BY:
APPROVED BY:

WORK ORDER NO.
E170121B

SHEET NAME
A6.20
SHEET X OF X SHEETS

Z:\B□S ARCHITECTURE\019 JOBS\01935.0 CITY OF LA-RESEDA ICE HOCKEY ROLLER RINK\01935.0 1.CURRENT DRAWINGS_24X36\01935.0_A620_24X36.DWG 12/3/2021 9:24 AM

SITE LIGHTING SCHEDULE (SEE ELEC. DWGS)

TYPE NO.	TYPE NAME	MANUFACTURER	MODEL	SIZE	COLOR/ FINISH	LAMP	REMARKS
A	PATHWAY COLUMN	SELUX	EXELIA GEN5 LED, SERIES EXRL	10' H	SS	LED	11
B	AG12 LED @ TREES	BK LIGHTING	ETV140	12" H	SAP	LED	2 @ EA TREE WELL
C	TIVO TAPE UNDER THE BENCH	TIVOLI LIGHTING		MATCH LENGTH OF BENCH		LED	IN EXTRUSION FOR EXTERIOR USE
D	WET LISTED WALL MOUNTED LED UP/DOWNLIGHT	WAC LIGHTING	WS-W2604	6 1/2"	BRUSHED ALUMINUM	LED	WALL MOUNTED
E	SOLAR POWERED OUTDOOR LED LIGHTING	SOLTECH	SUNLIKE TRUNNION	20"	ALUMINUM	LED	WALL MOUNTED
F	(N) RECESSED LED DOWNLIGHT	HALO COMMERCIAL	PR8	8"	MATTE METALLIC SILVER	LED	-
G	POLE MOUNTED	SELUX	Q-AT845-188/ RN6	24' H	SILVER	LED	-

BUILDING LIGHTING SCHEDULE

A1/A2	HIGH BAY LIGHTING FIXTURE	CREE LIGHTING	HXB &KBL SERIES	SEE ELEC. DWGS.	SS	LED	SEE ELEC. DWGS.
B	LED STRIP LIGHT	CREE LIGHTING	LS4C	4'-0"	WHITE	LED	SEE ELEC. DWGS.

ACCESSORY SCHEDULE

ROOM NO.	ROOM NAME	ACCESSORY (QTY.)	MANUFACTURER	MODEL	SIZE	COLOR/ FINISH	REMARKS
105	JANITOR	UTILITY SHELF	BRADLEY	9983	30"	SS	SURFACE MOUNT
106,107	MEN'S & WOMEN'S RESTROOM	COUNTERTOP PAPER TOWEL DISPENSER (2)	BOBRICK	B-526	-	SS	-
		MIRROR (2)	-	-	7'-4' (VIF) x 36"	FRAMELESS	SEE INTERIOR ELEVATIONS
		FLOOR STANDING WASTE RECEPTACLE (2)	BOBRICK	B-2260	-	SS	OPEN TOP-NO COVER
		CIRCULAR WASTE CHUTE FOR MOUNTING IN COUNTERTOPS (2)	BOBRICK	B-529	7' DIA	SS	
		COAT HOOK (8)	BOBRICK	B-542	-	SS	ON EVERY PARTITION DOOR
		GRAB BAR AMBULAT. ACCESS. COMPARTMENT (2)	BRADLEY	382	42"	SS-SATIN	MOUNTED ON PARTITION
		GRAB BAR TOILET (2)	BRADLEY	382	36"	SS-SATIN	CONCEALED MOUNTING
		GRAB BAR TOILET (2)	BRADLEY	382	42"	SS-SATIN	CONCEALED MOUNTING
		PARTITION-MOUNTED TOILET SEAT-COVER DISPENSER, SANITARY NAPKIN DISPOSAL AND TOILET TISSUE DISPENSER-SERVES 2 TOILET COMPARTMENTS (2)	BOBRICK	B-3571	-	SS	ONLY IN WOMEN'S RESTROOM
		ADA RECESSED TOILET SEAT-COVER DISPENSER, SANITARY NAPKIN DISPOSAL & TOILET TISSUE DISPENSER	BOBRICK	B-3574	-	SS	ONLY IN WOMEN'S RESTROOM
		PARTITION-MOUNTED TOILET SEAT-COVER AND TOILET TISSUE DISPENSER-SERVES 2 TOILET COMPARTMENTS (1)	BOBRICK	B-3471	-	SS	ONLY IN MEN'S RESTROOM
		ADA RECESSED TOILET SEAT-COVER DISPENSER & TOILET TISSUE DISPENSER (1)	BOBRICK	B-3474	-	SS	ONLY IN MEN'S RESTROOM
111,112	REF. RESTROOM, GIRL'S RESTROOM	ADA MIRROR (2)	BOBRICK	B-165	18" x 36"	SS	SEE INT. ELEVATIONS
		LAV SOAP DISPENSER (2)	BOBRICK	B-822	34 OZ.	SS	
		TOILET TISSUE DISPENSER (1)	BOBRICK	B-2740	12 1/2" x 4 7/8"	ALUM	ONLY IN REFEREE RESTROOM
		ADA RECESSED SEAT COVER DISPENSER (1)	BOBRICK	B-301	15 3/4" x 11"	SS	ONLY IN REFEREE RESTROOM
		PAPER TOWEL DISPENSER (2)	BOBRICK	B-4262	10 13/16" x 13 1/2" x 4 7/8"	SS	SURFACE MOUNTED.
		WASTE RECEPTACLE W/ COVER (2)	BOBRICK	B-2250	13 3/8" x 13 3/8" x 29 1/2"	SS	FLOOR STANDING.
		COAT HOOK (2)	BOBRICK	B-542	-	SS	
		GRAB BAR TOILET (2)	BRADLEY	382	36"	SS-SATIN	CONCEALED MOUNTING
		GRAB BAR TOILET (2)	BRADLEY	382	42"	SS-SATIN	CONCEALED MOUNTING
		ADA RECESSED TOILET SEAT-COVER DISPENSER, SANITARY NAPKIN DISPOSAL & TOILET TISSUE DISPENSER	BOBRICK	B-3574		SS	ONLLY IN GIRL'S RESTROOM
111, 112, 114,116,117 ,119	REF. ROOM, GIRL'S ROOM, LOCKER ROOMS	LOCKER ROOM MIRROR (6)	BOBRICK	B-165	18" x 54"	SS	SEE INT. ELEVATIONS
115,118	SHARED BATHROOMS 1 & 2	MIRROR (2)	-	-	13' (VIF) x 36"	FRAMELESS	SEE INTERIOR ELEVATIONS
		COUNTERTOP PAPER TOWEL DISPENSER (2)	BOBRICK	B-526	-	SS	-
		LAV SOAP DISPENSER (6)	BOBRICK	B-822	34 OZ.	SS	3 IN EA. SHARED BATHROOM (INCLUDES 1 IN EA. ADA RESTROOM)
		CIRCULAR WASTE CHUTE FOR MOUNTING IN COUNTERTOPS (2)	BOBRICK	B-529	7' DIA	SS	-
		FLOOR STANDING WASTE RECEPTACLE (2)	BOBRICK	B-2260		SS	OPEN TOP-NO COVER
		FOLDING SHOWER SEAT (2)	TEAKWORKSFORYOU	TBF-340160W	24" L X 16" D	WOOD	ADA COMPLIANT
		GRAB BAR SHOWER (2)	BRADLEY	382	48"	SS-SATIN	CONCEALED MOUNTING
		GRAB BAR SHOWER (2)	BRADLEY	382	14"	SS-SATIN	CONCEALED MOUNTING
		SHOWER CURTAIN ROD (4)	BOBRICK	B-207	1" DIA	SS-SATIN	CONCEALED MOUNTING (2)
		ADA MIRROR (2)	BOBRICK	B-165	18" x 36"	SS	-
		PAPER TOWEL DISPENSER IN ADA RESTROOM (2)	BOBRICK	B-4262	10 13/16" x 13 1/2" x 4 7/8"	SS	SURFACE MOUNTED.
		WASTE RECEPTACLE W/ COVER (2)	BOBRICK	B-2250	13 3/8" x 13 3/8" x 29 1/2"	SS	IN ADA RESTROOM
		TOILET TISSUE DISPENSER IN ADA RESTROOM (2)	BOBRICK	B-2740	12 1/2" x 4 7/8"	ALUM	SURFACE MOUNTED.
		ADA RECESSED SEAT COVER DISPENSER (2)	BOBRICK	B-301	15 3/4" x 11"	SS	SURFACE MOUNTED.
		GRAB BAR IN ADA RESTROOM (2)	BRADLEY	382	36"	SS-SATIN	CONCEALED MOUNTING
		GRAB BAR IN ADA RESTROOM (2)	BRADLEY	382	42"	SS-SATIN	CONCEALED MOUNTING
		COAT HOOK (6)	BOBRICK	B-542	-	SS	ALL DOORS

NOTE: SEE A0.23 FOR ALL MOUNTING HEIGHTS

FINISH SCHEDULE

ROOM NO.	ROOM NAME	WALL NORTH MATERIAL	NORTH FINISH	NORTH BASE	WALL SOUTH MATERIAL	SOUTH FINISH	SOUTH BASE	WALL EAST MATERIAL	EAST FINISH	EAST BASE	WALL WEST MATERIAL	WEST FINISH	WEST BASE	FLOOR MATERIAL	FLOOR FINISH	CEILING MATERIAL	CEILING FINISH	REMARKS
100	ICE RESURFACER	CMU	SEAL1	-	CMU	SEAL1	-	CMU	SEAL 1	-	CMU	SEAL 1	-	CONC	SEAL 1	-	-	SEE NOTE #1.
101	ENTRY	SPR/STR	-	-	-	-	-	GB	P1	MDF	CMU	P1	-	CONC	RB	-	-	PROVIDE MDF BASE ON THE GB WALL PER 01/A8.01
102	OFFICE	GB	P1	RB	GB	P1	RB	GB	P1	RB	GB	P1	RB	CONC	RB	-	-	SEE NOTE #1.
103	SKATE STORAGE	GB	P1	RB	GB	P1	RB	GB	P1	RB	GB	GB	RB	CONC	RB	-	-	SEE NOTE #1.
104	BREAK ROOM	GB	P1	RB	GB	P1	RB	GB	P1	RB	GB	P1	RB	CONC	RB	-	-	SEE NOTE #1.
105	JANITOR	CMU	P1	-	CMU	P1	-	CMU	P1	-	CMU	P1	-	CONC	SEAL 1	MTL	P1	SEE NOTE #1.
106	MEN'S RESTROOM	GB	TILE	T.COVE	GB	TILE	T.COVE	CMU	GL.F	COVE	GB	TILE	T.COVE	CONC	RB	GB	P1	SEE NOTE #1.
107	WOMEN'S REST.	GB	TILE	T.COVE	GB	TILE	T.COVE	CMU	GL.F	COVE	GB	TILE	T.COVE	CONC	RB	GB	P1	SEE NOTE #1.
108	VESTIBULE	CMU	P1	-	CMU	P1	-	CMU	P1	-	CMU	P1	-	CONC	RB	MTL	P1	SEE NOTE #1.
109	ICE ROOM	CMU	SEAL1	-	CMU	SEAL1	-	CMU	SEAL1	-	CMU	SEAL1	-	CONC	SEAL 1	MTL	-	SEE NOTE #1.
110	ELEC./MECH	CMU	SEAL1	RB	CMU	SEAL1	RB	CMU	SEAL1	RB	CMU	SEAL1	RB	CONC	SEAL 1	MTL	-	SEE NOTE #1.
111	REF. ROOM	CMU	P1	RB	CMU	P1	RB	CMU	P1	RB	CMU	P1	RB	CONC	RB	MTL	P1	GL.F □COVE ON THE RESTROOM WALLS
112	GIRL'S ROOM	CMU	P1	RB	CMU	P1	RB	CMU	P1	RB	CMU	P1	RB	CONC	RB	MTL	P1	GL.F □COVE ON THE RESTROOM WALLS
~~113~~	~~MECH. ROOM~~																	
114	LOCKER ROOM A	CMU	P1	RB	CMU	P1	RB	CMU	P1	RB	CMU	P1	RB	CONC	RB	MTL	P1	SEE NOTE #1.
115	SHARED BATH. 1	CMU	GL.F	COVE	CMU	GL.F	COVE	CMU	GL.F	COVE	CMU	GL.F	COVE	CONC	RB	MTL	P1	ALL WALLS SHALL HAVE GL.F. FLOOR @ SHOWERS IS CONC.
116	LOCKER ROOM B	CMU	P1	RB	CMU	P1	RB	CMU	P1	RB	CMU	P1	RB	CONC	RB	MTL	P1	SEE NOTE #1.
117	LOCKER ROOM C	CMU	P1	RB	CMU	P1	RB	CMU	P1	RB	CMU	P1	RB	CONC	RB	MTL	P1	SEE NOTE #1.
118	SHARED BATH. 2	CMU	GL.F	COVE	CMU	GL.F	COVE	CMU	GL.F	COVE	CMU	GL.F	COVE	CONC	RB	MTL	P1	ALL WALLS SHALL HAVE GL.F. FLOOR @ SHOWERS IS CONC.
119	LOCKER ROOM D	CMU	P1	RB	CMU	P1	RB	CMU	P1	RB	CMU	P1	RB	CONC	RB	MTL	P1	SEE NOTE #1.

MATERIAL LEGEND		FINISH LEGEND		BASE LEGEND	
GB	GYPSUM WALL BOARD, FINISH PER SPECS	P1	INT. PAINT, LOW VOC, SATIN FINISH.	T. COVE	CERAMIC TILE COVE BASE
CONC	CONCRETE	P2	INT. PAINT, LOW VOC, GLOSSY FINISH.	MDF	4" PAINTED TO MATCH THE WALL. FLUSH W/ GYP
STR	STOREFRONT	GL.F	GLAZED FINISH SPECTRA SUPPLIED BY ANGELUS BLOCK	RB	RUBBERBASE BY REGUPOL
CMU	CMU PRECISION BLOCK WALL BY ANGELUS BLOCK	RB	RUBBER FLOORING	COVE	COVE BASE W/ SPECTRA GLAZED FINISH SUPPLIED BY ANGELUS BLOCK
TILE	CERAMIC TILE BY DALTILE	ALUM	ALUMINUM		
MTL	METAL DECK	SEAL 1	CLEAR SEALER	NOTES:	
SPR	SPRUNG-TYPE MEMBRANE			1. ARCHITECT TO SELECT COLORS FOR PAINT & STAINS.	

PLUMBING FIXTURE SCHEDULE

ROOM NO.	ROOM NAME	FIXTURE	MANUFACTURER	MODEL	SIZE	COLOR/ FINISH	REMARKS
104	BREAK ROOM	SINK FAUCET	DELTA	B1310LF	-	CHROME	
		SINK	KOHLER	VAULT K-3996-1	SS	-	REAR OUTLET DRAIN (MAINTAIN 1" MAX COUNTERTOP THICKNESS FOR ADA COMPLIANCE)
105	JANITOR	MOP SINK	ADVANCE TABCO	9-OP-40DF	18.5"X25"X16" (VIF)	SS	-
		SERVICE FAUCET	ADVANCE TABCO	K-240	-	-	-
106, 107	MEN'S RESTROOMS, WOMEN'S RESTROOM	TOILET (8)	AMERICAN STANDARD	MADERA FLOWISE 3461001.020	ELONGATED, 16 1/2" HEIGHT	WHITE	(3 IN MEN'S, 5 IN WOMEN'S)FLOOR MOUNT, TOP SPUD, HIGH EFFICIENCY, EVERCLEAN, 1.28 GPF.
		FLUSH VALVE (8)	AMERICAN STANDARD	ULTIMA SELECTRONIC 6065121	-	CHROME	AT TOILETS.
		URINAL (3)	AMERICAN STANDARD	ALLBROOK 6550001.020	-	WHITE	ONLY IN MEN'S RESTROOM. ADA COMPLIANT.
		FLUSH VALVE (3)	AMERICAN STANDARD	SELECTRONIC 606B.051	-	CHROME	AT URINALS. ADA COMPLIANT. PURCHASE POWER KIT SEPARATELY
		LAVATORY (4)	HI-MACS	SINGLE SINK 1715	17" W x 15" L x 5" D	ARCTIC WHITE	INTEGRATED OVERFLOW. ADA COMPLIANT
		FAUCET (4)	AMERICAN STANDARD	MOMENTS SELECTRONIC 2506192.002	-	CHROME	ADA COMPLIANT. HARD-WIRED AC.
111, 112	REF. RESTROOM, GIRL'S RESTROOM	TOILET (2)	AMERICAN STANDARD	MADERA FLOWISE 3461001.020	ELONGATED, 16 1/2" HEIGHT	WHITE	FLOOR MOUNT, TOP SPUD, HIGH EFFICIENCY, EVERCLEAN, 1.28 GPF.
		FLUSH VALVE (2)	AMERICAN STANDARD	ULTIMA SELECTRONIC 6065121	-	CHROME	AT TOILETS.
		LAVATORY (2)	AMERICAN STANDARD	DECORUM 9024.011EC	20" W x 18 1/4" L x 5" D	WHITE	RIGHT HAND SOAP DISPENSER.
		FAUCET (2)	AMERICAN STANDARD	MOMENTS SELECTRONIC 2506192.002	-	CHROME	ADA COMPLIANT. HARD-WIRED AC.
115, 118	SHARED BATHROOM 1 & 2	LAVATORY (4)	HI-MACS	SINGLE SINK 1715	17" W x 15" L x 5" D	ARCTIC WHITE	INTEGRATED OVERFLOW. ADA COMPLIANT
		FAUCET (6)	AMERICAN STANDARD	MOMENTS SELECTRONIC 2506192.002	-	CHROME	ADA COMPLIANT. HARD-WIRED AC.
		TOILET (2)	AMERICAN STANDARD	MADERA FLOWISE 3461001.020	ELONGATED, 16 1/2" HEIGHT	WHITE	FLOOR MOUNT, TOP SPUD, HIGH EFFICIENCY, EVERCLEAN, 1.28 GPF.
		LAVATORY (2)	AMERICAN STANDARD	DECORUM 9024.011EC	20" W x 18 1/4" L x 5" D	WHITE	RIGHT HAND SOAP DISPENSER.

NOTES:	LAV SINK AT SHARED BATHROOMS (NOT IN ADA WATER CLOSETS), MEN'S AND WOMEN'S RESTROOMS IS AN INTEGRAL BOWL SOLID SURFACE COUNTERTOP BY 'LG HI-MACS' OR EQUAL.
	INSTALL GRAB BARS @ ALL ACCESSIBLE STALLS.
	COUNTERTOP/ BACKSPLASH AT BREAK ROOM IS SOLID SURFACE BY 'CORIAN' OR EQUAL.
	SEE DWGS. FOR CLEARANCES ASSOCIATED WITH PLUMB. FIXTURES.
(LEED 3.1)	HIGH-EFF. FIXTURES ARE SPECIFIED FOR:
	A) LAV FAUCETS ≤ 2GPM AVG. FLOW RATE.
	B) TOILETS ≤ 1.30GPM AVG. FLOW RATE.
	C) SHOWERS ≤ 2GPM AVG. FLOW RATE.

APPLIANCES

ROOM NO.	ROOM NAME	MANUFACTURER	ENERGY STAR	MODEL	SIZE	FINISH	REMARKS
104	BREAK ROOM	GE	YES	GTE17GTN/GSN	16.6 CU	S.S	

GENERAL NOTES:

1. WALL AND CEILING MATERIALS SHALL NOT EXCEED THE FLAME SPREAD INDEX PER CBC 2019 T803.11.

2. PER CBC 2019 SECTION 11B-302.1, FLOOR AND GROUND SURFACES SHALL BE STABLE, FIRM AND SLIP RESISTANT.

3. CHANGES IN LEVEL SHALL COMPLY WITH CBC 2019 SECTION 11B-303.

4.- 6. OMIT

7. ALL APPLIANCES SHALL BE ENERGY STAR RATED IF SUCH A DESIGNATION EXISTS FOR THAT APPLIANCE.

8. NON PAPER-FACED, MOLD AND WATER RESISTANT DRYWALL SHALL BE USED IN ALL BATHROOMS.

9. THE FLOW RATES FOR ALL PLUMBING FIXTURES SHALL COMPLY WITH THE MAXIMUM FLOW RATES SPECIFIED IN CBC SECTION 4.303.1.

10. CERAMIC TILE AT ALL BATHROOM WALLS SHALL BE THIN-SET, WHITE, 'SEMI-GLOSS' FINISH WITH WHITE GROUT, 3" x 6" SIZE IN RUNNING BOND PATTERN, WITH TOP WAINSCOT TILE TO HAVE EASED/ ROUND TOP EDGE AND BOTTOM WALL TILE SHALL HAVE COVE BASE, TYP. WHERE LOCATED AT FLOOR. PROVIDE 'REDGARD' ELASTOMERIC WATERPROOFING MEMBRANE OR EQUAL.

11. INSTALL GRAB BARS AT TOILETS & TUBS OF ACC. BATHROOMS PER ACCESSORY SCHEDULE & PLANS.

12. NEW PLUMBING FIXTURES AND FITTING SHALL NOT EXCEED THE MAXIMUM ALLOWABLE FLOW RATES SPECIFIED IN CBC SECTION 5.303.3

13. OMIT

14. BASE CABINETS SHALL BE REMOVABLE UNDER 'WORK SPACE'. 'SINK SPACE' HAS NO BASE CABINETS BUT HAS A 'CABINET DOOR' KICK PANEL AND FLOORING SHALL EXTEND UNDER THE COUNTER TO THE WALL, TYPICAL.

15. DEPTH OF KITCHEN SINK BOWL SHALL BE 6-1/2" MAX. (ONLY ONE BOWL OF DOUBLE-SINK BOWL SINK SHALL COMPLY).

16. MAX. HT. SHALL BE 46" FOR 50% OF SHELVING IN KITCHEN (OBSTRUCTED HIGH SIDE REACH).

17. ALL CABINET PULLS SHALL BE TRIMCO, TYP. #562-3

18.-19. OMIT.

20. MIRRORS SHALL BE INSTALLED W/ THE BOTTOM EDGE NO HIGHER THAN 40" A.F.F. TO REFLECTING SURFACE, TYP.

21. SEE SHEET A0.23-A0.25 FOR ADDITIONAL INFORMATION.

22. -23. OMIT.

24. ALL SOLID SURFACE COUNTERTOPS SHALL HAVE A SIDE SPLASH AT ADJOINING WALL.

25. SEE SHEET A0.23 FOR MOUNTING HEIGHTS OF FIXTURES, MIRRORS, SINKS, TOILETS, ETC.

26. ALL KITCHEN SINKS AND ALL LAVS AT BATHROOM COUNTERS SHALL BE 'UNDER-MOUNT' TYPE TO MEET THE 'MAX. 34" COUNTERTOP HEIGHT.'

27. WATER SUPPLY AND DRAIN PIPES UNDER LAVATORIES AND SINKS SHALL BE INSULATED OR OTHERWISE CONFIGURED TO PROTECT AGAINST CONTACT. THERE SHALL BE NO SHARP OR ABRASIVE SURFACES UNDER LAVATORIES AND SINKS . (11B-606.5)

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED

LICENSED ARCHITECT
LAWRENCE SCARPA
C 21812
REN 10/31/2023
STATE OF CALIFORNIA

BUREAU OF ENGINEERING
VERTICAL CONTROL:
HORIZONTAL CONTROL:
SHEET TITLE: SCHEDULES (SHELL & CORE)
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

DEPARTMENT OF PUBLIC WORKS

NO.	REVISIONS:	DATE:	BY:

CIP NO.

INDEX NO.

CITY OF LOS ANGELES
CITY ENGINEER
GARY LEE MOORE, P.E., ENV SP
DESIGN GROUP
ENGINEER:
DESIGNED BY:
DRAWN BY:
CHECKED BY:
APPROVED BY:
DATE:

WORK ORDER NO.
E170121B

SHEET NAME
A7.00
SHEET X OF X SHEETS

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REVISION DATES (DESIGN STAGE ONLY)

Sheet Version 4.0

Z:\B□S ARCHITECTURE\019 JOBS\01935.0 CITY OF LA-RESEDA ICE HOCKEY ROLLER RINK\01935.0 1.CURRENT DRAWINGS_24X36\01935.0_A700_24X36.DWG 12/3/2021 9:24 AM

AUDIO-VIDEO-LIGHTING SPECIALTY EQUIPMENT (OUTDOOR)- INFO PROVIDED BY ASEC						
TYPE		LOCATION (VERIFY W/ PLANS AND OWNER)	MANUFACTURER/ MODEL	QUANTITY (VERIFY W/ PLANS AND OWNER)	COLOR/ FINISH	REMARKS
NO.	NAME					
LC	LED BAR 1 METER IP65	GATEWAY	PER OWNER	15	PER OWNER	OUTDOOR RATED. SECURE IN CEILING AND ON GROUND.
LF	WHITE LED FLOOD IP65	PLANTER	PER OWNER	4	PER OWNER	-
S	OUTDOOR SURFACE SPEAKER	GATEWAY	PER OWNER	2	BLACK OR WHITE	PROVIDE ADAPTER & DSP AMPLIFIER.
AUDIO-VIDEO-LIGHTING SPECIALTY EQUIPMENT (INDOOR) - INFO PROVIDED BY ASEC						
LB	LED BAR 1 METER 6W	LOBBY/ ENTRY, ASSEMBLY AREA	PER OWNER	11	PER OWNER	-
TV	LED STRIP LIGHT	LOBBY/ ENTRY, ASSEMBLY AREA	SAMSUNG 55" 4K	3	PER OWNER	-
LW	WASH CANNON RGBA	ICE RINK	PER OWNER	6	PER OWNER	-
MH	LED MOVING HEAD 200W	ICE RINK, LOBBY/ENTRY	PER OWNER	6	PER OWNER	-
MH2	LED WARM WHITE MOVING HEAD	ICE RINK	PER OWNER	4	PER OWNER	-
MLB	LED BAR MOTORIZED	LOBBY/ ENTRY, ASSEMBLY AREA	PER OWNER	4	PER OWNER	-
S1	15" HIGH POWERED 2-WAY SURFACE SPEAKER	ICE RINK	PER OWNER	6	PER OWNER	-
	SCOREBOARD	-	EVERSAN 20'X4'	1	PER OWNER	SEE SECTIONS, RCP

FURNISHING/ EQUIPMENT SCHEDULE							
ROOM NO.	ROOM NAME	FURNISHING/EQUIPMENT	MANUFACTURER OR EQ.	MODEL	SIZE	COLOR/ FINISH	REMARKS
100	ICE RESURFACER ROOM	ICE RESURFACER	-	-	-	-	SEE R DWGS & SPECS. ELECTRIC.
		SNOW MELT PIT	-	-	SEE A4.00 & R DWGS.	-	SEE R DWGS. CONC. WALLS ARE PART OF S&C SCOPE
101	ENTRY / ASSEMBLY	BLEACHERS	RINKSYSTEMS	-	-	PER OWNER	SEE A1.10, 2 ROWS, NON-COMBUSTIBLE
		SNACK MERCHANDISER	VENDING COM	-	35.2"W x 34.75"D x 72"H	PER OWNER	32 SELECTIONS, OR EQUAL
		COLD BEVERAGE MERCHANDISER	VENDING COM	-	41"W x 38"D x 72" H	PER OWNER	OR EQUAL
		COFFEE VENDING MACHINE	VENDING COM	-	27.5"W x 28D x 72"H	PER OWNER	PROVIDE 15-116PSI (1-8 BAR) PER MANUFACTURER
102	OFFICE	DESKS	PER OWNER	-	SEE A4.00	PER OWNER	-
		CHAIRS	PER OWNER	-	SEE A4.00	PER OWNER	-
		SKATE STORAGE RACK (3)	RINKSYSTEMS	-	SEE A4.00	PER OWNER	FLOOR MOUNTED
103	SKATE STORAGE	SKATE SHARPENER	BLADE MASTER	-	SEE A4.00	PER OWNER	OR EQUAL
		TABLE	PER OWNER	-	SEE A4.00	PER OWNER	-
		SKATE STORAGE RACK	RINKSYSTEMS	-	SEE A4.00	PER OWNER	FLOOR MOUNTED
111, 112, 114,116,117, 119	REF. ROOM, GIRL'S ROOM, LOCKER ROOMS	SHELF W/ EQUIPMENT HOOKS	RINKSYSTEMS	-	-	-	SEE INT. ELEVATIONS
		BENCH	RINKSYSTEMS	-	-	-	SEE INT. ELEVATIONS. WALL MOUNTED W/ BRACKETS
120	ICE RINK	PROTECTIVE NETTING	PER OWNER	-	-	-	SEE NOTES BELOW
		SLED HOCKEY BOXES	PER OWNER	-	-	-	REMOVABLE

NOTES (SEE ALSO MODIFICATION):
1. PROTECTIVE NETTING: PER THE OFFICE OF THE FIRE STATE MARSHALL,THE CALIFORNIA TITLE19 REGULATIONS ALLOWS THE MANUFACTURER OR FABRICATOR TO MEET THE FIRE RESISTANCE REQUIREMENTS BY HAVING THE NETTING TREATED BY A CALIFORNIA LICENSED GENERAL APPLICATOR.

TITLE 19 CALIFORNIA CODE OF REGULATIONS.
ARTICLE 4 REGISTRATION OF FLAME RETARDANT.
1272. FABRIC REGISTRATION MANUFACTURERS WHO MARKET A FLAME RETARDANT FABRIC OR MATERIAL FOR USE AS DRAPERIES, UPHOLSTERY, WALL COVERINGS,ETC., OR A FLAME RETARDANT CANVAS FOR USE IN TENTS, MAY HAVE THEIR PRODUCT LISTED UNDER ITS TRADE NAME AS A REGISTERED FLAME RETARDANT FABRIC OR MATERIAL PROVIDED THAT:
(a) THE FABRIC OR MATERIAL IS TREATED BY A REGISTERED FLAME-RETARDANT APPLICATION CONCERN WITH A REGISTERED CHEMICAL.
CONTRACTOR SHALL ENGAGE A REGISTERED APPLICATOR TO TREAT THE PROTECTIVE NETTING PER THE ABOVE.

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REVISION DATES (DESIGN STAGE ONLY)

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED •

LICENSED ARCHITECT
LAWRENCE SCARPA
C 21812
REN 10/31/2023
STATE OF CALIFORNIA

BUREAU OF ENGINEERING
VERTICAL CONTROL:
HORIZONTAL CONTROL:
SHEET TITLE: SCHEDULES (FF&E)
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

DEPARTMENT OF PUBLIC WORKS
NO. | REVISIONS: | DATE: | BY:

CIP NO.

INDEX NO.

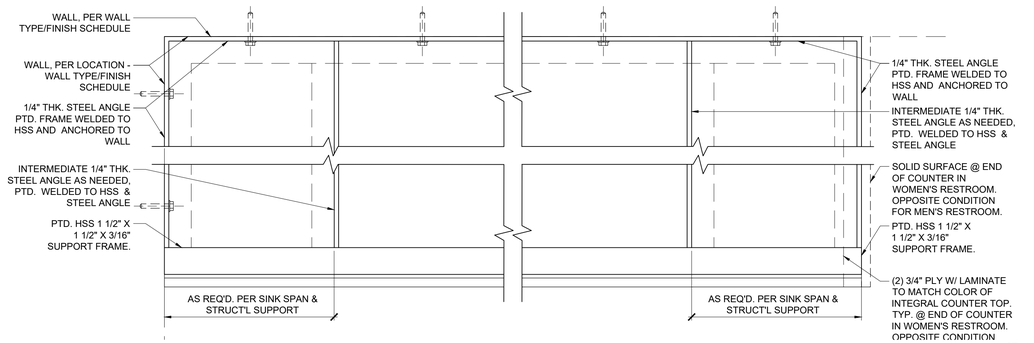
CITY OF LOS ANGELES
CITY ENGINEER
GARY LEE MOORE, P.E. ENV SP
DATE:
DESIGN GROUP:
ENGINEER:
DESIGNED BY:
DRAWN BY:
CHECKED BY:
APPROVED BY:

WORK ORDER NO.
E170121B

SHEET NAME
A7.00A
SHEET X OF X SHEETS

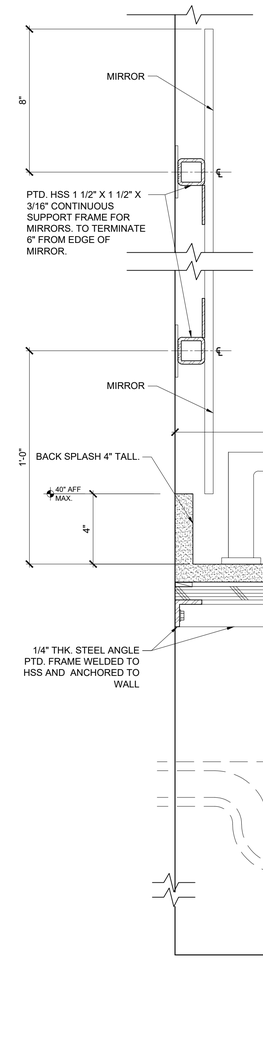
Sheet Version 4.0

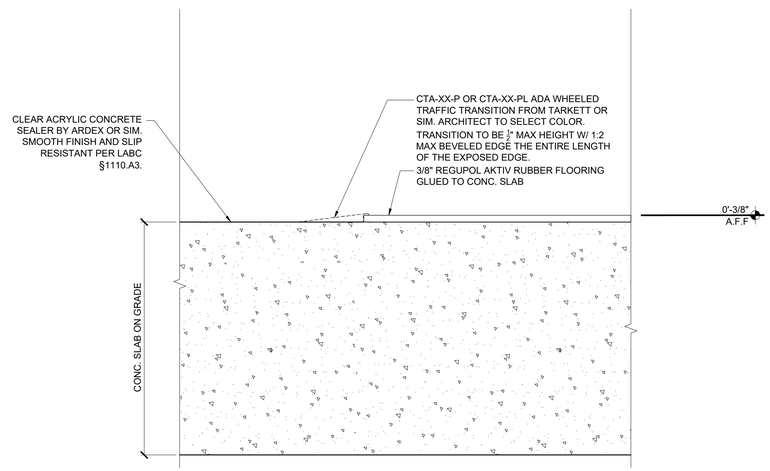
Z:\B□S ARCHITECTURE\019 JOBS\01935.0 CITY OF LA-RESEDA ICE HOCKEY ROLLER RINK\01935.0 1.CURRENT DRAWINGS_24X36\01935.0_A700A_24X36.DWG 12/3/2021 9:24 AM



03 BATHROOM COUNTERTOP SUPPORT FRAME@ SHARED BATHROOMS

REF: A7.10 - A7.13 SCALE: 3" = 1'-0"





04 WHEELED TRAFFIC TRANSITION

REF: SECTIONS,FINISH PLAN, ENLARGED PLANS SCALE: 3" = 1'-0"

01 BATHROOM COUNTERTOP @ SHARED BATHROOMS

REF: A7.10 - A7.13 SCALE: 3" = 1'-0"

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

LICENSED ARCHITECT
LAWRENCE SCARPA
C 21812
REN 10/31/2023
STATE OF CALIFORNIA

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED •

DEPARTMENT OF PUBLIC WORKS
BUREAU OF ENGINEERING

VERTICAL CONTROL:
HORIZONTAL CONTROL:
SHEET TITLE: FINISH DETAILS
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

NO.	REVISIONS	DATE:	BY:

CIP NO.
INDEX NO.

CITY OF LOS ANGELES
CITY ENGINEER
GARY LEE MOORE, P.E., ENV SP
DATE:
DESIGN GROUP
ENGINEER:
DESIGNED BY:
DRAWN BY:
CHECKED BY:
APPROVED BY:

WORK ORDER NO.
E170121B

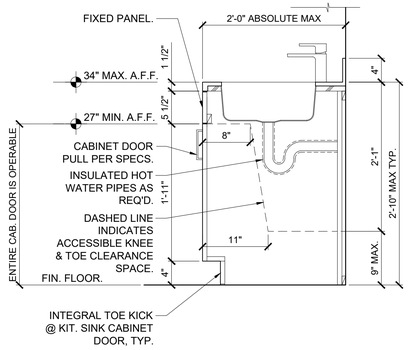
SHEET NAME
A7.01
SHEET X OF X SHEETS

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REVISION DATES (DESIGN STAGE ONLY)

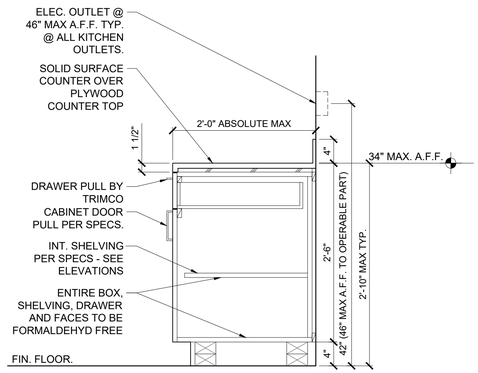
Sheet Version 4.0

Z:\B□S ARCHITECTURE\019 JOBS\01935.0 CITY OF LA-RESEDA ICE HOCKEY ROLLER RINK\01935.0 1.CURRENT DRAWINGS_24X36\01935.0_A701_24X36.DWG 12/3/2021 9:25 AM



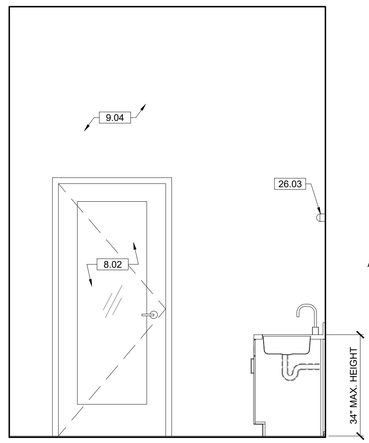
TYP. KITCHEN SINK SECTION 12

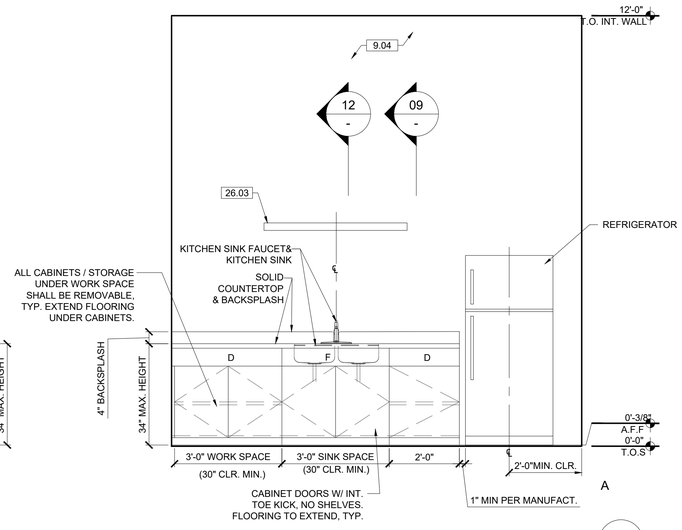
REF: 02/- SCALE: 1" = 1'-0"



TYP. KITCHEN CABINET SECTION 09

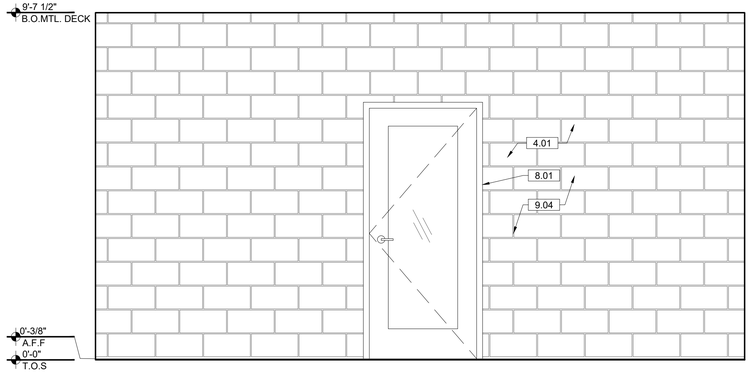
REF: 02/- SCALE: 1" = 1'-0"

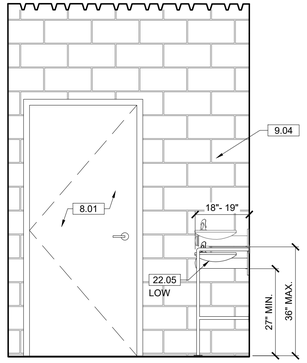


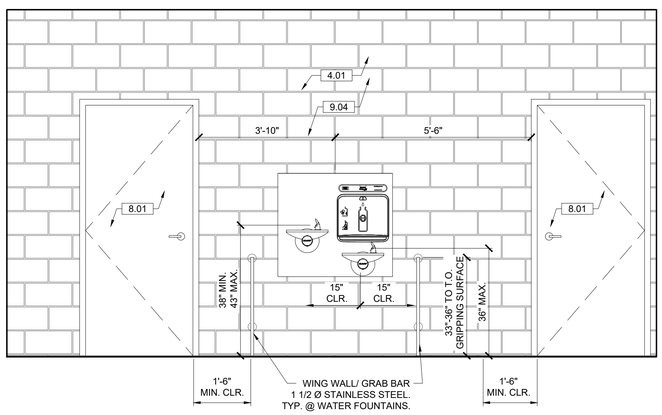


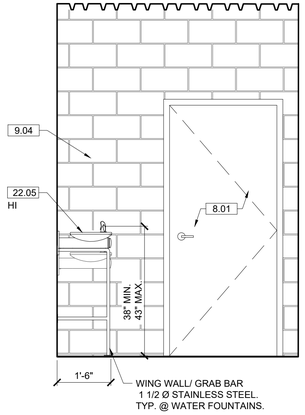
INTERIOR ELEVATIONS AT BREAK ROOM 02

REF: 01 / A4.00 SCALE: 1/2" = 1'-0"









SEE SHEET A0.23 &A0.24 FOR ADDITIONAL ACCESSIBILITY NOTES

INTERIOR ELEVATIONS AT VESTIBULE 108 01

REF: 01 / A4.10 SCALE: 1/2" = 1'-0"

KEYNOTES

NOTE: ITEMS IDENTIFIED ARE TYPICAL TO ALL LIKE ITEMS UNLESS NOTED OTHERWISE.

01 - GENERAL REQUIREMENTS
02 - NOT USED

03 - CONCRETE
3.01 CONC. SLAB ON GRADE PER STRUCT'L.
3.02 CONC. O/MTL. DECK PER STRUCT'L.
3.03 CONC. CURB
3.04 CONC. FOOTING PER STRUCT'L.
3.05 CONC. PAVING PER CIVIL DWGS.
3.06 CONC. SIDEWALK PER CIVIL DWGS.
3.07 CONC. PAD

04 - MASONRY
4.01 CMU BLDNG. WALL
4.02 CMU SITE WALL W/ 2" CMU CAP.

05 - METALS
5.01 STL. COLUMN PER STRUCT'L. PTD.
5.02 STL. BEAM PER STRUCT'L. PTD.
5.03 HSS POST PER STRUCT'L. PTD.
5.04 HSS BEAM PER STRUCT'L. PTD.
5.05 MEMBRANE STRUCTURE I BEAM.
5.06 MTL. DECK.
5.07 MTL. GUARD RAILING.
5.08 MTL. STUD WALL.

06 - WOOD AND PLASTICS

07 - THERMAL & MOISTURE PROTECTION
7.01 W.P. MEMBRANE PER DETL. & SPECS.
7.02 SINGLE PLY PVC ROOFING PER SPECS.
7.03 R-21 RIGID INSULATION @ WALLS.
7.04 UNDERSLAB MOISTURE VAPOR BARRIER.
7.05 ROOF DRAIN AND OVERFLOW.
7.06 CLEAR WATER-REPELLENT GRAFITTI COATING AT CMU WALL. (ALL EXPOSED SURFACES).
7.07 BATT INSULATION.

08 - OPENINGS (SEE DOOR/WINDOW SCHED)
8.01 STL. DOOR. & FRAME, PAINTED.
8.02 CLR. ANODIZED ALUM. STOREFRONT DOOR.
8.03 CLR. ANODIZED ALUM. STOREFRONT WINDOW.
8.04 DOOR HARDWARE SET PER SCHED.
8.05 EXTERIOR WALL LOUVER.
8.06 EXTERIOR WALL VENT WITH CAP.
8.07 ROLLING STL. DOOR & FRAME.
8.08 ICE RINK GATES
8.09 OVERHEAD GLASS DOOR.
8.10 ACCESS PANEL, COLOR TO MATCH ADJACENT MATERIAL.
8.11 ROOF ACCESS HATCH.

09 - FINISHES (SEE FIN. SCHED)
9.01 5/8" TYPE 'X' GYP. BD., PROVIDE 'WET RATED' AT BATHROOMS. PAINT.
9.02 CONC. FLR. SEAL PER FIN. SCHED.
9.03 RUBBER FLR. PER SPECS.
9.04 PAINT PER SPECS.
9.05 REVEAL PER DETAILS.
9.06 GRAFITTI COATING, TYP. @ ALL EXTERIOR SOLID WALLS.
9.07 GLAZED FINISH ON CMU.
9.08 CERAMIC TILE.

10 - SPECIALTIES
10.01 MIRROR PER SPECS.
10.02 SIGNAGE.
10.03 TOILET PAPER ROLL HOLDER PER ACCESSORY SCHED.
10.04 GRAB BAR.
10.05 COAT HOOK.
10.06 WASTE RECEPTACLE.
10.07 FOLDING SHOWER SEAT.
10.08 SHOWER ROD.
10.09 SHELF.
10.10 NETTING. NIC
10.11 FIRE EXTINGUISHER. RECESSED CABINET
10.12 TOILET SEAT COVER DISPENSER.
10.13 PAPER TOWEL DISPENSER.
10.14 BATHROOM PARTITION W/ ROBE HOOK @ EA. DOOR

11 - EQUIPMENT/APPLIANCES (SEE EQMT. SCHED)

12 - FURNISHINGS
12.01 BICYCLE RACKS FOR SHORT-TERM BIKE PARKING.
12.02 DASHERBOARDS. NIC.
12.03 BENCH. NIC.
12.04 BLEACHERS. NIC.
12.05 SCOREBOARD. NIC.
12.06 SKATE RACKS. NIC.

13 - SPECIAL CONSTRUCTION
13.01 MEMBRANE STRUCTURE.

14 - CONVEYING EQUIPMENT (NOT USED)

21 - FIRE SUPPRESSION
21.01 FIRE EXTINGUISHER.
21.02 FIRE SPRINKLER HORIZ. MAIN (SEE DIAGRAM)
21.03 FIRE SPRINKLER VALVE ASSEMBLY
21.04 FIRE DEPT. MAIN CONNECTION @ FRONT OF PROJECT. LAFD SHALL APPROVE FINAL LOCATION.
21.05 FIRE SPRINKLER HEAD.

22 - PLUMBING
22.01 WATER CLOSET PER PLUMBING LEGEND
22.02 LAV. SINK & FAUCET. PER PLUMBING LEGEND
22.03 JANITOR MOP SINK.
22.04 PLUMBING VENT PIPE.
22.05 DRINKING FOUNTAIN.
22.06 ULTRA LOW-FLOW TOILET.
22.07 SHOWER HEAD/ CONTROLS.
22.08 SHOWER DRAIN.
22.09 AREA DRAIN.
22.10 HOSE BIB.

23 - HEATING, VENTILATING, AND AIR-CONDITIONING
23.01 HVAC UNIT PER MECH.
23.02 AIR REGISTER WALL MOUNTED.
23.03 CEILING AIR REGISTER.
23.04 MAKE UP AIR LOUVER PER MECH. DWGS
23.05 BATHRM EXHAUST FAN PER SPECS.
23.06 BATHRM EXHAUST DUCT.
23.07 MECH. DUCT.
23.08 MECH. EQUIPMENT.

26 - ELECTRICAL
26.01 ELEC. PANEL PER PLANS & SCHED.
26.02 EXTERIOR LIGHT PER SCHED.
26.03 INTERIOR LIGHT PER SCHED.

27 - COMMUNICATION

28 - ELECTRONIC SAFETY AND SECURITY
28.01 SMOKE ALARM.
28.02 SECURITY CAMERA.
28.03 FIRE ALARM MAIN PANEL.

31 - EARTHWORK
31.01 APPROVED COMPACT FILL PER GEO & SOIL ENGINEER REPORT.

32 - EXTERIOR IMPROVEMENTS
32.01 ASPHALT PAVING PER CIVIL.
32.02 GRAPHICS/PAINT.SEE LAND. DWGS.
32.03 STORMWATER MANAGEMENT PER CIVIL DWGS.
32.04 STL. SECURITY GATE, PTD.
32.05 STL. SECURITY FENCE, PTD.
32.06 EXTERIOR AREA DRAINS.
32.07 BENCH.
32.08 TRENCH DRAIN.
32.09 TREE, SEE LANDSCAPE DWGS.
32.10 PLANTING, SEE LANDSCAPE DWGS.
32.11 (N) CONCRETE SIDEWALK, CURB, GUTTER PER CITY OF LA STANDARDS.
32.12 (N) CONC. APRON & DRIVEWAY CURB CUT PER CITY OF LA STANDARDS.
32.13 EQUIPMENT SCREEN.
32.14 CONC. WALL @ SITE FENCE.

33 - UTILITIES
33.01 WATER METER.
33.02 ELECTRICAL TRANSFORMER W/ BOLLARDS AS REQ'D.
33.03 ELECTRICAL METER.
33.04 POWER POLE.

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

LICENSED ARCHITECT
LAWRENCE SCARPA
C 21812
REN 10/31/2023
STATE OF CALIFORNIA

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED •

DEPARTMENT OF PUBLIC WORKS
BUREAU OF ENGINEERING
VERTICAL CONTROL:
HORIZONTAL CONTROL:
SHEET TITLE: INTERIOR ELEVATIONS
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

NO.	REVISIONS:	DATE:	BY:

CIP NO.
INDEX NO.

CITY OF LOS ANGELES
CITY ENGINEER
GARY LEE MOORE, P.E. ENV SP
DATE:
DESIGN GROUP:
ENGINEER:
DESIGNED BY:
DRAWN BY:
CHECKED BY:
APPROVED BY:

WORK ORDER NO.
E170121B

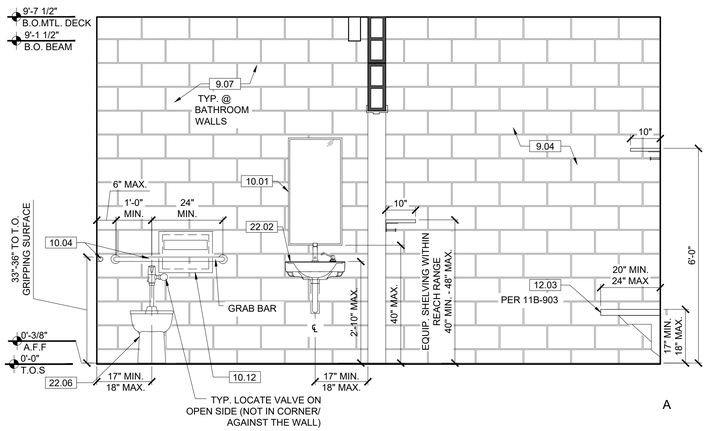
SHEET NAME
A7.10
SHEET X OF X SHEETS

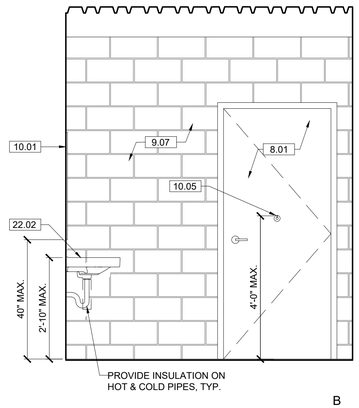
REVISION DATES (DESIGN STAGE ONLY)

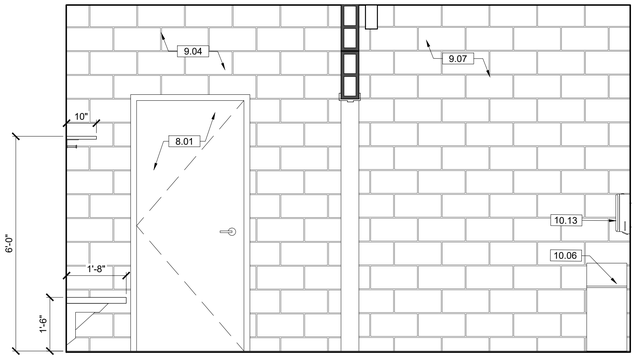
THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

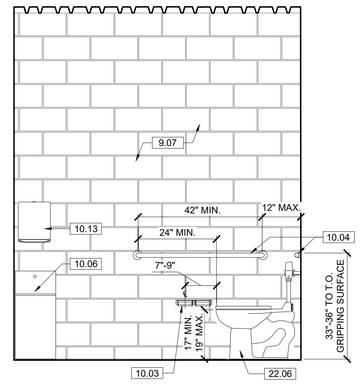
Sheet Version 4.0

Z:\B□S ARCHITECTURE\019 JOBS\01935.0 CITY OF LA-RESEDA ICE HOCKEY ROLLER RINK\01935.0 1.CURRENT DRAWINGS_24X36\01935.0_A710_24X36.DWG 12/3/2021 9:25 AM





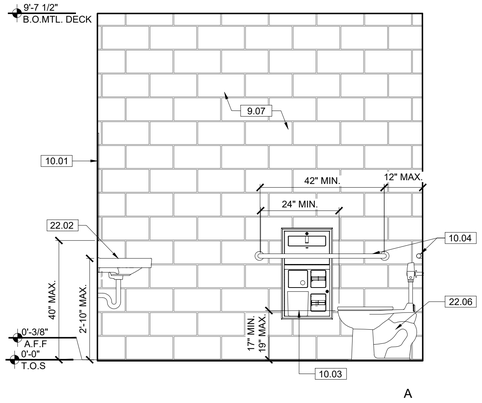


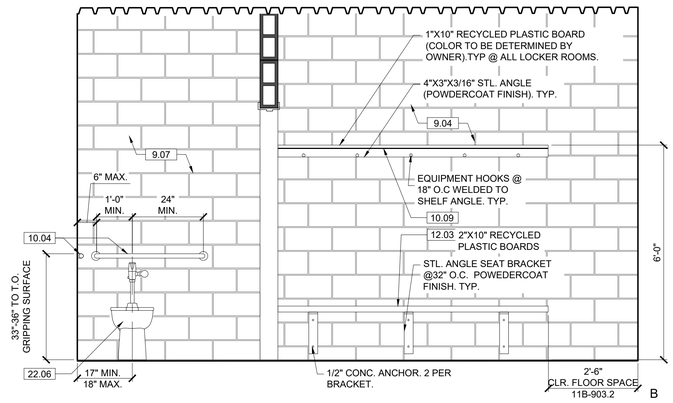


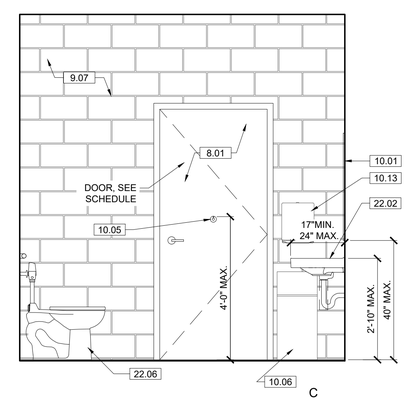
INTERIOR ELEVATION AT REFEREE'S ROOM 111

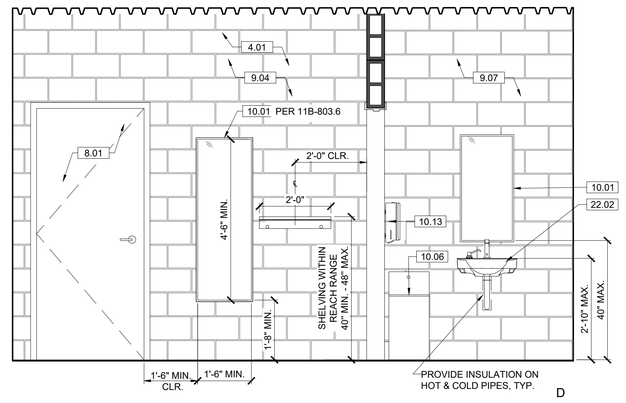
02

REF: 01 / A4.30 SCALE: 1/2" = 1'-0"









SEE SHEET A0.23 &A0.24 FOR ADDITIONAL ACCESSIBILITY NOTES

INTERIOR ELEVATION AT GIRL'S ROOM 112

01

REF: 01 / A4.30 SCALE: 1/2" = 1'-0"

KEYNOTES

NOTE: ITEMS IDENTIFIED ARE TYPICAL TO ALL LIKE ITEMS UNLESS NOTED OTHERWISE.

01 - GENERAL REQUIREMENTS
02 - NOT USED

03 - CONCRETE
3.01 CONC. SLAB ON GRADE PER STRUCT'L.
3.02 CONC. O/MTL. DECK PER STRUCT'L.
3.03 CONC. CURB
3.04 CONC. FOOTING PER STRUCT'L.
3.05 CONC. PAVING PER CIVIL DWGS.
3.06 CONC. SIDEWALK PER CIVIL DWGS.
3.07 CONC. PAD

04 - MASONRY
4.01 CMU BLDNG. WALL
4.02 CMU SITE WALL W/ 2" CMU CAP.

05 - METALS
5.01 STL. COLUMN PER STRUCT'L. PTD.
5.02 STL. BEAM PER STRUCT'L. PTD.
5.03 HSS POST PER STRUCT'L. PTD.
5.04 HSS BEAM PER STRUCT'L. PTD.
5.05 MEMBRANE STRUCTURE I BEAM.
5.06 MTL. DECK.
5.07 MTL. GUARD RAILING.
5.08 MTL. STUD WALL.

06 - WOOD AND PLASTICS

07 - THERMAL & MOISTURE PROTECTION
7.01 W.P. MEMBRANE PER DETL. & SPECS.
7.02 SINGLE PLY PVC ROOFING PER SPECS.
7.03 R-21 RIGID INSULATION @ WALLS.
7.04 UNDERSLAB MOISTURE VAPOR BARRIER.
7.05 ROOF DRAIN AND OVERFLOW.
7.06 CLEAR WATER-REPELLENT GRAFITTI COATING AT CMU WALL. (ALL EXPOSED SURFACES).
7.07 BATT INSULATION.

08 - OPENINGS (SEE DOOR/WINDOW SCHED)
8.01 STL. DOOR. & FRAME, PAINTED.
8.02 CLR. ANODIZED ALUM. STOREFRONT DOOR.
8.03 CLR. ANODIZED ALUM. STOREFRONT WINDOW.
8.04 DOOR HARDWARE SET PER SCHED.
8.05 EXTERIOR WALL LOUVER.
8.06 EXTERIOR WALL VENT WITH CAP.
8.07 ROLLING STL. DOOR & FRAME.
8.08 ICE RINK GATES
8.09 OVERHEAD GLASS DOOR.
8.10 ACCESS PANEL, COLOR TO MATCH ADJACENT MATERIAL.
8.11 ROOF ACCESS HATCH.

09 - FINISHES (SEE FIN. SCHED)
9.01 5/8" TYPE 'X' GYP. BD., PROVIDE 'WET RATED' AT BATHROOMS. PAINT.
9.02 CONC. FLR. SEAL PER FIN. SCHED.
9.03 RUBBER FLR. PER SPECS.
9.04 PAINT PER SPECS.
9.05 REVEAL PER DETAILS.
9.06 GRAFITTI COATING, TYP. @ ALL EXTERIOR SOLID WALLS.
9.07 GLAZED FINISH ON CMU.
9.08 CERAMIC TILE.

10 - SPECIALTIES
10.01 MIRROR PER SPECS.
10.02 SIGNAGE.
10.03 TOILET PAPER ROLL HOLDER PER ACCESSORY SCHED.
10.04 GRAB BAR.
10.05 COAT HOOK.
10.06 WASTE RECEPTACLE.
10.07 FOLDING SHOWER SEAT.
10.08 SHOWER ROD.
10.09 SHELF.
10.10 NETTING. NIC
10.11 FIRE EXTINGUISHER. RECESSED CABINET
10.12 TOILET SEAT COVER DISPENSER.
10.13 PAPER TOWEL DISPENSER.
10.14 BATHROOM PARTITION W/ ROBE HOOK @ EA. DOOR

11 - EQUIPMENT/APPLIANCES (SEE EQMT. SCHED)

12 - FURNISHINGS
12.01 BICYCLE RACKS FOR SHORT-TERM BIKE PARKING.
12.02 DASHERBOARDS. NIC.
12.03 BENCH. NIC.
12.04 BLEACHERS. NIC.
12.05 SCOREBOARD. NIC.
12.06 SKATE RACKS. NIC.

13 - SPECIAL CONSTRUCTION
13.01 MEMBRANE STRUCTURE.

14 - CONVEYING EQUIPMENT (NOT USED)

21 - FIRE SUPPRESSION
21.01 FIRE EXTINGUISHER.
21.02 FIRE SPRINKLER HORIZ. MAIN (SEE DIAGRAM)
21.03 FIRE SPRINKLER VALVE ASSEMBLY
21.04 FIRE DEPT. MAIN CONNECTION @ FRONT OF PROJECT. LAFD SHALL APPROVE FINAL LOCATION.
21.05 FIRE SPRINKLER HEAD.

22 - PLUMBING
22.01 WATER CLOSET PER PLUMBING LEGEND
22.02 LAV. SINK & FAUCET. PER PLUMBING LEGEND
22.03 JANITOR MOP SINK.
22.04 PLUMBING VENT PIPE.
22.05 DRINKING FOUNTAIN.
22.06 ULTRA LOW-FLOW TOILET.
22.07 SHOWER HEAD/ CONTROLS.
22.08 SHOWER DRAIN.
22.09 AREA DRAIN.
22.10 HOSE BIB.

23 - HEATING, VENTILATING, AND AIR-CONDITIONING
23.01 HVAC UNIT PER MECH.
23.02 AIR REGISTER WALL MOUNTED.
23.03 CEILING AIR REGISTER.
23.04 MAKE UP AIR LOUVER PER MECH. DWGS
23.05 BATHRM EXHAUST FAN PER SPECS.
23.06 BATHRM EXHAUST DUCT.
23.07 MECH. DUCT.
23.08 MECH. EQUIPMENT.

26 - ELECTRICAL
26.01 ELEC. PANEL PER PLANS & SCHED.
26.02 EXTERIOR LIGHT PER SCHED.
26.03 INTERIOR LIGHT PER SCHED.

27 - COMMUNICATION

28 - ELECTRONIC SAFETY AND SECURITY
28.01 SMOKE ALARM.
28.02 SECURITY CAMERA.
28.03 FIRE ALARM MAIN PANEL.

31 - EARTHWORK
31.01 APPROVED COMPACT FILL PER GEO & SOIL ENGINEER REPORT.

32 - EXTERIOR IMPROVEMENTS
32.01 ASPHALT PAVING PER CIVIL.
32.02 GRAPHICS/PAINT.SEE LAND. DWGS.
32.03 STORMWATER MANAGEMENT PER CIVIL DWGS.
32.04 STL. SECURITY GATE, PTD.
32.05 STL. SECURITY FENCE, PTD.
32.06 EXTERIOR AREA DRAINS.
32.07 BENCH.
32.08 TRENCH DRAIN.
32.09 TREE, SEE LANDSCAPE DWGS.
32.10 PLANTING, SEE LANDSCAPE DWGS.
32.11 (N) CONCRETE SIDEWALK, CURB, GUTTER PER CITY OF LA STANDARDS.
32.12 (N) CONC. APRON & DRIVEWAY CURB CUT PER CITY OF LA STANDARDS.
32.13 EQUIPMENT SCREEN.
32.14 CONC. WALL @ SITE FENCE.

33 - UTILITIES
33.01 WATER METER.
33.02 ELECTRICAL TRANSFORMER W/ BOLLARDS AS REQ'D.
33.03 ELECTRICAL METER.
33.04 POWER POLE.

REVISION DATES (DESIGN STAGE ONLY)

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

Sheet Version 4.0

Z:\B□S ARCHITECTURE\019 JOBS\01935.0 CITY OF LA-RESEDA ICE HOCKEY ROLLER RINK\01935.0 1.CURRENT DRAWINGS_24X36\01935.0_A711_24X36.DWG 12/3/2021 9:26 AM

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

LICENSED ARCHITECT
LAWRENCE SCARPA
C 21812
REN 10/31/2023
STATE OF CALIFORNIA

THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED

DEPARTMENT OF PUBLIC WORKS
BUREAU OF ENGINEERING

VERTICAL CONTROL:
HORIZONTAL CONTROL:
SHEET TITLE: INTERIOR ELEVATIONS
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

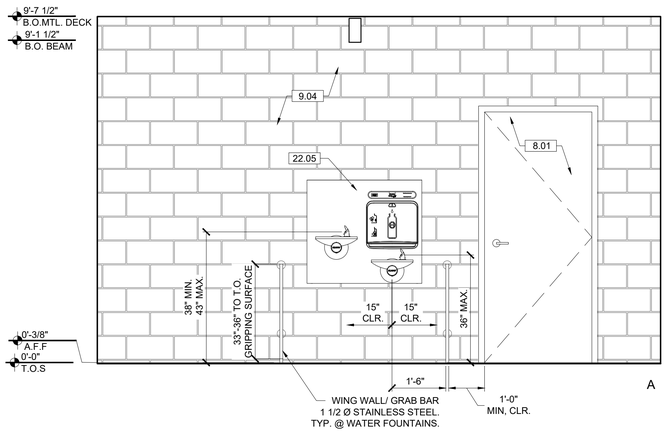
NO.	REVISIONS	DATE:	BY:

CIP NO.
INDEX NO.

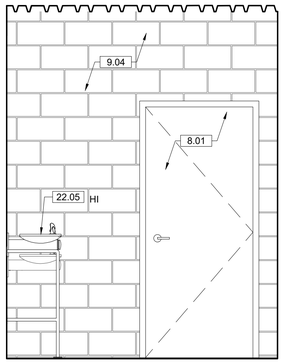
CITY OF LOS ANGELES
CITY ENGINEER
GARY LEE MOORE, P.E. ENV SP
DESIGN GROUP:
DATE:
ENGINEER:
DESIGNED BY:
DRAWN BY:
CHECKED BY:
APPROVED BY:

WORK ORDER NO.
E170121B

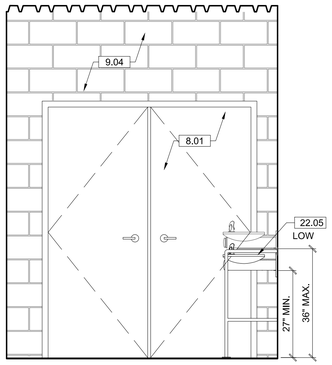
SHEET NAME
A7.11
SHEET X OF X SHEETS



A



B

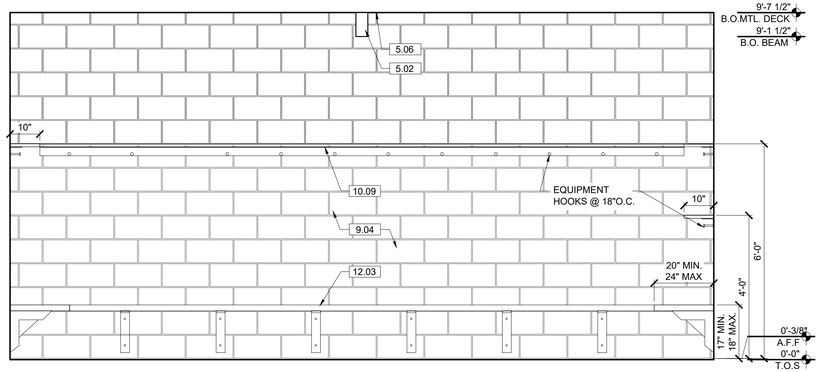


D

INTERIOR ELEVATION AT VESTIBULE

02

REF: 01 / A4.30 SCALE: 1/2" = 1'-0"

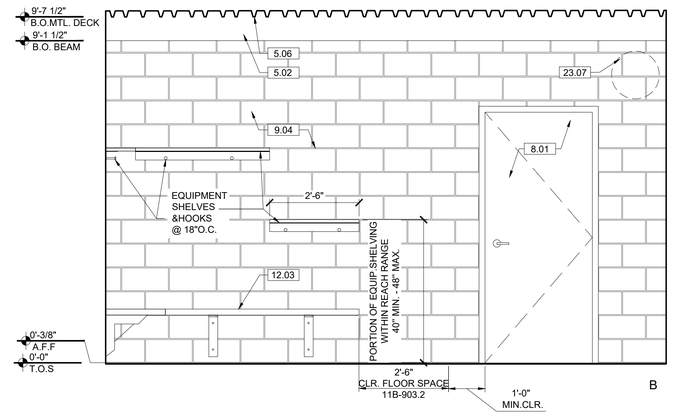


A

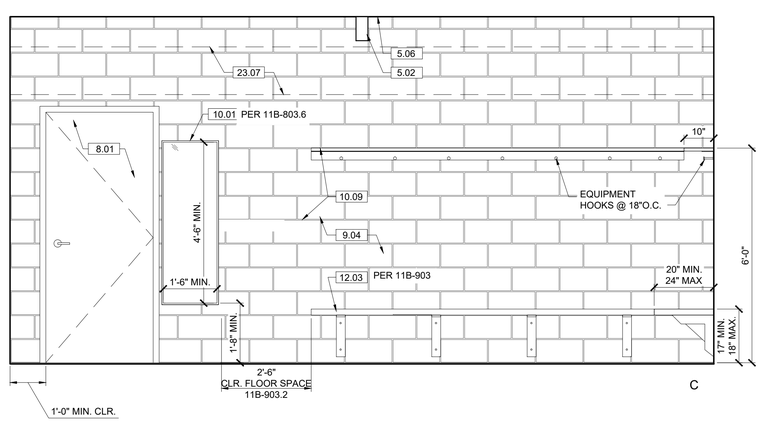
INTERIOR ELEVATION AT LOCKER ROOM C (TYP.)

01

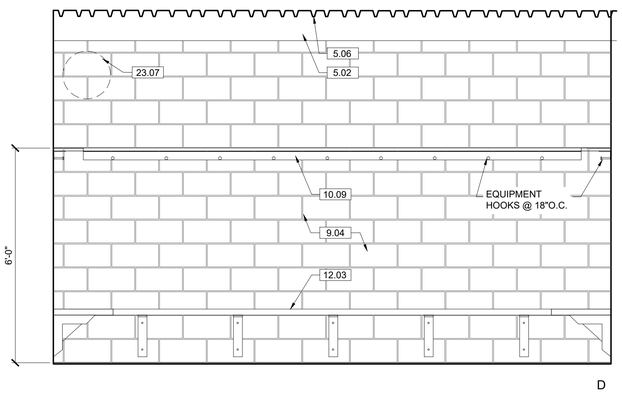
REF: 01 / A4.40 SCALE: 1/2" = 1'-0"



B



C



D

SEE SHEET A0.23 &A0.24 FOR ADDITIONAL ACCESSIBILITY NOTES

INTERIOR ELEVATION AT LOCKER ROOM C (TYP.) CON'T

01

REF: 01 / A4.40 SCALE: 1/2" = 1'-0"

KEYNOTES

NOTE: ITEMS IDENTIFIED ARE TYPICAL TO ALL LIKE ITEMS UNLESS NOTED OTHERWISE.

01 - GENERAL REQUIREMENTS
02 - NOT USED

03 - CONCRETE
3.01 CONC. SLAB ON GRADE PER STRUCT'L.
3.02 CONC. O/MTL. DECK PER STRUCT'L.
3.03 CONC. CURB
3.04 CONC. FOOTING PER STRUCT'L.
3.05 CONC. PAVING PER CIVIL DWGS.
3.06 CONC. SIDEWALK PER CIVIL DWGS.
3.07 CONC. PAD

04 - MASONRY
4.01 CMU BLDNG. WALL
4.02 CMU SITE WALL W/ 2" CMU CAP.

05 - METALS
5.01 STL. COLUMN PER STRUCT'L. PTD.
5.02 STL. BEAM PER STRUCT'L. PTD.
5.03 HSS POST PER STRUCT'L. PTD.
5.04 HSS BEAM PER STRUCT'L. PTD.
5.05 MEMBRANE STRUCTURE I BEAM.
5.06 MTL. DECK.
5.07 MTL. GUARD RAILING.
5.08 MTL. STUD WALL.

06 - WOOD AND PLASTICS

07 - THERMAL & MOISTURE PROTECTION
7.01 W.P. MEMBRANE PER DETL. & SPECS.
7.02 SINGLE PLY PVC ROOFING PER SPECS.
7.03 R-21 RIGID INSULATION @ WALLS.
7.04 UNDERSLAB MOISTURE VAPOR BARRIER.
7.05 ROOF DRAIN AND OVERFLOW.
7.06 CLEAR WATER-REPELLENT GRAFITTI COATING AT CMU WALL. (ALL EXPOSED SURFACES).
7.07 BATT INSULATION.

08 - OPENINGS (SEE DOOR/WINDOW SCHED)
8.01 STL. DOOR. & FRAME, PAINTED.
8.02 CLR. ANODIZED ALUM. STOREFRONT DOOR.
8.03 CLR. ANODIZED ALUM. STOREFRONT WINDOW.
8.04 DOOR HARDWARE SET PER SCHED.
8.05 EXTERIOR WALL LOUVER.
8.06 EXTERIOR WALL VENT WITH CAP.
8.07 ROLLING STL. DOOR & FRAME.
8.08 ICE RINK GATES
8.09 OVERHEAD GLASS DOOR.
8.10 ACCESS PANEL, COLOR TO MATCH ADJACENT MATERIAL.
8.11 ROOF ACCESS HATCH.

09 - FINISHES (SEE FIN. SCHED)
9.01 5/8" TYPE 'X' GYP. BD., PROVIDE 'WET RATED' AT BATHROOMS. PAINT.
9.02 CONC. FLR. SEAL PER FIN. SCHED.
9.03 RUBBER FLR. PER SPECS.
9.04 PAINT PER SPECS.
9.05 REVEAL PER DETAILS.
9.06 GRAFITTI COATING, TYP. @ ALL EXTERIOR SOLID WALLS.
9.07 GLAZED FINISH ON CMU.
9.08 CERAMIC TILE.

10 - SPECIALTIES
10.01 MIRROR PER SPECS.
10.02 SIGNAGE.
10.03 TOILET PAPER ROLL HOLDER PER ACCESSORY SCHED.
10.04 GRAB BAR.
10.05 COAT HOOK.
10.06 WASTE RECEPTACLE.
10.07 FOLDING SHOWER SEAT.
10.08 SHOWER ROD.
10.09 SHELF.
10.10 NETTING. NIC
10.11 FIRE EXTINGUISHER. RECESSED CABINET
10.12 TOILET SEAT COVER DISPENSER.
10.13 PAPER TOWEL DISPENSER.
10.14 BATHROOM PARTITION W/ ROBE HOOK @ EA. DOOR

11 - EQUIPMENT/APPLIANCES (SEE EQMT. SCHED)

12 - FURNISHINGS
12.01 BICYCLE RACKS FOR SHORT-TERM BIKE PARKING.
12.02 DASHERBOARDS. NIC.
12.03 BENCH. NIC.
12.04 BLEACHERS. NIC.
12.05 SCOREBOARD. NIC.
12.06 SKATE RACKS. NIC.

13 - SPECIAL CONSTRUCTION
13.01 MEMBRANE STRUCTURE.

14 - CONVEYING EQUIPMENT (NOT USED)

21 - FIRE SUPPRESSION
21.01 FIRE EXTINGUISHER.
21.02 FIRE SPRINKLER HORIZ. MAIN (SEE DIAGRAM)
21.03 FIRE SPRINKLER VALVE ASSEMBLY
21.04 FIRE DEPT. MAIN CONNECTION @ FRONT OF PROJECT. LAFD SHALL APPROVE FINAL LOCATION.
21.05 FIRE SPRINKLER HEAD.

22 - PLUMBING
22.01 WATER CLOSET PER PLUMBING LEGEND
22.02 LAV. SINK & FAUCET. PER PLUMBING LEGEND
22.03 JANITOR MOP SINK.
22.04 PLUMBING VENT PIPE.
22.05 DRINKING FOUNTAIN.
22.06 ULTRA LOW-FLOW TOILET.
22.07 SHOWER HEAD/ CONTROLS.
22.08 SHOWER DRAIN.
22.09 AREA DRAIN.
22.10 HOSE BIB.

23 - HEATING, VENTILATING, AND AIR-CONDITIONING
23.01 HVAC UNIT PER MECH.
23.02 AIR REGISTER WALL MOUNTED.
23.03 CEILING AIR REGISTER.
23.04 MAKE UP AIR LOUVER PER MECH. DWGS
23.05 BATHRM EXHAUST FAN PER SPECS.
23.06 BATHRM EXHAUST DUCT.
23.07 MECH. DUCT.
23.08 MECH. EQUIPMENT.

26 - ELECTRICAL
26.01 ELEC. PANEL PER PLANS & SCHED.
26.02 EXTERIOR LIGHT PER SCHED.
26.03 INTERIOR LIGHT PER SCHED.

27 - COMMUNICATION

28 - ELECTRONIC SAFETY AND SECURITY
28.01 SMOKE ALARM.
28.02 SECURITY CAMERA.
28.03 FIRE ALARM MAIN PANEL.

31 - EARTHWORK
31.01 APPROVED COMPACT FILL PER GEO & SOIL ENGINEER REPORT.

32 - EXTERIOR IMPROVEMENTS
32.01 ASPHALT PAVING PER CIVIL.
32.02 GRAPHICS/PAINT.SEE LAND. DWGS.
32.03 STORMWATER MANAGEMENT PER CIVIL DWGS.
32.04 STL. SECURITY GATE, PTD.
32.05 STL. SECURITY FENCE, PTD.
32.06 EXTERIOR AREA DRAINS.
32.07 BENCH.
32.08 TRENCH DRAIN.
32.09 TREE, SEE LANDSCAPE DWGS.
32.10 PLANTING, SEE LANDSCAPE DWGS.
32.11 (N) CONCRETE SIDEWALK, CURB, GUTTER PER CITY OF LA STANDARDS.
32.12 (N) CONC. APRON & DRIVEWAY CURB CUT PER CITY OF LA STANDARDS.
32.13 EQUIPMENT SCREEN.
32.14 CONC. WALL @ SITE FENCE.

33 - UTILITIES
33.01 WATER METER.
33.02 ELECTRICAL TRANSFORMER W/ BOLLARDS AS REQ'D.
33.03 ELECTRICAL METER.
33.04 POWER POLE.

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

LICENSED ARCHITECT
LAWRENCE SCARPA
C 21812
REN 10/31/2023
STATE OF CALIFORNIA

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED

DEPARTMENT OF PUBLIC WORKS
BUREAU OF ENGINEERING

VERTICAL CONTROL:
HORIZONTAL CONTROL:
SHEET TITLE: INTERIOR ELEVATIONS
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

NO.	REVISIONS:	DATE:	BY:

CIP NO.
INDEX NO.

CITY OF LOS ANGELES

CITY ENGINEER
GARY LEE MOORE, P.E. ENV SP
DATE:
DESIGN GROUP:
ENGINEER:
DESIGNED BY:
DRAWN BY:
CHECKED BY:
APPROVED BY:

WORK ORDER NO.
E170121B

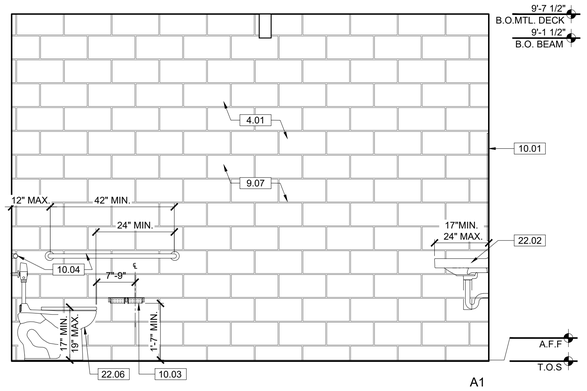
SHEET NAME
A7.12
SHEET X OF X SHEETS

REVISION DATES (DESIGN STAGE ONLY)

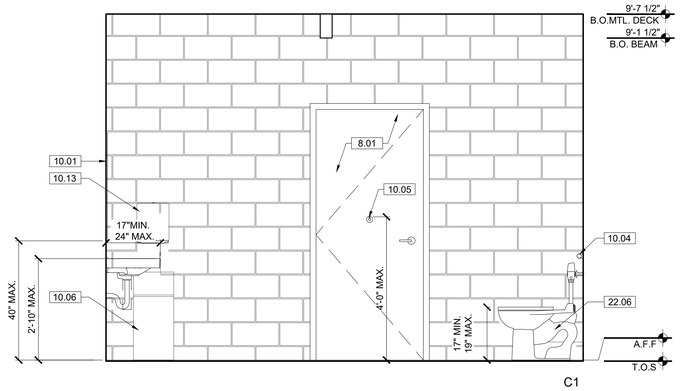
THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

Sheet Version 4.0

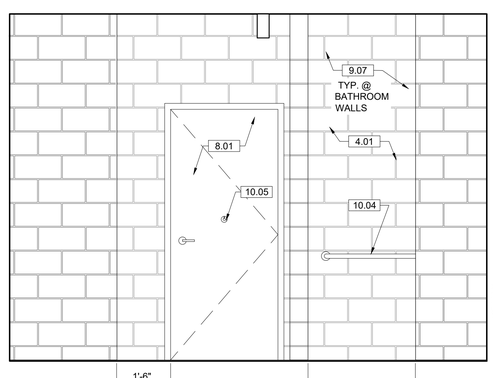
Z:\B□S ARCHITECTURE\019 JOBS\01935.0 CITY OF LA-RESEDA ICE HOCKEY ROLLER RINK\01935.0 1.CURRENT DRAWINGS_24X36\01935.0_A712_24X36.DWG 12/3/2021 9:26 AM

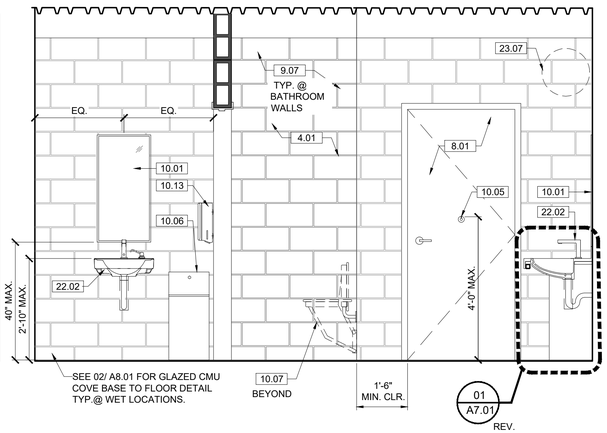


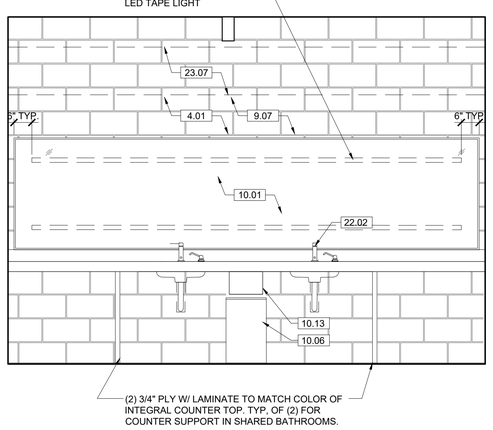
A1

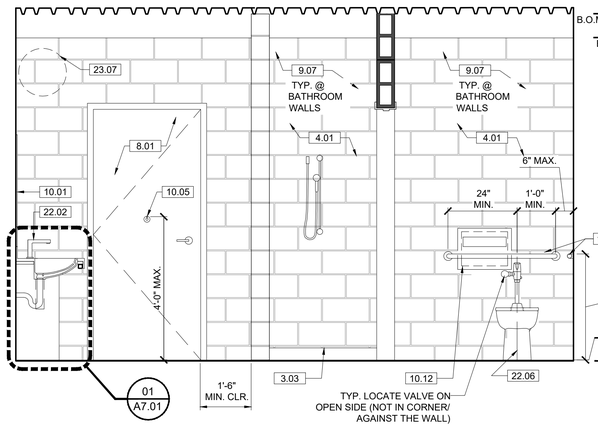


C1









SEE SHEET A0.23 &A0.24 FOR ADDITIONAL ACCESSIBILITY NOTES	SEE SHEET 3/A7.01 FOR BATHROOM COUNTER TOP FRAMING SUPPORT PLAN

INTERIOR ELEVATIONS AT SHARED BATHROOM

01

REF: 01 / A4.40

SCALE: 1/2" = 1'-0"

KEYNOTES

NOTE: ITEMS IDENTIFIED ARE TYPICAL TO ALL LIKE ITEMS UNLESS NOTED OTHERWISE.

01 - GENERAL REQUIREMENTS
02 - NOT USED

03 - CONCRETE
3.01 CONC. SLAB ON GRADE PER STRUCT'L.
3.02 CONC. O/MTL. DECK PER STRUCT'L.
3.03 CONC. CURB
3.04 CONC. FOOTING PER STRUCT'L.
3.05 CONC. PAVING PER CIVIL DWGS.
3.06 CONC. SIDEWALK PER CIVIL DWGS.
3.07 CONC. PAD

04 - MASONRY
4.01 CMU BLDNG. WALL
4.02 CMU SITE WALL W/ 2" CMU CAP.

05 - METALS
5.01 STL. COLUMN PER STRUCT'L. PTD.
5.02 STL. BEAM PER STRUCT'L. PTD.
5.03 HSS POST PER STRUCT'L. PTD.
5.04 HSS BEAM PER STRUCT'L. PTD.
5.05 MEMBRANE STRUCTURE I BEAM.
5.06 MTL. DECK.
5.07 MTL. GUARD RAILING.
5.08 MTL. STUD WALL.

06 - WOOD AND PLASTICS

07 - THERMAL & MOISTURE PROTECTION
7.01 W.P. MEMBRANE PER DETL. & SPECS.
7.02 SINGLE PLY PVC ROOFING PER SPECS.
7.03 R-21 RIGID INSULATION @ WALLS.
7.04 UNDERSLAB MOISTURE VAPOR BARRIER.
7.05 ROOF DRAIN AND OVERFLOW.
7.06 CLEAR WATER-REPELLENT GRAFITTI COATING AT CMU WALL. (ALL EXPOSED SURFACES).
7.07 BATT INSULATION.

08 - OPENINGS (SEE DOOR/WINDOW SCHED)
8.01 STL. DOOR. & FRAME, PAINTED.
8.02 CLR. ANODIZED ALUM. STOREFRONT DOOR.
8.03 CLR. ANODIZED ALUM. STOREFRONT WINDOW.
8.04 DOOR HARDWARE SET PER SCHED.
8.05 EXTERIOR WALL LOUVER.
8.06 EXTERIOR WALL VENT WITH CAP.
8.07 ROLLING STL. DOOR & FRAME.
8.08 ICE RINK GATES
8.09 OVERHEAD GLASS DOOR.
8.10 ACCESS PANEL, COLOR TO MATCH ADJACENT MATERIAL.
8.11 ROOF ACCESS HATCH.

09 - FINISHES (SEE FIN. SCHED)
9.01 5/8" TYPE 'X' GYP. BD., PROVIDE 'WET RATED' AT BATHROOMS. PAINT.
9.02 CONC. FLR. SEAL PER FIN. SCHED.
9.03 RUBBER FLR. PER SPECS.
9.04 PAINT PER SPECS.
9.05 REVEAL PER DETAILS.
9.06 GRAFITTI COATING, TYP. @ ALL EXTERIOR SOLID WALLS.
9.07 GLAZED FINISH ON CMU.
9.08 CERAMIC TILE.

10 - SPECIALTIES
10.01 MIRROR PER SPECS.
10.02 SIGNAGE.
10.03 TOILET PAPER ROLL HOLDER PER ACCESSORY SCHED.
10.04 GRAB BAR.
10.05 COAT HOOK.
10.06 WASTE RECEPTACLE.
10.07 FOLDING SHOWER SEAT.
10.08 SHOWER ROD.
10.09 SHELF.
10.10 NETTING. NIC
10.11 FIRE EXTINGUISHER. RECESSED CABINET
10.12 TOILET SEAT COVER DISPENSER.
10.13 PAPER TOWEL DISPENSER.
10.14 BATHROOM PARTITION W/ ROBE HOOK @ EA. DOOR

11 - EQUIPMENT/APPLIANCES (SEE EQMT. SCHED)

12 - FURNISHINGS
12.01 BICYCLE RACKS FOR SHORT-TERM BIKE PARKING.
12.02 DASHERBOARDS. NIC.
12.03 BENCH. NIC.
12.04 BLEACHERS. NIC.
12.05 SCOREBOARD. NIC.
12.06 SKATE RACKS. NIC.

13 - SPECIAL CONSTRUCTION
13.01 MEMBRANE STRUCTURE.

14 - CONVEYING EQUIPMENT (NOT USED)

21 - FIRE SUPPRESSION
21.01 FIRE EXTINGUISHER.
21.02 FIRE SPRINKLER HORIZ. MAIN (SEE DIAGRAM)
21.03 FIRE SPRINKLER VALVE ASSEMBLY
21.04 FIRE DEPT. MAIN CONNECTION @ FRONT OF PROJECT. LAFD SHALL APPROVE FINAL LOCATION.
21.05 FIRE SPRINKLER HEAD.

22 - PLUMBING
22.01 WATER CLOSET PER PLUMBING LEGEND
22.02 LAV. SINK & FAUCET. PER PLUMBING LEGEND
22.03 JANITOR MOP SINK.
22.04 PLUMBING VENT PIPE.
22.05 DRINKING FOUNTAIN.
22.06 ULTRA LOW-FLOW TOILET.
22.07 SHOWER HEAD/ CONTROLS.
22.08 SHOWER DRAIN.
22.09 AREA DRAIN.
22.10 HOSE BIB.

23 - HEATING, VENTILATING, AND AIR-CONDITIONING
23.01 HVAC UNIT PER MECH.
23.02 AIR REGISTER WALL MOUNTED.
23.03 CEILING AIR REGISTER.
23.04 MAKE UP AIR LOUVER PER MECH. DWGS
23.05 BATHRM EXHAUST FAN PER SPECS.
23.06 BATHRM EXHAUST DUCT.
23.07 MECH. DUCT.
23.08 MECH. EQUIPMENT.

26 - ELECTRICAL
26.01 ELEC. PANEL PER PLANS & SCHED.
26.02 EXTERIOR LIGHT PER SCHED.
26.03 INTERIOR LIGHT PER SCHED.

27 - COMMUNICATION

28 - ELECTRONIC SAFETY AND SECURITY
28.01 SMOKE ALARM.
28.02 SECURITY CAMERA.
28.03 FIRE ALARM MAIN PANEL.

31 - EARTHWORK
31.01 APPROVED COMPACT FILL PER GEO & SOIL ENGINEER REPORT.

32 - EXTERIOR IMPROVEMENTS
32.01 ASPHALT PAVING PER CIVIL.
32.02 GRAPHICS/PAINT.SEE LAND. DWGS.
32.03 STORMWATER MANAGEMENT PER CIVIL DWGS.
32.04 STL. SECURITY GATE, PTD.
32.05 STL. SECURITY FENCE, PTD.
32.06 EXTERIOR AREA DRAINS.
32.07 BENCH.
32.08 TRENCH DRAIN.
32.09 TREE, SEE LANDSCAPE DWGS.
32.10 PLANTING, SEE LANDSCAPE DWGS.
32.11 (N) CONCRETE SIDEWALK, CURB, GUTTER PER CITY OF LA STANDARDS.
32.12 (N) CONC. APRON & DRIVEWAY CURB CUT PER CITY OF LA STANDARDS.
32.13 EQUIPMENT SCREEN.
32.14 CONC. WALL @ SITE FENCE.

33 - UTILITIES
33.01 WATER METER.
33.02 ELECTRICAL TRANSFORMER W/ BOLLARDS AS REQ'D.
33.03 ELECTRICAL METER.
33.04 POWER POLE.

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

LICENSED ARCHITECT
LAWRENCE SCARPA
C 21812
REN 10/31/2023
STATE OF CALIFORNIA

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED •

BUREAU OF ENGINEERING
VERTICAL CONTROL:
HORIZONTAL CONTROL:
SHEET TITLE: INTERIOR ELEVATIONS
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

DEPARTMENT OF PUBLIC WORKS
NO. | REVISIONS: | DATE: | BY:
CIP NO.
INDEX NO.

CITY OF LOS ANGELES
GARY LEE MOORE, P.E. ENV SP
CITY ENGINEER
DESIGN GROUP
DATE:
ENGINEER:
DESIGNED BY:
DRAWN BY:
CHECKED BY:
APPROVED BY:

WORK ORDER NO.
E170121B

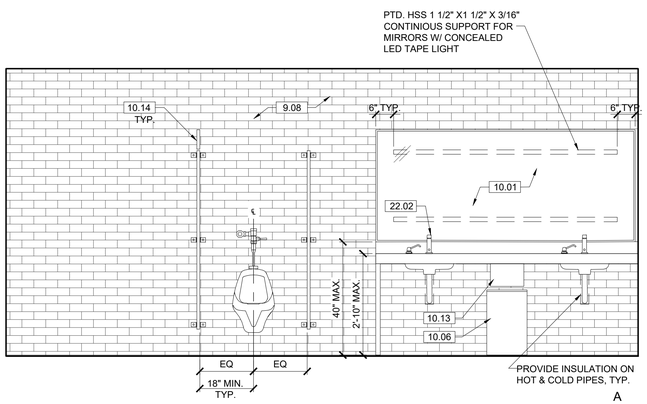
SHEET NAME
A7.13
SHEET X OF X SHEETS

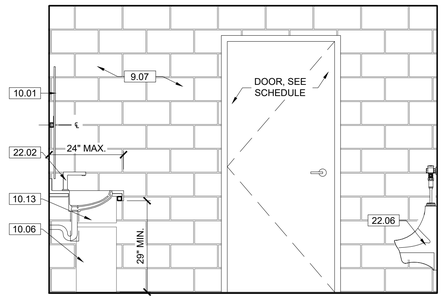
THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

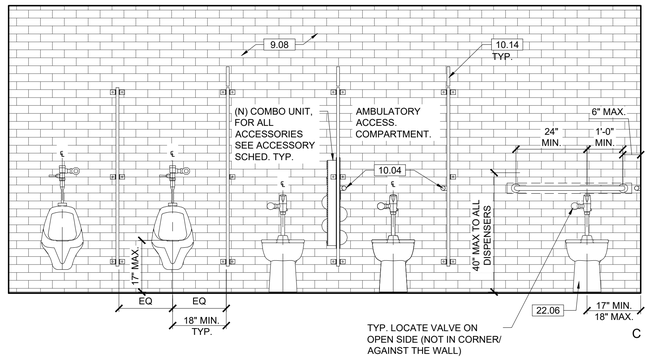
REVISION DATES (DESIGN STAGE ONLY)

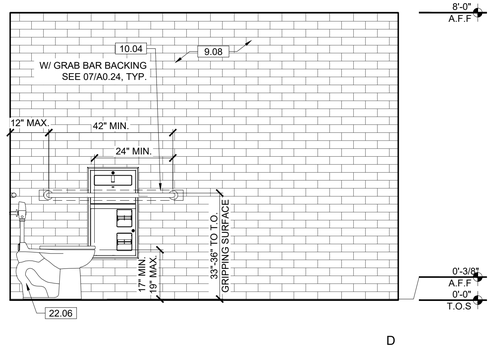
Sheet Version 4.0

Z:\B□S ARCHITECTURE\019 JOBS\01935.0 CITY OF LA-RESEDA ICE HOCKEY ROLLER RINK\01935.0 1.CURRENT DRAWINGS_24X36\01935.0_A713_24X36.DWG 12/3/2021 9:26 AM





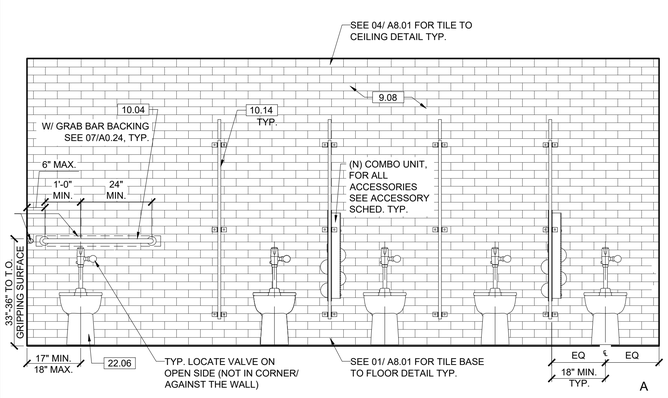


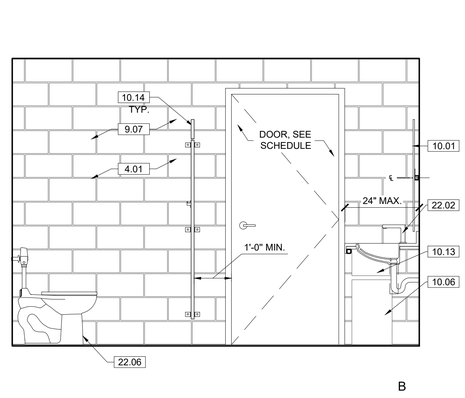


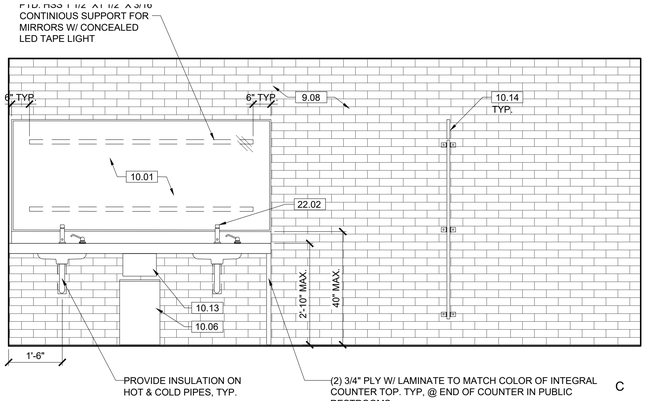
INTERIOR ELEVATIONS AT MEN'S RESTROOM

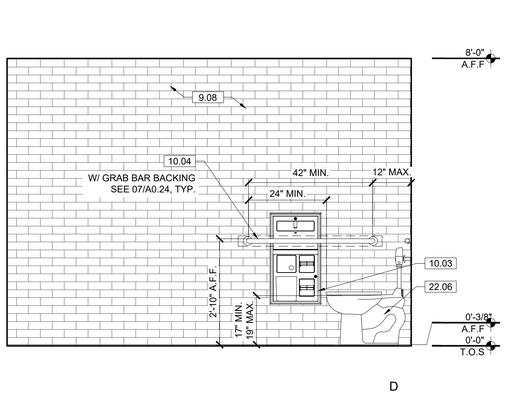
02

REF: 01 / A4.10 SCALE: 1/2" = 1'-0"









SEE SHEET A0.23 &A0.24 FOR ADDITIONAL ACCESSIBILITY NOTES	SEE SHEET 3/A7.01 FOR BATHROOM COUNTER TOP FRAMING SUPPORT PLAN

INTERIOR ELEVATIONS AT WOMEN'S RESTROOM

01

REF: 01 / A4.10 SCALE: 1/2" = 1'-0"

KEYNOTES

NOTE: ITEMS IDENTIFIED ARE TYPICAL TO ALL LIKE ITEMS UNLESS NOTED OTHERWISE.

01 - GENERAL REQUIREMENTS
02 - NOT USED

03 - CONCRETE
3.01 CONC. SLAB ON GRADE PER STRUCT'L.
3.02 CONC. O/MTL. DECK PER STRUCT'L.
3.03 CONC. CURB
3.04 CONC. FOOTING PER STRUCT'L.
3.05 CONC. PAVING PER CIVIL DWGS.
3.06 CONC. SIDEWALK PER CIVIL DWGS.
3.07 CONC. PAD

04 - MASONRY
4.01 CMU BLDNG. WALL
4.02 CMU SITE WALL W/ 2" CMU CAP.

05 - METALS
5.01 STL. COLUMN PER STRUCT'L. PTD.
5.02 STL. BEAM PER STRUCT'L. PTD.
5.03 HSS POST PER STRUCT'L. PTD.
5.04 HSS BEAM PER STRUCT'L. PTD.
5.05 MEMBRANE STRUCTURE I BEAM.
5.06 MTL. DECK.
5.07 MTL. GUARD RAILING.
5.08 MTL. STUD WALL.

06 - WOOD AND PLASTICS

07 - THERMAL & MOISTURE PROTECTION
7.01 W.P. MEMBRANE PER DETL. & SPECS.
7.02 SINGLE PLY PVC ROOFING PER SPECS.
7.03 R-21 RIGID INSULATION @ WALLS.
7.04 UNDERSLAB MOISTURE VAPOR BARRIER.
7.05 ROOF DRAIN AND OVERFLOW.
7.06 CLEAR WATER-REPELLENT GRAFITTI COATING AT CMU WALL. (ALL EXPOSED SURFACES).
7.07 BATT INSULATION.

08 - OPENINGS (SEE DOOR/WINDOW SCHED)
8.01 STL. DOOR. & FRAME, PAINTED.
8.02 CLR. ANODIZED ALUM. STOREFRONT DOOR.
8.03 CLR. ANODIZED ALUM. STOREFRONT WINDOW.
8.04 DOOR HARDWARE SET PER SCHED.
8.05 EXTERIOR WALL LOUVER.
8.06 EXTERIOR WALL VENT WITH CAP.
8.07 ROLLING STL. DOOR & FRAME.
8.08 ICE RINK GATES
8.09 OVERHEAD GLASS DOOR.
8.10 ACCESS PANEL, COLOR TO MATCH ADJACENT MATERIAL.
8.11 ROOF ACCESS HATCH.

09 - FINISHES (SEE FIN. SCHED)
9.01 5/8" TYPE 'X' GYP. BD., PROVIDE 'WET RATED' AT BATHROOMS. PAINT.
9.02 CONC. FLR. SEAL PER FIN. SCHED.
9.03 RUBBER FLR. PER SPECS.
9.04 PAINT PER SPECS.
9.05 REVEAL PER DETAILS.
9.06 GRAFITTI COATING, TYP. @ ALL EXTERIOR SOLID WALLS.
9.07 GLAZED FINISH ON CMU.
9.08 CERAMIC TILE.

10 - SPECIALTIES
10.01 MIRROR PER SPECS.
10.02 SIGNAGE.
10.03 TOILET PAPER ROLL HOLDER PER ACCESSORY SCHED.
10.04 GRAB BAR.
10.05 COAT HOOK.
10.06 WASTE RECEPTACLE.
10.07 FOLDING SHOWER SEAT.
10.08 SHOWER ROD.
10.09 SHELF.
10.10 NETTING. NIC
10.11 FIRE EXTINGUISHER. RECESSED CABINET
10.12 TOILET SEAT COVER DISPENSER.
10.13 PAPER TOWEL DISPENSER.
10.14 BATHROOM PARTITION W/ ROBE HOOK @ EA. DOOR

11 - EQUIPMENT/APPLIANCES (SEE EQMT. SCHED)

12 - FURNISHINGS
12.01 BICYCLE RACKS FOR SHORT-TERM BIKE PARKING.
12.02 DASHERBOARDS. NIC.
12.03 BENCH. NIC.
12.04 BLEACHERS. NIC.
12.05 SCOREBOARD. NIC.
12.06 SKATE RACKS. NIC.

13 - SPECIAL CONSTRUCTION
13.01 MEMBRANE STRUCTURE.

14 - CONVEYING EQUIPMENT (NOT USED)

21 - FIRE SUPPRESSION
21.01 FIRE EXTINGUISHER.
21.02 FIRE SPRINKLER HORIZ. MAIN (SEE DIAGRAM)
21.03 FIRE SPRINKLER VALVE ASSEMBLY
21.04 FIRE DEPT. MAIN CONNECTION @ FRONT OF PROJECT. LAFD SHALL APPROVE FINAL LOCATION.
21.05 FIRE SPRINKLER HEAD.

22 - PLUMBING
22.01 WATER CLOSET PER PLUMBING LEGEND
22.02 LAV. SINK & FAUCET. PER PLUMBING LEGEND
22.03 JANITOR MOP SINK.
22.04 PLUMBING VENT PIPE.
22.05 DRINKING FOUNTAIN.
22.06 ULTRA LOW-FLOW TOILET.
22.07 SHOWER HEAD/ CONTROLS.
22.08 SHOWER DRAIN.
22.09 AREA DRAIN.
22.10 HOSE BIB.

23 - HEATING, VENTILATING, AND AIR-CONDITIONING
23.01 HVAC UNIT PER MECH.
23.02 AIR REGISTER WALL MOUNTED.
23.03 CEILING AIR REGISTER.
23.04 MAKE UP AIR LOUVER PER MECH. DWGS
23.05 BATHRM EXHAUST FAN PER SPECS.
23.06 BATHRM EXHAUST DUCT.
23.07 MECH. DUCT.
23.08 MECH. EQUIPMENT.

26 - ELECTRICAL
26.01 ELEC. PANEL PER PLANS & SCHED.
26.02 EXTERIOR LIGHT PER SCHED.
26.03 INTERIOR LIGHT PER SCHED.

27 - COMMUNICATION

28 - ELECTRONIC SAFETY AND SECURITY
28.01 SMOKE ALARM.
28.02 SECURITY CAMERA.
28.03 FIRE ALARM MAIN PANEL.

31 - EARTHWORK
31.01 APPROVED COMPACT FILL PER GEO & SOIL ENGINEER REPORT.

32 - EXTERIOR IMPROVEMENTS
32.01 ASPHALT PAVING PER CIVIL.
32.02 GRAPHICS/PAINT.SEE LAND. DWGS.
32.03 STORMWATER MANAGEMENT PER CIVIL DWGS.
32.04 STL. SECURITY GATE, PTD.
32.05 STL. SECURITY FENCE, PTD.
32.06 EXTERIOR AREA DRAINS.
32.07 BENCH.
32.08 TRENCH DRAIN.
32.09 TREE, SEE LANDSCAPE DWGS.
32.10 PLANTING, SEE LANDSCAPE DWGS.
32.11 (N) CONCRETE SIDEWALK, CURB, GUTTER PER CITY OF LA STANDARDS.
32.12 (N) CONC. APRON & DRIVEWAY CURB CUT PER CITY OF LA STANDARDS.
32.13 EQUIPMENT SCREEN.
32.14 CONC. WALL @ SITE FENCE.

33 - UTILITIES
33.01 WATER METER.
33.02 ELECTRICAL TRANSFORMER W/ BOLLARDS AS REQ'D.
33.03 ELECTRICAL METER.
33.04 POWER POLE.

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

LICENSED ARCHITECT
LAWRENCE SCARPA
C 21812
REN 10/31/2023
STATE OF CALIFORNIA

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED •

DEPARTMENT OF PUBLIC WORKS
BUREAU OF ENGINEERING

VERTICAL CONTROL:
HORIZONTAL CONTROL:
SHEET TITLE: INTERIOR ELEVATIONS
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

NO. REVISIONS: DATE: BY:

CIP NO.
INDEX NO.

CITY OF LOS ANGELES
CITY ENGINEER
GARY LEE MOORE, P.E. ENV SP
DESIGN GROUP:
DATE:
ENGINEER:
DESIGNED BY:
DRAWN BY:
CHECKED BY:
APPROVED BY:

WORK ORDER NO.
E170121B

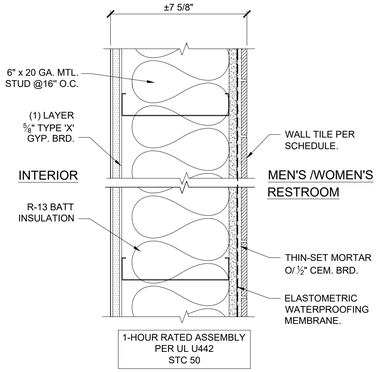
SHEET NAME
A7.14
SHEET X OF X SHEETS

REVISION DATES (DESIGN STAGE ONLY)

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

Sheet Version 4.0

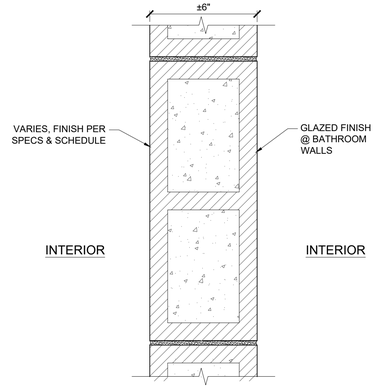
Z:\B□S ARCHITECTURE\019 JOBS\01935.0 CITY OF LA-RESEDA ICE HOCKEY ROLLER RINK\01935.0 1.CURRENT DRAWINGS_24X36\01935.0_A714_24X36.DWG 12/3/2021 9:27 AM



F

(N) WALL W/ TILE FINISH

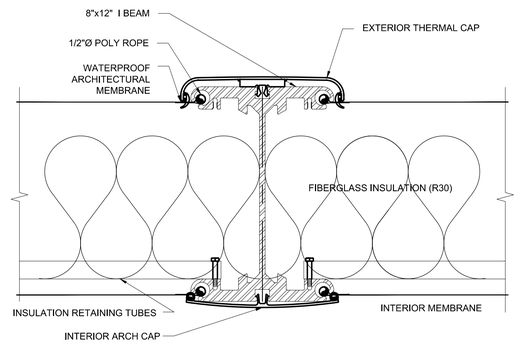
REF: FLOOR PLANS - A8.01, A8.02 SCALE: 3" = 1'-0"



C

6" CMU INTERIOR WALL

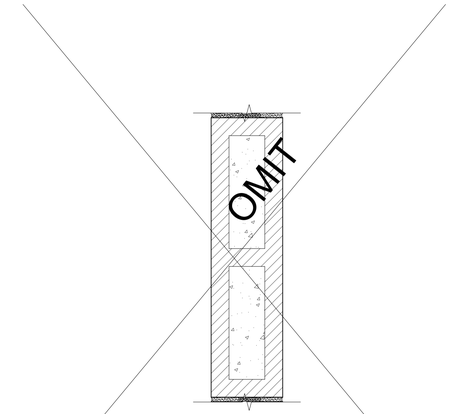
REF: FLOOR PLANS SCALE: 3" = 1'-0"



H

MEMBRANE WALL

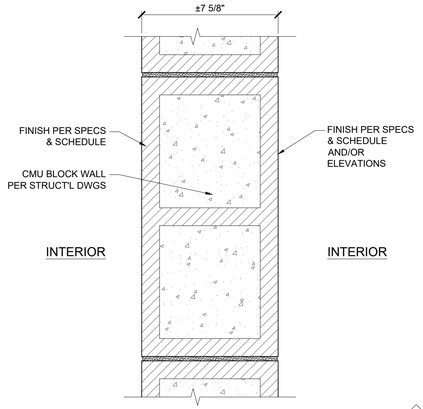
REF: FLOOR PLANS SCALE: 3" = 1'-0"



E

4" CMU SHAFT WALL

REF: FLOOR PLANS SCALE: 3" = 1'-0"



B1

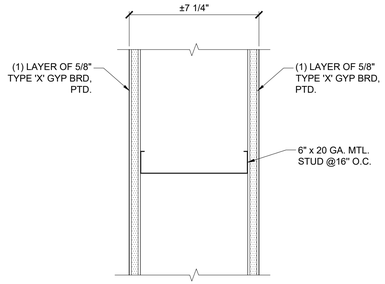
1-HR RATED 8" INT. CMU WALL

REF: FLOOR PLANS SCALE: 3" = 1'-0"

B

8" CMU INTERIOR WALL

REF: FLOOR PLANS SCALE: 3" = 1'-0"

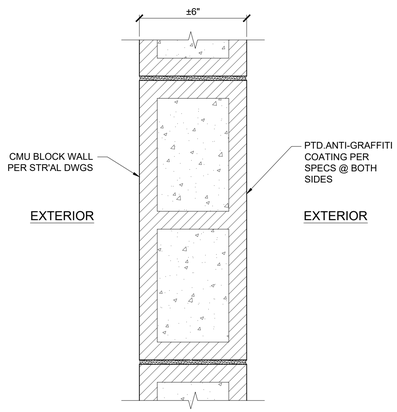


:SEE SHEETS A6.10 - A6.14 FOR EXT. WALL DETAILS @ ENTRY GATEWAY

G

1-HR RATED INT. MTL. STUD WALL

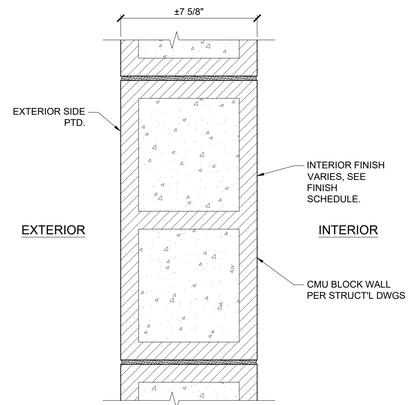
REF: FLOOR PLANS SCALE: 3" = 1'-0"



D

6" CMU SITE WALL

REF: FLOOR PLANS SCALE: 3" = 1'-0"



A1

NON-RATED 8" EXT. CMU WALL

REF: FLOOR PLANS SCALE: 3" = 1'-0"

A

1-HR RATED 8" EXT. CMU WALL

REF: FLOOR PLANS SCALE: 3" = 1'-0"

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REVISION DATES (DESIGN STAGE ONLY)

Sheet Version 4.0

Z:\B□S ARCHITECTURE\019 JOBS\01935.0 CITY OF LA-RESEDA ICE HOCKEY ROLLER RINK\01935.0 1.CURRENT DRAWINGS_24X36\01935.0_A800_24X36.DWG 12/3/2021 9:27 AM

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

LICENSED ARCHITECT
LAWRENCE SCARPA
C 21812
REN 10/31/2023
STATE OF CALIFORNIA

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED

DEPARTMENT OF PUBLIC WORKS
BUREAU OF ENGINEERING
VERTICAL CONTROL:
HORIZONTAL CONTROL:
SHEET TITLE: WALL TYPES
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

NO.	REVISIONS:	DATE:	BY:

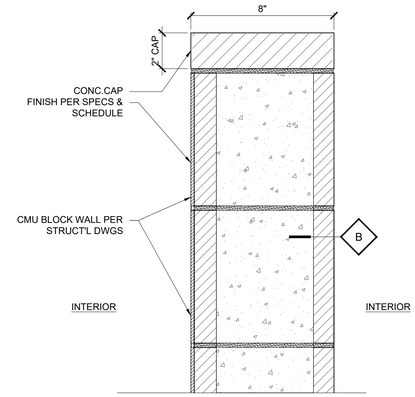
CIP NO.

INDEX NO.

CITY OF LOS ANGELES
CITY ENGINEER
GARY LEE MOORE, P.E. ENV SP
DESIGN GROUP
DATE:
ENGINEER:
DESIGNED BY:
DRAWN BY:
CHECKED BY:
APPROVED BY:

WORK ORDER NO.
E170121B

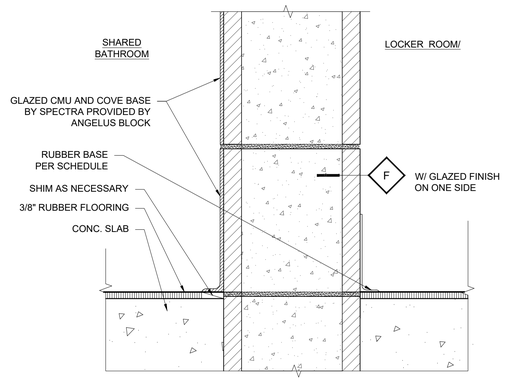
SHEET NAME
A8.00
SHEET X OF X SHEETS



03

CONC. CAP @ CMU WALL, TYP.

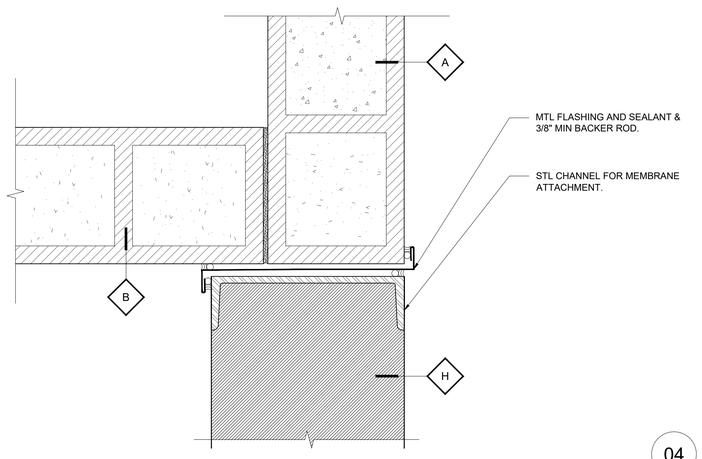
REF: SECTIONS, FINISH SCHEDULE SCALE: 3" = 1'-0"



02

COVE BASE-CMU

REF: A4.40, FINISH SCHEDULE SCALE: 3" = 1'-0"

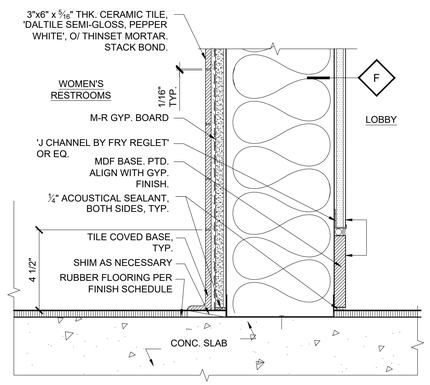


:SEE SHEETS A6.10 - A6.14 FOR EXT. WALL DETAILS @ ENTRY GATEWAY

04

MEMBRANE @ CMU

REF: 01/A4.40 SCALE: 3" = 1'-0"



01

BASE OF WALL @ RESTROOM/LOBBY

REF: SECTIONS, FINISH SCHEDULE SCALE: 3" = 1'-0"

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

LICENSED ARCHITECT
LAWRENCE SCARPA
C 21812
REN 10/31/2023
STATE OF CALIFORNIA

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED •

BUREAU OF ENGINEERING

VERTICAL CONTROL:
HORIZONTAL CONTROL:
SHEET TITLE: WALL DETAILS
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

DEPARTMENT OF PUBLIC WORKS

NO.	REVISIONS	DATE:	BY:

CIP NO.

INDEX NO.

CITY OF LOS ANGELES

CITY ENGINEER
GARY LEE MOORE, P.E. ENV SP
DESIGN GROUP
DATE:
ENGINEER:
DESIGNED BY:
DRAWN BY:
CHECKED BY:
APPROVED BY:

WORK ORDER NO.
E170121B

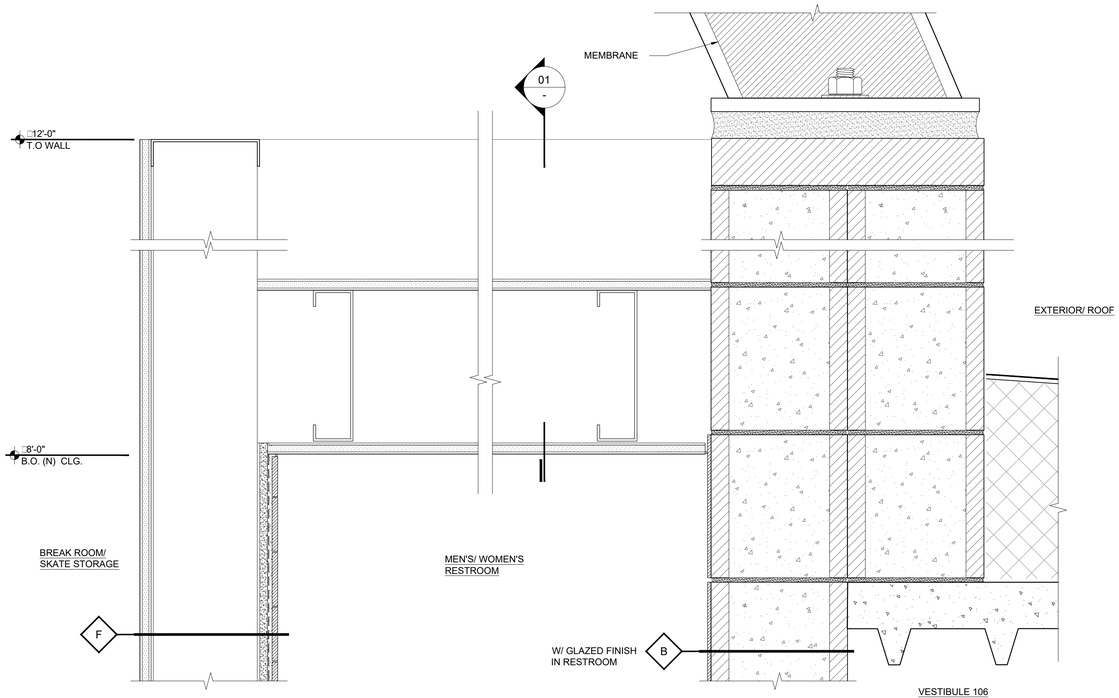
SHEET NAME
A8.01
SHEET X OF X SHEETS

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REVISION DATES
(DESIGN STAGE ONLY)

Sheet Version 4.0

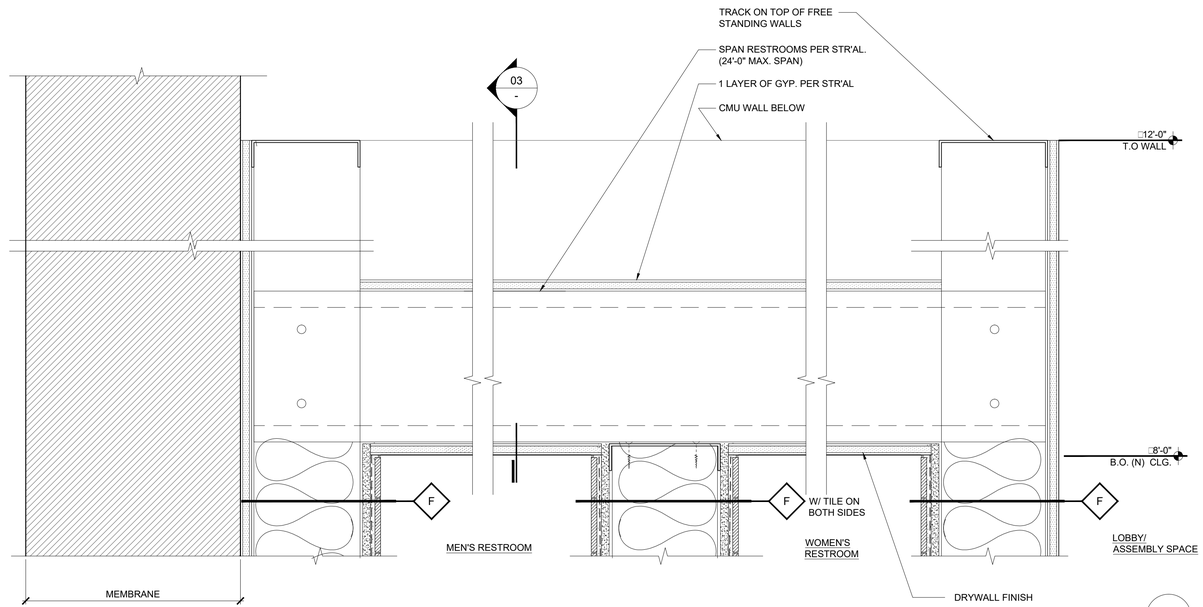
Z:\B□S ARCHITECTURE\019 JOBS\01935.0 CITY OF LA-RESEDA ICE HOCKEY ROLLER RINK\01935.0 1.CURRENT DRAWINGS_24X36\01935.0_A801_24X36.DWG 12/3/2021 9:28 AM



03

CEILING @ PUBLIC RESTROOMS

REF: 01/A3.00, ENLARGED SECTIONS SCALE: 3" = 1'-0"



01

CEILING @ PUBLIC RESTROOMS

REF: 02/A3.01, ENLARGED SECTIONS SCALE: 3" = 1'-0"

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

LICENSED ARCHITECT
LAWRENCE SCARPA
C 21812
REN 10/31/2023
STATE OF CALIFORNIA

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED

BUREAU OF ENGINEERING

VERTICAL CONTROL:
HORIZONTAL CONTROL:
SHEET TITLE: CEILING DETAILS
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

DEPARTMENT OF PUBLIC WORKS

NO. REVISIONS: DATE: BY:

CIP NO.

INDEX NO.

CITY OF LOS ANGELES

CITY ENGINEER
GARY LEE MOORE, P.E., ENV SP
DESIGN GROUP
ENGINEER:
DESIGNED BY:
DRAWN BY:
CHECKED BY:
APPROVED BY:
DATE:

WORK ORDER NO.
E170121B

SHEET NAME
A8.02
SHEET X OF X SHEETS

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REVISION DATES
(DESIGN STAGE ONLY)

Sheet Version 4.0

Z:\B□S ARCHITECTURE\019 JOBS\01935.0 CITY OF LA-RESEDA ICE HOCKEY ROLLER RINK\01935.0 1.CURRENT DRAWINGS_24X36\01935.0_A802_24X36.DWG 12/3/2021 9:28 AM

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

INFORMATION BULLETIN / PUBLIC - BUILDING CODE
REFERENCE NO.: LABC 1803.5.3 Effective: 01-01-2017
DOCUMENT NO.: **P/BC 2017-116** Revised:
Previously Issued As: P/BC 2014-116

FOUNDATION DESIGN FOR EXPANSIVE SOILS

Foundation systems for buildings on expansive soils shall be designed and constructed in a manner that will minimize damage to the structure from movement of the soil. The following guidelines are intended to provide the required mitigation:

I. NEW CONSTRUCTION

In order to mitigate the potential for expansive soils, either a soils report shall be submitted to the Grading Division for review and approval or the building footings shall be designed in accordance with the following requirements:

1. Depth of footings below the natural and finish grades shall not be less than 24 inches for exterior and 18 inches for interior footings.
2. Exterior walls and interior bearing walls shall be supported on continuous footings.
3. Footings shall be reinforced with four ½-inch-diameter deformed reinforcing bars. Two bars shall be placed within 4 inches of the bottom of the footings and two bars within 4 inches of the top of the footing with a minimum concrete cover per ACI 318, Section 20.6.1.3.
4. On-grade concrete floor slabs shall be placed on a 4-inch fill of coarse aggregate or on a 2-inch sand bed over a moisture barrier membrane. The slabs shall be at least 3 ½ inches thick and shall be reinforced with ½-inch-diameter deformed reinforcing bars. Reinforcing bars shall be spaced at intervals not exceeding 16 inches each way.
5. The soil below an interior concrete slab shall be pre-saturated to a depth of 18 inches prior to placing the concrete.
6. All drainage adjacent to footings shall be conducted away from the structure by a minimum 3-foot-wide apron sloped at no less than 2 percent and draining into an approved non-erosive device.
7. Allowable foundation and lateral pressures for footing design shall not exceed the values shown in Table 1806.2.

Construction in accordance with these requirements does not prevent the building/grading inspector from requiring a soils report at any time, based upon site conditions.

II. SLAB-ON-GROUND FOUNDATIONS

Slab-on-ground foundations such as a post-tensioned mat or raft will require a soils report and they shall be designed in accordance with Code Section 1808.6.2.

As a covered entity under Title II of the Americans with Disabilities Act, the City of Los Angeles does not discriminate on the basis of disability and, upon request, will provide reasonable accommodation to ensure equal access to its programs, services and activities.

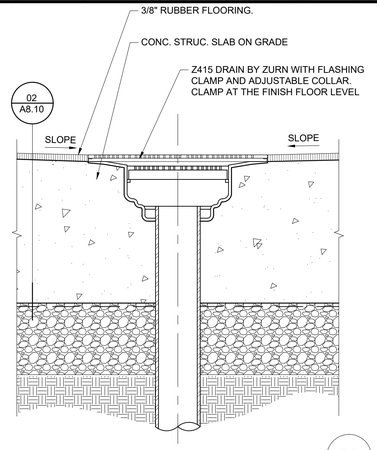
III. EXISTING FOOTINGS

Existing residential buildings which are being remodeled or added onto may utilize the existing footings to support the proposed construction in lieu of compliance with the requirements specified above provided the following conditions are met:

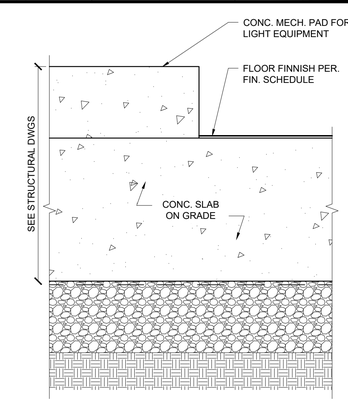
1. The total value of the remodeling project, including any additions, must not exceed 50% of the replacement value of the existing building.
2. The project shall be limited to the existing single family dwellings being enlarged or remodeled using the existing footings. All new footings must comply with all requirements contained in this information bulletin.
3. For other than one-story additions, the civil or structural engineer of record shall prepare a statement to be included on the plans, stating that the engineer has inspected the supporting soils on the site and is knowledgeable of the soils in the area. The statement shall also include the following information:
   a. The type of soil on the site and the estimated classification of expansiveness.
   b. The structural adequacy and condition of existing footings.
4. All drainage adjacent to existing footings shall be conducted away from the structure.

As a covered entity under Title II of the Americans with Disabilities Act, the City of Los Angeles does not discriminate on the basis of disability and, upon request, will provide reasonable accommodation to ensure equal access to its programs, services and activities.

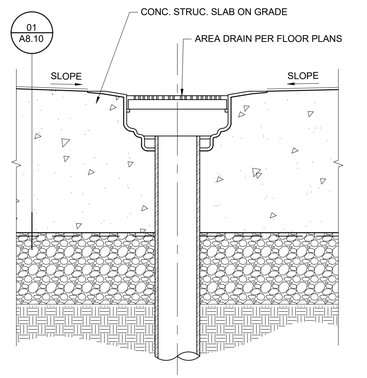
NOTE:
FOR ICE RINK FLOOR DETAILS SEE REFRIGERANT DRAWINGS, SHEET R5.01.



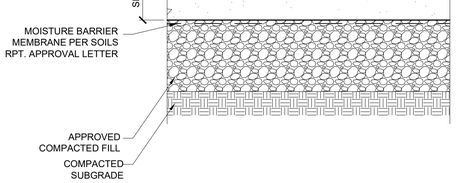
FLOOR DRAIN @ RUBBER FLOOR — 06
REF: ENLARGED PLANS SCALE: 3" = 1'-0"



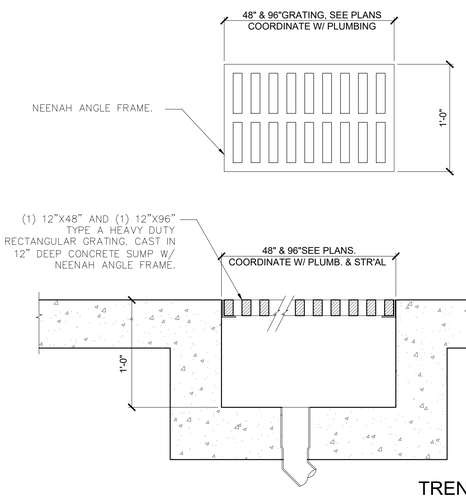
CONC. MECHANICAL PAD — 03
REF: A3.11, A4.20, A0.35 SCALE: 3" = 1'-0"



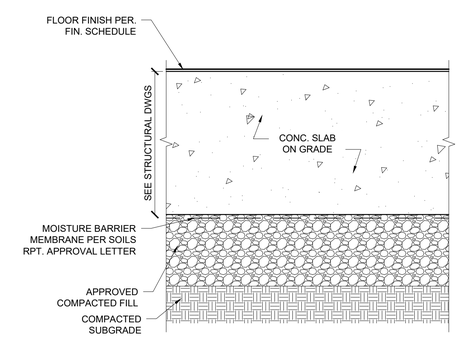
FLR DRAIN @ SLAB-ON-GRADE — 05
REF: A4.20, A4.40 SCALE: 3" = 1'-0"



RUBBER FLOORING — 02
REF: SECTIONS, A0.35 SCALE: 3" = 1'-0"



TRENCH DRAIN — 04
REF: SECTIONS, A4.00 SCALE: 1 1/2" = 1'-0"



NOTE: SEE A0.35 FOR SOILS RPT. APPROVAL LETTER AND SOILS REPORT DATED 11/08/19 & 03/25/21 FOR MORE INFORMATION.

SEALED CONC. FLOOR — 01
REF: SECTIONS, A0.35 SCALE: 3" = 1'-0"

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

LICENSED ARCHITECT
LAWRENCE SCARPA
C 21812
REN 10/31/2023
STATE OF CALIFORNIA
• THIS SLAW WAS ELECTRONICALLY SIGNED AND STAMPED •

DEPARTMENT OF PUBLIC WORKS
BUREAU OF ENGINEERING
VERTICAL CONTROL:
HORIZONTAL CONTROL:
SHEET TITLE: FLOOR DETAILS
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

NO.	REVISIONS:	DATE:	BY:

CIP NO.
INDEX NO.

CITY OF LOS ANGELES
CITY ENGINEER
GARY LEE MOORE, P.E. ENV SP
DESIGN GROUP
DATE:
ENGINEER:
DESIGNED BY:
DRAWN BY:
CHECKED BY:
APPROVED BY:

WORK ORDER NO.
E170121B

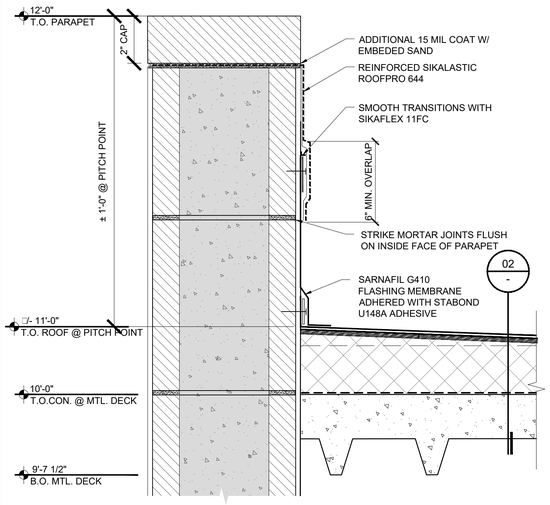
SHEET NAME
A8.10
SHEET X OF X SHEETS

REVISION DATES (DESIGN STAGE ONLY)

Sheet Version 4.0

Z:\B□S ARCHITECTURE\019 JOBS\01935.0 CITY OF LA-RESEDA ICE HOCKEY ROLLER RINK\01935.0 1.CURRENT DRAWINGS_24X36\01935.0_A810_24X36.DWG 12/3/2021 9:28 AM

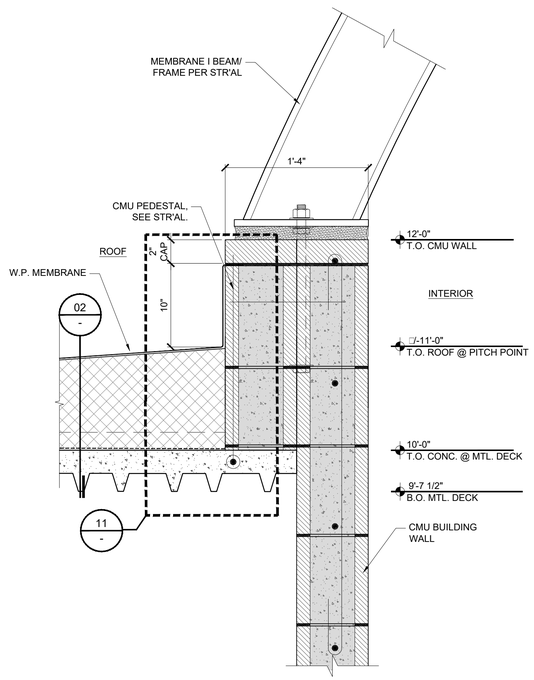
NOTE: ROOF DETAILS ARE BASED ON THE SIKA-SARNAFIL SYSTEM, TYP.



TERMINATION @ PARAPET

11

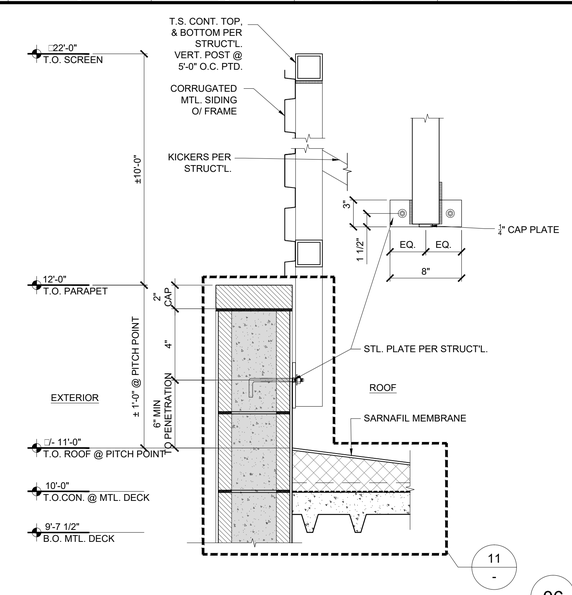
REF: ENLARGED SECTIONS, 01/A4.50 SCALE: 3" = 1'-0"



PARAPET@SPRUNG MEMBRANE

08

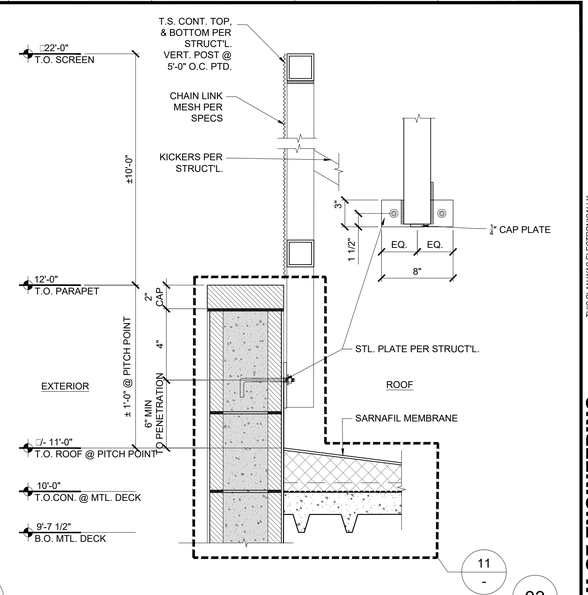
REF: ENLARGED SECTIONS, 01/A4.50 SCALE: 1 1/2" = 1'-0"



METAL SCREEN @ ROOF EQUIPMENT

06

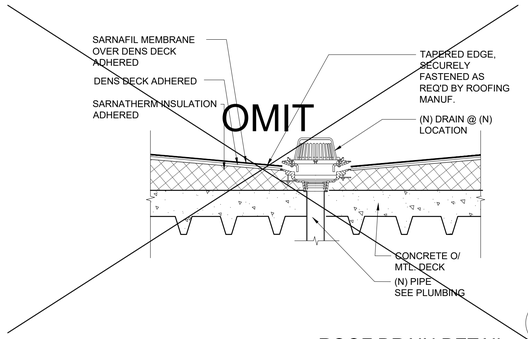
REF: ENLARGED SECTIONS, 01/A4.50 SCALE: 1 1/2" = 1'-0"



CHAIN LINK FENCE @ ROOF EQUIPMENT

03

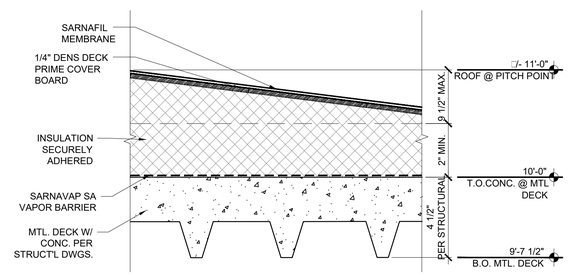
REF: ENLARGED SECTIONS, 01/A4.50 SCALE: 1 1/2" = 1'-0"



ROOF DRAIN DETAIL

05

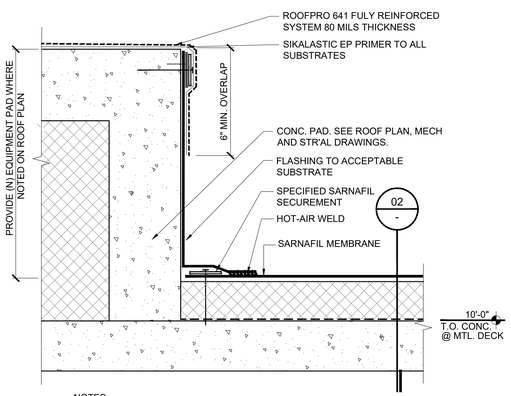
REF: -- SCALE: 1 1/2" = 1'-0"



ROOFING @ CONCRETE O/ MTL. DECK

02

REF: ENLARGED SECTIONS SCALE: 3" = 1'-0"

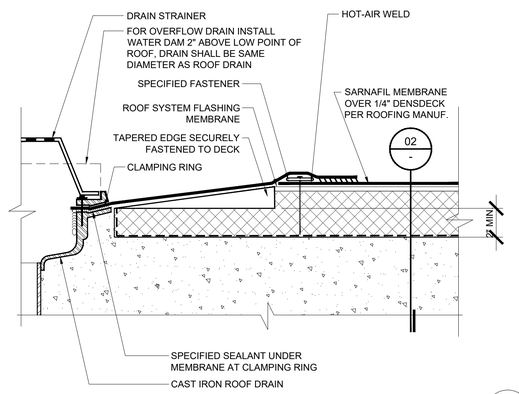


NOTES:
1) SIKALASTIC REGULAR (NOT RAPID) EP PRIMER MUST BE USED OVER PVC MEMBRANES.

MECH.PAD DETAIL

10

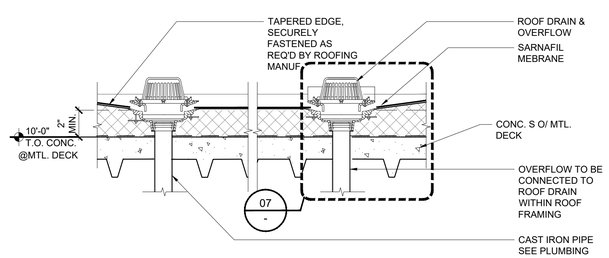
REF: ENLARGED SECTIONS, 01/A4.50 SCALE: 3" = 1'-0"



ROOF DRAIN DETAIL

07

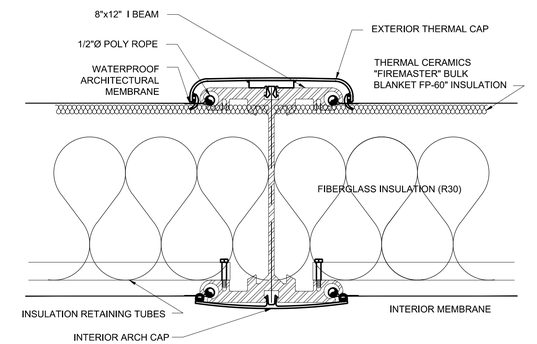
REF: 04/- SCALE: 3" = 1'-0"



ROOF DRAIN-OVERFLOW DETAIL

04

REF: A1.20, 01/A4.50 SCALE: 1 1/2" = 1'-0"



CLASS A ROOF MEMBRANE ASSEMBLY

01

REF: SECTIONS, ENLARGED SECTIONS SCALE: 3" = 1'-0"

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

LICENSED ARCHITECT LAWRENCE SCARPA C 21812 REN 10/31/2023 STATE OF CALIFORNIA

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED •

DEPARTMENT OF PUBLIC WORKS
BUREAU OF ENGINEERING

VERTICAL CONTROL:
HORIZONTAL CONTROL:
SHEET TITLE: ROOF DETAILS
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

NO	REVISIONS:	DATE:	BY:

CIP NO.

INDEX NO.

CITY OF LOS ANGELES
CITY ENGINEER
GARY LEE MOORE, P.E., ENV SP
DESIGN GROUP:
DATE:
ENGINEER:
DESIGNED BY:
DRAWN BY:
CHECKED BY:
APPROVED BY:

WORK ORDER NO.
E170121B

SHEET NAME
A8.20
SHEET X OF X SHEETS

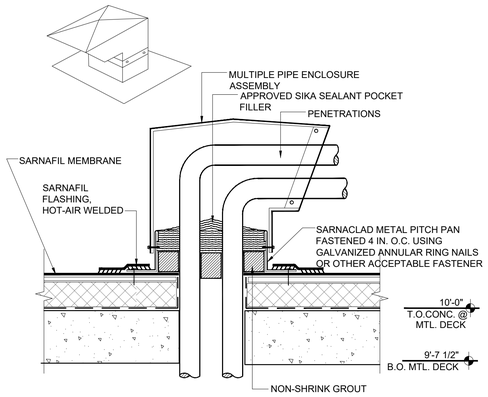
THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REVISION DATES (DESIGN STAGE ONLY)

Sheet Version 4.0

Z:\B□S ARCHITECTURE\019 JOBS\01935.0 CITY OF LA-RESEDA ICE HOCKEY ROLLER RINK\01935.0 1.CURRENT DRAWINGS_24X36\01935.0_A820_24X36.DWG 12/3/2021 9:28 AM

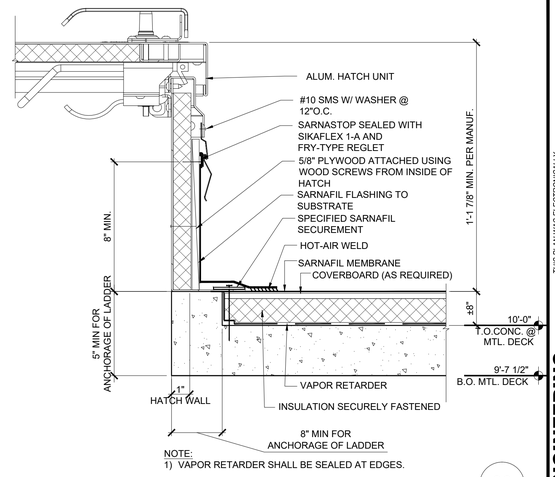
NOTE: ROOF DETAILS ARE BASED ON THE SIKA-SARNAFIL SYSTEM, TYP.



NOTES:
1) PITCH POCKETS ARE TO BE ELIMINATED WHERE POSSIBLE.
2) SEALANT IS A MAINTENANCE ITEM. MAINTENANCE IS NOT COVERED UNDER THE SIKA SARNAFIL WARRANTY.

MULTIPLE PIPE PENETRATION DETAIL 06

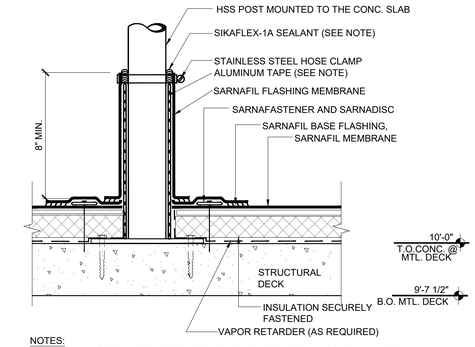
REF: 01/A4.50 SCALE: 3" = 1'-0"



NOTE:
1) VAPOR RETARDER SHALL BE SEALED AT EDGES.

ROOF HATCH FLASHING DETAIL 03

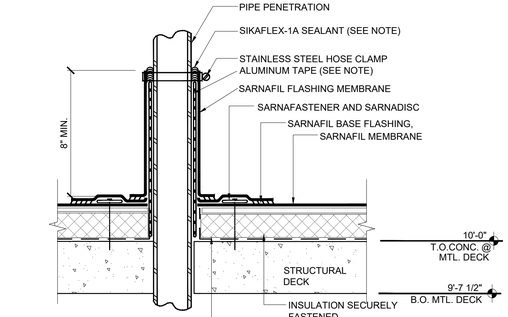
REF: 01/A4.50, ENLARGED SECTIONS SCALE: 3" = 1'-0"



NOTES:
1) ALUMINUM TAPE IS REQUIRED IF EXISTING PENETRATION IS CONTAMINATED.
2) SEALANT IS A MAINTENANCE ITEM, MAINTENANCE IS NOT COVERED UNDER THE SARNAFIL WARRANTY
3) VAPOR RETARDER SHALL BE SEALED AT EDGES.

DETAIL@ FENCE POST 08

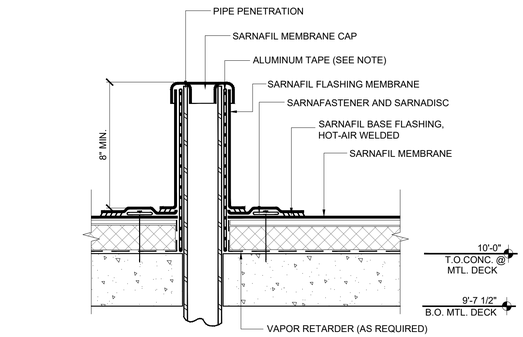
REF: 01/ A4.50 SCALE: 3" = 1'-0"



NOTES:
1) ALUMINUM TAPE IS REQUIRED IF EXISTING PENETRATION IS CONTAMINATED.
2) SEALANT IS A MAINTENANCE ITEM, MAINTENANCE IS NOT COVERED UNDER THE SARNAFIL WARRANTY
3) VAPOR RETARDER SHALL BE SEALED AT EDGES.

PIPE PENETRATION DETAIL 05

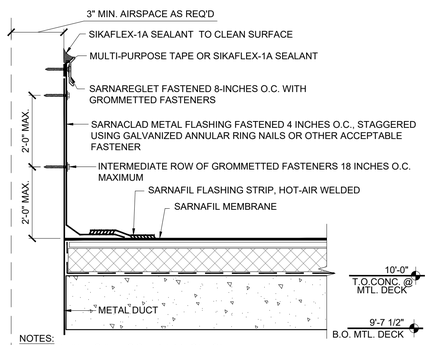
REF: 01/A4.50 SCALE: 3" = 1'-0"



NOTES:
1) ALUMINUM TAPE IS REQUIRED IF EXISTING PENETRATION IS CONTAMINATED.
2) VAPOR RETARDER SHALL BE SEALED AT EDGES.

VENT DETAIL 02

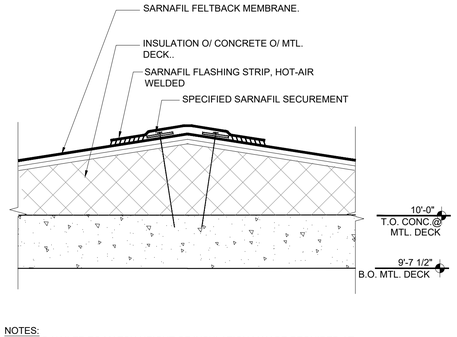
REF: A1.20, 01/A4.50 SCALE: 3" = 1'-0"



NOTES:
1) SEALANT IS A TWO STEP APPLICATION:
   A) BEHIND TOP OF SARNAFIL FLASHING.
   B) AT TOP OF SARNAREGLET.
2) SEALANT IS A MAINTENANCE ITEM, MAINTENANCE IS NOT COVERED UNDER SIKA SARNAFIL WARRANTY.

DETAIL@ EXHAUST FAN 07

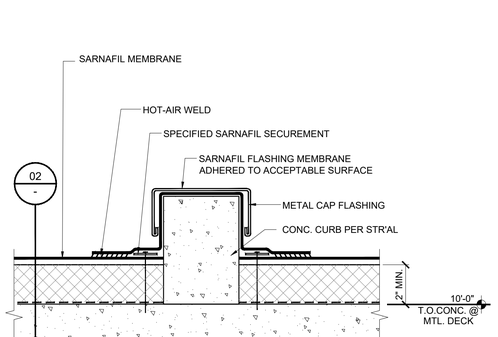
REF: 01/ A4.50 SCALE: 3" = 1'-0"



NOTES:
1) WOOD NAILER TO MATCH HEIGHT OF INSULATION MAY BE REQUIRED AT PEAK IF INSULATION THICKNESS EXCEEDS 2 INCHES.
2) OPTION DETAIL USING SARNAFASTENERS AND SARNADISC SPACING MAY VARY. CONSULT SIKA SARNAFIL TECHNICAL DEPARTMENT.

TYP.PEAK RIDGE DETAIL 04

REF: 01/A4.50 SCALE: 3" = 1'-0"



EQUIPMENT SUPPORT DETAIL 01

REF: 01/A4.50 SCALE: 3" = 1'-0"

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REVISION DATES (DESIGN STAGE ONLY)

Sheet Version 4.0

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED •

LICENSED ARCHITECT
LAWRENCE SCARPA
C 21812
REN 10/31/2023
STATE OF CALIFORNIA

BUREAU OF ENGINEERING

VERTICAL CONTROL:
HORIZONTAL CONTROL:
SHEET TITLE: ROOF DETAILS
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

DEPARTMENT OF PUBLIC WORKS

NO.	REVISIONS:	DATE:	BY:

CIP NO.

INDEX NO.

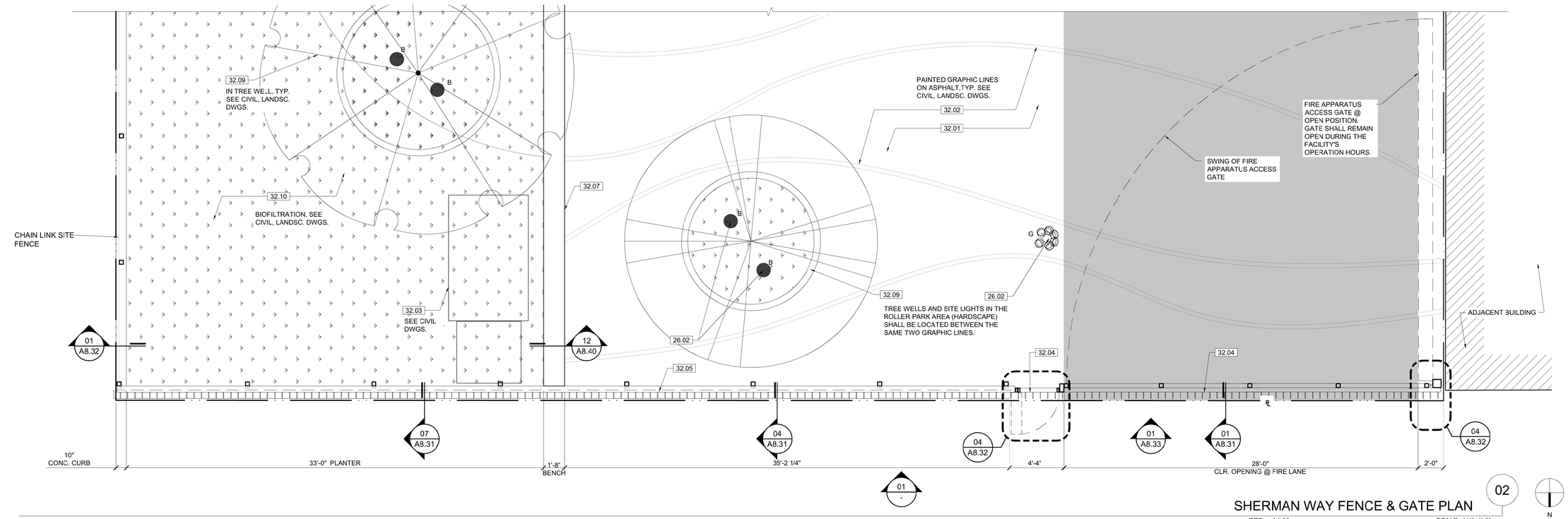
CITY OF LOS ANGELES

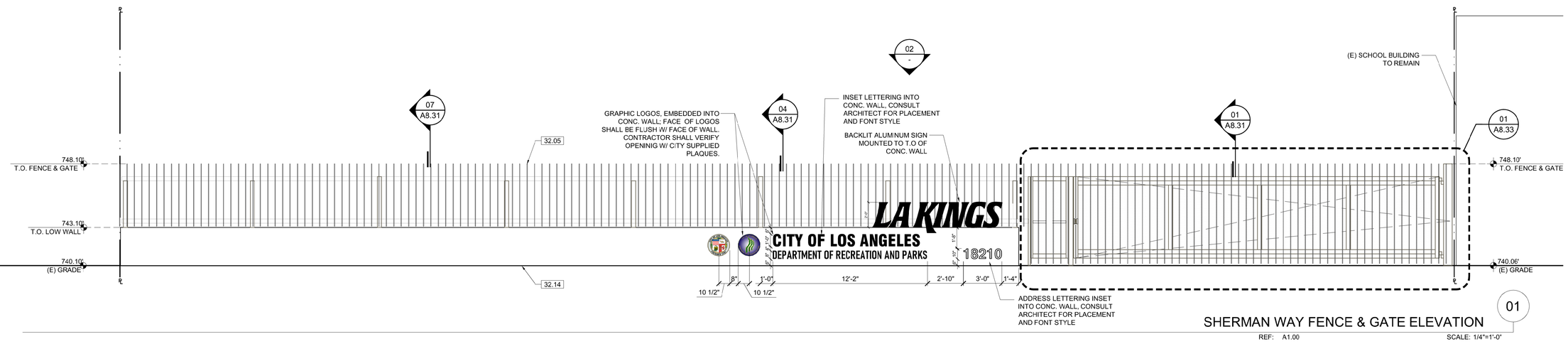
CITY ENGINEER
GARY LEE MOORE, P.E., ENV SP
DESIGN GROUP:
ENGINEER:
DESIGNED BY:
DRAWN BY:
CHECKED BY:
APPROVED BY:
DATE:

WORK ORDER NO.
E170121B

SHEET NAME
A8.21
SHEET X OF X SHEETS

Z:\B□S ARCHITECTURE\019 JOBS\01935.0 CITY OF LA-RESEDA ICE HOCKEY ROLLER RINK\01935.0 1.CURRENT DRAWINGS_24X36\01935.0_A821_24X36.DWG 12/7/2021 1:58 PM





KEYNOTES

NOTE: ITEMS IDENTIFIED ARE TYPICAL TO ALL LIKE ITEMS UNLESS NOTED OTHERWISE.

01 - GENERAL REQUIREMENTS
02 - NOT USED

03 - CONCRETE
3.01 CONC. SLAB ON GRADE PER STRUCT'L.
3.02 CONC. O/MTL. DECK PER STRUCT'L.
3.03 CONC. CURB
3.04 CONC. FOOTING PER STRUCT'L.
3.05 CONC. PAVING PER CIVIL DWGS.
3.06 CONC. SIDEWALK PER CIVIL DWGS.
3.07 CONC. PAD

04 - MASONRY
4.01 CMU BLDNG. WALL
4.02 CMU SITE WALL W/ 2" CMU CAP.

05 - METALS
5.01 STL. COLUMN PER STRUCT'L. PTD.
5.02 STL. BEAM PER STRUCT'L. PTD.
5.03 HSS POST PER STRUCT'L. PTD.
5.04 HSS BEAM PER STRUCT'L. PTD.
5.05 MEMBRANE STRUCTURE I BEAM.
5.06 MTL. DECK.
5.07 MTL. GUARD RAILING.
5.08 MTL. STUD WALL.

06 - WOOD AND PLASTICS

07 - THERMAL & MOISTURE PROTECTION
7.01 W.P. MEMBRANE PER DETL. & SPECS.
7.02 SINGLE PLY PVC ROOFING PER SPECS.
7.03 R-21 RIGID INSULATION @ WALLS.
7.04 UNDERSLAB MOISTURE VAPOR BARRIER.
7.05 ROOF DRAIN AND OVERFLOW.
7.06 CLEAR WATER-REPELLENT GRAFITTI COATING AT CMU WALL. (ALL EXPOSED SURFACES).
7.07 BATT INSULATION.

08 - OPENINGS (SEE DOOR/WINDOW SCHED)
8.01 STL. DOOR. & FRAME, PAINTED.
8.02 CLR. ANODIZED ALUM. STOREFRONT DOOR.
8.03 CLR. ANODIZED ALUM. STOREFRONT WINDOW.
8.04 DOOR HARDWARE SET PER SCHED.
8.05 EXTERIOR WALL LOUVER.
8.06 EXTERIOR WALL VENT WITH CAP.
8.07 ROLLING STL. DOOR & FRAME.
8.08 ICE RINK GATES
8.09 OVERHEAD GLASS DOOR.
8.10 ACCESS PANEL, COLOR TO MATCH ADJACENT MATERIAL.
8.11 ROOF ACCESS HATCH.

09 - FINISHES (SEE FIN. SCHED)
9.01 5/8" TYPE 'X' GYP. BD., PROVIDE 'WET RATED' AT BATHROOMS. PAINT.
9.02 CONC. FLR. SEAL PER FIN. SCHED.
9.03 RUBBER FLR. PER SPECS.
9.04 PAINT PER SPECS.
9.05 REVEAL PER DETAILS.
9.06 GRAFITTI COATING, TYP. @ ALL EXTERIOR SOLID WALLS.
9.07 GLAZED FINISH ON CMU.
9.08 CERAMIC TILE.

10 - SPECIALTIES
10.01 MIRROR PER SPECS.
10.02 SIGNAGE.
10.03 TOILET PAPER ROLL HOLDER PER ACCESSORY SCHED.
10.04 GRAB BAR.
10.05 COAT HOOK.
10.06 WASTE RECEPTACLE.
10.07 FOLDING SHOWER SEAT.
10.08 SHOWER ROD.
10.09 SHELF.
10.10 NETTING. NIC
10.11 FIRE EXTINGUISHER. RECESSED CABINET
10.12 TOILET SEAT COVER DISPENSER.
10.13 PAPER TOWEL DISPENSER.
10.14 BATHROOM PARTITION W/ ROBE HOOK @ EA. DOOR

11 - EQUIPMENT/APPLIANCES (SEE EQMT. SCHED)

12 - FURNISHINGS
12.01 BICYCLE RACKS FOR SHORT-TERM BIKE PARKING.
12.02 DASHERBOARDS. NIC.
12.03 BENCH. NIC.
12.04 BLEACHERS. NIC.
12.05 SCOREBOARD. NIC.
12.06 SKATE RACKS. NIC.

13 - SPECIAL CONSTRUCTION
13.01 MEMBRANE STRUCTURE.

14 - CONVEYING EQUIPMENT (NOT USED)

21 - FIRE SUPPRESSION
21.01 FIRE EXTINGUISHER.
21.02 FIRE SPRINKLER HORIZ. MAIN (SEE DIAGRAM)
21.03 FIRE SPRINKLER VALVE ASSEMBLY
21.04 FIRE DEPT. MAIN CONNECTION @ FRONT OF PROJECT. LAFD SHALL APPROVE FINAL LOCATION.
21.05 FIRE SPRINKLER HEAD.

22 - PLUMBING
22.01 WATER CLOSET PER PLUMBING LEGEND
22.02 LAV. SINK & FAUCET. PER PLUMBING LEGEND
22.03 JANITOR MOP SINK.
22.04 PLUMBING VENT PIPE.
22.05 DRINKING FOUNTAIN.
22.06 ULTRA LOW-FLOW TOILET.
22.07 SHOWER HEAD/ CONTROLS.
22.08 SHOWER DRAIN.
22.09 AREA DRAIN.
22.10 HOSE BIB.

23 - HEATING, VENTILATING, AND AIR-CONDITIONING
23.01 HVAC UNIT PER MECH.
23.02 AIR REGISTER WALL MOUNTED.
23.03 CEILING AIR REGISTER.
23.04 MAKE UP AIR LOUVER PER MECH. DWGS
23.05 BATHRM EXHAUST FAN PER SPECS.
23.06 BATHRM EXHAUST DUCT.
23.07 MECH. DUCT.
23.08 MECH. EQUIPMENT.

26 - ELECTRICAL
26.01 ELEC. PANEL PER PLANS & SCHED.
26.02 EXTERIOR LIGHT PER SCHED.
26.03 INTERIOR LIGHT PER SCHED.

27 - COMMUNICATION

28 - ELECTRONIC SAFETY AND SECURITY
28.01 SMOKE ALARM.
28.02 SECURITY CAMERA.
28.03 FIRE ALARM MAIN PANEL.

31 - EARTHWORK
31.01 APPROVED COMPACT FILL PER GEO & SOIL ENGINEER REPORT.

32 - EXTERIOR IMPROVEMENTS
32.01 ASPHALT PAVING PER CIVIL.
32.02 GRAPHICS/PAINT.SEE LAND. DWGS.
32.03 STORMWATER MANAGEMENT PER CIVIL DWGS.
32.04 STL. SECURITY GATE, PTD.
32.05 STL. SECURITY FENCE, PTD.
32.06 EXTERIOR AREA DRAINS.
32.07 BENCH.
32.08 TRENCH DRAIN.
32.09 TREE, SEE LANDSCAPE DWGS.
32.10 PLANTING, SEE LANDSCAPE DWGS.
32.11 (N) CONCRETE SIDEWALK, CURB, GUTTER PER CITY OF LA STANDARDS.
32.12 (N) CONC. APRON & DRIVEWAY CURB CUT PER CITY OF LA STANDARDS.
32.13 EQUIPMENT SCREEN.
32.14 CONC. WALL @ SITE FENCE.

33 - UTILITIES
33.01 WATER METER.
33.02 ELECTRICAL TRANSFORMER W/ BOLLARDS AS REQ'D.
33.03 ELECTRICAL METER.
33.04 POWER POLE.

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REVISION DATES (DESIGN STAGE ONLY)

Sheet Version 4.0

Z:\B+S ARCHITECTURE\019 JOBS\01935.0 CITY OF LA-RESEDA ICE HOCKEY ROLLER RINK\01935.0 1.CURRENT DRAWINGS_24X36\01935.0_A830_24X36.DWG 11/11/2021 1:38 PM

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

LICENSED ARCHITECT
LAWRENCE STAMPA
C 21812
REN 10/31/2023
STATE OF CALIFORNIA
THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED

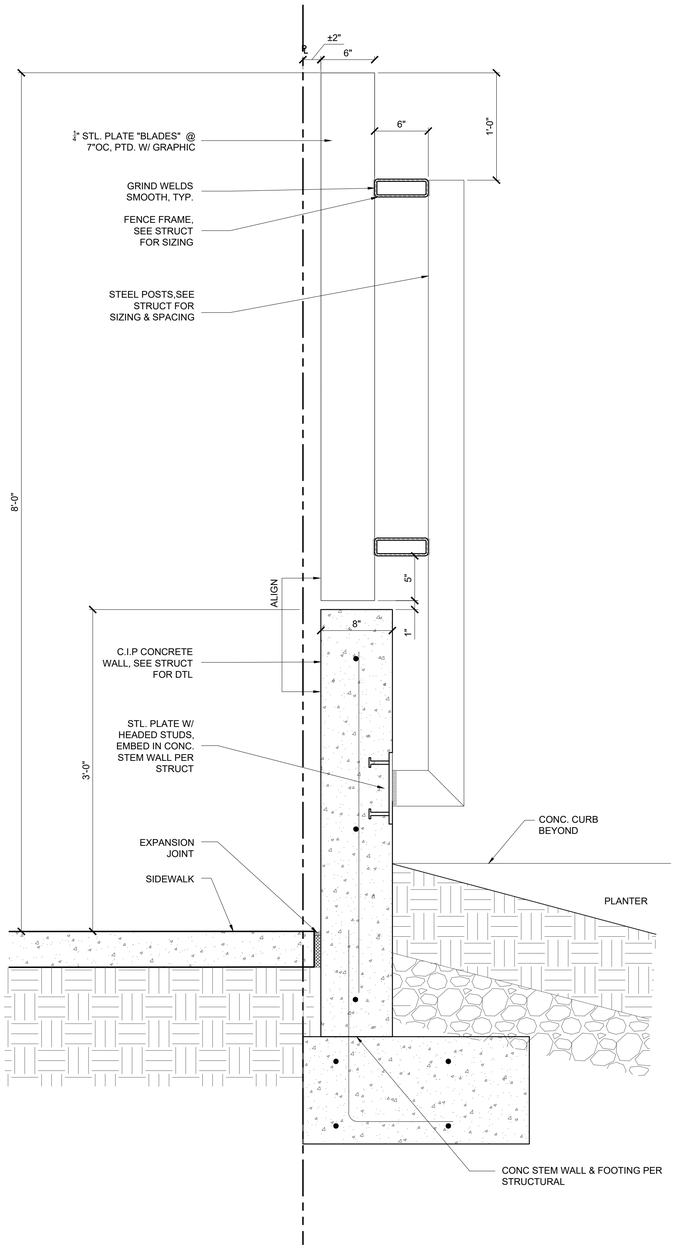
BUREAU OF ENGINEERING
VERTICAL CONTROL:
HORIZONTAL CONTROL:
SHEET TITLE: SITE DETAILS
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

DEPARTMENT OF PUBLIC WORKS
CITY ENGINEER
DATE:
DESIGN GROUP
ENGINEER:
DESIGNED BY:
DRAWN BY:
CHECKED BY:
APPROVED BY:
NO. REVISIONS: BY: DATE:
CIP NO.
INDEX NO.

CITY OF LOS ANGELES
GARY LEE MOORE, P.E., ENV SP

WORK ORDER NO.
E170121B

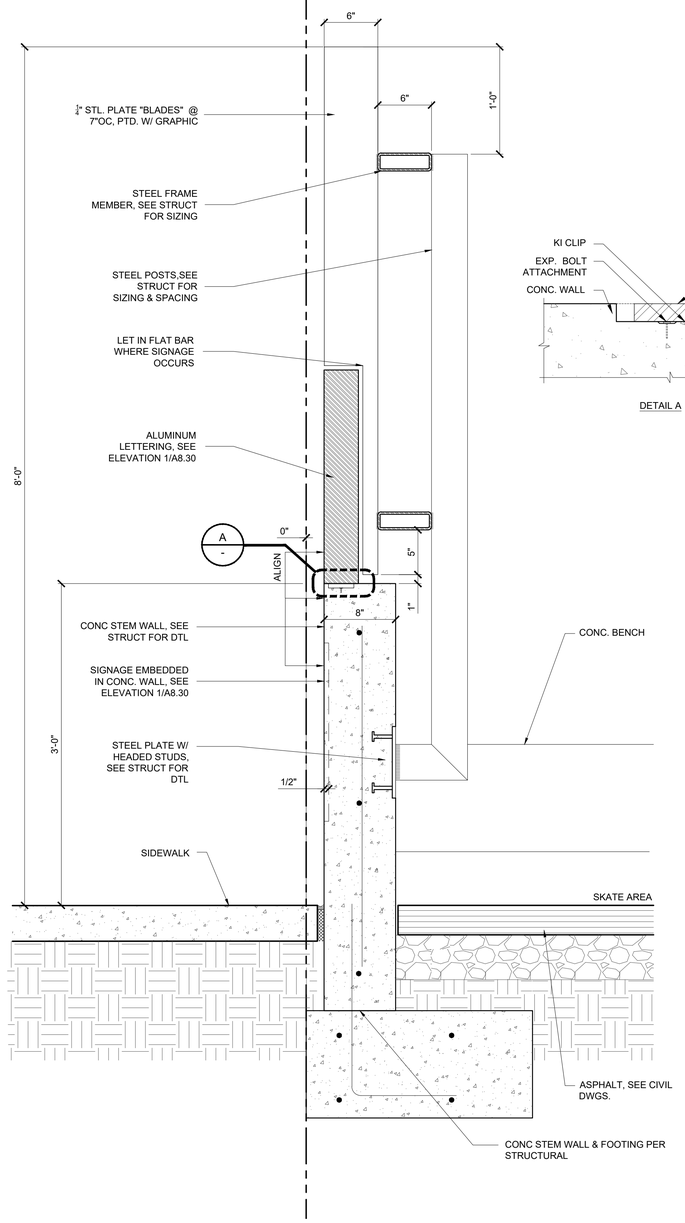
SHEET NAME
A8.30
SHEET X OF X SHEETS



07

FENCE SECTION

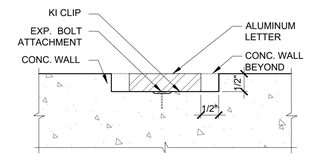
REF: 02/A8.30□01/A8.33 SCALE: 1 1/2" = 1'-0"



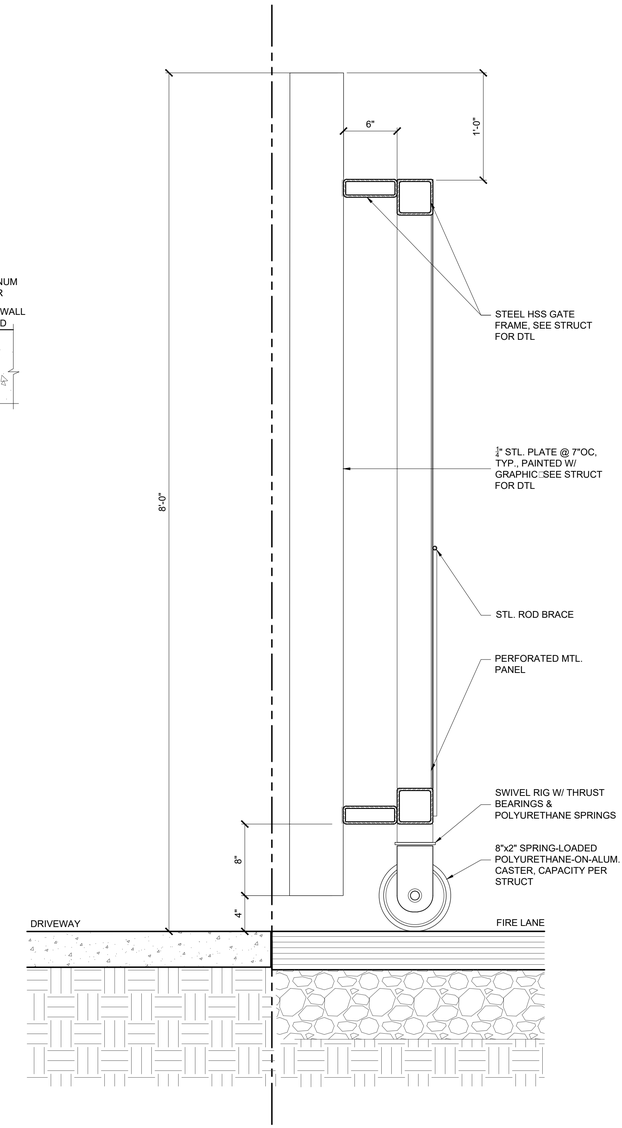
04

FENCE SECTION

REF: 02/A8.30 SCALE: 1 1/2" = 1'-0"



DETAIL A



01

GATE SECTION

REF: 02/A8.30□01/A8.33 SCALE: 1 1/2" = 1'-0"

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REVISION DATES (DESIGN STAGE ONLY)

Sheet Version 4.0

Z:\B□S ARCHITECTURE\019 JOBS\01935.0 CITY OF LA-RESEDA ICE HOCKEY ROLLER RINK\01935.0 1.CURRENT DRAWINGS_24X36\01935.0_A831_24X36.DWG 12/3/2021 9:29 AM

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

LICENSED ARCHITECT
LAWRENCE SCARPA
C 21812
REN. 10/31/2023
STATE OF CALIFORNIA

THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED

BUREAU OF ENGINEERING

VERTICAL CONTROL:
HORIZONTAL CONTROL:
SHEET TITLE: SITE DETAILS
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

DEPARTMENT OF PUBLIC WORKS

NO.	REVISIONS:	DATE:	BY:

CIP NO.

INDEX NO.

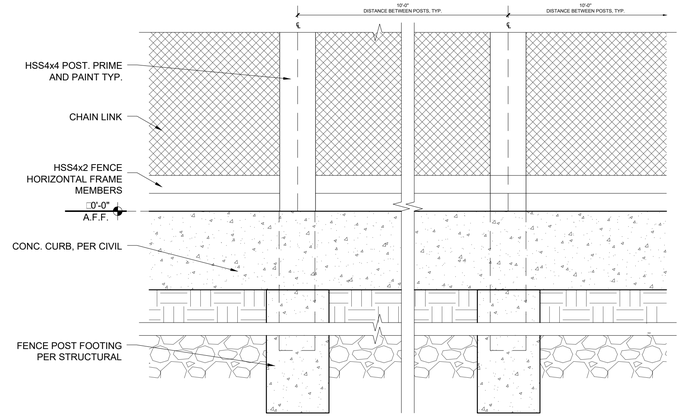
CITY OF LOS ANGELES

GARY LEE MOORE, P.E., ENV SP

CITY ENGINEER
DESIGN GROUP
DATE:
ENGINEER:
DESIGNED BY:
DRAWN BY:
CHECKED BY:
APPROVED BY:

WORK ORDER NO.
E170121B

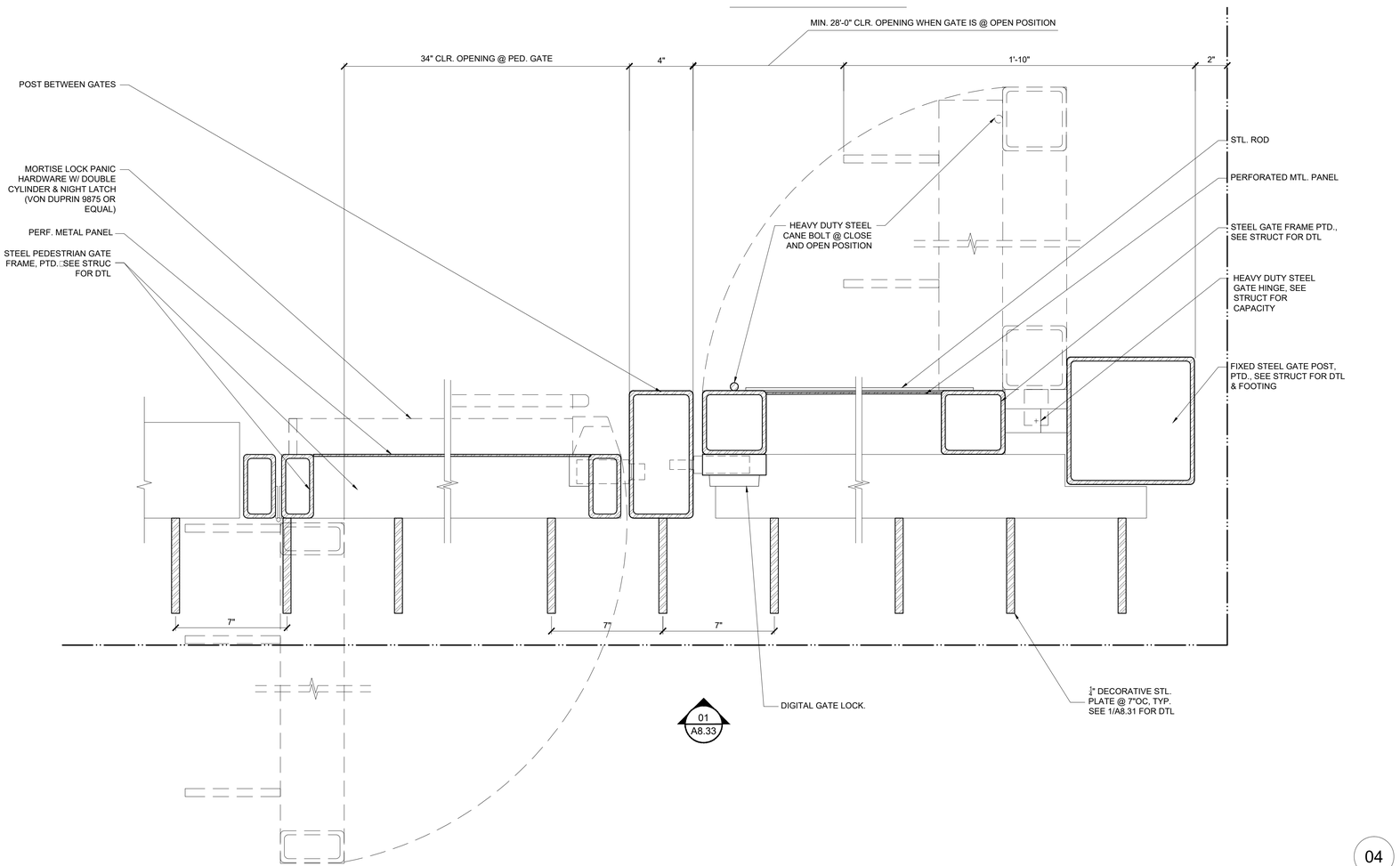
SHEET NAME
A8.31
SHEET X OF X SHEETS



SECTION @ FENCE POST FOOTINGS

06

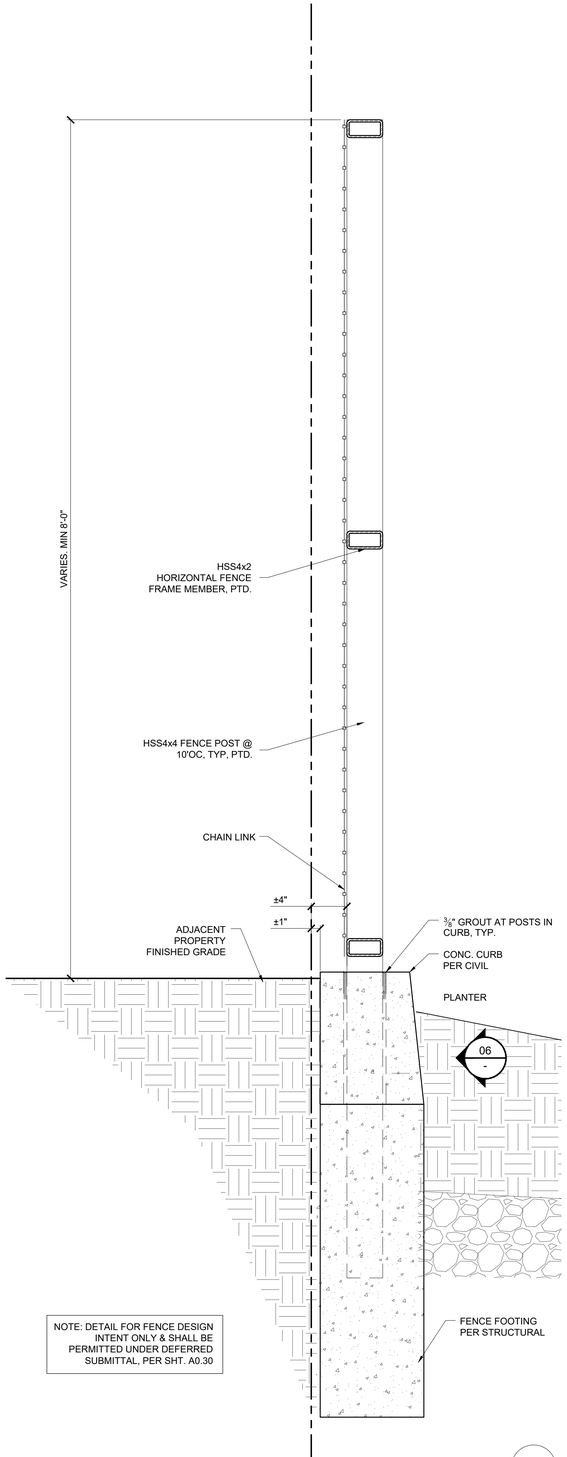
REF: 01/A8.32 SCALE: 1 1/2" = 1'-0"



SWING AND PEDESTRIAN GATES PLAN @ STREET ENTRY

04

REF: 02/A8.30□01/A8.33 SCALE: 3" = 1'-0"



NOTE: DETAIL FOR FENCE DESIGN INTENT ONLY & SHALL BE PERMITTED UNDER DEFERRED SUBMITTAL, PER SHT. A0.30

CHAIN LINK FENCE DETAIL

01

REF: 02/A8.30 SCALE: 1 1/2" = 1'-0"

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED •

LICENSED ARCHITECT
LAWRENCE SUARA
C 21812
REN 10/31/2023
STATE OF CALIFORNIA

DEPARTMENT OF PUBLIC WORKS
BUREAU OF ENGINEERING

VERTICAL CONTROL:
HORIZONTAL CONTROL:
SHEET TITLE: SITE DETAILS
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

NO. REVISIONS: DATE: BY:

CIP NO.

INDEX NO.

CITY OF LOS ANGELES
CITY ENGINEER
DATE:
GARY LEE MOORE, P.E., ENV SP
DESIGN GROUP
ENGINEER:
DESIGNED BY:
DRAWN BY:
CHECKED BY:
APPROVED BY:

WORK ORDER NO.
E170121B

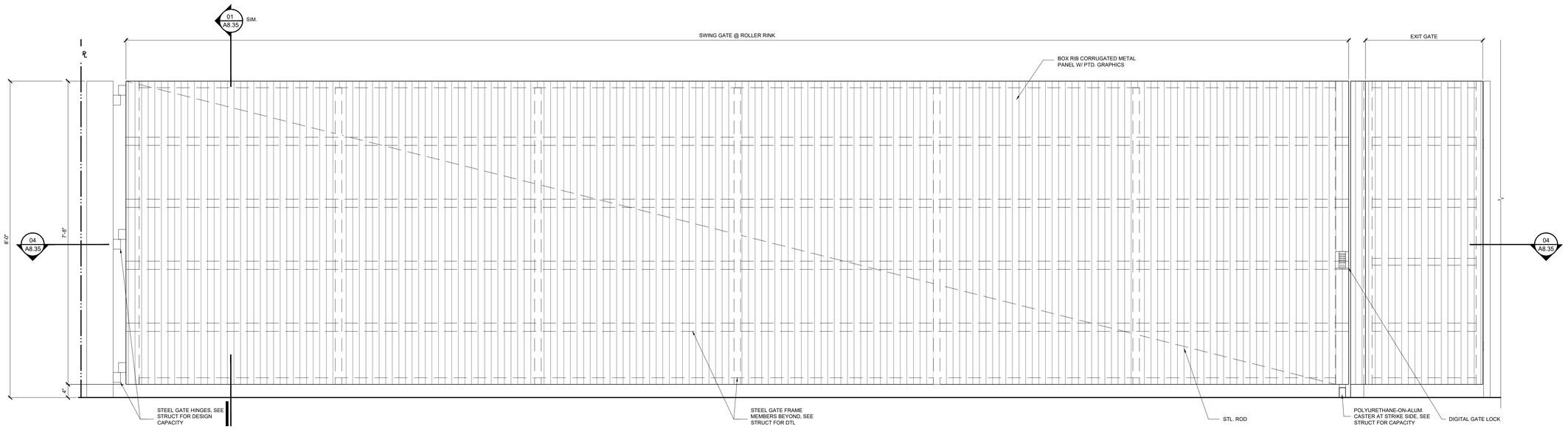
SHEET NAME
A8.32
SHEET X OF X SHEETS

REVISION DATES (DESIGN STAGE ONLY)

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

Sheet Version 4.0

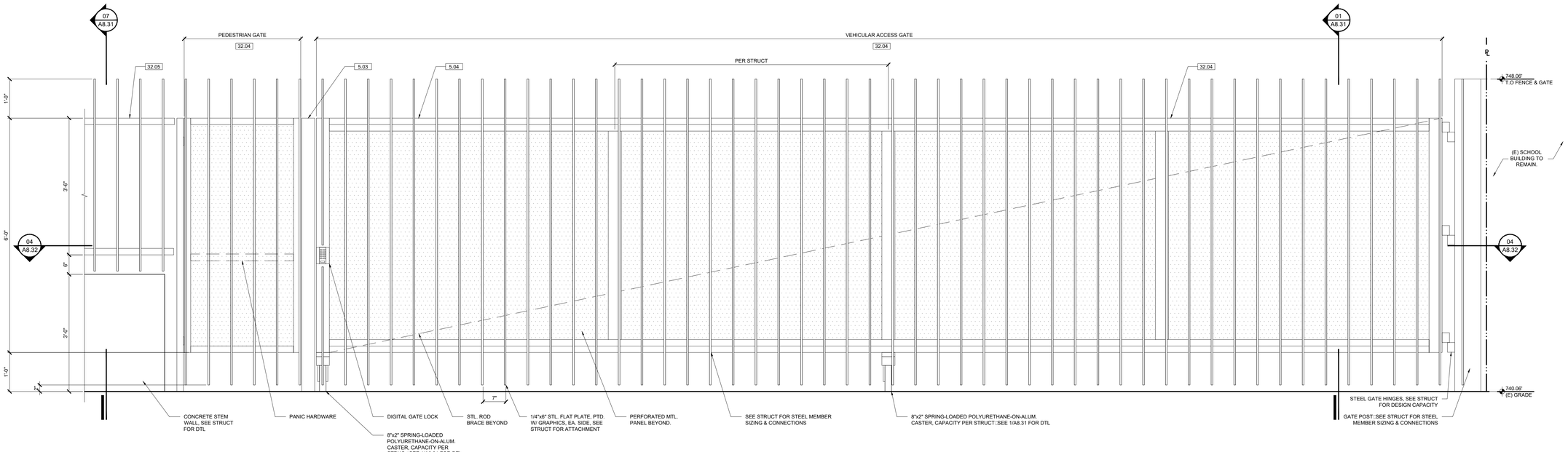
Z:\B□S ARCHITECTURE\019 JOBS\01935.0 CITY OF LA-RESEDA ICE HOCKEY ROLLER RINK\01935.0 1.CURRENT DRAWINGS_24X36\01935.0_A832_24X36.DWG 12/3/2021 9:29 AM



02

ELEVATION @ ROLER RINK GATES

REF: 01/A8.34, 04/A8.35 SCALE: 3/4" = 1'-0"



01

ELEVATION @ FRONT GATES

REF: 01/A8.30 SCALE: 3/4" = 1'-0"

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REVISION DATES (DESIGN STAGE ONLY)

Sheet Version 4.0

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

LICENSED ARCHITECT
LAWRENCE SCARPA
C 21812
REN 10/31/2023
STATE OF CALIFORNIA

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED

BUREAU OF ENGINEERING

VERTICAL CONTROL:
HORIZONTAL CONTROL:

SHEET TITLE: SITE DETAILS

PROJECT: RESEDA SKATE FACILITY

ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

DEPARTMENT OF PUBLIC WORKS

NO.	REVISIONS:	DATE:	BY:

CIP NO.

INDEX NO.

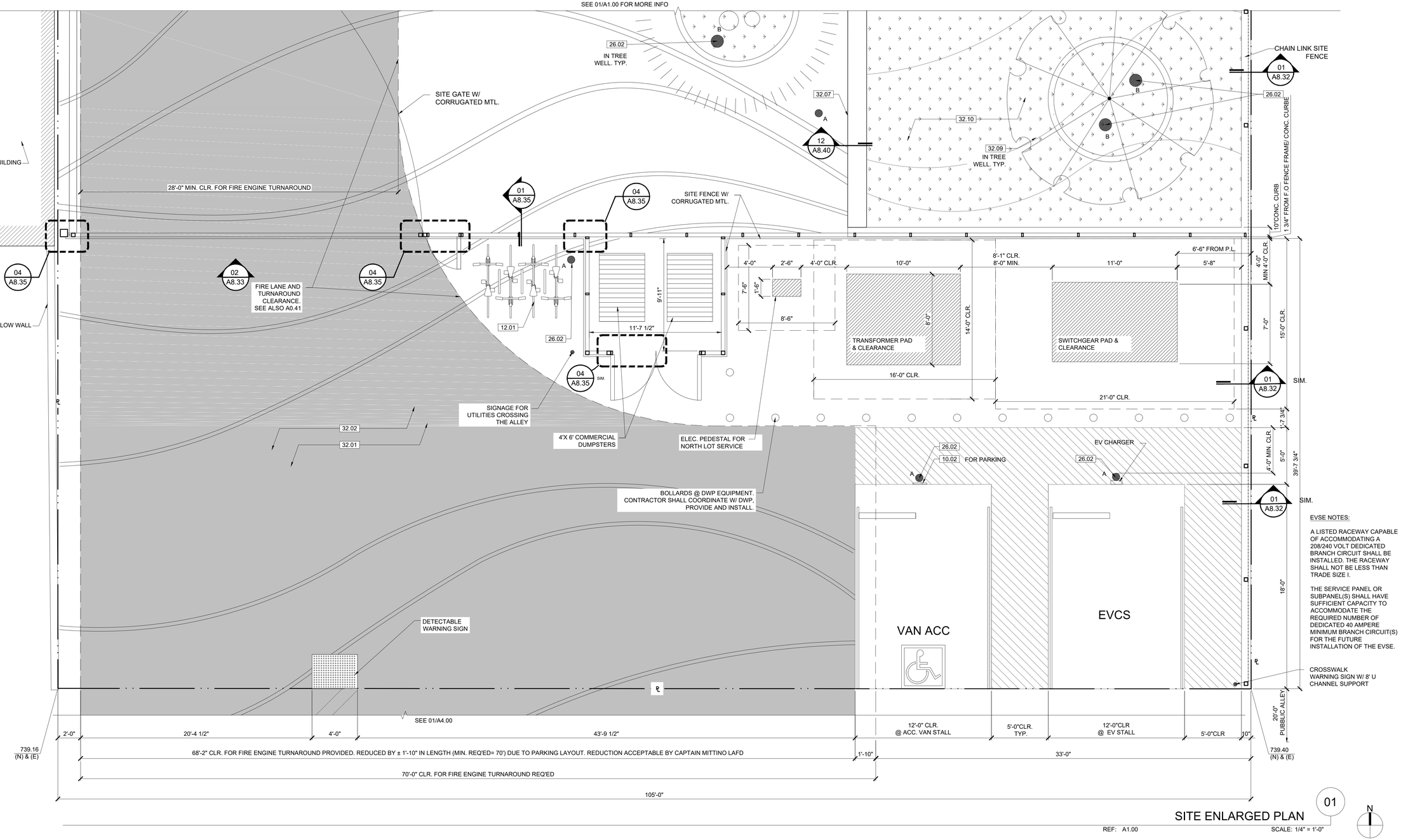
CITY OF LOS ANGELES

CITY ENGINEER
GARY LEE MOORE, P.E., ENV SP
DESIGN GROUP
DATE:
ENGINEER:
DESIGNED BY:
DRAWN BY:
CHECKED BY:
APPROVED BY:

WORK ORDER NO.
E170121B

SHEET NAME
A8.33
SHEET X OF X SHEETS

Z:\B□S ARCHITECTURE\019 JOBS\01935.0 CITY OF LA-RESEDA ICE HOCKEY ROLLER RINK\01935.0 1.CURRENT DRAWINGS_24X36\01935.0_A833_24X36.DWG 12/3/2021 9:30 AM



SITE ENLARGED PLAN

01

REF: A1.00 SCALE: 1/4" = 1'-0"

N

KEYNOTES

NOTE: ITEMS IDENTIFIED ARE TYPICAL TO ALL LIKE ITEMS UNLESS NOTED OTHERWISE.

01 - GENERAL REQUIREMENTS
02 - NOT USED

03 - CONCRETE
3.01 CONC. SLAB ON GRADE PER STRUCT'L.
3.02 CONC. O/MTL. DECK PER STRUCT'L.
3.03 CONC. CURB
3.04 CONC. FOOTING PER STRUCT'L.
3.05 CONC. PAVING PER CIVIL DWGS.
3.06 CONC. SIDEWALK PER CIVIL DWGS.
3.07 CONC. PAD

04 - MASONRY
4.01 CMU BLDNG. WALL
4.02 CMU SITE WALL W/ 2" CMU CAP.

05 - METALS
5.01 STL. COLUMN PER STRUCT'L. PTD.
5.02 STL. BEAM PER STRUCT'L. PTD.
5.03 HSS POST PER STRUCT'L. PTD.
5.04 HSS BEAM PER STRUCT'L. PTD.
5.05 MEMBRANE STRUCTURE I BEAM.
5.06 MTL. DECK.
5.07 MTL. GUARD RAILING.
5.08 MTL. STUD WALL.

06 - WOOD AND PLASTICS

07 - THERMAL & MOISTURE PROTECTION
7.01 W.P. MEMBRANE PER DETL. & SPECS.
7.02 SINGLE PLY PVC ROOFING PER SPECS.
7.03 R-21 RIGID INSULATION @ WALLS.
7.04 UNDERSLAB MOISTURE VAPOR BARRIER
7.05 ROOF DRAIN AND OVERFLOW.
7.06 CLEAR WATER-REPELLENT GRAFITTI COATING AT CMU WALL. (ALL EXPOSED SURFACES).
7.07 BATT INSULATION.

08 - OPENINGS (SEE DOOR/WINDOW SCHED)
8.01 STL. DOOR. & FRAME, PAINTED.
8.02 CLR. ANODIZED ALUM. STOREFRONT DOOR.
8.03 CLR. ANODIZED ALUM. STOREFRONT WINDOW.
8.04 DOOR HARDWARE SET PER SCHED.
8.05 EXTERIOR WALL LOUVER.
8.06 EXTERIOR WALL VENT WITH CAP.
8.07 ROLLING STL. DOOR & FRAME.
8.08 ICE RINK GATES
8.09 OVERHEAD GLASS DOOR.
8.10 ACCESS PANEL, COLOR TO MATCH ADJACENT MATERIAL.
8.11 ROOF ACCESS HATCH.

09 - FINISHES (SEE FIN. SCHED)
9.01 5/8" TYPE 'X' GYP. BD., PROVIDE 'WET RATED' AT BATHROOMS. PAINT.
9.02 CONC. FLR. SEAL PER FIN. SCHED.
9.03 RUBBER FLR. PER SPECS.
9.04 PAINT PER SPECS.
9.05 REVEAL PER DETAILS.
9.06 GRAFITTI COATING, TYP. @ ALL EXTERIOR SOLID WALLS.
9.07 GLAZED FINISH ON CMU.
9.08 CERAMIC TILE.

10 - SPECIALTIES
10.01 MIRROR PER SPECS.
10.02 SIGNAGE.
10.03 TOILET PAPER ROLL HOLDER PER ACCESSORY SCHED.
10.04 GRAB BAR.
10.05 COAT HOOK.
10.06 WASTE RECEPTACLE.
10.07 FOLDING SHOWER SEAT.
10.08 SHOWER ROD.
10.09 SHELF.
10.10 NETTING. NIC
10.11 FIRE EXTINGUISHER. RECESSED CABINET
10.12 TOILET SEAT COVER DISPENSER.
10.13 PAPER TOWEL DISPENSER.
10.14 BATHROOM PARTITION W/ ROBE HOOK @ EA. DOOR

11 - EQUIPMENT/APPLIANCES (SEE EQMT. SCHED)

12 - FURNISHINGS
12.01 BICYCLE RACKS FOR SHORT-TERM BIKE PARKING.
12.02 DASHERBOARDS. NIC.
12.03 BENCH. NIC.
12.04 BLEACHERS. NIC.
12.05 SCOREBOARD. NIC.
12.06 SKATE RACKS. NIC.

13 - SPECIAL CONSTRUCTION
13.01 MEMBRANE STRUCTURE.

14 - CONVEYING EQUIPMENT (NOT USED)

21 - FIRE SUPPRESSION
21.01 FIRE EXTINGUISHER.
21.02 FIRE SPRINKLER HORIZ. MAIN (SEE DIAGRAM)
21.03 FIRE SPRINKLER VALVE ASSEMBLY
21.04 FIRE DEPT. MAIN CONNECTION @ FRONT OF PROJECT. LAFD SHALL APPROVE FINAL LOCATION.
21.05 FIRE SPRINKLER HEAD.

22 - PLUMBING
22.01 WATER CLOSET PER PLUMBING LEGEND
22.02 LAV. SINK & FAUCET. PER PLUMBING LEGEND
22.03 JANITOR MOP SINK.
22.04 PLUMBING VENT PIPE.
22.05 DRINKING FOUNTAIN.
22.06 ULTRA LOW-FLOW TOILET.
22.07 SHOWER HEAD/ CONTROLS.
22.08 SHOWER DRAIN.
22.09 AREA DRAIN.
22.10 HOSE BIB.

23.05 BATHRM EXHAUST FAN PER SPECS.
23.06 BATHRM EXHAUST DUCT.
23.07 MECH. DUCT.
23.08 MECH. EQUIPMENT.

26 - ELECTRICAL
26.01 ELEC. PANEL PER PLANS & SCHED.
26.02 EXTERIOR LIGHT PER SCHED.
26.03 INTERIOR LIGHT PER SCHED.

27 - COMMUNICATION

28 - ELECTRONIC SAFETY AND SECURITY
28.01 SMOKE ALARM.
28.02 SECURITY CAMERA.
28.03 FIRE ALARM MAIN PANEL.

31 - EARTHWORK
31.01 APPROVED COMPACT FILL PER GEO & SOIL ENGINEER REPORT.

32 - EXTERIOR IMPROVEMENTS
32.01 ASPHALT PAVING PER CIVIL.
32.02 GRAPHICS/PAINT.SEE LAND. DWGS.
32.03 STORMWATER MANAGEMENT PER CIVIL DWGS.
32.04 STL. SECURITY GATE, PTD.
32.05 STL. SECURITY FENCE, PTD.
32.06 EXTERIOR AREA DRAINS.
32.07 BENCH.
32.08 TRENCH DRAIN.
32.09 TREE, SEE LANDSCAPE DWGS.
32.10 PLANTING, SEE LANDSCAPE DWGS.
32.11 (N) CONCRETE SIDEWALK, CURB, GUTTER PER CITY OF LA STANDARDS.
32.12 (N) CONC. APRON & DRIVEWAY CURB CUT PER CITY OF LA STANDARDS.
32.13 EQUIPMENT SCREEN.
32.14 CONC. WALL @ SITE FENCE.

33 - UTILITIES
33.01 WATER METER.
33.02 ELECTRICAL TRANSFORMER W/ BOLLARDS AS REQ'D.
33.03 ELECTRICAL METER.
33.04 POWER POLE.

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REVISION DATES (DESIGN STAGE ONLY)

Sheet Version 4.0

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED

LICENSED ARCHITECT
LAWRENCE SCARPA
C 21812
REN 10/31/2023
STATE OF CALIFORNIA

DEPARTMENT OF PUBLIC WORKS
BUREAU OF ENGINEERING
VERTICAL CONTROL:
HORIZONTAL CONTROL:
SHEET TITLE: SITE DETAILS
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

NO.	REVISIONS:	DATE:	BY:

CIP NO.

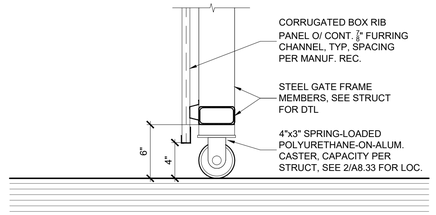
INDEX NO.

CITY OF LOS ANGELES
GARY LEE MOORE, P.E., ENV SP
CITY ENGINEER
DESIGN GROUP
DATE:
ENGINEER:
DESIGNED BY:
DRAWN BY:
CHECKED BY:
APPROVED BY:

WORK ORDER NO.
E170121B

SHEET NAME
A8.34
SHEET X OF X SHEETS

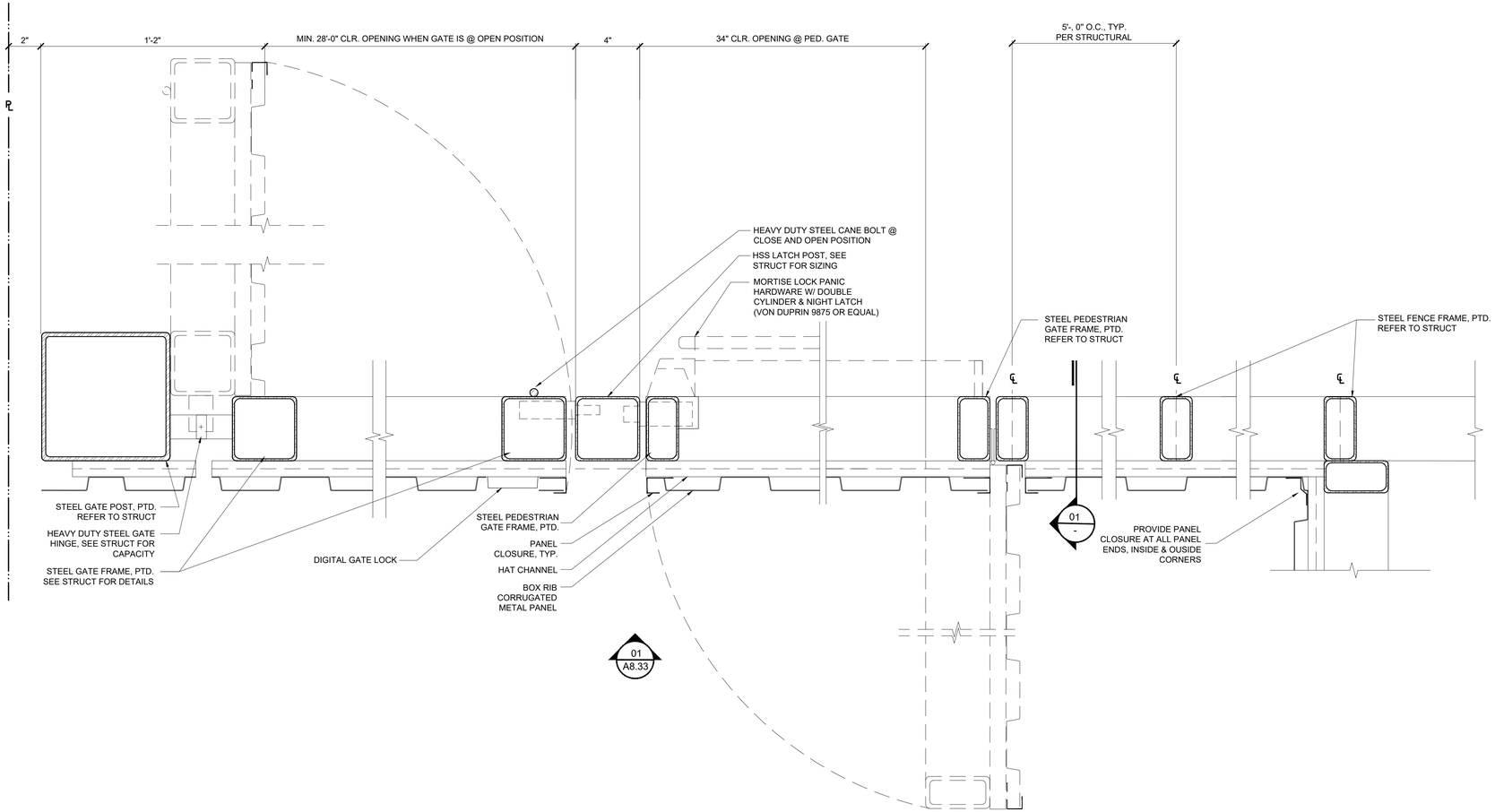
Z:\B□S ARCHITECTURE\019 JOBS\01935.0 CITY OF LA-RESEDA ICE HOCKEY ROLLER RINK\01935.0 1.CURRENT DRAWINGS_24X36\01935.0_A834_24X36.DWG 12/3/2021 9:30 AM



GATE W/ CORRUGATION WHEEL DETAIL

02

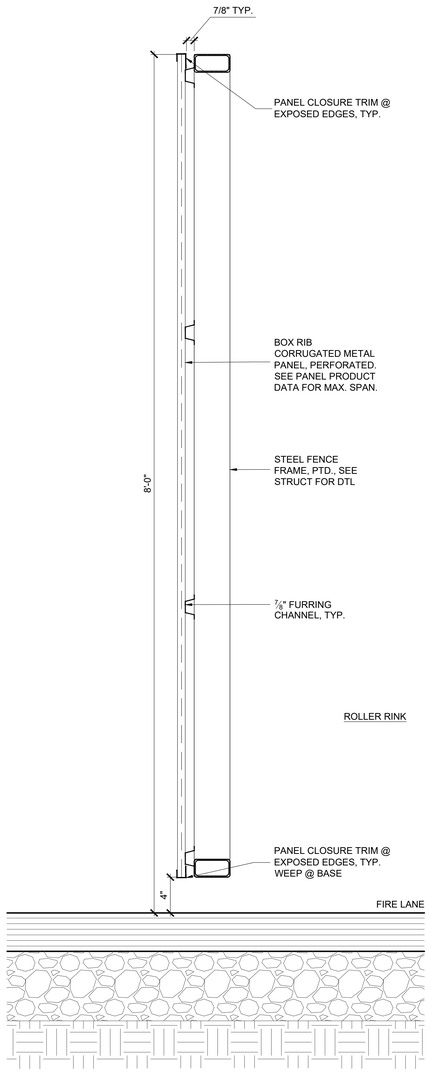
REF: 01/A8.34, 04/A8.35 SCALE: 1 1/2" = 1'-0"



SWING AND PEDESTRIAN GATES PLAN @ ROLLER RINK

04

REF: 01/A8.34 SCALE: 3" = 1'-0"



FENCE W/ CORRUGATION @ ROLLER RINK

01

REF: 01/A8.34, 04/A8.35 SCALE: 1 1/2" = 1'-0"

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED •

LICENSED ARCHITECT
LAWRENCE SCARPA
C 21812
REN 10/31/2023
STATE OF CALIFORNIA

BUREAU OF ENGINEERING

VERTICAL CONTROL:
HORIZONTAL CONTROL:
SHEET TITLE: SITE DETAILS
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

DEPARTMENT OF PUBLIC WORKS

NO. REVISIONS: DATE: BY:

CIP NO.

INDEX NO.

CITY OF LOS ANGELES

CITY ENGINEER: DATE:
GARY LEE MOORE, P.E., ENV SP
DESIGN GROUP:
ENGINEER:
DESIGNED BY:
DRAWN BY:
CHECKED BY:
APPROVED BY:

WORK ORDER NO.
E170121B

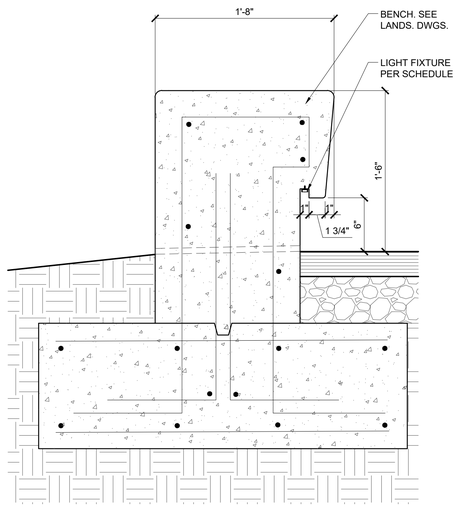
SHEET NAME
A8.35
SHEET X OF X SHEETS

REVISION DATES (DESIGN STAGE ONLY)

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

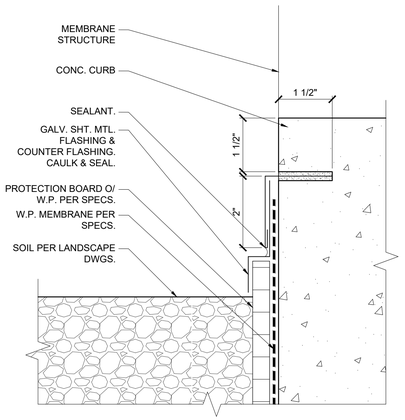
Sheet Version 4.0

Z:\B□S ARCHITECTURE\019 JOBS\01935.0 CITY OF LA-RESEDA ICE HOCKEY ROLLER RINK\01935.0 1.CURRENT DRAWINGS_24X36\01935.0_A835_24X36.DWG 12/3/2021 9:30 AM



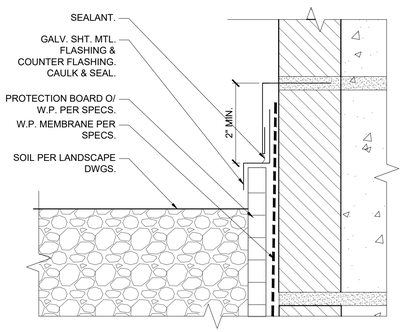
CONC. BENCH @ BIOSWALE 12

REF: 01/A1.00, 01/A8.30 SCALE: 1 1/2" = 1'-0"



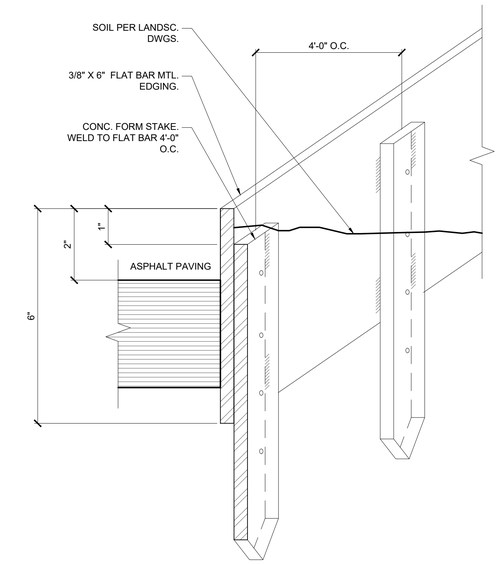
FLASHING DETAIL @ CONC. CURB TO LANDSCAPING 09

REF: 09/- SCALE: 6" = 1'-0"



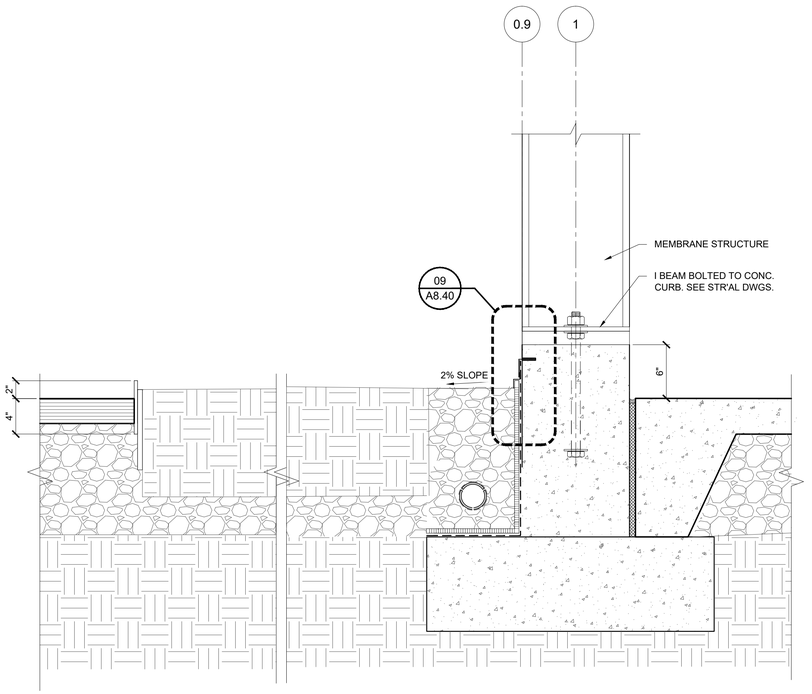
TYP. FLASHING DETAIL @ CMU BUILDING WALL TO LANDSCAPING 06

REF: 07/- SCALE: 6" = 1'-0"



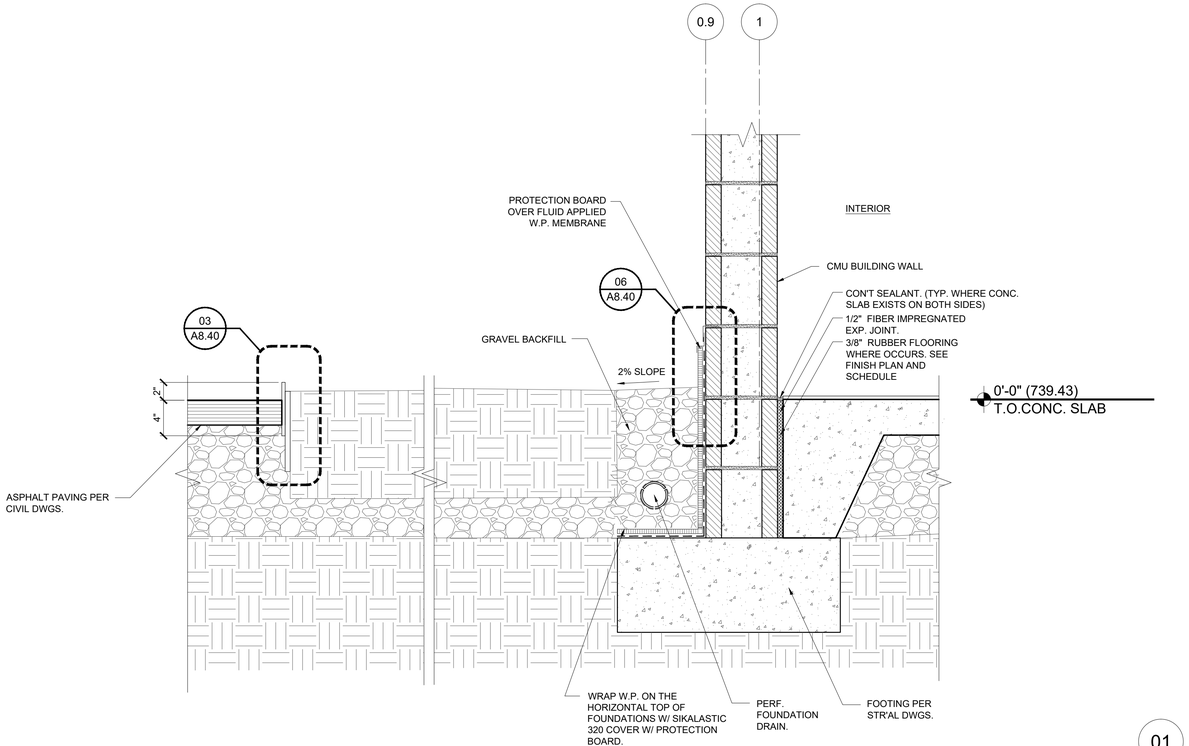
DETAIL @ PLANTED AREA 03

REF: 01/- SCALE: 6" = 1'-0"



DETAIL @ PLANTED AREA @ MEMBRANE STRUCTURE 07

REF: A3.01 SCALE: 1 1/2" = 1'-0"



DETAIL @ PLANTED AREA @ CMU WALL 01

REF: A3.11 SCALE: 1 1/2" = 1'-0"

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

LICENSED ARCHITECT
LAWRENCE SCARPA
C 21812
REN 10/31/2023
STATE OF CALIFORNIA

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED •

DEPARTMENT OF PUBLIC WORKS
BUREAU OF ENGINEERING
VERTICAL CONTROL:
HORIZONTAL CONTROL:
SHEET TITLE: SITE DETAILS
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

NO.	REVISIONS	DATE	BY:

CIP NO.

INDEX NO.

CITY OF LOS ANGELES
GARY LEE MOORE, P.E. ENV SP CITY ENGINEER
DESIGN GROUP: DATE:
ENGINEER:
DESIGNED BY:
DRAWN BY:
CHECKED BY:
APPROVED BY:

WORK ORDER NO.
E170121B

SHEET NAME
A8.40
SHEET X OF X SHEETS

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REVISION DATES (DESIGN STAGE ONLY)

Sheet Version 4.0

Z:\B□S ARCHITECTURE\019 JOBS\01935.0 CITY OF LA-RESEDA ICE HOCKEY ROLLER RINK\01935.0 1.CURRENT DRAWINGS_24X36\01935.0_A840_24X36.DWG 12/3/2021 9:30 AM

GENERAL NOTES:

1. ALL WORK PERFORMED IN THIS CONTRACT SHALL CONFORM TO:

   A. THE PROJECT SPECIFICATIONS AND ALL SAFETY REGULATION; CODES AND REQUIREMENTS PERTINENT TO THE PROJECT CONSTRUCTION.

   B. THE LATEST EDITION AND SUPPLEMENTS OF THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION (SSPWC) AND AMERICAN PUBLIC WORKS ASSOCIATION (APWA).

   C. CITY OF LOS ANGELES STANDARD PLANS AND SPECIFICATIONS.

   D. PROJECT GEOTECHNICAL REPORT.

2. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO BE KNOWLEDGEABLE TO INTERPRET AND APPLY THE ABOVE CODES AND SPECIFICATIONS.

3. ALL WORK SHALL COMPLY WITH THE REQUIREMENTS OF THE WORK SPECIFIED ON THE DRAWINGS, SPECIFICATIONS AND WITHIN THE VARIOUS NOTES SHOWN HEREIN.

4. THE EXISTING CONDITIONS SHOWN DIAGRAMMATICALLY ON THE PLANS ORIGINATED FROM AS BUILT DRAWINGS AND FIELD SURVEY. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VISIT THE JOB SITE AND VERIFY THE EXACT EXISTING CONDITIONS BEFORE SUBMITTING HIS/HER BID. ANY DISCREPANCY SHALL BE REPORTED IMMEDIATELY TO THE CITY ENGINEER FOR PROPER ACTION.

5. THE CONTRACTOR SHALL PROTECT ALL EXISTING STRUCTURES IN THE AREA OF WORK WHICH ARE NOT INCLUDED IN THIS CONSTRUCTION. ANY DAMAGE RESULTING FROM THIS WORK SHALL BE REPAIRED AND/OR REPLACED AT NO ADDITIONAL COST TO THE CITY.

6. UNCLOG, CLEAN AND FLUSH THE ENTIRE SITE DRAINAGE SYSTEM AFTER PAVING AND IMMEDIATELY BEFORE A RAIN FORECAST.

7. ALL EXISTING STREET IMPROVEMENTS, UNLESS OTHERWISE INDICATED HEREIN TO BE REMOVED, SHALL BE PROTECTED IN PLACE. THESE ITEMS INCLUDE LIGHT POLES, POWER POLES, SIGNAL POLES AND APPURTENANCES.

8. CONTRACTOR SHALL NOTIFY ALL UTILITY OWNERS BOTH IN PRIVATE PROPERTY AND IN PUBLIC RIGHT-OF-WAY FOR EXISTING LATERALS TO BE REMOVED OR CAPPED.

9. UTILITIES TO BE VERIFIED IN FIELD TO ENSURE EXISTING UTILITY TO REMAIN. CONTRACTOR IS RESPONSIBLE FOR THE RELOCATION, IF REQUIRED. ALL EXISTING/RELOCATED UTILTIES PER NEW SITE LAYOUT WILL BE PROTECTED IN PLACE.

   UNDERGROUND SERVICE ALERT:

10. BEFORE COMMENCING ANY EXCAVATION ON-SITE AND OFF-SITE, THE CONTRACTOR SHALL OBTAIN AN UNDERGROUND SERVICE ALERT INQUIRY I.D. NUMBER BY CALLING 1-800-422-4133. TWO WORKING DAYS SHALL BE ALLOWED AFTER THE I.D. NUMBER IS OBTAINED AND BEFORE THE EXCAVATION WORK IS STARTED THAT UTILITY COMPANIES CAN BE NOTIFIED.

    PROTECTION AND RESTORATION OF EXISTING IMPROVEMENTS:

11. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF PUBLIC AND PRIVATE PROPERTY ADJACENT TO THE WORK PER SECTION 7-9 OF THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION.

    REMOVALS:

12. EXISTING STRUCTURES AND SUBSTRUCTURES WHICH ARE INDICATED TO BE REMOVED IN THIS CONSTRUCTION DOCUMENTS SHALL BE TOTALLY REMOVED AND DISPOSED OF OFFSITE, UNLESS OTHERWISE INDICATED. EXISTING FACILITIES WHICH ARE DISCOVERED DURING CONSTRUCTION (INCLUDING WALLS, FOOTINGS, AND FOUNDATIONS) SHALL BE REPORTED TO AND COORDINATED WITH THE GEOTECHNICAL ENGINEER OF RECORD AS TO THEIR REMOVAL. NOTIFY THE CITY ENGINEER IN WRITING PRIOR TO COMMENCING THE WORK.

13. ALL SITE PREPARATION AS INDICATED SHALL BE MADE UNDER THE CONTINUOUS INSPECTION OF THE GEOTECHNICAL ENGINEER. SECURE THE REQUIRED PERMITS FROM THE CALIFORNIA DIVISION OF INDUSTRIAL SAFETY FOR THE CONSTRUCTION OF TRENCHES, SHORING OR EXCAVATIONS WHICH ARE 5 FEET OR DEEPER OR WORK THAT MAY JEOPARDIZE THE SAFETY OF WORKERS. SHORING CALCULATIONS SHALL BE PROVIDED BY THE CONTRACTOR AT HIS EXPENSE AS REQUIRED FOR APPROVAL AND PERMITTING.

14. THE CONTRACTOR SHALL KEEP THE CONSTRUCTION AREA SUFFICIENTLY DAMPENED TO CONTROL DUST CAUSED BY WORK ACTIVITIES AS REQUIRED BY THE CITY ENGINEER. THE CONTRACTOR SHALL PROVIDE 6' HIGH TEMPORARY FENCING WITH VISUAL BARRIER AROUND THE PROJECT LIMITS AND A TEMPORARY CONSTRUCTION ACCESS ON-SITE.

15. ALL WORK IN THE PUBLIC RIGHT OF WAY REQUIRES APPROVAL BY THE CITY OF LOS ANGELES DEPARTMENT OF TRANSPORTATION AND PUBLIC WORKS BEFORE CONSTRUCTION BEGINS. CONTRACTOR SHALL SECURE AND PAY FOR ALL PERMITS INCLUDING UTILITY CONNECTIONS REQUIRED PRIOR TO CONSTRUCTION.

16. VOIDS RESULTING FROM REMOVAL OF STRUCTURES SHALL BE FILLED WITH SUITABLE MATERIALS APPROVED BY THE GEOTECHNICAL ENGINEER AND COMPACTED TO 95% MINIMUM DENSITY PER ASTM D-1557 AND THE RECOMMENDATIONS WITHIN THE SOILS ENGINEERING EXPLORATION REPORT.

17. UPON COMPLETION OF PROJECT, CONTRACTOR SHALL REMOVE EXISTING CONSTRUCTION FENCING, APPURTENANCES AND OFFICE TRAILERS FROM THE SITE. PAVEMENT SHALL BE PATCHED AND REPAIRED TO MATCH ADJACENT PAVEMENT AND APPROVED BY THE CITY ENGINEER AS APPLICABLE.

18. ANY ADDITIONAL SURVEYS OR TESTING AS A RESULT OF CONTRACTOR ERROR OR MISINFORMATION WILL BE CHARGED TO THE CONTRACTOR.

19. THE CONSTRUCTION SHALL NOT RESTRICT A FIVE FOOT CLEAR AND UNOBSTRUCTED ACCESS TO ANY WATER OR POWER DISTRIBUTION FACILITIES (POWER POLES, PULL-BOXES, TRANSFORMERS, VAULTS, PUMPS, VALVES, METERS, APPURTENANCES, ETC.) OR TO THE LOCATION OF THE HOOK UP, THE CONSTRUCTION SHALL NOT BE WITHIN TEN FEET OF ANY POWER LINES WHETHER OR NOT THE LINES ARE LOCATED ON THE PROPERTY. FAILURE TO COMPLY MAY CAUSE CONSTRUCTION DELAYS AND/OR ADDITIONAL EXPENSES.

20. FILL AND BACKFILL SHALL BE MOISTURE CONDITIONED, PLACED AND COMPACTED IN ACCORDANCE WITH THE REQUIREMENTS OF THE GEOTECHNICAL REPORT. ANY IMPORTED SOIL SHALL BE INSPECTED AND APPROVED AT THE BORROW SITE BY THE GEOTECHNICAL ENGINEER AND TESTED PRIOR TO ITS IMPORT. AT LEAST THREE (3) DAYS ADVANCE NOTICE IS REQUIRED TO FACILITATE SCHEDULING.

GENERAL NOTES CONT'D:

21. TRIM TREE ROOTS AS NECESSARY OR GRADED ON AREAS TO BE PAVED. TRIM ROOTS UNDER THE DIRECTION OF A CERTIFIED CITY APPROVED ARBORIST. NOTIFY THE CITY ENGINEER PRIOR TO TRIMMING OF TREES.

22. ADJUST TO GRADE EXISTING MANHOLE RIMS, VALVE BOXES AND ELECTRICAL VAULT LIDS TO DESIGN GRADES WITHIN THE IMPROVEMENT AREA, UNLESS NOTED OTHERWISE. CONTRACTOR TO VERIFY LOCATION AND NUMBER OF MANHOLE RIMS, VALVE BOXES AND ELECTRICAL VAULT LIDS IN THE FIELD PRIOR TO BIDDING.

23. IF EXISTING UTILITIES ARE EXPOSED OR DETERMINED TO EXIST UNDER THE ROUGH GRADING SITE, CONTRACTOR SHALL PROVIDE A FLAGGED STAKE THAT INDICATE THEIR LOCATION, TYPE OF UTILITY, SIZE, PIPE MATERIAL, AND DEPTH. STAKES SHALL BE INSTALLED NO LESS THAN 50' ON CENTER ON STRAIGHT LINES AND AT BENDS.

24. SITE BOUNDARIES, EASEMENTS, DRAINAGE DEVICES AND RESTRICTED USE AREAS SHALL BE LOCATED PER CONSTRUCTION STAKING BY A LICENSED SURVEYOR PAID FOR BY THE CONTRACTOR. PRIOR TO GRADING, AS REQUESTED BY THE CITY ENGINEER, ALL PROPERTY LINES, EASEMENTS, AND RESTRICTED USE AREAS SHALL BE STAKED.

25. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO PROVIDE THE CITY ENGINEER WITH A COMPLETE SET OF REPRODUCIBLE & RED MARKED PRINT "AS-BUILT" DRAWINGS OF ALL WORK PERFORMED UNDER THIS CONTRACT, AS SHOWN WITHIN THESE CONSTRUCTION DRAWINGS. ALL FIELD CHANGES SHALL BE SHOWN IN DETAIL ON THE "AS-BUILT" DRAWINGS AND SHALL INCORPORATE AS A MINIMUM, NEW ELEVATIONS, GRADES AND ALIGNMENT OF UNDERGROUND FACILITIES WITH DIMENSIONAL TIES TO BUILDING OR OTHER VISIBLE IMPROVEMENTS.

26. CONTRACTOR IS RESPONSIBLE FOR THE RESTORATION TO THEIR EXISTING CONDITION OF THE FACILITIES WHICH WERE INTENDED TO REMAIN IN PLACE. AND ALL REPAIRS TO ANY DAMAGED MATERIALS OR FACILITIES SHALL BE MADE BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE CITY.

27. CONSTRUCT OFFSITE WORK TO COMPLY WITH THE REQUIREMENTS OF THE LOCAL GOVERNING AGENCY. CONTRACTOR TO SECURE AND PAY FOR ALL REQUIRED CONSTRUCTION PERMITS.

GENERAL GEOTECHNICAL NOTES:

1. ALL WORK MUST BE IN COMPLIANCE WITH THE RECOMMENDATIONS INCLUDED IN THE GEOTECHNICAL CONSULTANT'S REPORT(S) AND THE APPROVED GRADING PLANS AND SPECIFICATIONS.

2. SITE GEOTECHNICAL INVESTIGATION WAS PREPARED BY CONVERSE CONSULTANTS W.O. #E170121B, GED FILE #19-080 DATED AUGUST 28, 2019, ENTITLED "GEOTECHNICAL ENGINEERING REPORT - RESEDA SKATE FACILITY PROJECT 18210, 18128 AND 18138 WEST SHERMAN WAY LOS ANGELES, CALIFORNIA" RECOMMENDATIONS OF THE SOILS REPORT AND ADDENDA ARE PART OF THIS NOTE AND SHALL BE PERFORMED BY THE CONTRACTOR AS APPLICABLE.

3. THE GEOTECHNICAL ENGINEER IS TO APPROVE THE KEY OR BOTTOM OF EXCAVATION AND LEAVE A CERTIFICATE ON THE SITE FOR THE CITY INSPECTOR. THE CITY INSPECTOR IS TO BE NOTIFIED BEFORE ANY GRADING BEGINS AND FOR BOTTOM INSPECTION BEFORE FILL IS PLACED. FILL MAY NOT BE PLACED WITHOUT THE APPROVAL OF THE CITY INSPECTOR.

4. THE GEOTECHNICAL ENGINEER SHALL PROVIDE SUFFICIENT INSPECTIONS DURING THE PREPARATION OF THE NATURAL GROUND AND THE PLACEMENT AND COMPACTION OF THE FILL TO BE SATISFIED THAT THE WORK IS BEING PERFORMED IN ACCORDANCE WITH THE PLAN AND APPLICABLE CODE REQUIREMENTS.

5. ROUGH GRADING MUST CONFORM TO THE FINAL ENGINEERING GEOLOGY AND SOILS ENGINEERING REPORT. CONTRACTOR MUST REQUEST A GEOLOGIC APPROVED REPORT FROM THE SOILS ENGINEER FOR SUBMITTAL TO THE OAR.

6. FOUNDATION AND WALL EXCAVATIONS MUST BE INSPECTED AND APPROVED BY THE GEOTECHNICAL ENGINEER, PRIOR TO THE PLACING OF STEEL OR CONCRETE.

7. THE EXISTING SOIL (UNCERTIFIED FILL) BENEATH THE ROLLER RINK SHALL BE REMOVED TO A DEPTH OF 24 INCHES BELOW EXISTING GRADE. THE EXCAVATION SHALL EXTEND LATERALLY AT LEAST 2 FEET BEYOND THE EDGES OF THE ASPHALT CONCRETE OR THE PROPERTY BOUNDARY, WHICHEVER IS LESS.

8. THE EXISTING CLAYEY SOIL MAY BE REUSED AS BACKFILL TO WITHIN 12 INCHES BELOW THE ASPHALT CONCRETE. THE ASPHALT CONCRETE SHALL BE UNDERLAIN BY AT LEAST 12 INCHES OF IMPORTED GRANULAR FILL COMPACTED TO AT LEAST 95 PERCENT RC. CRUSHED MISCELLANEOUS BASE (CMB) AND/OR CRUSHED AGGREGATE BASE (CAB) ARE ACCEPTABLE.

9. OVER-EXCAVATION BENEATH THE ICE RINK IS NOT REQUIRED FOR FOOTINGS EMBEDDED AT LEAST 6 INCHES INTO NATIVE SOIL. FOOTINGS INTO NATIVE SOIL ARE ANTICIPATED ALONG THE EAST AND SOUTH PERIMETER. THE EXISTING UNCERTIFIED FILL SHALL BE REMOVED BENEATH ALL FOOTINGS NOT EMBEDDED INTO NATIVE SOIL. THE EXISTING UNCERTIFIED FILL BENEATH INTERIOR SOG FLOORS SHALL ALSO BE REMOVED AND REPLACED WITH COMPACTED FILL.

10. OVER-EXCAVATION IS NOT REQUIRED FOR FOOTINGS EMBEDDED AT LEAST 6 INCHES INTO NATIVE SOIL. THE EXISTING UNCERTIFIED FILL SHALL BE REMOVED BENEATH ALL FOOTING NOT EMBEDDED INTO NATIVE SOIL. THE EXISTING UNCERTIFIED FILL BENEATH INTERIOR SOG FLOORS SHALL ALSO BE REMOVED AND REPLACED WITH COMPACTED FILL.

11. THE GEOTECHNICAL ENGINEER ANTICIPATES THE VERTICAL OVER-EXCAVATION WILL RESULT IN APPROXIMATELY 18 TO 24 INCHES OF COMPACTED FILL BENEATH FOOTINGS, EXCLUDING THOSE THAT ARE EMBEDDED INTO NATIVE SOIL. THE LATERAL OVER-EXCAVATION FOR FOOTINGS SHALL BE EQUAL TO THE VERTICAL OVER-EXCAVATION UNLESS FOOTINGS ARE EMBEDDED INTO NATIVE SOIL.

12. THE EXISTING SOIL BENEATH THE PROPOSED CMU SITE WALL SHALL BE REMOVED TO A DEPTH OF 12 INCHES BELOW THE BOTTOM OF FOOTING. LATERAL OVER-EXCAVATION IS NOT REQUIRED.

13. THE EXISTING FILL BENEATH EXTERIOR CONCRETE FLATWORK (I.E. PEDESTRIAN WALKWAYS) SHALL BE REMOVED TO A DEPTH OF 12 INCHES BELOW EXISTING GRADE AND AT LEAST 6 INCHES BELOW THE SLAB, WHICHEVER IS GREATER. THE ONSITE SOIL MAY BE REUSED AS BACKFILL, EXCEPT FOR THE UPPER 4 INCHES. THE UPPER 4 INCHES SHALL CONSIST OF IMPORTED GRANULAR FILL COMPACTED TO AT LEAST 90 PERCENT RC.

14. EXCAVATION BOTTOMS SHALL BE SCARIFIED AT LEAST 6 INCHES, MOISTURE CONDITIONED TO WITHIN 3 PERCENT ABOVE THE OPTIMUM MOISTURE CONTENT, AND COMPACTED TO A MINIMUM 90 PERCENT RC, AS DETERMINED BY ASTM D1557. ALL EXCAVATION BOTTOMS SHALL BE OBSERVED, TESTED, AND APPROVED BY REPRESENTATIVE OF THE GED AND THE LADBS, GRADING INSPECTOR PRIOR TO PLACEMENT TO FILL.

15. IF ADEQUATE COMPACTION CANNOT BE ACHIEVED BY A DRYING/MIXING/BLENDING OPERATION, BOTTOM STABILIZATION SHALL BE PERFORMED. THE BOTTOM SHALL BE EXCAVATED AN ADDITIONAL 12 INCHES. THE NEW BOTTOM SHALL BE LINED WITH MIRAFI 600X OR APPROVED EQUAL STABILIZATION GEOTEXTILE. A 12-INCH THICK LAYER OF 3/4-INCH TO 1 INCH CRUSHED ROCK SHALL BE PLACED ON TOP OF STABILIZATION GEOTEXTILE. THE TOP OF THE CRUSHED ROCK LATER SHALL BE COVERED WITH MIRAFI 140N OR APPROVED EQUAL FILTER CLOTH.

16. ALL TEMPORARY EXCAVATIONS SHALL CONFORM TO THE STATE OF CALIFORNIA CONSTRUCTION SAFETY ORDERS(CAL/OSHA).

GENERAL GEOTECHNICAL NOTES CONT'D:

17. UNSURCHARGED VERTICAL EXCAVATIONS SHALL NOT EXCEED 5 FEET. UNSURCHARGED EXCAVATIONS GREATER THAN 5 FEET AND TO A MAXIMUM OF 10 FEET SHALL BE SLOPED AT A 1:1 (H:V) OR FLATTER INCLINATION FROM THE GROUND SURFACE TO THE BOTTOM OF THE EXCAVATION. EXCAVATIONS GREATER THAN 10 FEET SHALL BE SHORED.

FILL NOTES:

1. THE ONSITE CLAYEY FILL AND NATIVE SOIL MAY BE REUSED AS COMPACTED FILL, EXCEPT AS SUBGRADE BELOW THE CONCRETE SLAB-ON-GRADE FLOOR. THE ONSITE SOILS ARE SUITABLE FOR REUSE ONLY IF THEY ARE FREE OF ORGANIC MATERIAL, DEBRIS, AND DON'T CONTAIN FRAGMENTS GREATER THAN 3 INCHES IN MAXIMUM DIMENSION. DRYING OF WET SITE SOILS OR MIXING OF THESE SOILS WITH DRYER SOILS MAY BE REQUIRED PRIOR TO BEING USED AS COMPACTED FILL

2. THE UPPER 12 INCHES OF COMPACTED FILL BENEATH CONCRETE SLAB-ON-GRADE FLOORS SHALL CONSIST OF IMPORT FILL. IMPORT FILL MATERIAL SHALL BE PREDOMINANTLY GRANULAR (MINIMUM 80% PASSING NUMBER 4 SIEVE AND BETWEEN 10% AND 35% PASSING THE NUMBER 200 SIEVE), AND NON-EXPANSIVE (EL LESS THAN 25). ALSO, THE IMPORT FILL MATERIAL SHALL BE FREE OF ORGANIC OR INORGANIC DEBRIS, CONTAMINATION AND MATERIALS WITH ANY DIMENSION LARGER THAN 3 INCHES. IMPORT MATERIAL SHALL BE REVIEWED FOR APPROVAL BY THE GED PRIOR TO IMPORTING TO THE JOB SITE. THE GED SHALL BE NOTIFIED A MINIMUM OF THREE WORKING DAYS PRIOR TO SCHEDULED IMPORTING OF SOIL TO THE PROJECT SITE.

3. FILL MATERIAL SHALL BE PLACED IN LOOSE LIFTS NOT EXCEEDING 8 INCHES IN THICKNESS, MOISTURE CONDITIONED TO WITHIN 3 PERCENT ABOVE OPTIMUM, AND MECHANICALLY COMPACTED. THE HYDROMETER TEST RESULTS INDICATE THE ONSITE MATERIALS HAVE A CLAY CONTENT GREATER THAN 15 PERCENT; THEREFORE, PRIMARY STRUCTURAL FILL SHALL BE COMPACTED TO AT LEAST 90 PERCENT RC. NONSTRUCTURAL (I.E. SECONDARY) FILL SHALL ALSO BE COMPACTED TO AT LEAST 90 PERCENT RC. ALL CRUSHED MISCELLANEOUS BASE (CMB) AND/OR CRUSHED AGGREGATE BASE (CAB) BENEATH PAVEMENTS SHALL BE COMPACTED TO AT LEAST 95 PERCENT RC.

4. FILL PLACEMENT AND COMPACTION SHALL BE OBSERVED AND TESTED BY THE GED. COMPACTED FILL SOILS SHALL BE KEPT MOIST (AT OR SLIGHTLY ABOVE THE SPECIFIED MOISTURE CONTENT AT THE TIME OF COMPACTION), BUT NOT FLOODED, UNTIL COVERED WITH SUBSEQUENT CONSTRUCTION. IF COMPACTED FILL BECOMES DISTURBED, IT SHALL BE REWORKED OR REMOVED AND REPLACED. CERTIFICATION AND INSPECTION APPROVALS FOR COMPROMISED SOILS ARE VOID AND INVALID.

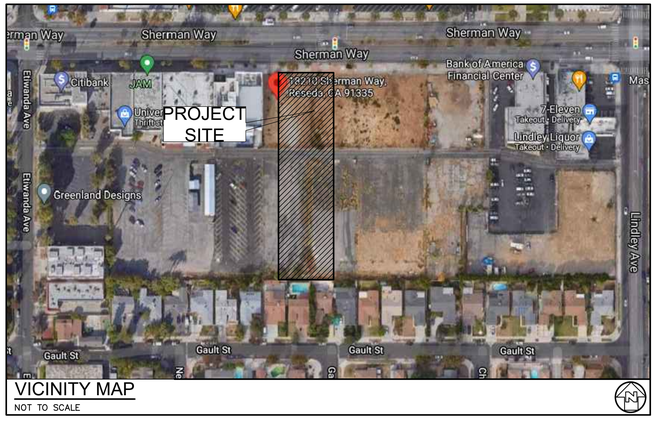
5. TRENCH EXCAVATIONS FOR UTILITY PIPES MAY BE BACKFILLED WITH THE ONSITE SOILS UNDER THE OBSERVATION OF A REPRESENTATIVE OF THE GED. AFTER UTILITY PIPES HAVE BEEN LAID, PROPERLY BEDDED, AND COVERED PER THE PROJECT SPECIFICATIONS, THEY SHALL BE BACKFILLED TO THE GROUND SURFACE OR DESIGN SUBGRADE WITH CONTROLLED BACKFILL. CONTROLLED BACKFILL SHALL BE MOISTURE CONDITIONED, PLACED AND COMPACTED IN ACCORDANCE WITH THE RECOMMENDATIONS PRESENTED IN SECTION 6.2.6 OF THIS REPORT. DENSIFICATION BY FLOODING OR JETTING IS NOT ALLOWED.

6. UPON SUCCESSFUL COMPLETION OF FILL PLACEMENT AND COMPACTION, THE GED WILL ISSUE A COMPACTION CERTIFICATION FOR THE FILL. UNLESS APPROVED BY THE BUILDING INSPECTOR DURING CONSTRUCTION, THE CONTRACTOR SHALL NOT POUR FOOTINGS UNTIL AN APPROVAL LETTER IS ISSUED BY THE LADBS, GRADING DIVISION FOR THE COMPACTION CERTIFICATION. THE CONTRACTOR MAY EXCAVATE IN COMPACTED FILL FOR FOUNDATION ELEMENTS BEFORE THE FILL CERTIFICATION APPROVAL LETTER IS ISSUED, BUT DOES SO AT HIS/HER OWN RISK.

SHEET INDEX

CIVIL:

C100	GENERAL NOTES
C101	GENERAL NOTES
CD100	DEMOLITION PLAN
C200	SITE CONTROL PLAN
C300	GRADING PLAN
C301	GRADING SECTIONS
C302	GRADING SECTIONS
C303	OVER EXCAVATION PLAN
C400	UTILITY PLAN
C401	STORM DRAIN PROFILE
C402	LID PLAN
C500	MISCELLANEOUS DETAILS
C501	MISCELLANEOUS DETAILS
C502	MISCELLANEOUS DETAILS
C503	MISCELLANEOUS DETAILS
C504	MISCELLANEOUS DETAILS
C600	EROSION CONTROL PLANS
C601	EROSION CONTROL DETAILS



VICINITY MAP
NOT TO SCALE

THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED

REGISTERED PROFESSIONAL ENGINEER
CHRISTIAN C. ADAMS
No. C36079
Exp. 6/30/22
CIVIL
STATE OF CALIFORNIA

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

BUREAU OF ENGINEERING
VERTICAL CONTROL: C.E.F.B. 43060 PGS. 37-44
HORIZONTAL CONTROL: C.E.F.B. 43060 PGS. 37-44
SHEET TITLE: GENERAL NOTES, LEGENDS, AND ABBREVIATIONS
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 & 18132 SHERMAN WAY, RESEDA CA 91335

DEPARTMENT OF PUBLIC WORKS
NO.	REVISIONS:	DATE:	BY:

CIP NO.

INDEX NO.

CITY OF LOS ANGELES
GARY LEE MOORE, P.E., ENV SP
CITY ENGINEER
DESIGN GROUP:
DATE:
ENGINEER: VIRGILIO ADANAN
LIC. NO.: C36079
DESIGNED BY: VIRGILIO ADANAN
DRAWN BY: AUTUMN WAGGONER
CHECKED BY: VIRGILIO ADANAN
APPROVED BY:

VCA ENGINEERS, INC.
CIVIL ENGINEERS
Civil & Certified Arborist, Suite 210, Alhambra, CA 91801
Tel: (626) 282-4005 Fax: (626) 282-4007

WORK ORDER NO.
E170121B

SHEET NAME
C100
SHEET 1 OF 17 SHEETS

REVISION DATES (DESIGN STAGE ONLY)

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

UTILITY NOTES:

WATER UTILITY NOTES:

1. ALL FITTINGS SUBJECT TO AN UNBALANCED HYDROSTATIC FORCE SHALL BE RESTRAINED WITH 2000 PSI CONCRETE THRUST BLOCKS BEARING AGAINST UNDISTURBED SOIL. IN ADDITION, ALL FLEXIBLE JOINTS SHALL BE RESTRAINED WITH ANCHOR BOXES.
2. THE CONTRACTOR SHALL FURNISH, INSTALL AND TEST ALL PIPING FOR WATER INSIDE THE DEVELOPMENT, INCLUDING FIRE SERVICE AND HYDRANTS, AND THE DOMESTIC WATER SYSTEM. THE CONTRACTOR SHALL ALSO BE RESPONSIBLE FOR ALL THE WATER APPURTENANCES, VALVES WATER METERS (SUB–METERS), FITTINGS, THRUST BLOCKS OR RESTRAINT SYSTEM, AND FINAL CHLORINATION/ DISINFECTION OF THE WHOLE WATER DISTRIBUTION SYSTEM OF THE PROJECT IN ACCORDANCE WITH THE WATER DISTRIBUTION SPEC 02510 REQUIREMENTS.
3. FIRE DEPARTMENT CONNECTION AT REDUCE PRESSURE PRINCIPLE BACKFLOW ASSEMBLY SHALL BE OF AN APPROVED TYPE, PROPERLY SUPPORTED, AND LOCATED WITHOUT INTERFERENCE FROM NEARBY OBSTRUCTIONS AND ON THE STREET SIDE OF THE BUILDING(S) WHERE APPROVED BY THE AUTHORITY HAVING JURISDICTION (AHJ).
4. FIRE DEPARTMENT CONNECTION(S) SHALL BE IDENTIFIED BY A SIGN HAVING RAISED LETTERS AT LEAST 1–INCH IN SIZE, CAST ON A PLATE OF FITTING ("AUTO SPKR", OR "OPEN SPKR", "STANDPIPE"), ETC.
5. PIPING SHALL BE "LISTED" FOR FIRE PROTECTION SERVICE AND COMPLY WITH AWWA STANDARDS, WHERE APPLICABLE. FITTINGS SHALL BE OF AN "APPROVED" TYPE.
6. ALL CONTROL VALVES SHALL BE "LISTED" INDICATING TYPE UNLESS A NON–INDICATING VALVE, SUCH AS AN UNDERGROUND GATE VALVE WITH APPROVED ROADWAY BOX COMPLETE WITH T–WRENCH, IS ACCEPTABLE TO THE AUTHORITY HAVING JURISDICTION (AHJ).
7. DOMESTIC WATER LINE PIPE SIZE 2–1/2" AND SMALLER USE COPPER TUBING, TYPE L HARD. PROVIDE PIPE CORROSION PROTECTION.
8. ALL TEES, PLUGS, CAPS, BENDS, AND HYDRANT BRANCHES ON PIPE INSTALLED UNDERGROUND SHALL BE RESTRAINED (PIPE CLAMPS AND TIE–RODS, THRUST BLOCKS, LOCKED MECHANICAL OR PUSH–ON JOINTS, MECHANICAL JOINTS UTILIZING SET SCREW RETAINER GLANDS, OR OTHER APPROVED METHODS) AGAINST MOVEMENT.
9. CONTRACTOR TO PROVIDE FIRE DEPARTMENT APPROVED SIGN TO INDICATE LOCATION OF FIRE DEPARTMENT CONNECTION TO READ AS:

   1.) "FDC" WHERE THE FIRE DEPARTMENT CONNECTION IS LOCATED.

STORM DRAINAGE UTILITY NOTES:

1. CONTRACTOR TO COORDINATE WITH CITY OF LOS ANGELES FOR CONNECTION TO STREET STORM DRAINAGE LINE.
2. CONTRACTOR TO FIELD VERIFY ACTUAL ELEVATION AND LOCATION OF EXISTING STORM DRAIN LINE AND STRUCTURE PRIOR TO INSTALLATION.
3. CONTRACTOR TO COORDINATE WITH THE OFF–SITE WORKS APPROVED BY THE CITY OF LOS ANGELES AND LOS ANGELES COUNTY FOR THE CONSTRUCTION OF STORM DRAIN LINE OUTLET CONNECTION.
4. ALL CATCH BASINS AND DRAINAGE INLETS SHALL BE STENCILED WITH "NO DUMPING, DRAINS TO OCEAN" LOGO.
5. CONTRACTOR SHALL VERIFY ALL CONDITIONS AND DIMENSIONS AND SHALL REPORT ANY DISCREPANCIES TO THE CITY ENGINEER PRIOR TO THE COMMENCEMENT OF ANY WORK.
6. TRENCH EXCAVATION AND BACKFILLING SHALL BE IN ACCORDANCE WITH APPLICABLE STANDARDS. THE CONTRACTORS SHALL COMPLY WITH ALL APPLICABLE DIVISION OF INDUSTRIAL REGULATIONS (CAL–OSHA) SAFETY STANDARDS.
7. COORDINATE WITH PLUMBING PLAN FOR EXACT LOCATION OF POINT OF CONNECTION BETWEEN PLUMBING AND CIVIL. ADJUST LINE AS REQUIRED.
8. MINIMUM STORM DRAIN LINE PIPE SLOPE AT 0.50%.
9. ALL CONNECTION TO CITY OF LOS ANGELES STORM DRAINAGE LINE TO BE SCHEDULE 80 PVC PIPE OR AS APPROVED BY CITY OF LOS ANGELES PER STORM DRAINAGE CONNECTION PERMIT.
10. DIRECT ROOF DOWNSPOUT TO PLANTER BOX OR CONNECT TO ONSITE STORM DRAINAGE LINE TOWARDS THE BIO–FILTRATION AS INDICATED ON AREA UTILITY PLAN AND DETAILS.

SEWER UTILITY NOTES:

1. CONTRACTOR TO COORDINATE WITH CITY OF LOS ANGELES FOR CONNECTION TO STREET HOUSE CONNECTION.
2. CONTRACTOR TO FIELD VERIFY ACTUAL ELEVATION AND LOCATION OF EXISTING SEWER LINE PRIOR INSTALLATION. CCTV THE LINE AND IF THE EXISTING LATERAL LINE IS BROKEN, CONTRACTOR TO REPLACE WITH NEW.
3. CONTRACTOR TO COORDINATE WITH THE OFF–SITE WORKS DURING INSTALLATION, ADJUST SEWER LINE CONNECTION AS REQUIRED.
4. CONTRACTOR TO VERIFY ALL CONDITIONS AND DIMENSIONS AND SHALL REPORT ANY DISCREPANCIES TO THE ENGINEER PRIOR TO THE COMMENCEMENT OF ANY WORK.
5. TRENCH EXCAVATION AND BACKFILLING SHALL BE IN ACCORDANCE WITH APPLICABLE STANDARD. THE CONTRACTORS SHALL COMPLY WITH ALL APPLICABLE DIVISION OF INDUSTRIAL REGULATIONS (CAL–OSHA) SAFETY STANDARDS.
6. COORDINATE WITH PLUMBING PLAN FOR EXACT LOCATION OF POINT OF CONNECTION BETWEEN PLUMBING AND CIVIL. ADJUST LINE AS REQUIRED.
7. FOR TOP OF RIM, CLEAN OUT COVER ELEVATION, AND MANHOLE COVER ELEVATION, COORDINATE UTILITY PLAN WITH GRADING PLANS; REPORT ANY DISCREPANCIES TO THE CITY ENGINEER PRIOR TO THE COMMENCEMENT OF ANY WORK.
8. TEST SHALL BE CONDUCTED IN ACCORDANCE WITH SECTION 306 – UNDERGROUND CONDUIT CONSTRUCTION OF THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION.
9. CONTRACTOR TO FIELD VERIFY EXISTING SEWER LINE/HOUSE CONNECTION, CONDUCT CCTV TO VERIFY PIPE SIZE, INVERT ELEVATION AND IDENTIFY IF THE EXISTING PIPE ARE DAMAGED OR NOT. DAMAGED EXISTING PIPE NEEDS TO BE REPLACED BASED ON THE FINDINGS.
10. CONTRACTOR TO COORDINATE POINT OF CONNECTION BETWEEN SEWER LATERAL (HOUSE CONNECTION) AND BUILDING PLUMBING SEWER LAY–OUT. CONTRACTOR MAY USE ONE HOUSE CONNECTION ONLY IF THE EXISTING PIPE SIZE IS 6"ø (OR 4"ø WITH GREATER THAN 2% SLOPE AND DEPENDING ON THE REQUIRED PLUMBING OUTLET PIPE SIZE).
11. CONTRACTOR TO INSTALL 6"ø SEWER LATERAL AT 1% MINIMUM SLOPE. FOR OTHER PIPE SIZE SEE PLUMBING.

LEGEND:

CONCRETE PAVEMENT PER DETAIL 2 ON SHEET C500.	
ASPHALT FIRE LANE	
ASPHALT PAVEMENT	
TURF OR PLANTER AREA (SEE LANDSCAPING DRAWINGS)	
WALL (SEE ARCHITECTURAL AND STRUCTURAL DRAWINGS)	
ASPHALT PAVEMENT DEMO	
TURF OR PLANTER AREA DEMO	
CONCRETE SIDEWALK DEMO	
PROPERTY LINE	
CENTER LINE	
FINISHED GRADE CONTOUR	150.00
EXISTING GRADE CONTOUR	150.00
EXISTING GRADE ELEVATION	(150.00)
FINISHED GRADE ELEVATION	150.00
CHAIN LINK FENCE (CLF)	x x
FLOW LINE	
RIDGE LINE	R
GRADE BREAK	GB
GAS LINE	G
ELECTRICAL CONDUIT	E
TRAFFIC SIGNAL LINE	TS
STORM DRAIN LINE	SD
FIRE WATER LINE	FW
FRENCH DRAIN LINE	FD
IRRIGATION LINE	IRR
SEWER LINE	SS
DOMESTIC WATER LINE	DW
CONTROL POINT	
STORM DRAIN MANHOLE	Ⓓ
SEWER MANHOLE	Ⓢ
STREET LIGHT	☼
GAS VALVE	⊗GV
PULL BOX	□PB
ELECTRICAL RISER	□
GUY WIRES	⟵
POWER POLE	
WATER METER	□WM
WATER VALVE	⊗WV
FIRE HYDRANT	
FIRE DEPARTMENT CONNECTION	FDC
POST INDICATOR VALVE	⊗ PIV
BACKFLOW PREVENTER	

ABBREVIATIONS:

AC	ASPHALT CONCRETE
AD	AREA DRAIN
APWA	AMERICAN PUBLIC WORKS ASSOCIATION
ARCH	ARCHITECTURAL
ASPH	ASPHALT
BC	BEGINNING OF CURVE
BLDG	BUILDING
BM	BENCHMARK
BW	BACK OF SIDEWALK
BX	BOTTOM OF RAMP
BS	BOTTOM OF STEP
CAB	CRUSHED AGGREGATE BASE
CB	CATCH BASIN
CCTV	CLOSED CIRCUIT TELEVISION
CEFB	CITY ENGINEER FIELD BOOK
CF	CURB FACE
℄	CENTERLINE
CI	CAST IRON
CLF	CHAIN LINK FENCE
CLR	CLEAR
CMB	CRUSHED MISCELLANEOUS BASE
CO	CLEANOUT
CONC	CONCRETE
CPM	CONSTRUCTION PROJECT MANAGER
DIA	DIAMETER
DIP	DUCTILE IRON PIPE
DDSG	DRIVE DOUBLE–LEAF SWING GATE
DMH	DRAIN MAINTENANCE HOLE
DS	DRAIN
DW	DOMESTIC WATER
DWG(S)	DRAWING(S)
DWP	DEPARTMENT OF WATER AND POWER
DWY	DRIVEWAY
E	EAST
EC	END OF CURVE
EDS	EDISON
EG	EDGE OF GUTTER/EXISTING GRADE
ELEC	ELECTRICAL
EL, ELEV	ELEVATION
EJ	EXPANSION JOINT
EP	EDGE OF PAVEMENT
EXIST, EX	EXISTING
EXP	EXPANSION
FB	FIELD BOOK
FD	FRENCH DRAIN
FDC	FIRE DEPARTMENT CONNECTION
FF	FINISH FLOOR ELEVATION
FG	FINISH GRADE
FH	FIRE HYDRANT
FL	FLOW LINE
FND	FOUNDATION
FS	FINISH SURFACE
FT	FEET
FW	FIRE WATER
G	GAS
GB	GRADE BREAK
GM	GAS METER
GVLT	GAS VAULT
GV	GAS VALVE
HP	HIGH POINT
IE	INVERT ELEVATION
IIE	INLET INVERT ELEVATION
INV	INVERT
IRR	IRRIGATION
ITEM NO.	ITEM SHOWN ON PTR
L	LENGTH

ABBREVIATIONS:

MAX	MAXIMUM
MEAS	MEASURED
MH	MAINTENANCE HOLE, MANHOLE
MIN	MINIMUM
N	NORTH
NPR	NEWSPAPER RACK
OC	ON CENTER
OIE	OUTLET INVERT ELEVATION
OAR	OWNERS AGENT REPRESENTITIVE
P	PROPORTIONED
PA	PLANTING AREA
PM	PUNCH MARK ON MANHOLE, PARKING METER
PCC	PORTLAND CONCRETE CEMENT
PIV	POST INDICATOR VALVE
PL	PROPERTY LINE
PP	POWER POLE
PTR	PRELIMINARY TITLE REPORT
PSG	PEDESTRIAN SWING GATE
PVC	POLYVINYL CHLORIDE PIPE
PVMT	PAVEMENT
R	RADIUS (GEOMETRY), RIDGE (GRADING), RECORD (SURVEY)
RCP	REINFORCED CONCRETE PIPE
REF	REFERENCE
RW	RIGHT OF WAY
S	SLOPE, SOUTH, SEWER
SD	STORM DRAIN
SDR	STANDARD PIPE DIMENSION RATIO
SSMH	SANITARY SEWER MANHOLE
SDMH	STORM DRAIN MANHOLE
SLPB	STREET LIGHT PULLBOX
SPK	SPIKE
SPKR	SPRINKLER
SS	SANITARY SEWER
STA	STATION, STD(S), STANDARD(S)
S&W	SPIKE & WASHER
SW	SIDEWALK
T	TANGENT
TA	TREE AREA
TAD	TOP OF AREA DRAIN
TC	TOP OF CONCRETE OR CURB
TCB	TOP OF CATCH BASIN
TCO	TOP OF CLEAN OUT
TE	TOP ELEVATION
TEL	TELEPHONE
TEL VLT	TELEPHONE VAULT
TG	TOP OF GRATE
TMH	TELEPHONE MANHOLE
TMS	TOP OF MOW STRIP
TOS	TOP OF SLOPE, TOP OF SLAB
TOE	TOP OF EMBANKMENT
TSPB	TRAFFIC SIGNAL PULLBOX
TS	TOP OF STEP
TW	TOP OF WALL
TX	TOP OF RAMP
TYP	TYPICAL
U/G	UNDERGROUND
VCP	VITRIFIED CLAY PIPE
VIF	VERIFY IN FIELD
V V	VAULT IN VENTS
W	DOMESTIC WATER, WEST
C	WATER METER
WV	WATER VALVE
WVLT	WATER VAULT
YB	YARD BOX

(W,S,G,E) (WATER, SEWER, GAS, ELECTRICAL)

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

REGISTERED PROFESSIONAL ENGINEER
CHRISTIAN C. ADAMS
No. C36079
Exp. 6/30/22
CIVIL
STATE OF CALIFORNIA

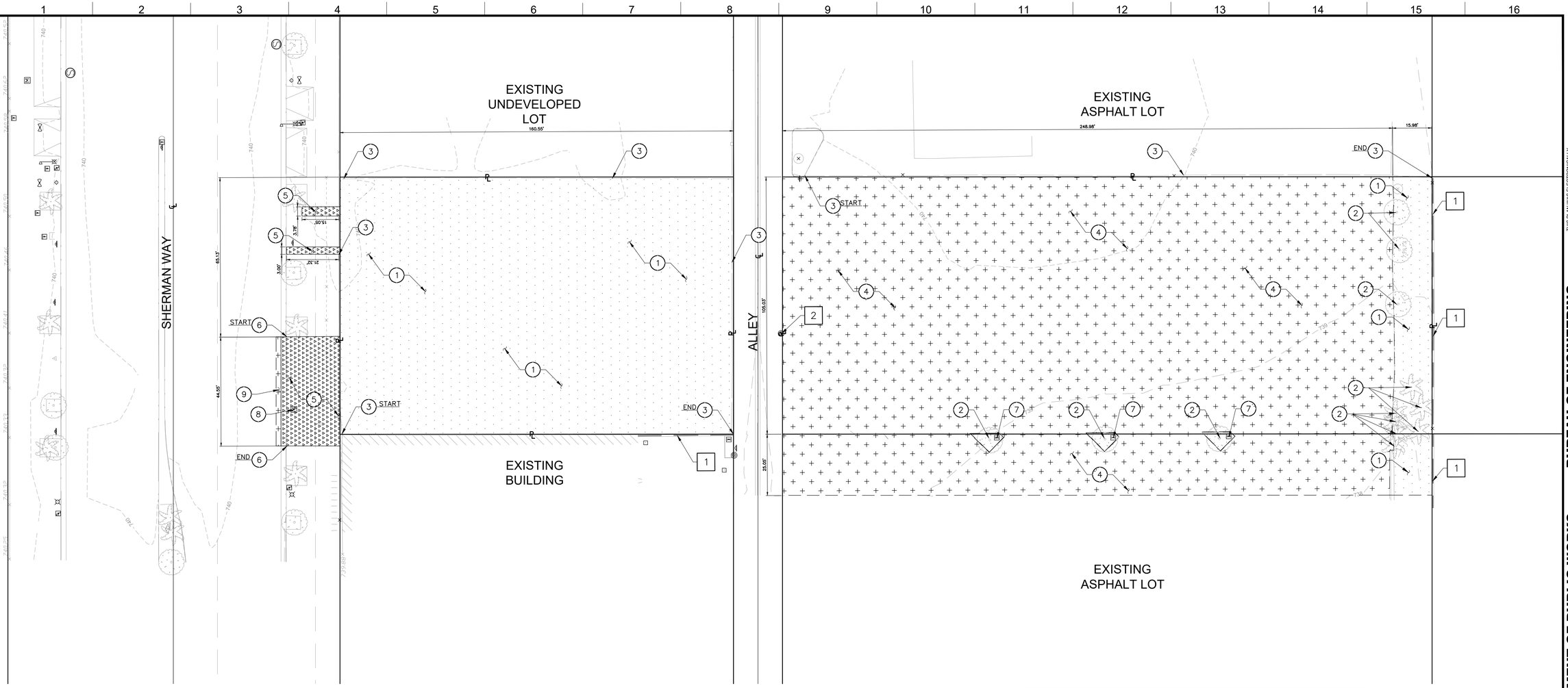
• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED •

BUREAU OF ENGINEERING
VERTICAL CONTROL: C.E.F.B. 43060 PGS. 37-44
HORIZONTAL CONTROL: C.E.F.B. 43060 PGS. 37-44
SHEET TITLE: GENERAL NOTES, LEGENDS, AND ABBREVIATIONS
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 & 18132 SHERMAN WAY, RESEDA CA 91335

DEPARTMENT OF PUBLIC WORKS
CIP NO.
INDEX NO.
BY:
DATE:
NO. REVISIONS:

CITY OF LOS ANGELES
GARY LEE MOORE, P.E., ENV SP — CITY ENGINEER
DESIGN GROUP — DATE:
ENGINEER: VIRGILIO ADANAN — LIC. NO.: C36079
DESIGNED BY: VIRGILIO ADANAN
DRAWN BY: AUTUMN WAGGONER
CHECKED BY: VIRGILIO ADANAN
APPROVED BY:

VCA ENGINEERS, INC.
Civil & Structural Engineering
Civil & Surveying
Civil & Transportation
Civil & Water Resources
Civil & Environmental
Civil & Geotechnical
Civil & Geotechnical
Civil & Geotechnical



REMOVAL NOTES:

1. CLEAR, GRUB, AND REMOVE EXISTING TURF, SHRUBS AND ROOTS.
2. REMOVE EXISTING TREES AND ROOT BALL IN ITS ENTIRETY.
3. REMOVE EXISTING CHAINLINK FENCE AND FOOTINGS IN ITS ENTIRETY, APX 650 LF.
4. REMOVE EXISTING 3" THICK ASPHALT PAVEMENT, FULL DEPTH.
5. REMOVE EXISTING 4" THICK CONCRETE SIDEWALK AND 4" THICK BASE COURSE, FULL DEPTH.
6. REMOVE EXISTING CURB AND GUTTER AND BASE COURSE, FULL DEPTH.
7. REMOVE EXISTING IRRIGATION BOX.
8. REMOVE AND RELOCATE EXISTING WATER METER OUTSIDE OF NEW DRIVEWAY APRON.
9. SAWCUT AND REMOVE 2' ASPHALT PAVEMENT ADJACENT TO CURB AND GUTTER REMOVAL.

PROTECT-IN-PLACE NOTES:

1. PROTECT IN PLACE EXISTING CMU WALL.
2. PROTECT IN PLACE EXISTING POWER POLE.

LEGEND:

- CLEAR, GRUB, AND REMOVE EXISTING TURF, SHRUBS AND ROOTS
- REMOVE EXISTING ASPHALT PAVEMENT AND BASE COURSE IN ENTIRETY
- REMOVE EXISTING CONCRETE

SHEET NOTES:

1. FOR GENERAL NOTES, LEGENDS, AND ABBREVIATIONS, SEE SHEET C100 AND C101.
2. SEE ARCHITECTURAL DRAWINGS FOR OTHER SITE RELATED DIMENSIONS NOT SHOWN ON THIS DRAWING.
3. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY ANY SURFACE AND/OR UNDERGROUND UTILITIES IN CONFLICT WITH THE PROPOSED DEMOLITION AND DESIGN ITEMS. CONTRACTOR SHALL REPORT ANY DISCREPANCIES AND/OR CONSTRUCTION RELATED ISSUES TO THE OWNER OR OWNER REPRESENTATIVE PRIOR TO THE COMMENCEMENT OF WORK.
4. CONTRACTOR TO VERIFY IN FIELD THE JOINING TO EXISTING ELEVATIONS AND THE CURRENT SITE CONDITIONS WITH THE DESIGN GRADES. CONTRACTOR SHALL REPORT ANY DISCREPANCIES AND/OR CONSTRUCTION RELATED ISSUES TO THE OWNER OR OWNER REPRESENTATIVE PRIOR TO THE COMMENCEMENT OF WORK.

DEMOLITION PLAN

20 10 0 20 40

GRAPHIC SCALE
SCALE: 1"=20'

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REVISION DATES
(DESIGN STAGE ONLY)

Sheet Version 4.0

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Design Division

REGISTERED PROFESSIONAL ENGINEER
REGINALD C. ADAMS
No. C36079
Exp. 6/30/22
CIVIL
STATE OF CALIFORNIA

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED

BUREAU OF ENGINEERING

VERTICAL CONTROL: C.E.F.B. 43060 PGS. 37-44
HORIZONTAL CONTROL: C.E.F.B. 43060 PGS. 37-44

SHEET TITLE: DEMOLITION PLAN
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 & 18132 SHERMAN WAY, RESEDA CA 91335

DEPARTMENT OF PUBLIC WORKS

NO.	REVISIONS:	DATE:	BY:

CIP NO.

INDEX NO.

CITY OF LOS ANGELES
GARY LEE MOORE, P.E., ENV SP
CITY ENGINEER
DATE:

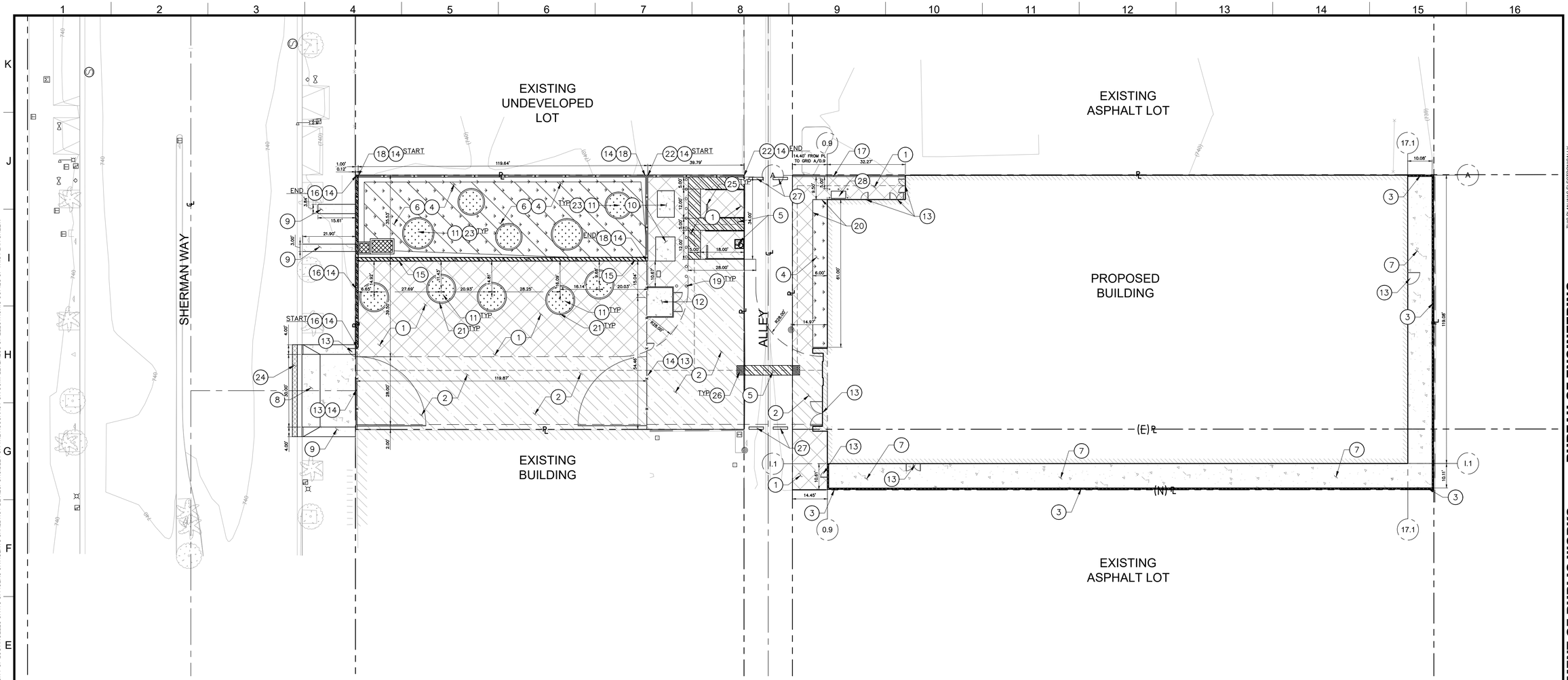
DESIGN GROUP
LIC. NO.: C36079
ENGINEER: VIRGILIO AGANAN
DESIGNED BY: VIRGILIO AGANAN
DRAWN BY: AUTUMN WAGGONER
CHECKED BY: VIRGILIO AGANAN
APPROVED BY:

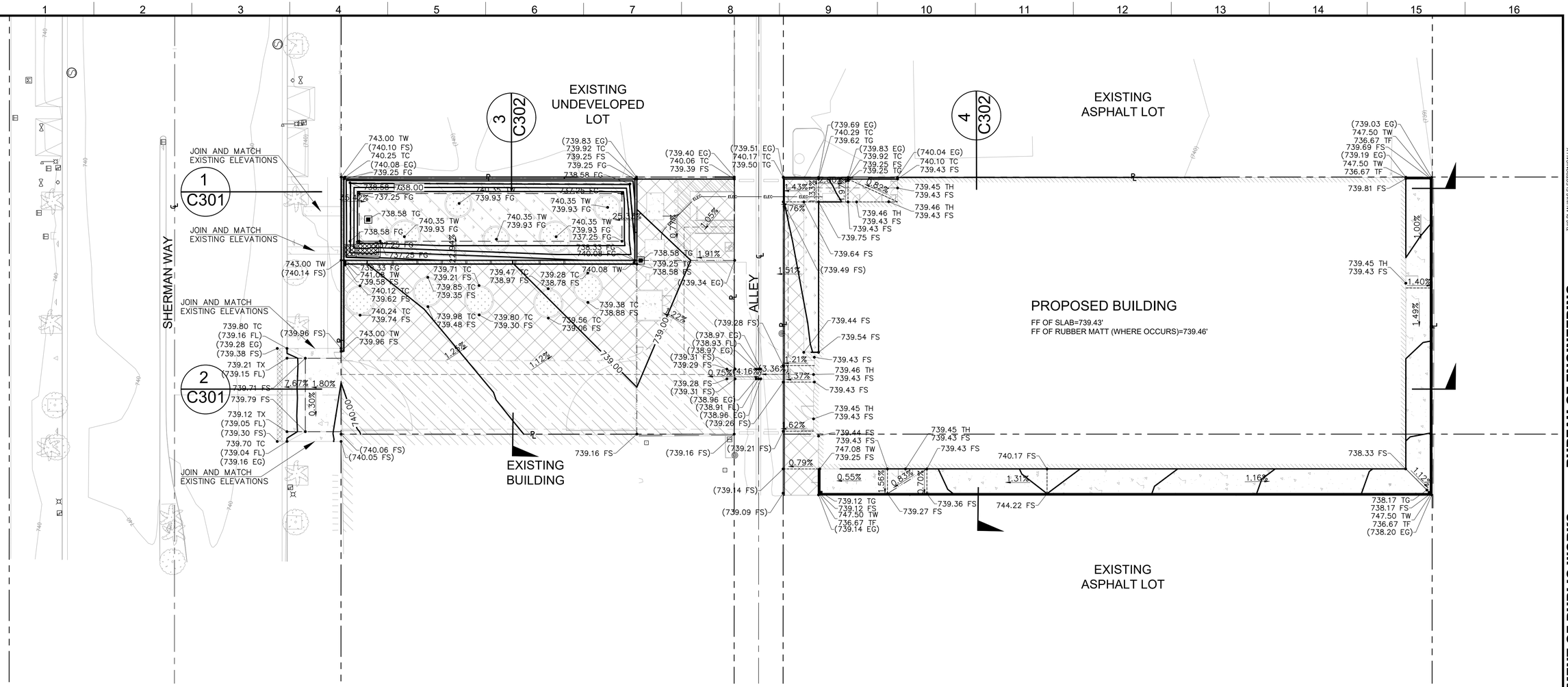
WORK ORDER NO.
E170121B

SHEET NAME
CD100
SHEET 3 OF 17 SHEETS

VCA ENGINEERS, INC.
CIVIL ENGINEERS
Suite E-5, Sunkist Avenue, Suite 210, Alhambra, CA 91801
Tel. 626.293.0888 Fax. 626.293.0883

Z:\VCA PROJECTS 5\2103 TO XXX\2158-419 RESEDA SKATE FACILITY\DRAWINGS\SHEETS\CD100.DWG 12/8/2021 4:02 PM


SHERMAN WAY
EXISTING UNDEVELOPED LOT
EXISTING BUILDING
ALLEY
EXISTING ASPHALT LOT
PROPOSED BUILDING
(E) ℄
(N) ℄
EXISTING ASPHALT LOT
START
END
TYP
119.64'
39.79'
32.27'
14.40' FROM PL TO GRID A/0.9
119.87'
54.46'
28.50'
61.00'
119.08'
14.45'
10.08'
10.67'
10.17'
14.9'
6.00'
34.00'
28.00'
18.00'
5.00'
12.00'
15.61'
21.90'
3.84'
3.00'
4.50'
2.00'
6.65'
27.69'
20.93'
28.25'
16.14'
20.03'
15.04'
39.50'
10.67'
8.50'
1.00'
0.12'
R25.00'
R25.00'
R25.00



GRADING NOTES:

1. ALL GRADING SLOPES SHALL BE PLANTED AND SPRINKLERED (7012.1).
2. STANDARD 12 INCH HIGH BERM IS REQUIRED AT TOP OF ALL GRADED SLOPES (7013.3).
3. NO FILL TO BE PLACED UNTIL THE CITY GRADING INSPECTOR HAS INSPECTED AND APPROVED THE BOTTOM EXCAVATION.
4. MAN–MADE FILL SHALL BE COMPACTED TO A MINIMUM RELATIVE COMPACTION OF 90% MAX DRY DENSITY WITHIN 40 FEET BELOW FINISH GRADE AND 93% OF MAX DRY DENSITY DEEPER THAN 40 FEET BELOW FINISH GRADE, UNLESS A LOWER RELATIVE COMPACTION (NOT LESS THAN 90% OF MAX DRY DENSITY) IS JUSTIFIED BY THE SOILS ENGINEER.
5. TEMPORARY EROSION CONTROL TO BE INSTALLED BETWEEN OCTOBER 1 AND APRIL 15. OBTAIN GRADING INSPECTOR'S AND DEPARTMENT OF PUBLIC WORKS APPROVAL OF PROPOSED PROCEDURES.
6. REGISTERED DEPUTY GRADING INSPECTOR IS REQUIRED ON GRADING AND FOUNDATION EARTHWORK WHERE:
   - A. SITE EXCEEDS 60,000 SF
   - B. CUT OR FILL SLOPES EXCEED 2:1
   - C. CUTS>40 FT. IN HEIGHT AND WITHIN 20 FT. OF A PROPERTY LINE
   - D. ANY EXCAVATION BELOW A 1:1 PLANE FROM PROPERTY LINE
   - E PROJECTS INVOLVE UNUSUAL HAZARDS
   - F. SHORING WORK INCLUDES SLOT CUTS

ESTIMATED EARTHWORK QUANTITY

ESTIMATED CUT	=	3,875 CY
ESTIMATED FILL	=	1,100 CY
ESTIMATED OVEREX/RECOMPACTION	=	2,275 CY
ESTIMATED EXPORT	=	3,875 CY
ESTIMATED IMPORTED FILL	=	1,100 CY

NOTES:

1. THE ESTIMATED QUANTITIES PROVIDED ABOVE ARE FOR REFERENCE ONLY TO BE USED FOR JURISDICTIONAL PLAN CHECKING AND PERMITTING PURPOSES ONLY.
2. ESTIMATED EARTHWORK ABOVE IS BASED ON DESIGN FINISH GRADES TO EXISTING GRADES IN SURVEY. THE ESTIMATED EARTHWORK DOES NOT CONSIDER THE FOUNDATION VOLUMES OR THE REMOVAL OF ANY UNSUITABLE MATERIAL, EXISTING BASEMENTS, PITS, VAULTS, TOP SOIL OR VEGETATION.
3. THE ESTIMATED EARTHWORK QUANTITIES DO NOT INCLUDE SHRINKAGE FACTORS DUE TO COMPACTION OR ANY OVER EXCAVATION QUANTITIES.
4. THE CONTRACTOR SHALL CALCULATE HIS OWN EARTHWORK QUANTITIES NECESSARY FOR HIS BID AND WORK. VCA IS NOT RESPONSIBLE AND LIABLE FOR THE CONTRACTOR'S EARTHWORK CALCULATIONS.
5. ESTIMATED RECOMPACTION QUANTITIES ABOVE ASSUME THAT ONSITE MATERIALS IS SUITABLE FOR RECOMPACTION. ONSITE MATERIALS AND IMPORTED MATERIALS MUST FIRST BE APPROVED BY THE GEOTECHNICAL ENGINEER PRIOR TO INSTALLATION, REMOVAL, OR REPLACEMENT.
6. THE ESTIMATED QUANTITIES WERE CALCULATED AND LIMITED ON ONSITE AREA ONLY.

GEOTECHNICAL ENGINEER STATEMENT

THIS PLAN HAS BEEN REVIEWED AND CONFORMS TO THE RECOMMENDATIONS OF THE SOILS ENGINEERING/REPORTS DATED 08/28/2019 AND SUPPLEMENTAL DATED 12/21/2020.

SIGNATURE AND DATE _____

GRADING PLAN

20 10 0 20 40

GRAPHIC SCALE
SCALE: 1"=20'

VCA ENGINEERS, INC.
CIVIL ENGINEERS
Civil & Structural
234 S. Sunset Avenue, Suite 210, Alhambra, CA 91801
TEL (626) 282-8444 FAX (626) 576-0643

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

REGISTERED PROFESSIONAL ENGINEER
CHRISTOPHER C. ADAMS
No. C36079
Exp. 6/30/22
CIVIL
STATE OF CALIFORNIA

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED •

BUREAU OF ENGINEERING
VERTICAL CONTROL: C.E.F.B. 43060 PGS. 37-44
HORIZONTAL CONTROL: C.E.F.B. 43060 PGS. 37-44
SHEET TITLE: GRADING PLAN
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 & 18132 SHERMAN WAY, RESEDA CA 91335

DEPARTMENT OF PUBLIC WORKS
NO. | REVISIONS: | BY: | DATE:
CIP NO.
INDEX NO.

CITY OF LOS ANGELES
GARY LEE MOORE, P.E., ENV SP — CITY ENGINEER — DATE:
DESIGN GROUP
ENGINEER: VIRGILIO AOANAN — LIC. NO.: C36079
DESIGNED BY: VIRGILIO AOANAN
DRAWN BY: AUTUMN WAGGONER
CHECKED BY: VIRGILIO AOANAN
APPROVED BY:

WORK ORDER NO.
E170121B

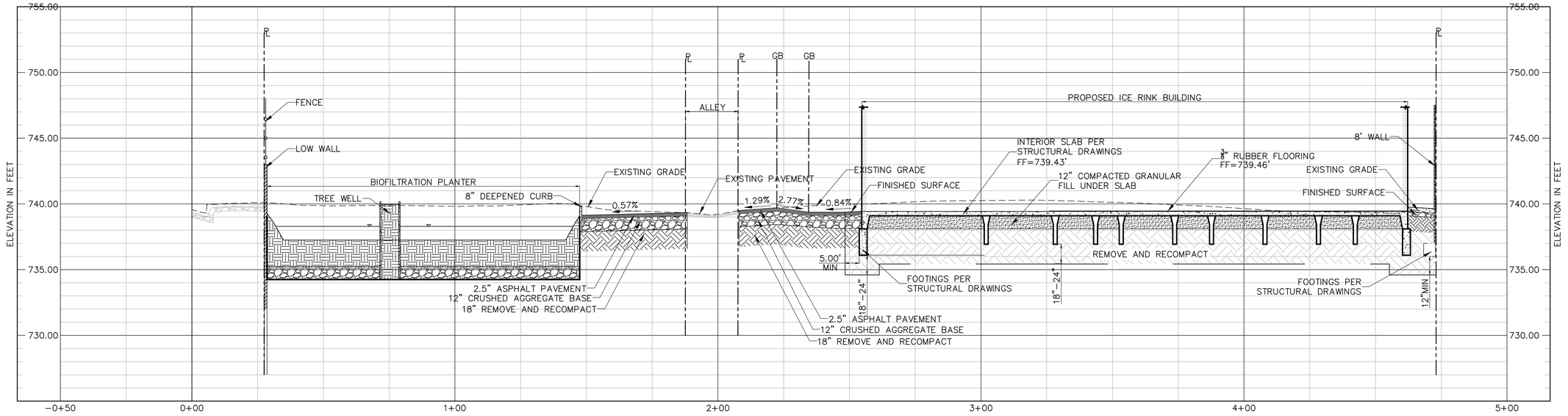
SHEET NAME
C300
SHEET 5 OF 17 SHEETS

REVISION DATES (RESOLVE STAGE ONLY)

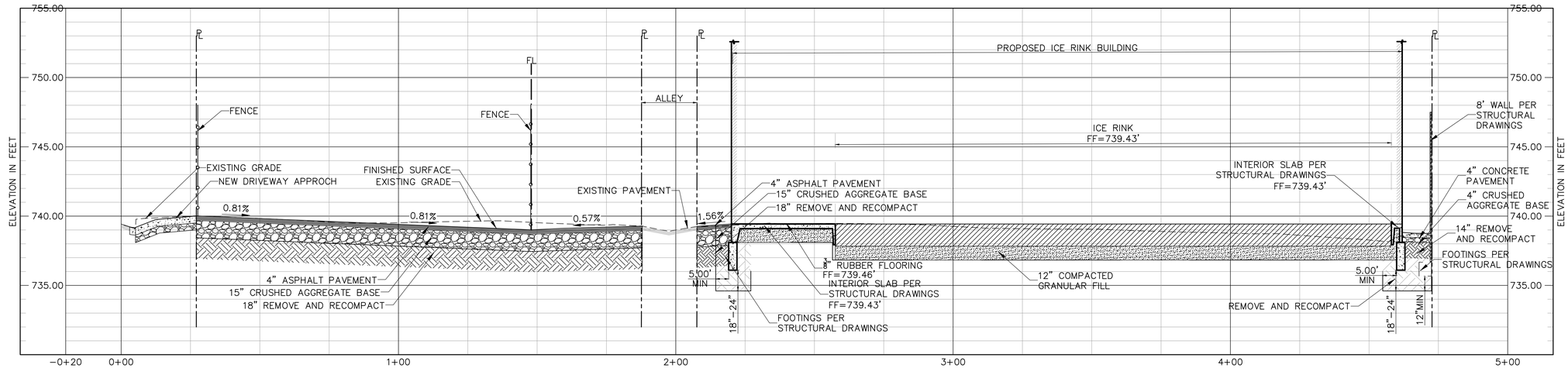
THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

Sheet Version 4.0

Z:\VCA PROJECTS 5\2103 TO XXX\2158-419 RESEDA SKATE FACILITY\DRAWINGS\SHEETS\C300.DWG 12/8/2021 4:03 PM



GRADING SECTION 1
SCALE HOR 1"=20' VER 1"=4' C300



GRADING SECTION 2
SCALE HOR 1"=20' VER 1"=4' C300

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

REGISTERED PROFESSIONAL ENGINEER
DAVID C. ADAMAN
No. C36079
Exp. 6/30/22
CIVIL
STATE OF CALIFORNIA

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED •

BUREAU OF ENGINEERING

VERTICAL CONTROL: C.E.F.B. 43060 PGS. 37-44
HORIZONTAL CONTROL: C.E.F.B. 43060 PGS. 37-44

SHEET TITLE: GRADING SECTIONS

PROJECT: RESEDA SKATE FACILITY

ADDRESS: 18210 & 18132 SHERMAN WAY, RESEDA CA 91335

DEPARTMENT OF PUBLIC WORKS

NO.	REVISIONS:	BY:	DATE:

CIP NO.

INDEX NO.

CITY OF LOS ANGELES
GARY LEE MOORE, P.E., ENV SP — CITY ENGINEER — DATE:

DESIGN GROUP — LIC. NO.: C36079

ENGINEER: VIRGILIO ADAMAN
DESIGNED BY: VIRGILIO ADAMAN
DRAWN BY: AUTUMN WAGGONER
CHECKED BY: VIRGILIO ADAMAN
APPROVED BY:

VCA ENGINEERS, INC.
CIVIL & STRUCTURAL
Civil & Structural Avenue, Suite 210 - Alhambra
Tel. 626.284.4565 Fax. 323.724.9041

WORK ORDER NO.
E170121B

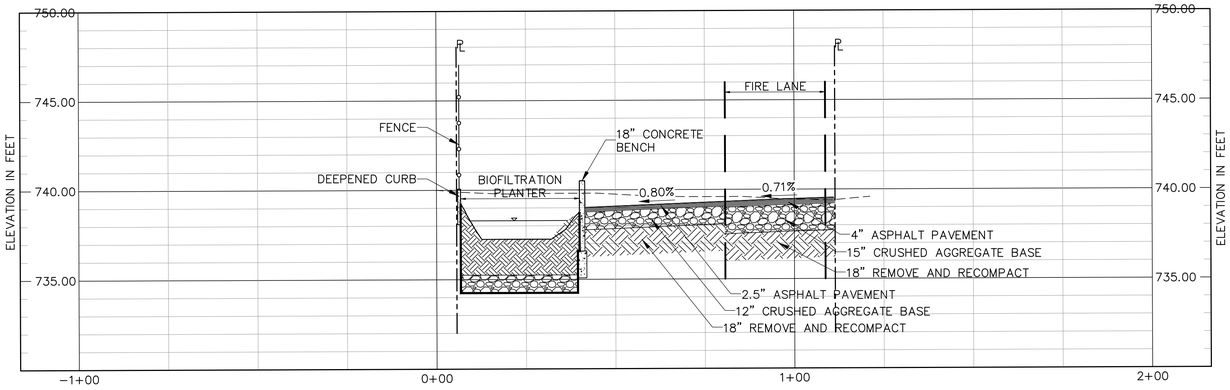
SHEET NAME
C301
SHEET 6 OF 17 SHEETS

REVISION DATES:
(DESIGN STAGES ONLY)

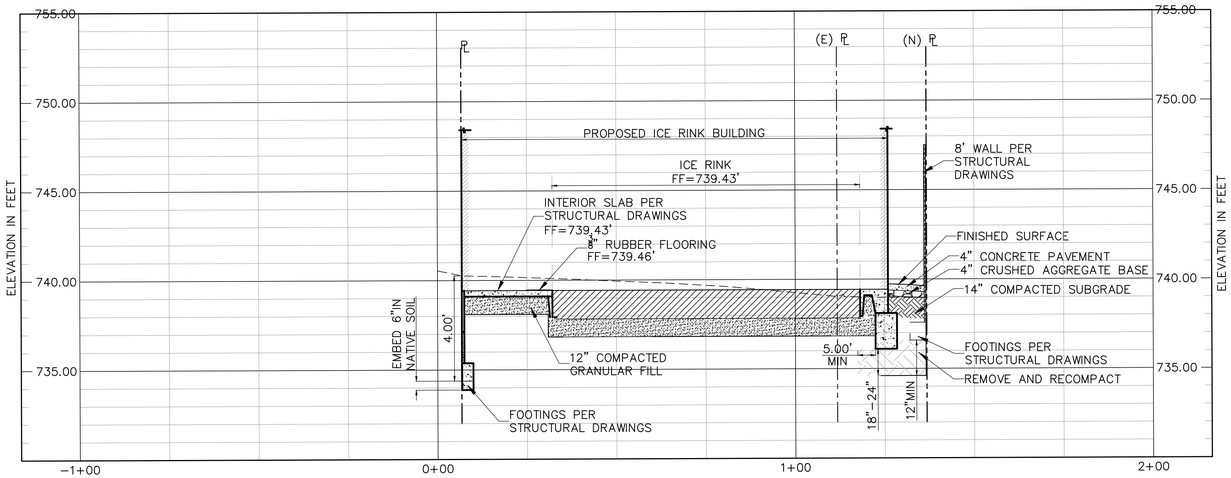
Sheet Version 4.0

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

Z:\VCA PROJECTS 5\2103 TO XXX\2158-419 RESEDA SKATE FACILITY\DRAWINGS\SHEETS\C301.DWG 12/8/2021 4:03 PM



GRADING SECTION 3
SCALE HOR 1"=20' VER 1"=4' C300



GRADING SECTION 4
SCALE HOR 1"=20' VER 1"=4' C300

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REVISION DATES (DESIGN STAGE ONLY)

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Design Division

REGISTERED PROFESSIONAL ENGINEER
REGILIO C. ADANAN
No. C36079
Exp. 6/30/22
CIVIL
STATE OF CALIFORNIA

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED •

BUREAU OF ENGINEERING

VERTICAL CONTROL: C.E.F.B. 43060 PGS. 37-44
HORIZONTAL CONTROL: C.E.F.B. 43060 PGS. 37-44

SHEET TITLE: GRADING SECTIONS
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 & 18132 SHERMAN WAY, RESEDA CA 91335

DEPARTMENT OF PUBLIC WORKS

NO.	REVISIONS:	DATE:	BY:

CIP NO.

INDEX NO.

CITY OF LOS ANGELES
GARY LEE MOORE, P.E., ENV SP
CITY ENGINEER
DESIGN GROUP
LIC. NO.: C36079
DATE:

ENGINEER: VIRGILIO ADANAN
DESIGNED BY: VIRGILIO ADANAN
DRAWN BY: AUTUMN WAGGONER
CHECKED BY: VIRGILIO ADANAN
APPROVED BY:

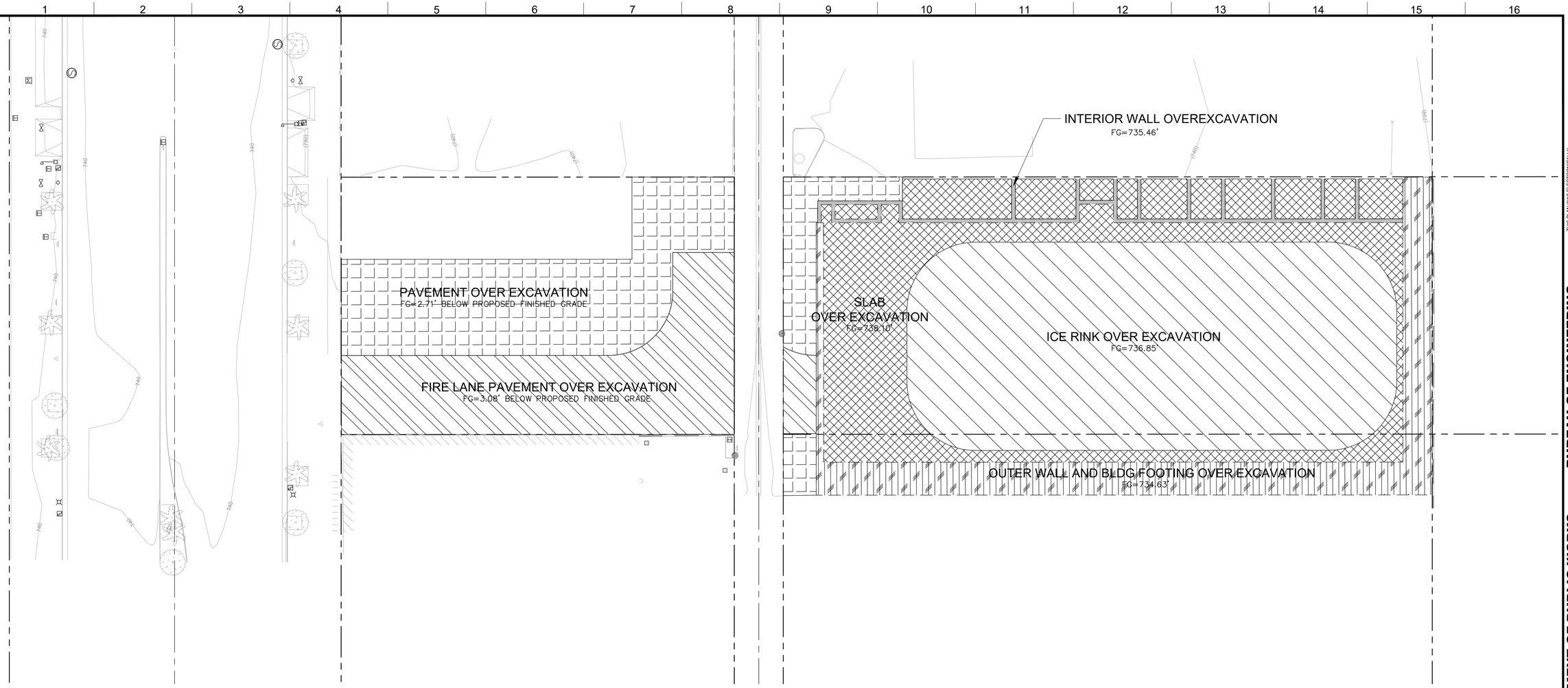
VCA ENGINEERS, INC.
CIVIL ENGINEERS
Suite G, Sunset Avenue, Suite 210, Alhambra, CA 91801
TEL (626) 3-3434 FAX (626) 3-3435

WORK ORDER NO.
E170121B

SHEET NAME
C302
SHEET 7 OF 17 SHEETS

Sheet Version 4.0

Z:\VCA PROJECTS 5\2103 TO XXX\2158-419 RESEDA SKATE FACILITY\DRAWINGS\SHEETS\C302.DWG 12/8/2021 4:03 PM



GENERAL GEOTECHNICAL NOTES:

1. ALL WORK MUST BE IN COMPLIANCE WITH THE RECOMMENDATIONS INCLUDED IN THE GEOTECHNICAL CONSULTANT'S REPORT(S) AND THE APPROVED GRADING PLANS AND SPECIFICATIONS.
2. SITE GEOTECHNICAL INVESTIGATION WAS PREPARED BY CONVERSE CONSULTANTS W.O. #E170121B, GED FILE #19–080 DATED AUGUST 28, 2019, ENTITLED "GEOTECHNICAL ENGINEERING REPORT – RESEDA SKATE FACILITY PROJECT 18210, 18128 AND 18138 WEST SHERMAN WAY LOS ANGELES, CALIFORNIA" RECOMMENDATIONS OF THE SOILS REPORT AND ADDENDA ARE PART OF THIS NOTE AND SHALL BE PERFORMED BY THE CONTRACTOR AS APPLICABLE.
3. THE GEOTECHNICAL ENGINEER IS TO APPROVE THE KEY OR BOTTOM OF EXCAVATION AND LEAVE A CERTIFICATE ON THE SITE FOR THE CITY INSPECTOR. THE CITY INSPECTOR IS TO BE NOTIFIED BEFORE ANY GRADING BEGINS AND FOR BOTTOM INSPECTION BEFORE FILL IS PLACED. FILL MAY NOT BE PLACED WITHOUT THE APPROVAL OF THE CITY INSPECTOR.
4. FOUNDATION AND WALL EXCAVATIONS MUST BE INSPECTED AND APPROVED BY THE GEOTECHNICAL ENGINEER, PRIOR TO THE PLACING OF STEEL OR CONCRETE.
5. OVER–EXCAVATION IS NOT REQUIRED FOR FOOTINGS EMBEDDED AT LEAST 6 INCHES INTO NATIVE SOIL. THE EXISTING UNCERTIFIED FILL SHALL BE REMOVED BENEATH ALL FOOTING NOT EMBEDDED INTO NATIVE SOIL. THE EXISTING UNCERTIFIED FILL BENEATH INTERIOR SOG FLOORS SHALL ALSO BE REMOVED AND REPLACED WITH COMPACTED FILL.
6. THE GEOTECHNICAL ENGINEER ANTICIPATES THE VERTICAL OVER–EXCAVATION WILL RESULT IN APPROXIMATELY 18 TO 24 INCHES OF COMPACTED FILL BENEATH FOOTINGS, EXCLUDING THOSE THAT ARE EMBEDDED INTO NATIVE SOIL. THE LATERAL OVER–EXCAVATION FOR FOOTINGS SHALL BE EQUAL TO THE VERTICAL OVER–EXCAVATION UNLESS FOOTINGS ARE EMBEDDED INTO NATIVE SOIL.
7. THE EXISTING SOIL BENEATH THE PROPOSED CMU SITE WALL SHALL BE REMOVED TO A DEPTH OF 12 INCHES BELOW THE BOTTOM OF FOOTING. LATERAL OVER–EXCAVATION IS NOT REQUIRED.
8. THE EXISTING FILL BENEATH EXTERIOR CONCRETE FLATWORK (I.E. PEDESTRIAN WALKWAYS) SHALL BE REMOVED TO A DEPTH OF 12 INCHES BELOW EXISTING GRADE AND AT LEAST 6 INCHES BELOW THE SLAB, WHICHEVER IS GREATER. THE ONSITE SOIL MAY BE REUSED AS BACKFILL, EXCEPT FOR THE UPPER 4 INCHES. THE UPPER 4 INCHES SHALL CONSIST OF IMPORTED GRANULAR FILL COMPACTED TO AT LEAST 90 PERCENT RC.
9. EXCAVATION BOTTOMS SHALL BE SCARIFIED AT LEAST 6 INCHES, MOISTURE CONDITIONED TO WITHIN 3 PERCENT ABOVE THE OPTIMUM MOISTURE CONTENT, AND COMPACTED TO A MINIMUM 90 PERCENT RC, AS DETERMINED BY ASTM D1557. ALL EXCAVATION BOTTOMS SHALL BE OBSERVED, TESTED, AND APPROVED BY REPRESENTATIVE OF THE GED AND THE LADBS, GRADING INSPECTOR PRIOR TO PLACEMENT TO FILL.
10. ALL TEMPORARY EXCAVATIONS SHALL CONFORM TO THE STATE OF CALIFORNIA CONSTRUCTION SAFETY ORDERS(CAL/OSHA).
17. UNSURCHARGED VERTICAL EXCAVATIONS SHALL NOT EXCEED 5 FEET. UNSURCHARGED EXCAVATIONS GREATER THAN 5 FEET AND TO A MAXIMUM OF 10 FEET SHALL BE SLOPED AT A 1:1 (H:V) OR FLATTER INCLINATION FROM THE GROUND SURFACE TO THE BOTTOM OF THE EXCAVATION. EXCAVATIONS GREATER THAN 10 FEET SHALL BE SHORED.

LEGEND:

- PAVEMENT EXCAVATION, 2.71' BELOW PROPOSED FINISHED GRADE
- FIRE LANE EXCAVATION 3.08' BELOW PROPOSED FINISHED GRADE
- SLAB OVEREXCAVATION, FG=738.10'
- OUTER WALL AND BLDG FOOTING OVEREXCAVATION, FG=734.63'
- INTERIOR WALL FOOTING OVEREXCAVATION, FG=735.46'
- ICE RINK OVEREXCAVATION FG=736.85'

SHEET NOTES:

1. FOR ADDITIONAL GEOTECHNICAL NOTES SEE SHEET C100.

OVER EXCAVATION PLAN

20 10 0 20 40

GRAPHIC SCALE
SCALE: 1"=20'

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REVISION DATES (DESIGN STAGE ONLY)

Sheet Version 4.0

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

REGISTERED PROFESSIONAL ENGINEER
VIRGILIO C. ADANAN
No. C36079
Exp. 6/30/22
CIVIL
STATE OF CALIFORNIA

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED •

BUREAU OF ENGINEERING

VERTICAL CONTROL: C.E.F.B. 43060 PGS. 37-44
HORIZONTAL CONTROL: C.E.F.B. 43060 PGS. 37-44

SHEET TITLE: OVER EXCAVATION PLAN
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 & 18132 SHERMAN WAY, RESEDA CA 91335

DEPARTMENT OF PUBLIC WORKS

NO.	REVISIONS:	DATE:	BY:

CIP NO.

INDEX NO.

CITY OF LOS ANGELES
GARY LEE MOORE, P.E., ENV SP — CITY ENGINEER

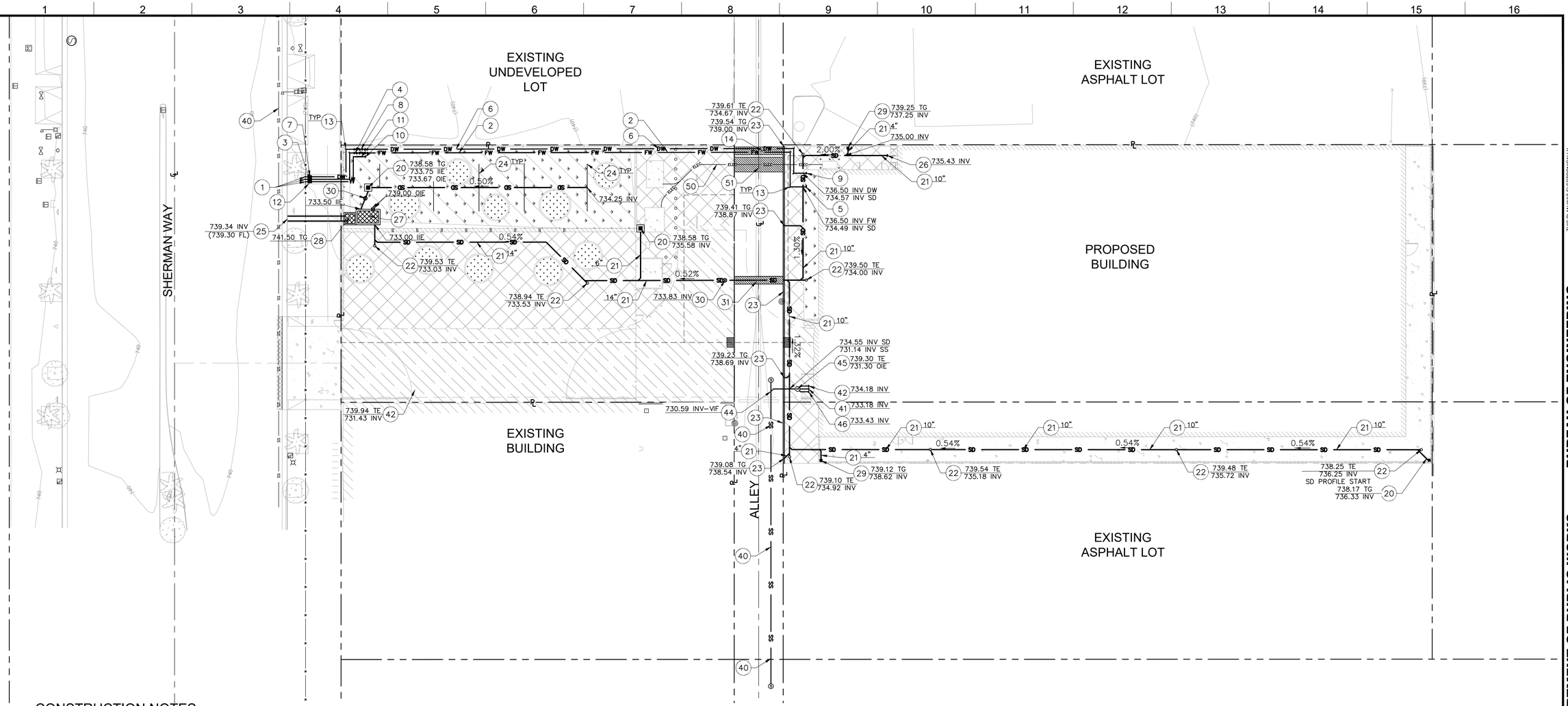
DESIGN GROUP: — DATE:
ENGINEER: VIRGILIO ADANAN — LIC. NO. C36079
DESIGNED BY: VIRGILIO ADANAN
DRAWN BY: AUTUMN WAGGONER
CHECKED BY: VIRGILIO ADANAN
APPROVED BY:

VCA ENGINEERS, INC.
Civil & Structural Engineers
Civil & Structural Engineers
234 E. Colorado Boulevard, Suite 210, Pasadena, CA 91101-2113
Tel: (626) 304-2201 Fax: (626) 304-2202

WORK ORDER NO.
E170121B

SHEET NAME
C303
SHEET 4 OF 17 SHEETS

Z:\VCA PROJECTS 5\2103 TO XXX\2158-419 RESEDA SKATE FACILITY\DRAWINGS\SHEETS\C303.DWG 12/8/2021 4:03 PM



CONSTRUCTION NOTES:

WATER NOTES:

1. POINT OF CONNECTION TO EXISTING 8" MONOLITHIC CAST IRON WATER MAINLINE (8"ø FOR FIRE SERVICE LATERAL, 3" FOR DOMESTIC WATER, AND 1.5"ø FOR IRRIGATION LATERAL). COORDINATE WITH THE UTILITY PURVEYOR FOR CONNECTION REQUIREMENT. CONTRACTOR TO PAY FOR PERMIT AND FEES.
2. INSTALL 8"ø FIRE WATER LINE, AWWA C900 PRESSURE CLASS 200 (DR14). BEDDING PER DETAIL 2 ON SHEET C501.
3. 8" ø FIRE WATER METER, COORDINATE WITH WATER PURVEYOR PRIOR TO ORDERING AND INSTALLATION.
4. INSTALL 8" FIRE WATER DOUBLE CHECK DETECTOR ASSEMBLY. COORDINATE WITH WATER PURVEYOR FOR BACKFLOW DEVICE APPROVAL PRIOR TO ORDERING.
5. CONNECT TO BUILDING FIRE WATER LINE. COORDINATE & MATCH LOCATION WITH BUILDING PLUMBING. PROVIDE REDUCER FITTINGS AS REQUIRED TO MATCH/JOIN WITH BUILDING PLUMBING.
6. INSTALL 3"ø DOMESTIC WATER LINE, AWWA C900 PRESSURE CLASS 200 (DR14). BEDDING PER DETAIL 2 ON SHEET C501.
7. 3"ø DOMESTIC WATER METER, COORDINATE WITH WATER PURVEYOR PRIOR TO ORDERING AND INSTALLATION.
8. INSTALL 3" DOMESTIC WATER REDUCED PRESSURE BACKFLOW ASSEMBLY WATTS LF909 OR APPROVED EQUAL. COORDINATE WITH WATER PURVEYOR FOR BACKFLOW DEVICE APPROVAL PRIOR TO ORDERING.
9. CONNECT TO BUILDING DOMESTIC WATER LINE. COORDINATE AND MATCH LOCATION WITH BUILDING PLUMBING. PROVIDE REDUCER FITTINGS AS REQUIRED TO MATCH/JOIN WITH BUILDING PLUMBING.
10. CONNECT TO 1.5"ø ONSITE IRRIGATION LINE. COORDINATE AND MATCH LOCATION WITH LANDSCAPE DRAWINGS.

WATER NOTES CONT.:

11. INSTALL 1.5" IRRIGATION BACKFLOW PREVENTER, LOCATION PER LANDSCAPE DRAWINGS.
12. INSTALL 1.5" METER FOR IRRIGATION SYSTEM. COORDINATE WITH WATER PURVEYOR PRIOR TO ORDERING AND INSTALLATION.
13. INSTALL THRUST BLOCK SEE DETAIL 1 ON SHEET C502.
14. PROVIDE BLUE COLORED SLURRY OVER THE PROPOSED DOMESTIC AND FIRE WATER LINES CROSSING THE ALLEY. SLURRY SHOULD EXTEND FROM PROPERTY LINE TO PROPERTY LINE.

STORM DRAIN NOTES :

20. CONSTRUCT 12"X12" CATCH BASIN WITH KRISTAR FOSSIL FILTER PER DETAIL 3 ON SHEET C501.
21. INSTALL SCH 40 STORM DRAIN PIPE, SIZE PER PLAN, BEDDING PER DETAIL 2 ON SHEET C501.
22. INSTALL STORM DRAIN CLEAN OUT PER DETAIL 1 ON SHEET C501.
23. INSTALL SLOT DRAIN PER DETAIL 5 ON SHEET C500.
24. INSTALL 6" PERFORATED PIPE PER DETAIL 4 ON SHEET C500.
25. 2'-6" PARKWAY DRAIN PER SPPWC STD PLAN 151-2.
26. CONNECT TO BUILDING STORM DRAIN LINE. COORDINATE & MATCH LOCATION WITH BUILDING PLUMBING. PROVIDE REDUCER FITTINGS AS REQUIRED TO MATCH/JOIN WITH BUILDING PLUMBING.
27. INSTALL SUMP PIT PER DETAIL 1 ON SHEET C503. SEE MEP DRAWINGS FOR PUMP DETAILS.
28. INSTALL ENERGY DISSIPATER BOX PER DETAIL 1 ON SHEET C503.

STORM DRAIN NOTES CONT.:

29. INSTALL AREA DRAIN PER DETAIL 4 ON SHEET C501.
30. PROVIDE BACKWATER VALVE AND VALVE BOX.
31. PROVIDE GREEN COLORED SLURRY OVER THE PROPOSED STORM DRAIN LINE WHEN CROSSING THE ALLEY. SLURRY SHOULD EXTEND FROM PROPERTY LINE TO PROPERTY LINE.

SANITARY SEWER NOTES:

40. 8"ø VCP SANITARY SEWER MAIN LINE, TO BE INSTALLED PER B-PERMIT PLANS.
41. SANITARY SEWER POINT OF CONNECTION TO BUILDING. COORDINATE WITH BUILDING PLUMBING FOR POINT OF CONNECTION. PROVIDE REDUCE FITTINGS AS REQUIRED.
42. CONNECT TO GREY WATER SYSTEM PER MEP PLANS.
43. INSTALL NEW 6" VCP SANITARY SEWER LINE, BEDDING PER DETAIL 2 ON SHEET C501.
44. CONNECT TO SEWER MAIN LINE, PROVIDE SEWER HOUSE CONNECTION PER CITY OF LOS ANGELES STANDARD PLAN S-110-1 TYPE D.
45. PROVIDE DROP MANHOLE PER SPPWC-202-2.
46. CONNECT TO ICE RINK SUB-DRAIN SYSTEM PER MEP PLANS.

OTHER UTILITY NOTES:

50. DWP DUCT BANK TO BE INSTALLED PER DWP DRAWING #20P0638.
51. PROVIDE RED COLORED SLURRY OVER THE PROPOSED DUCT BANK CROSSING THE ALLEY. SLURRY SHOULD EXTEND FROM PROPERTY LINE TO PROPERTY LINE.

SHEET NOTES:

1. FOR GENERAL NOTES, LEGEND AND ABBREVIATIONS, SEE SHEET C100 AND C101.
2. FOR ADDITIONAL UTILITY NOTES, SEE SHEET C100 AND C101.
3. FOR TOP OF GRATE, CLEAN OUT, MANHOLE COVER, TOP OF DRAINAGE GRATES, TOP OF RIM COORDINATE WITH GRADING PLANS. CONTRACTOR TO REPORT/NOTIFY THE CITY ENGINEER FOR ANY CONFLICT IN ELEVATION AND LOCATION PRIOR TO COMMENCEMENT OF WORK.
4. PRIOR TO START OF CONSTRUCTION, CONTRACTOR SHALL VERIFY IN FIELD INVERT ELEVATIONS, STREET POINT OF CONNECTION OF UTILITY LINES, UTILITY CROSSINGS AND REPORT UNKNOWN CONDITIONS, FEATURES TO THE CITY ENGINEER.
5. CONTRACTOR TO INSTALL 6"ø SEWER LATERAL AT 1% MINIMUM SLOPE.

UTILITY PLAN

20 10 0 20 40

GRAPHIC SCALE
SCALE: 1"=20'

VCA ENGINEERS, INC.
CIVIL ENGINEERS
444 S. Flower Street, Suite 2100
Los Angeles, CA 90071
TEL (213) 955-0200

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

REGISTERED PROFESSIONAL ENGINEER
CHRISTOPHER C. ADAMS
No. C36079
Exp. 6/30/22
CIVIL
STATE OF CALIFORNIA

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED

BUREAU OF ENGINEERING
VERTICAL CONTROL: C.E.F.B. 43060 PGS. 37-44
HORIZONTAL CONTROL: C.E.F.B. 43060 PGS. 37-44
SHEET TITLE: UTILITY PLAN
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 & 18132 SHERMAN WAY, RESEDA CA 91335

DEPARTMENT OF PUBLIC WORKS
NO. | REVISIONS: | DATE: | BY:
CIP NO.
INDEX NO.

CITY OF LOS ANGELES
GARY LEE MOORE, P.E., ENV SP
CITY ENGINEER
DESIGN GROUP
LIC. NO.: C36079
DATE:
ENGINEER: VIRGILIO ADANAN
DESIGNED BY: VIRGILIO ADANAN
DRAWN BY: AUTUMN WAGGONER
CHECKED BY: VIRGILIO ADANAN
APPROVED BY:

WORK ORDER NO.
E170121B

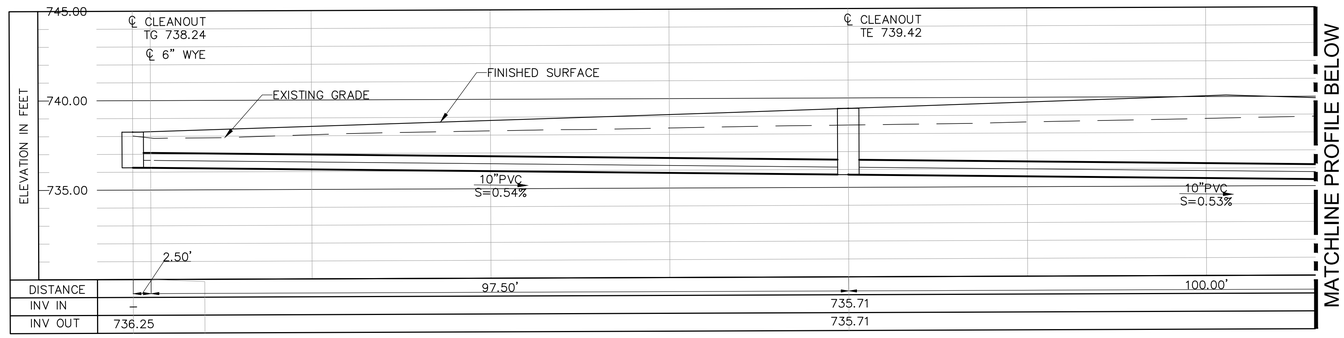
SHEET NAME
C400
SHEET 8 OF 17 SHEETS

REVISION DATES
(DESIGN STAGE ONLY)

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

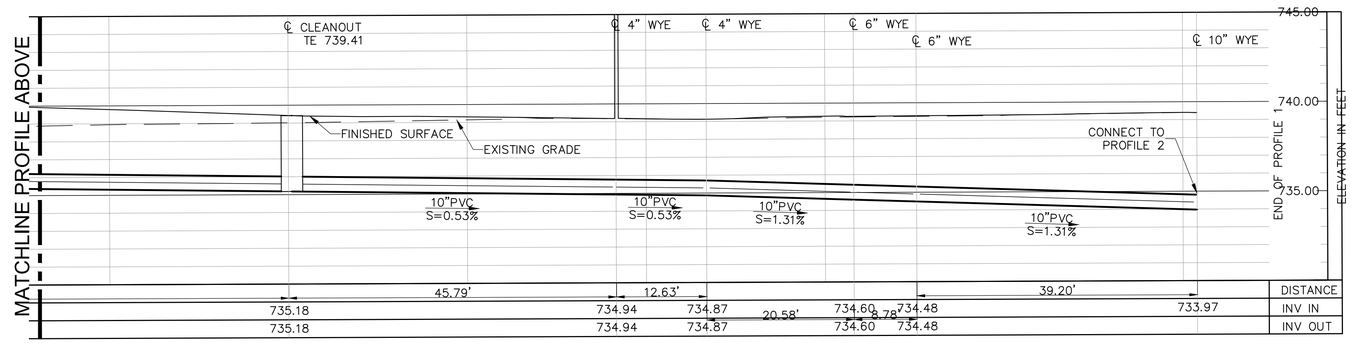
Sheet Version 4.0

Z:\VCA PROJECTS 5\2103 TO XXX\2158-419 RESEDA SKATE FACILITY\DRAWINGS\SHEETS\C400.DWG 12/8/2021 4:03 PM



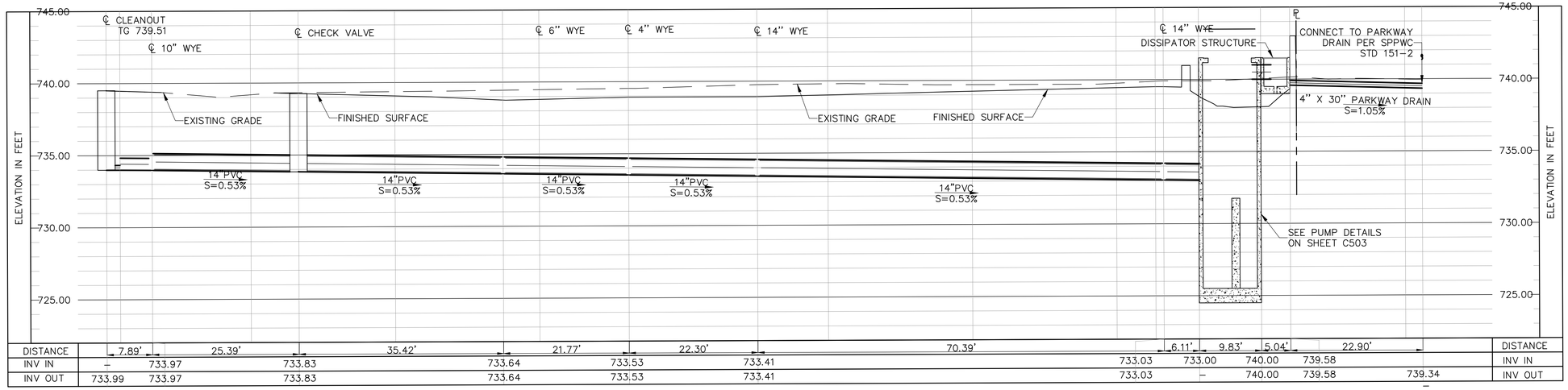
STORMDRAIN PROFILE 1 (1 / C400)

SCALE HOR 1"=10' VER 1"=4'



STORMDRAIN PROFILE 1 cont. (2 / C400)

SCALE HOR 1"=10' VER 1"=4'



STORMDRAIN PROFILE 2 (3 / C400)

SCALE HOR 1"=10' VER 1"=4'

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

REGISTERED PROFESSIONAL ENGINEER
VIRGILIO C. ADANAN
No. C36079
Exp. 6/30/22
CIVIL
STATE OF CALIFORNIA

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED

BUREAU OF ENGINEERING

VERTICAL CONTROL: C.E.F.B. 43060 PGS. 37-44
HORIZONTAL CONTROL: C.E.F.B. 43060 PGS. 37-44

SHEET TITLE: STORM DRAIN PROFILE

PROJECT: RESEDA SKATE FACILITY

ADDRESS: 18210 & 18132 SHERMAN WAY, RESEDA CA 91335

DEPARTMENT OF PUBLIC WORKS

CITY OF LOS ANGELES

GARY LEE MOORE, P.E., ENV SP — CITY ENGINEER

DESIGN GROUP — LIC. NO.: C36079 — DATE:

ENGINEER: VIRGILIO ADANAN
DESIGNED BY: VIRGILIO ADANAN
DRAWN BY: AUTUMN WAGGONER
CHECKED BY: VIRGILIO ADANAN
APPROVED BY:

NO. REVISIONS: — BY: — DATE:

CIP NO.

INDEX NO.

WORK ORDER NO.
E170121B

SHEET NAME
C401
SHEET 9 OF 17 SHEETS

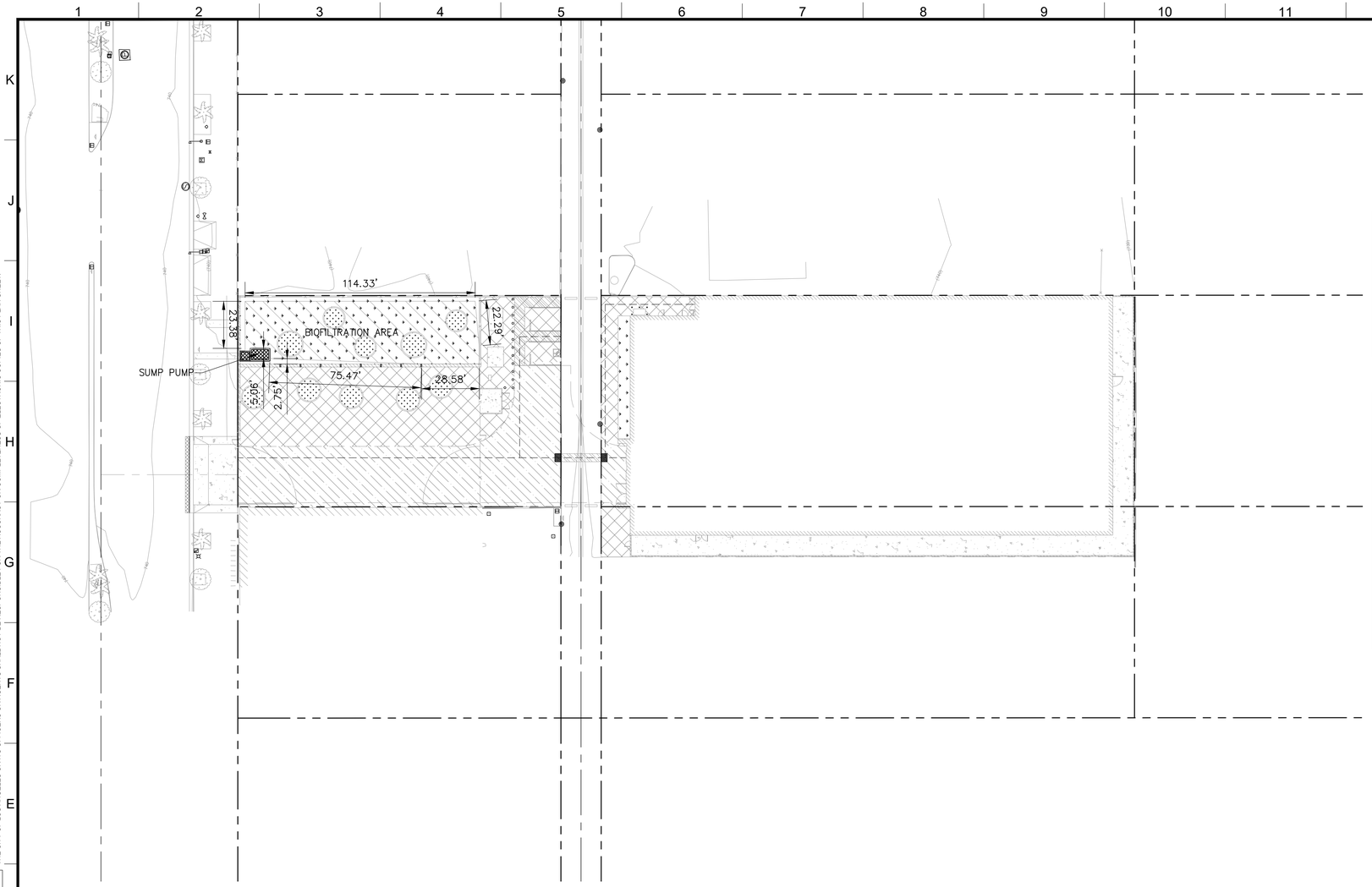
VCA ENGINEERS, INC.
CIVIL & STRUCTURAL
Civil & Structural Avenue, Suite 210 - Alhambra
Tel. (626) 284-8888 Fax. (626) 284-8843

REVISION DATES (DESIGN STAGES ONLY)

Sheet Version 4.0

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

Z:\VCA PROJECTS 5\2103 TO XXX\2158-419 RESEDA SKATE FACILITY\DRAWINGS\SHEETS\C401.DWG 12/8/2021 4:03 PM



LID SUMMARY TABLE

TRIBUTARY AREA	IMPERVIOUS TRIBUTARY AREA (SQ FT)	$SWQD_V$ (CUFT)	$SWQD_V$X1.5 (CUFT)	BMP	REQUIRED BIOFILTRATION AREA (SF)	PROVIDED BIOFILTRATION AREA (SF)
ENTIRE SITE	46,531.77	3,694	5,541	BIOFILTRATION PLANTER PER DETAIL 4 ON C500	2,858	2,856

SHEET NOTE:

1. ANY CHANGES (TYPE, SIZE, LOCATION) TO APPROVED STORMWATER BEST MANAGEMENT PRACTICE(S) (BMPS) MUST OBTAIN WRITTEN APPROVAL FROM LOS ANGELES DEPARTMENT OF PUBLIC WORKS, BUREAU OF SANITATION PRIOR TO CONSTRUCTION OF BMP(S).

LEGEND:

LANDSCAPING AREA

BIOFILTRATION AREA

LID PLAN

40 20 0 40 80

GRAPHIC SCALE
SCALE: 1"=40'

Low Impact Development (LID)
Post Construction Stormwater Mitigation
Best Management Practices (BMPs)

STORMWATER BMP(s) VERIFICATION

Upon LADBS Inspector Verification that approved stormwater BMPs are in place, a Stormwater Observation Report (SOR) Form shall be submitted to Department of Public Works, Bureau of Sanitation. 201 N. Figueroa, 3rd floor, station 18.

Project Address: 18210 SHERMAN WAY RESEDA,CA 91335

RESIDENTIAL (4 UNITS OR LESS, <10,000 SF, <2,500 SF within a ESA)

Item #	Stormwater BMP	Description (Units, total)	Reference Sheet(s)* (Sheet #)
1	Rain Tank(s) – 50 to 129 gal each		
2	Rain Tank(s) – > 130 gal min		
3	Shade Tree - min 15 gal		
4	Flow thru Planter(s)		
5	Permeable pavers / Porous concrete (min 10% open space)	☐ Incidental; _____ total SF ☐ Infiltration; _____ total SF	
6	Rain Garden	☐ #____ - Lined; _____ total SF ☐ #____ - Unlined; _____ total SF	
7	Dry Well		
8	SUMP Pump (modification was not required)		

ALL OTHER DEVELOPMENT
(Residential: 5 ≥ units, 10,000 ≥ SF, within a ESA and ≥2,500SF)

	Item #	Stormwater BMP	Description (Units, total)	Reference Sheet(s)* (Sheet #)
Infiltration	1	Infiltration Basin / Trench		
	2	Dry Well		
	3	Permeable pavers / Porous concrete (min 10% open space)	☐ Incidental; _____ total SF ☐ Infiltration; _____ total SF	
Capture & Use	4	Rain Tank(s) – 530 gal min		
	5	Cistern	☐ Above Grade ☐ Below Grade	
Treat & Discharge	6	Flow thru Planter(s)		
	7	Biofiltration	☒ #1 - Lined; 2,892 total SF ☐ #____ - Unlined; _____ total SF	C400,C401,C500,C503
	8	Vegetative Swale / Filter Strip		
	9	Catch Basin Filter(s)		
	10	Trench Drain Filter(s)		
	11	Down Spout Filter(s)		
	12	SUMP Pump (modification was not required)		

* At a minimum: Site Plan, Architectural Elevations, Roof Plan, Civil Sheets and Detail

STORMWATER OBSERVATION REPORT FORM
(Residential ≥ 5 units & All other Development)

LOW IMPACT DEVELOPMENT

IN THE EVENT THAT THE APPROVED STORMWATER BMP CANNOT BE BUILT PER PLANS (OR ANY MODIFICATION), CONSULT WITH BUREAU OF SANITATION STAFF PRIOR TO ANY PLAN MODIFICATIONS. FAILURE TO DO SO MAY DELAY OBTAINING A FINAL APPROVAL AND CERTIFICATE OF OCCUPANCY (C OF O).

STORMWATER OBSERVATION *means the visual observation of the stormwater related Best Management Practices (BMPs) for conformance with the approved LID Plan at significant construction stages and at completion of the project. Stormwater observation does not include or waive the responsibility for the inspections required by Section 108 or other sections of the City of Los Angeles Building Code.*

STORMWATER OBSERVATION *must be performed by the engineer or architect responsible for the approved LID Plan or designated staff in their employment.* ***As part of the observation, provide photos of the BMPs taken during various construction phases.***

STORMWATER OBSERVATION REPORT *must be signed and stamped (see below) by the engineer or architect responsible for the approved LID Plan and submitted to the city prior to the issuance to the certificate of occupancy.* ***PRIOR TO CERTIFICATE OF OCCUPANCY (C of O), SOR FORM, PRINTED PHOTOS OF THE BMPS TAKEN DURING VARIOUS CONSTRUCTION PHASES AND APPROVED STAMPED PLANS BY THE BUREAU OF SANITATION MUST BE SUBMITTED TO THE PUBLIC COUNTER FOR STAFF APPROVAL.***

Project Address: 18210 SHERMAN WAY RESEDA,CA 91335	Building Permit No.: 21010-10000-01858
Name of Engineer/Architect responsible for the approved LID Plan: Virgil Aoanan	Phone Number: 323-729-6098

List all BMPs installed as part of the project: Coordinates of the most significant (or typical) BMPs:

BMP Type: BIOFILTRATION PLANTER # of units: 1 Lat: 34.20089 ; Long:-118.52971	BMP Type:_____ # of units: ___ Lat: _____ ; Long:_____
BMP Type:_____ # of units: ____ Lat: _____ ; Long:_____	BMP Type:_____ # of units: ____ Lat: _____ ; Long:_____

I DECLARE THAT THE FOLLOWING STATEMENTS ARE TRUE TO THE BEST OF MY KNOWLEDGE:

1. I am the engineer or architect responsible for the approved LID Plan, and;
2. I, or designated staff under my responsible charge, has preformed the required site visits at each significant construction stage and at the completion to verify that the Best Management Practices (BMPs) as shown on approved plans have been constructed and installed in accordance with the approved LID Plan.

Signature Date

Wet Stamp of Engineer or Architect

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

REGISTERED PROFESSIONAL ENGINEER
VIRGILIO C. AOANAN
No. C36079
Exp. 6/30/22
CIVIL
STATE OF CALIFORNIA

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED •

BUREAU OF ENGINEERING
VERTICAL CONTROL: C.E.F.B. 43060 PGS. 37-44
HORIZONTAL CONTROL: C.E.F.B. 43060 PGS. 37-44
SHEET TITLE: LID PLAN
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 & 18132 SHERMAN WAY, RESEDA CA 91335

DEPARTMENT OF PUBLIC WORKS
NO. | REVISIONS: | DATE: | BY:

CIP NO.

INDEX NO.

CITY OF LOS ANGELES
GARY LEE MOORE, P.E., ENV SP
CITY ENGINEER
DESIGN GROUP
LIC. NO.: C36079
DATE:
ENGINEER: VIRGILIO AOANAN
DESIGNED BY: VIRGILIO AOANAN
DRAWN BY: AUTUMN WAGGONER
CHECKED BY: VIRGILIO AOANAN
APPROVED BY:

VCA ENGINEERS, INC.
Civil & Structural Engineers
2049 S. Barrington Avenue, Suite 210 • Barrington, Illinois 60010
TEL 310.575.8260 • FAX 310.575.8261

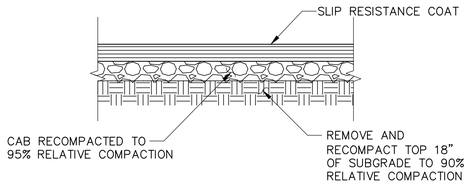
WORK ORDER NO.
E170121B

SHEET NAME
C402
SHEET 10 OF 17 SHEETS

REVISION DATES (DESIGN STAGE ONLY)

Sheet Version 4.0

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

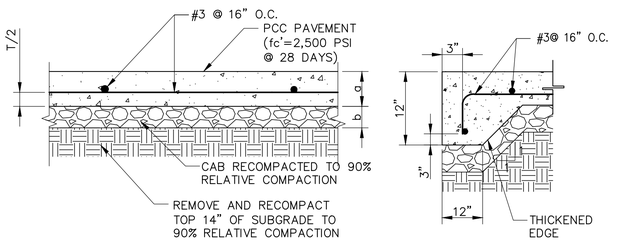


LOCATION	ASPHALT CONCRETE THICKNESS	BASE COURSE THICKNESS
FIRE LANE	4"	15"
PARKING	2.5"	12"
SKATE RINK	2.5"	12"

NOTES:

1. PROVIDE SLIP RESISTANCE COAT PER MANUFACTURER REQUIREMENTS AND SPECIFICATIONS 32 1216.

1 ASPHALT PAVEMENT SECTION
SCALE: NOT TO SCALE

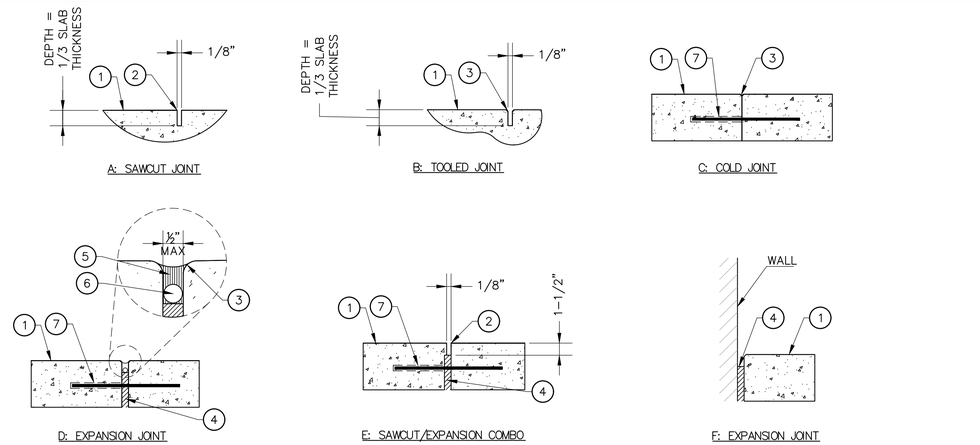


LOCATION	CONCRETE THICKNESS	BASE COURSE THICKNESS
CONCRETE PAVING	4"	4"

NOTES:

1. CONCRETE. fc'=2,500 PSI @ 28 DAYS. FOR NON TRAFFIC
2. REBARS, fy=60,000 psi ASTM AG15.
3. PAVING SHALL HAVE A MEDIUM BROOM FINISH ON ALL SURFACES LESS THAN 6% AND A HEAVY BROOM FINISH ON ALL SURFACES GREATER THAN 6%..
4. REFER TO DETAIL 3 FOR PAVEMENT JOINT DETAIL.

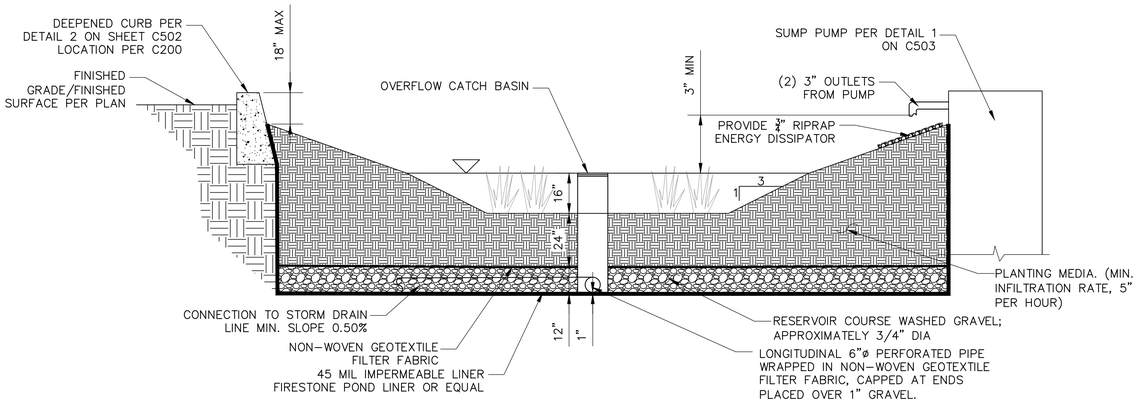
2 CONCRETE PAVEMENT SECTION
SCALE: NOT TO SCALE



LEGEND

1. PAVING FINISH SURFACE.
2. SAWCUT.
3. 1/4" R. @ EDGES. TYP.
4. PREMOLDED E.J. FILLER.
5. JOINT SEALANT. COLOR TO BE SELECTED BY LANDSCAPE ARCHITECT. SUBMIT COLOR SAMPLES PRIOR TO INSTALLATION.
6. BACKER ROD.
7. 18" #4 REBAR W/ 'SPEED DOWEL' @ 36" OC, CENTER IN CONC. AT COLD JOINTS & E.J.'S
8. CONTROL JOINTS 20' O.C MAX.
9. CONTRACTOR TO SUBMIT SHOP DRAWINGS OF CONTROL JOINT AND EXPANSION JOIN LAYOUT.

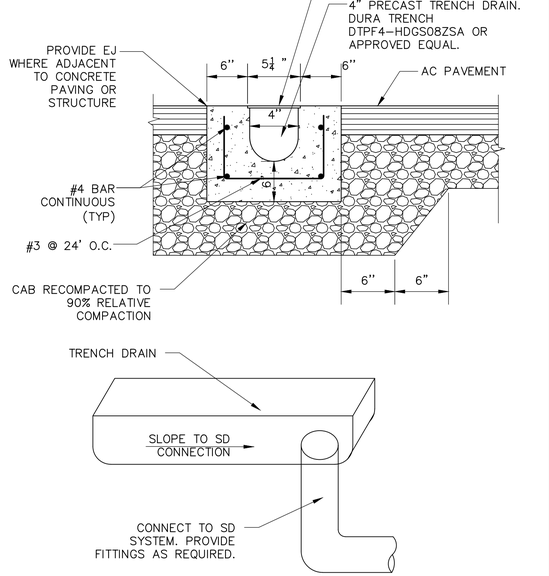
3 PAVEMENT JOINT DETAILS
SCALE: NOT TO SCALE



NOTES:

1. FOR PLANTING AND LANDSCAPING REQUIREMENTS SEE LANDSCAPE DRAWINGS.
2. FOR SPLASH BLOCK/DISSIPATOR AND FEATURES SEE ARCHITECTURAL DRAWINGS.
3. FOR PLANTER AND OUTLET DRAINAGE LINES AND DRAINAGE STRUCTURES SEE CIVIL DRAWINGS SHEET C400.
4. COORDINATE PLANTING DETAILS AND FEATURES WITH ARCHITECTURAL, LANDSCAPE, STRUCTURAL AND CIVIL DRAWINGS.
5. PROVIDE "NO DUMPING" STENCIL PER DETAIL 6 ON SHEET C501 AT ALL OUTLETS.

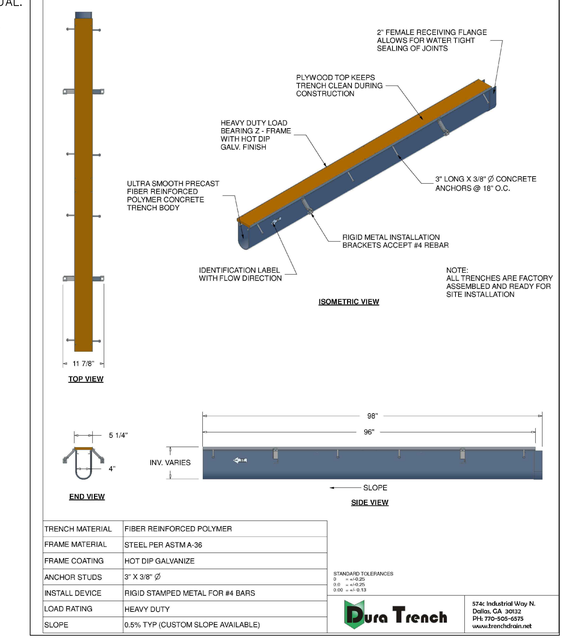
4 BIOFILTRATION SWALE
SCALE: NOT TO SCALE



NOTES:

1. ALL METAL PARTS SHALL BE GALVANIZED AFTER FABRICATION AND WELDING, AND BEFORE ASSEMBLING.
2. CONCRETE, FC'=3,000 PSI @ 28 DAYS PER SSPWC.
3. GRATES SHALL BE OF VANDAL-RESISTANT CONSTRUCTION, ADA, AND HEEL PROOF COMPLIANT.
4. ELONGATED OPENINGS PLACED WHERE THE LONG DIMENSION IS PERPENDICULAR TO THE DOMINANT DIRECTION OF TRAVEL.
5. FRAME AND GRATE SHALL BE TRAFFIC-RATED WHEN INSTALLED IN PAVED (ASPHALT OR CONCRETE) AREAS.
6. PROVIDE 1/2" MAX GRID/OPENINGS IN GRATING IN THE DIRECTION OF TRAFFIC FLOW.

5 TRENCH DRAIN
SCALE: NOT TO SCALE



TRENCH MATERIAL	FIBER REINFORCED POLYMER
FRAME MATERIAL	STEEL PER ASTM A-36
FRAME COATING	HOT DIP GALVANIZE
ANCHOR STUDS	3" X 3/8" Ø
INSTALL DEVICE	RIGID STAMPED METAL FOR #4 BARS
LOAD RATING	HEAVY DUTY
SLOPE	0.5% TYP (CUSTOM SLOPE AVAILABLE)

STANDARD TOLERANCES
0 - +/-0.25
0.6 - +/-0.25
0.06 - +/-0.13

Dura Trench

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

REGISTERED PROFESSIONAL ENGINEER
CHRISTIAN C. ADAMS
No. C36079
Exp. 6/30/22
CIVIL
STATE OF CALIFORNIA

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED •

BUREAU OF ENGINEERING
VERTICAL CONTROL: C.E.F.B. 43060 PGS. 37-44
HORIZONTAL CONTROL: C.E.F.B. 43060 PGS. 37-44
SHEET TITLE: MISCELLANEOUS DETAILS
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 & 18132 SHERMAN WAY, RESEDA CA 91335

DEPARTMENT OF PUBLIC WORKS
NO. | REVISIONS: | DATE: | BY:
CIP NO.
INDEX NO.

CITY OF LOS ANGELES
GARY LEE MOORE, P.E., ENV SP
CITY ENGINEER
DESIGN GROUP
LIC. NO.: C36079
DATE:
ENGINEER: VIRGILIO AGNANA
DESIGNED BY: VIRGILIO AGNANA
DRAWN BY: AUTUMN WAGGONER
CHECKED BY: VIRGILIO AGNANA
APPROVED BY:

VCA ENGINEERS, INC.
CIVIL ENGINEERS
5161 E. Lincoln Avenue, Suite 210, Anaheim, CA 92807
714.970.0900 Fax. 310.710.6453

WORK ORDER NO.
E170121B

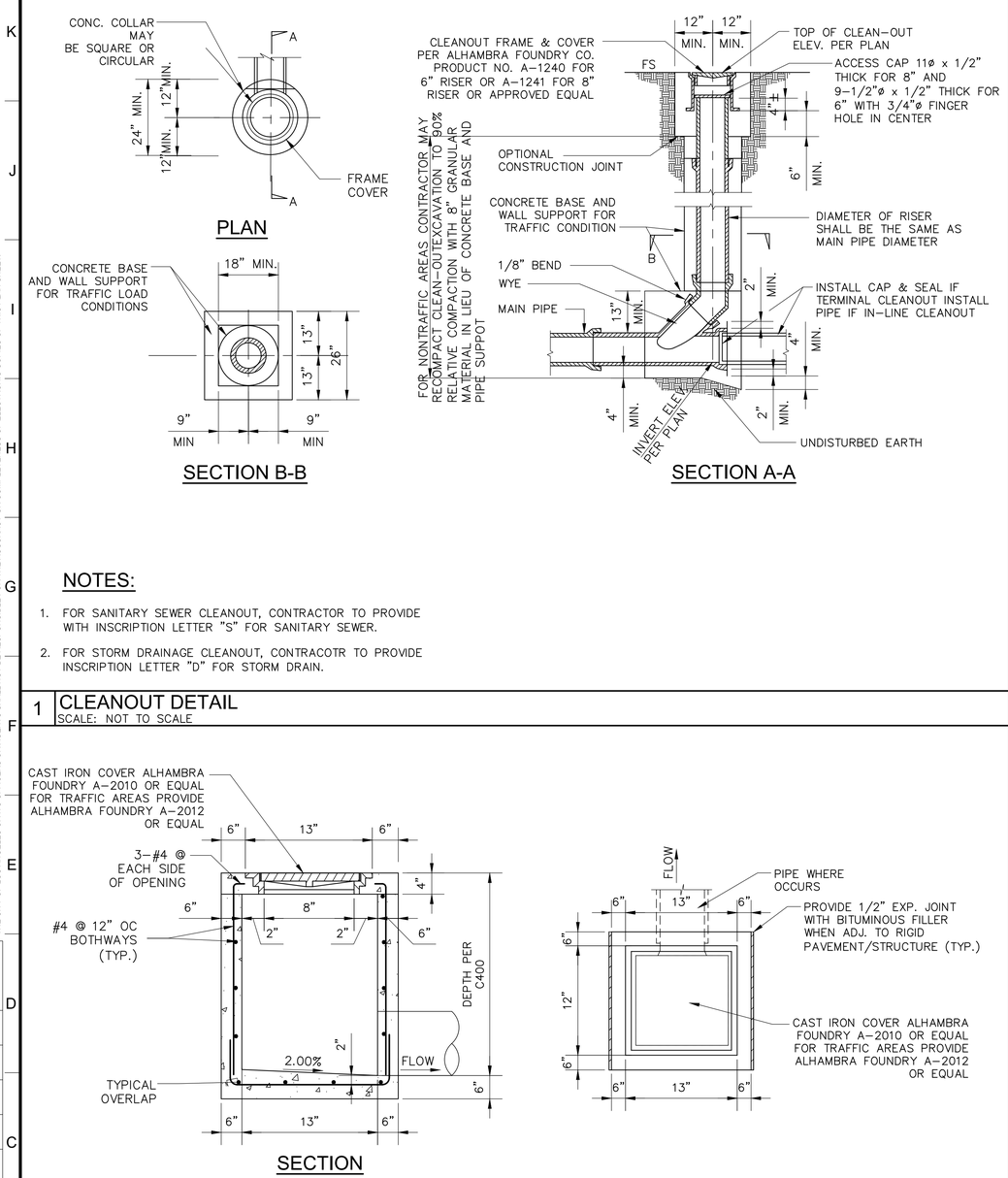
SHEET NAME
C500
SHEET 11 OF 17 SHEETS

(REVISION DATES (DESIGN & PAGE ONLY))

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

Sheet Version 4.0

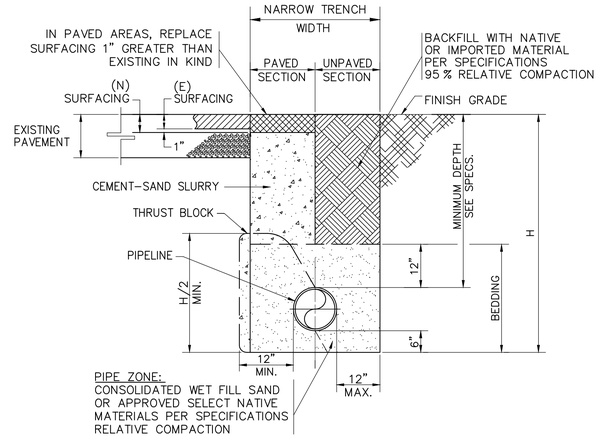
Z:\VCA PROJECTS 5\2103 TO XXX\2158-419 RESEDA SKATE FACILITY\DRAWINGS\SHEETS\C500.DWG 12/8/2021 4:04 PM



NOTES:

1. FOR SANITARY SEWER CLEANOUT, CONTRACTOR TO PROVIDE WITH INSCRIPTION LETTER "S" FOR SANITARY SEWER.
2. FOR STORM DRAINAGE CLEANOUT, CONTRACOTR TO PROVIDE INSCRIPTION LETTER "D" FOR STORM DRAIN.

1 CLEANOUT DETAIL
SCALE: NOT TO SCALE



NOTES:

1. PAVEMENT FINISH SURFACE SHALL BE A SMOOTH CONTINUATION OF ADJOINING PAVED SURFACE.
2. PIPELINE BEDDING MATERIAL, TRENCH BACKFILL MATERIAL, AND COMPACTION SHALL COMPLY WITH THE SOIL REPORT.
3. BEDDING MATERIALS CONSISTING OF SAND, GRAVEL, OR CMB SHOULD BE USED TO BACKFILL AROUND UTILITY PIPES TO APPROXIMATELY ONE FOOT ABOVE THE TOP OF THE PIPE. ONSITE SOILS WHICH HAVE A SAND EQUIVALENT (SE) OF 30 OR GREATER CAN ALSO BE USED AS BEDDING MATERIAL. NO MORE THAN 30% OF BACKFILL VOLUME SHOULD BE LARGER THAN ¾". PRIOR TO PLACING THE PIPES, THE PIPE TRENCH SUBGRADE SHOULD BE OBSERVED BY A REPRESENTATIVE OF THE PROJECT GEOTECHNICAL ENGINEER. IN THE LARGEST DIMENSION. IMPORTED BACKFILL SHOULD BE APPROVED BY PROJECT GEOTECHNICAL CONSULTANT PRIOR TO DELIVERY AT THE SITE.
4. IT IS RECOMMENDED THAT UTILITY TRENCHES ARE NOT BE OR PLACED PARALLED TO AND BELOW A 1½:1 PLANE PROJECTED DOWN FROM THE BASE OF THE OUTER EDGE OF A CONVENTIONAL FOUNDATION.
5. IF THE EXPOSED SUBGRADE IS LOOSE OR UNSTABLE, THE UNSUITABLE SUBGRADE SOIL MUST BE EXCAVATED AND REPLACED WITH BEDDING MATERIAL. BEDDING MUST BE PLACED UNIFORMLY ON EACH SIDE OF THE PIPE AND MECHANICALLY COMPACTED.
6. FLOODING OR JETTING TO DENSIFY THE BEDDING MATERIALS IS NOT ALLOWED DUE TO THE CLAYEY NATURE OF ONSITE SOILS.
7. THE BACKFILL FOR THE REMAINING PORTION OF THE TRENCH ABOVE THE PIPES SHOULD BE PLACED IN LOOSE LIFTS NOT TO EXCEED 6 INCHES, MOISTURE-CONDITIONED WITHIN OPTIMUM AND 2 PERCENT ABOVE OPTIMUM MOISTURE CONTENT, AND MECHANICALLY COMPACTED TO AT LEAST 95 PERCENT RELATIVE COMPACTION IN ACCORDANCE WITH ASTM D1557. THINNER LIFTS MAY BE NECESSARY TO ACHIEVE THE RECOMMENDED LEVEL OF COMPACTION OF THE BACKFILL DUE TO EQUIPMENT LIMITATIONS.
8. THE HIGHER COMPACTION IS REQUIRED FOR FILL MATERIAL THAT HAS LESS THAN FIFTEEN PERCENT (15%) OF THE MATERIAL FINER THAN 0.005MM.
9. TRENCHES IN PAVEMENT AREAS SHOULD BE CAPPED WITH AT LEAST 12 INCHES OF COMPACTED, ON-SITE SOIL SIMILAR TO THAT OF THE ADJOINING SUBGRADE. THE UPPER 12 INCHES OF TRENCH BACKFILL IN AREAS TO BE
10. PAVED SHOULD BE COMPACTED TO AT LEAST 95 PERCENT RELATIVE COMPACTION. SPECIAL CARE SHOULD BETAKEN IN THE CONTROL OF UTILITY TRENCH BACKFILLING IN THE PAVEMENT AREAS.
11. PIPELINE BEDDING MAY BE LEAN CONCRETE CONSISTING OF TWO SACKS OF PORTLAND CEMENT PER CUBIC YARD OF SLURRY IN LEIU OF SAND AS LONG AS SLURRY IS VIBRATED IN PLACE.
12. MINIMUM COVERAGE OF UTILITIES IS 36-INCHES. IF THIS CANNOT BE ATTAINED, CAP WITH 1-SACK CONCRETE SLURRY. IN PAVING AREAS, BACKFILL TRENCHES WITH SLURRY UP TO BOTTOM OF PAVING. IN LANDSCAPE AREAS, SLURRY IS ALLOWED UP TO TWO-FEET BELOW GRADE.
13. PROVIDE METALLIC WARNING TAPE 12-INCHES BELOW GRADE ABOVE UTILITIES.

NARROW UNSUPPORTED VERTICAL WALLED TRENCH WIDTH

NOMINAL PIPE DIAMETER (INCHES)	NARROW TRENCH WIDTH MIN. (INCHES)
3	18
4	18
6	18
8	24
10	30
15	35
48	91

MIN. DEPTH UNLESS SPECIFIED ON UTILITY PLAN C400

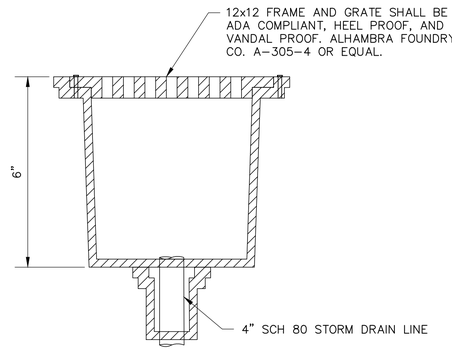
PIPE	MIN. DEPTH (INCHES)
STEEL PIPE	24
COPPER WATER TUBE	18
CAST-IRON PRESSURE PIPE	36
PLASTIC PIPE (OTHER THAN WASTE)	30
SEWER & STORM DRAIN	18
IRRIGATION PIPE (NON PRESSURE)	12
IRRIGATION PIPE (PRESSURE)	24

2 BEDDING DETAIL
SCALE: NOT TO SCALE

NOTES:

1. USE 3/4" DIA. PIPE BAR SPACERS ASSEMBLED ON (2) 1/2" DIA. RODS WITH THREADS AND NUTS AT BOTH ENDS.
2. ALL METAL PARTS SHALL BE GALVANIZED AFTER FABRICATION AND WELDING, AND BEFORE ASSEMBLING.
3. CONCRETE, FC'=3,000 PSI @ 28 DAYS PER SSPWC.
4. CATCH BASIN ALTERNATE CAN BE PREFABRICATED AVAILABLE ON THE MARKET.
5. GRATES SHALL BE OF VANDAL-RESISTANT CONSTRUCTION, ADA, AND HEEL PROOF COMPLIANT.
6. ELONGATED OPENINGS PLACED WHERE THE LONG DIMENSION IS PERPENDICULAR TO THE DOMINANT DIRECTION OF TRAVEL.
7. FRAME AND GRATE SHALL BE TRAFFIC-RATED WHEN INSTALLED IN PAVED (ASPHALT OR CONCRETE) AREAS.
8. PROVIDE 1/2" MAX GRID/OPENINGS IN GRATING IN THE DIRECTION OF TRAFFIC FLOW.

3 CATCH BASIN DETAIL
SCALE: NOT TO SCALE



NOTES:

1. ALL METAL PARTS SHALL BE GALVANIZED AFTER FABRICATION AND WELDING, AND BEFORE ASSEMBLING.

4 AREA DRAIN DETAIL
SCALE: NOT TO SCALE

NOTES:

1. PROVIDE 8" MIN DIAMETER FOR STENCIL.
2. STENCIL IN BLUE PAINT NEAR ALL CATCH BASIN DRAINS TO READ "NO DUMPING, THIS DRAINS TO OCEAN".
3. STENCILS MAY BE PURCHASED AT THE LOCAL COUNTY BUILDING AND SAFETY OFFICE AT 626-458-6390.

5 NO DUMPING SYMBOL
SCALE: NOT TO SCALE

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Design Guidelines

REGISTERED PROFESSIONAL ENGINEER
CHRISTOPHER C. ADAMS
No. C36079
Exp. 6/30/22
CIVIL
STATE OF CALIFORNIA

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED •

BUREAU OF ENGINEERING
VERTICAL CONTROL: C.E.F.B. 43060 PGS. 37-44
HORIZONTAL CONTROL: C.E.F.B. 43060 PGS. 37-44
SHEET TITLE: MISCELLANEOUS DETAILS
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 & 18132 SHERMAN WAY, RESEDA CA 91335

CITY OF LOS ANGELES
DEPARTMENT OF PUBLIC WORKS

NO.	REVISIONS:	DATE:	BY:

CIP NO.
INDEX NO.

CITY ENGINEER
DATE:
GARY LEE MOORE, P.E., ENV SP
DESIGN GROUP
LIC. NO.: C36079
ENGINEER: VIRGILIO ADANAN
DESIGNED BY: VIRGILIO ADANAN
DRAWN BY: AUTUMN WAGGONER
CHECKED BY: VIRGILIO ADANAN
APPROVED BY:

VCA ENGINEERS, INC.
CIVIL STRUCTURAL
Civil & Structural Engineers
Civil & Structural Avenue, Suite 210 - Alhambra
Tel. 626.284.4565 Fax. 626.284.4643

WORK ORDER NO.
E170121B

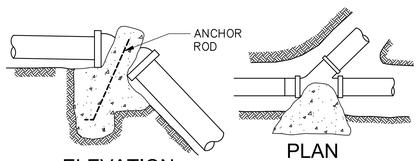
SHEET NAME
C501
SHEET 12 OF 17 SHEETS

REVISION DATES (DESIGN STAGES ONLY)

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

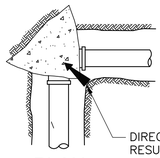
Sheet Version 4.0

Z:\VCA PROJECTS 5\2103 TO XXX\2158-419 RESEDA SKATE FACILITY\DRAWINGS\SHEETS\C501.DWG 12/8/2021 4:04 PM

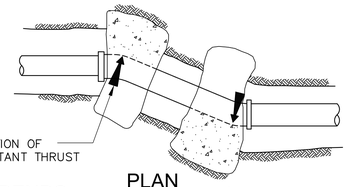


ELEVATION
VERTICAL BEND
(SEE NOTE 5)

PLAN
WYE

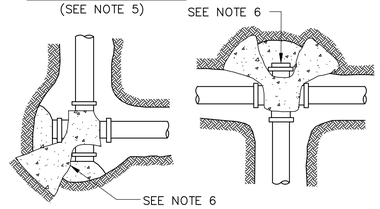


PLAN



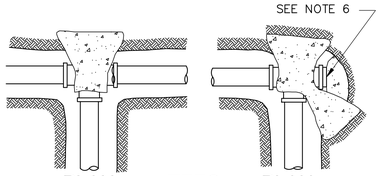
PLAN

BENDS

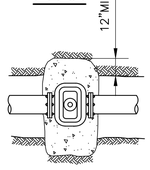


PLAN PLAN

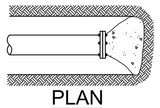
CROSSES



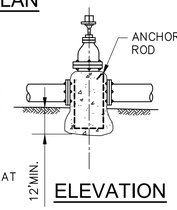
PLAN TEES PLAN



PLAN
VALVES



PLAN
BLIND FLANGE OR PLUG AT END OF WATERMAIN



ELEVATION

GENERAL NOTES:

1. ALL ANCHOR AND THRUST BLOCKS SHALL BEAR AGAINST UNDISTURBED SOIL.
2. MINIMUM ALLOWABLE WATER PRESSURE FOR DESIGN OF THRUST BLOCKS IS 150 PSI. BEARING AREA INCREASE IN PRESSURE.
3. ALL CONCRETE USED IN THRUST BLOCKS SHALL ATTAIN 2000 PSI STRENGTH @ 28 DAYS.
4. ALL ANCHOR RODS SHALL BE REINFORCING STEEL AND A MINIMUM OF 1/2–INCH IN DIAMETER.
5. USE ANCHOR BLOCKS AT VERTICAL BENDS WHEN PIPE IS ABOVE OR BELOW GROUND. SIZE OF BLOCK AND ROD SHALL BE AS SHOWN ON THE PLANS OR AS DETERMINED BY THE ENGINEER IN THE FIELD.
6. USE 30 POUND FELT TO INSURE COLD JOINT.
7. CONCRETE SHALL NOT COME INTO DIRECT WITH ASBESTOS CEMENT PIPE.
8. FOR PIPE 14" IN DIAMETER OR LARGER ENGINEER IS TO SUBMIT CALCULATIONS.

TABLE 1

MINIMUM BEARING AREAS IN SQ.FT.				
MAIN SIZE	TEE	90° BEND	45° BEND	22 1/2° BEND
6"	4	4	4	3
8"	5	7	4	3
10"	9	12	6	4
12"	12	16	9	6

BASED ON 150 PSI W.W.R. PRESSURE & SOIL BEARING LOADS OF 2000 PSF THE RATIO OF WIDTH TO HEIGHT SHALL NOT EXCEED 1 1/2 TO 1

TEES,PLUGS,CAPS & HYDRANTS.

TABLE II

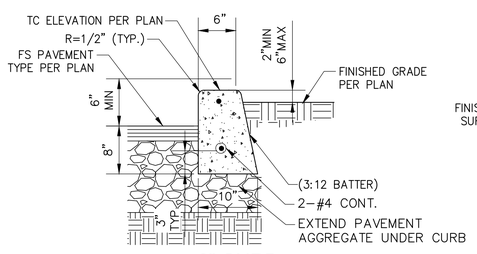
SOIL TYPE	MAX. ALLOWABLE SOIL BEARING VALUES	FACTORS FOR INCREASING AREAS IN TABLE 1
LOOSE SAND	500 PSF	4
SOFT SANDY CLAY	1000 PSF	2
ADOBE	1000 PSF	2
COMPACT FINE SAND	2000 PSF	1
COMPACT COARSE SAND	2000 PSF	1
MEDIUM STIFF CLAY	2000 PSF	1

THE CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING THE SAFE SOIL BEARING VALUES AND SIZE OF BEARING AREAS.

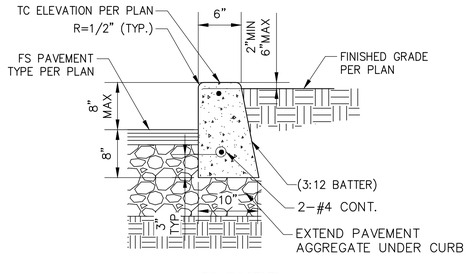
BASED ON 2 FEET MINIMUM DEPTH OF COVER OVER THE PIPE.

1 CONCRETE THRUST BLOCK DETAILS

SCALE: NOT TO SCALE



6" CURB



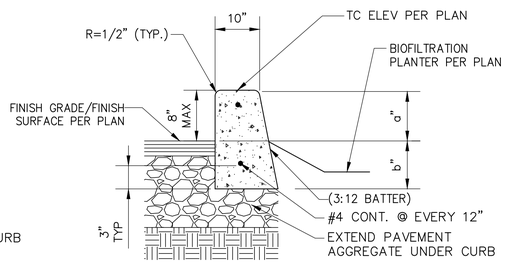
8" CURB

NOTES:

1. PROVIDE 1/4" EXPANSION JOINT WITH PREFORMED JOINT FILLER AT ALL ANGLE POINTS AND THE BEGINNING AND END OF ALL CURVES.
2. TERMINATE REBARS ½" FROM EXPANSION JOINT
3. PROVIDE CONTRACTION JOINTS CONSISTING OF ONE INCH DEEP CUT SCORES AT 20' O.C. MAX.
4. WHERE A WALK IS ADJACENT TO THE CURB, THE JOINTS SHALL LINE WITH JOINTS IN THE WALK.

2 CONCRETE CURB DETAILS

SCALE: NOT TO SCALE



a	b
a≥8"	8"
12"≥a>8"	12"
18"≥a>12"	18"

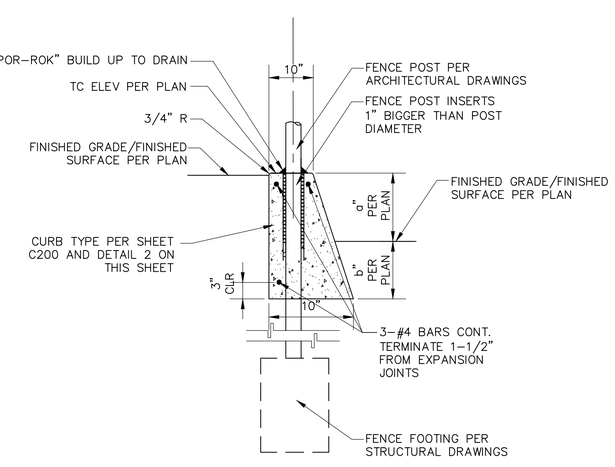
DEEPENED CURB

NOTES:

1. PROVIDE CONTRACTION JOINTS CONSISTING OF ONE INCH DEEP CUT SCORES AT 20' O.C. MAX.
2. TERMINATE REBARS ½" FROM EXPANSION JOINT
3. WHERE A WALK IS ADJACENT TO THE CURB, THE JOINTS SHALL LINE WITH JOINTS IN THE WALK.

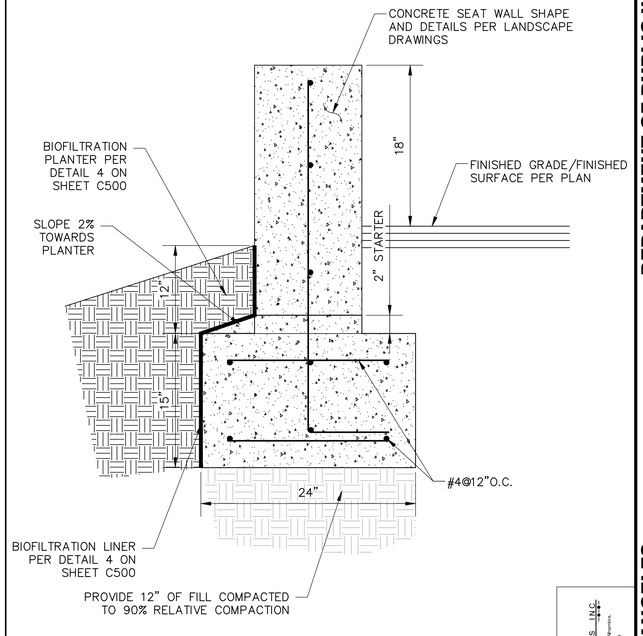
3 CONCRETE CURB WITH FENCE POST DETAIL

SCALE: NOT TO SCALE



4 CONCRETE SEAT WALL FOOTING DETAIL

SCALE: NOT TO SCALE



NOTES:

1. REBARS, Fy=600,000 PSI ASTM AG15.
2. CONCRETE, fc'=3,000 PSI @ 28 DAYS.

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

REGISTERED PROFESSIONAL ENGINEER
KRISTIO C. ADAMS
No. C36079
Exp. 6/30/22
CIVIL
STATE OF CALIFORNIA

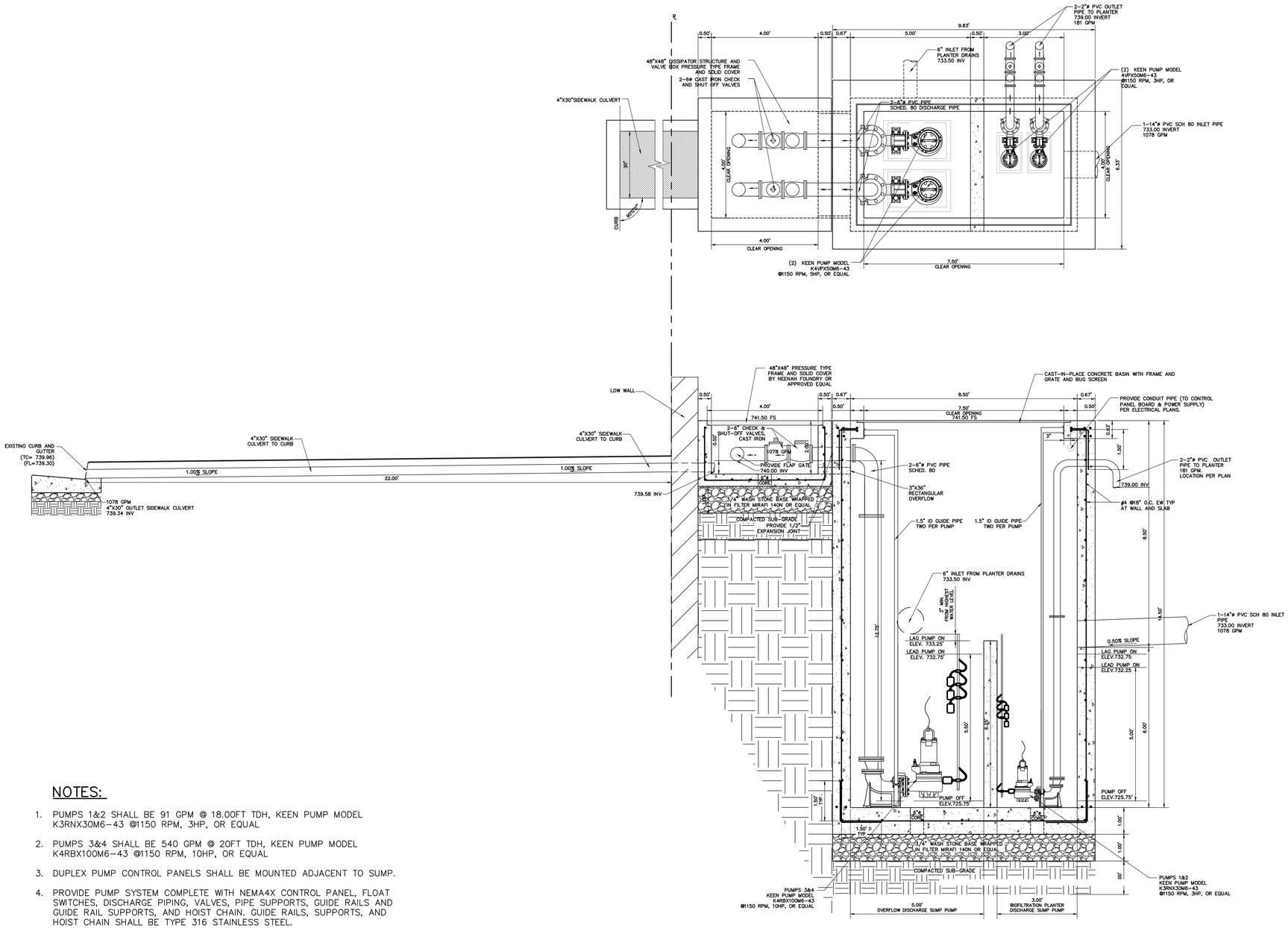
• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED •

BUREAU OF ENGINEERING
VERTICAL CONTROL: C.E.F.B. 43060 PGS. 37-44
HORIZONTAL CONTROL: C.E.F.B. 43060 PGS. 37-44
SHEET TITLE: MISCELLANEOUS DETAILS
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 & 18132 SHERMAN WAY, RESEDA CA 91335

DEPARTMENT OF PUBLIC WORKS
BY: DATE: REVISIONS: NO.
1.
2.
3.
CIP NO.
INDEX NO.

CITY OF LOS ANGELES
GARY LEE MOORE, P.E., ENV SP
CITY ENGINEER
DESIGN GROUP: ENGINEER: VIRGILIO ADANAN LIC. NO.: C36079
DESIGNED BY: VIRGILIO ADANAN
DRAWN BY: AUTUMN WAGGONER
CHECKED BY: VIRGILIO ADANAN
APPROVED BY:
DATE:

VCA ENGINEERS, INC.
Civil & Structural Engineering
Civil & Structural Engineering
Civil & Structural Engineering



NOTES:

1. PUMPS 1&2 SHALL BE 91 GPM @ 18.00FT TDH, KEEN PUMP MODEL K3RNX30M6-43 @1150 RPM, 3HP, OR EQUAL
2. PUMPS 3&4 SHALL BE 540 GPM @ 20FT TDH, KEEN PUMP MODEL K4RBX100M6-43 @1150 RPM, 10HP, OR EQUAL
3. DUPLEX PUMP CONTROL PANELS SHALL BE MOUNTED ADJACENT TO SUMP.
4. PROVIDE PUMP SYSTEM COMPLETE WITH NEMA4X CONTROL PANEL, FLOAT SWITCHES, DISCHARGE PIPING, VALVES, PIPE SUPPORTS, GUIDE RAILS AND GUIDE RAIL SUPPORTS, AND HOIST CHAIN. GUIDE RAILS, SUPPORTS, AND HOIST CHAIN SHALL BE TYPE 316 STAINLESS STEEL.
5. CONTROL PANEL SHALL INCLUDE HAND-OFF-AUTO SWITCH, START/STOP PUSH BUTTONS, PUMP RUN LIGHT, PUMP ALARM LIGHT, AND ALARM RESET PUSHBUTTON.
6. MOUNT CONTROL PANEL ON TYPE 316 STAINLESS STEEL UNISTRUT.
7. PUMP TO BE INSTALLED PER MANUFACTURE RECOMMENDATIONS. MANUFACTURER REPRESENTATIVE: DICK SHEAR 626-899-2453 WFI.SHEAR@GMAIL.COM.
8. SUMP BASIN CONCRETE. fc'=4,000 PSI @ 28 DAYS.
9. REBARS, fy=60,000 psi ASTM AG15.

1 SUMP PUMP DETAIL
SCALE: NOT TO SCALE

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REVISION DATES (DESIGN STAGE ONLY)

Sheet Version 4.0

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

REGISTERED PROFESSIONAL ENGINEER
CHRISTO C. ADAMS
No. C36079
Exp. 6/30/22
CIVIL
STATE OF CALIFORNIA

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED •

BUREAU OF ENGINEERING
VERTICAL CONTROL: C.E.F.B. 43060 PGS. 37-44
HORIZONTAL CONTROL: C.E.F.B. 43060 PGS. 37-44
SHEET TITLE: MISCELLANEOUS DETAILS
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 & 18132 SHERMAN WAY, RESEDA CA 91335

DEPARTMENT OF PUBLIC WORKS

NO.	REVISIONS:	DATE:	BY:

CIP NO.

INDEX NO.

CITY OF LOS ANGELES
GARY LEE MOORE, P.E., ENV SP
CITY ENGINEER
DATE:
DESIGN GROUP
ENGINEER: VIRGILIO AOANAN LIC. NO.: C36079
DESIGNED BY: VIRGILIO AOANAN
DRAWN BY: AUTUMN WAGGONER
CHECKED BY: VIRGILIO AOANAN
APPROVED BY:

VCA ENGINEERS, INC.
CIVIL STRUCTURAL
Suite B, 2049 Century Park East, Suite 2100, Los Angeles, CA 90067
TEL: (310) 203-0080 FAX: (310) 203-0043

WORK ORDER NO.
E170121B

SHEET NAME
C503
SHEET 14 OF 17 SHEETS

Z:\VCA PROJECTS 5\2103 TO XXX\2158-419 RESEDA SKATE FACILITY\DRAWINGS\SHEETS\C503.DWG 12/8/2021 4:04 PM

BOARD OF BUILDING AND SAFETY COMMISSIONERS

VAN AMBATIELOS
PRESIDENT

JAVIER NUNEZ
VICE PRESIDENT

JOSELYN GEAGA-ROSENTHAL
GEORGE HOVAGUIMIAN
ELVIN W. MOON

CITY OF LOS ANGELES
CALIFORNIA

ERIC GARCETTI
MAYOR

DEPARTMENT OF BUILDING AND SAFETY
201 NORTH FIGUEROA STREET
LOS ANGELES, CA 90012

OSAMA YOUNAN, P.E.
GENERAL MANAGER
SUPERINTENDENT OF BUILDING

JOHN WEIGHT
EXECUTIVE OFFICER

SOILS REPORT APPROVAL LETTER

March 25, 2021

LOG # 116702
SOILS/GEOLOGY FILE - 2

City of Los Angeles
221 N. Figueroa St., # 350
Los Angeles, CA 90012

TRACT: 21799
LOT(S): 5 (arb 1 and 2)
LOCATION: 18128 - 18138 W. Sherman Way

CURRENT REFERENCE REPORT/LETTER(S)	REPORT No.	DATE OF DOCUMENT	PREPARED BY
Addendum Report	19-080	12/21/2020	City of LA – GED

PREVIOUS REFERENCE REPORT/LETTER(S)	REPORT No.	DATE OF DOCUMENT	PREPARED BY
Dept. Approval Letter	110593	11/08/2019	LADBS
Soils Report	19-080	08/28/2019	City of LA – GED

The Grading Division of the Department of Building and Safety has reviewed the referenced addendum report that provides supplemental recommendations for the proposed Peseda Skate Facility Project. The project scope is described on page one of the 12/21/2020 report.

The Department reviewed and conditionally approved the previous referenced report for the proposed roller rink, indoor ice-skating rink, and surface parking. The earth materials at the subsurface exploration locations consist of up to 5 feet of uncertified fill underlain by lean clay. The consultants recommend to support the proposed structures on conventional foundations bearing on native undisturbed soils and/or compacted fill.

The referenced addendum report provides an alternative deep foundation option for the Shade Structure.

The referenced report is acceptable, provided the following conditions are complied with during site development:

(Note: Numbers in parenthesis ( ) refer to applicable sections of the 2017 City of LA Building Code. P/BC numbers refer the applicable Information Bulletin. Information Bulletins can be accessed on the internet at LADBS.ORG.)

LADBS: G-5 (Rev.11/23/2016) AN EQUAL EMPLOYMENT OPPORTUNITY - AFFIRMATIVE ACTION EMPLOYER

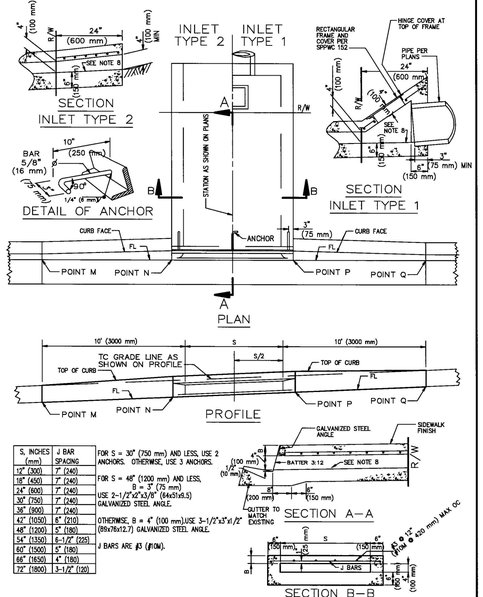
1. All conditions of the previous Department approval letter dated 11/08/2019 110593), except as specifically modified herein, shall be complied with.
2. All latest recommendations of the 12/21/2020 report that are in addition to restrictive than the conditions contained herein shall be incorporated into the plan
3. CIDH piles shall be designed as recommended on pages 2 and 3 of the 12/21/202
4. Onsite storm water infiltration shall not be used at the subject site.

YING LIU
Geotechnical Engineer II

Log No. 116702
213-482-0480

cc: City of LA - GED, Project Consultant
VN District Office

1 SOILS APPROVAL LETTER
SCALE: NOT TO SCALE



S, INCHES (mm)	J BAR SPACING
12" (300)	7" (240)
18" (450)	7" (240)
24" (600)	7" (240)
30" (750)	7" (240)
36" (900)	7" (240)
42" (1050)	6" (210)
48" (1200)	5" (180)
54" (1350)	4-1/2" (225)
60" (1500)	5" (180)
66" (1650)	4" (180)
72" (1800)	3-1/2" (120)

FOR S = 30" (750 mm) AND LESS, USE 2 ANCHORS. OTHERWISE, USE 3 ANCHORS.
FOR S = 48" (1200 mm) AND LESS, B = 3" (75 mm)
USE 2–1/2"x2"x3/8" (64x51x9.5) GALVANIZED STEEL ANGLE.
OTHERWISE, B = 4" (100 mm)USE 3–1/2"x3"x1/2" (89x76x12.7) GALVANIZED STEEL ANGLE.
J BARS ARE #3 (#10M).

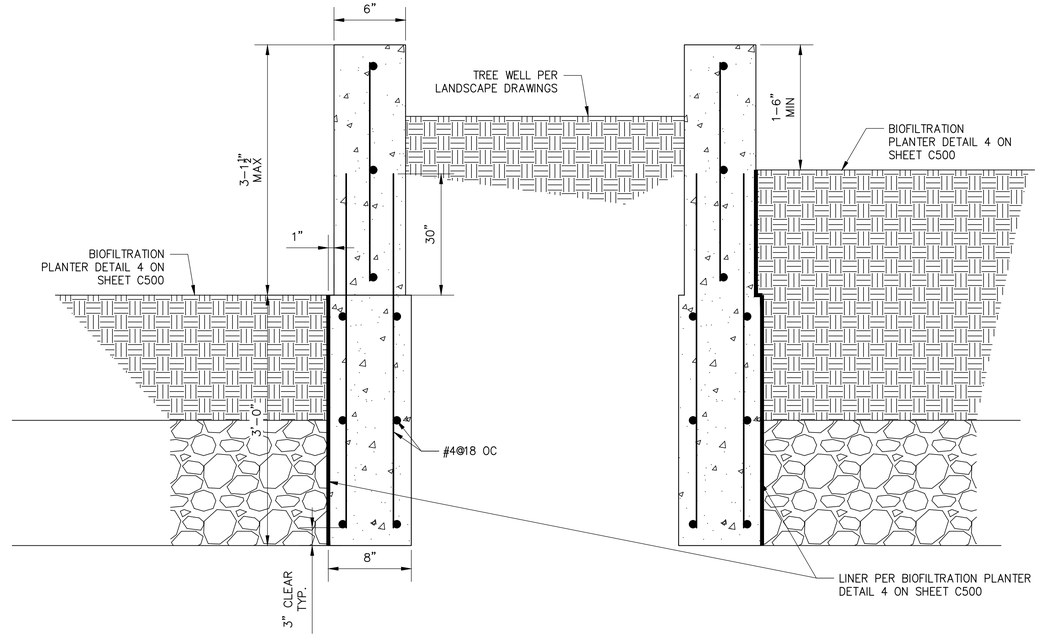
STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION		
PROMULGATED BY THE PUBLIC WORKS STANDARDS INC. GREENBOOK COMMITTEE 1963 REV. 1996, 2009	PARKWAY DRAIN USE WITH STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION	STANDARD PLAN 151–2 SHEET 1 OF 2

NOTES

1. FLOOR OF BOX SHALL BE TROWELED SMOOTH.
2. IF THE TOE OF SLOPE IS ALLOWED WITHIN THE R/W, INLET TYPE 1 BEGINS AT THE TOE RATHER THAN AT THE R/W LINE.
3. FOR OPEN DITCH (TYPE 2), THE 24" (600 mm) EXTENSION BEYOND THE R/W LINE IS NOT REQUIRED WHEN BACK OF WALK IS 24" (600 mm) OR MORE FROM THE R/W LINE; HOWEVER, THE PIPE SHALL EXTEND TO THE R/W LINE IN ANY EVENT.
4. TOP OF INLET STRUCTURE (TYPE 1 & 2) SHALL BE FLUSH WITH ADJACENT SURFACE WHERE PRACTICAL.
5. A HEADED STEEL STUD 5/8" x 6–3/8" WITH A 1" HEAD (16 x 160 mm, 25 mm HEAD) ATTACHED BY A FULL PENETRATION BUTT WELD MAY BE USED AS AN ALTERNATE ANCHOR.
6. NORMAL CURB FACE AT POINT M AND Q. CURB FACE IS B + 5" (125 mm) AT POINT N AND P.
7. THE 3" (75 mm) LEG OF THE 5/8" (16 mm) DIA ANCHORS SHALL BE PARALLEL TO THE TOP OF SIDEWALK.
8. SLOPE = 2.0%.

STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION	
PARKWAY DRAIN	STANDARD PLAN 151–2 SHEET 2 OF 2

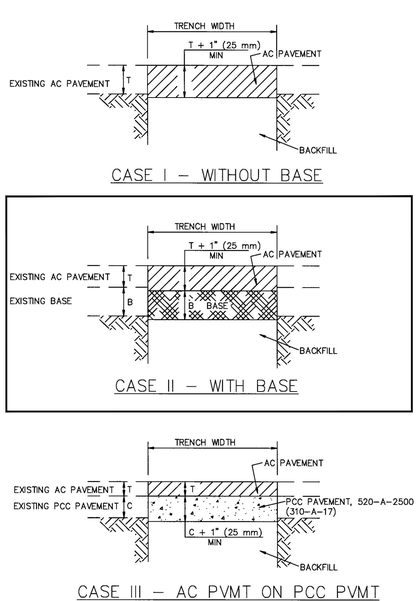
3 PARKWAY DRAIN DETAIL
SCALE: NOT TO SCALE



NOTES:

1. REBARS, Fy=600,000 PSI ASTM AG15.
2. CONCRETE, fc'=3,000 PSI @ 28 DAYS.

2 TREE WELL CURB WALL DETAIL
SCALE: NOT TO SCALE



STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION		
PROMULGATED BY THE PUBLIC WORKS STANDARDS INC. GREENBOOK COMMITTEE 1963 REV. 2005, 2009	ASPHALT CONCRETE PAVEMENT REPLACEMENT USE WITH STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION	STANDARD PLAN 133–3 SHEET 1 OF 2

NOTES:

1. BACKFILL AND DENSIFICATION SHALL CONFORM TO SSPWC 306–1.3.
3. TEMPORARY RESURFACING SHALL BE PLACED PER SSPWC 306–1.5.1.

STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION	
ASPHALT CONCRETE PAVEMENT REPLACEMENT	STANDARD PLAN 133–3 SHEET 2 OF 2

4 ASPHALT REPLACEMENT
SCALE: NOT TO SCALE

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

REGISTERED PROFESSIONAL ENGINEER
CHRISTIAN C. ADAMS
No. C36079
Exp. 6/30/22
CIVIL
STATE OF CALIFORNIA

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED •

BUREAU OF ENGINEERING
VERTICAL CONTROL: C.E.F.B. 43060 PGS. 37-44
HORIZONTAL CONTROL: C.E.F.B. 43060 PGS. 37-44
SHEET TITLE: MISCELLANEOUS DETAILS
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 & 18132 SHERMAN WAY, RESEDA CA 91335

DEPARTMENT OF PUBLIC WORKS
BY:
DATE:
NO. REVISIONS:
CIP NO.
INDEX NO.

CITY OF LOS ANGELES
CITY ENGINEER
GARY LEE MOORE, P.E., ENV SP
DESIGN GROUP
DATE:
ENGINEER: VIRGILIO AGNANAN LIC. NO.: C36079
DESIGNED BY: VIRGILIO AGNANAN
DRAWN BY: AUTUMN WAGGONER
CHECKED BY: VIRGILIO AGNANAN
APPROVED BY:

VCA ENGINEERS, INC.
CIVIL • STRUCTURAL • SURVEYING
5464 S. Sorrento Avenue, Suite 210, Alhambra, CA 91803
TEL (626) 284-9888 FAX (626) 284-9883

WORK ORDER NO.
E170121B

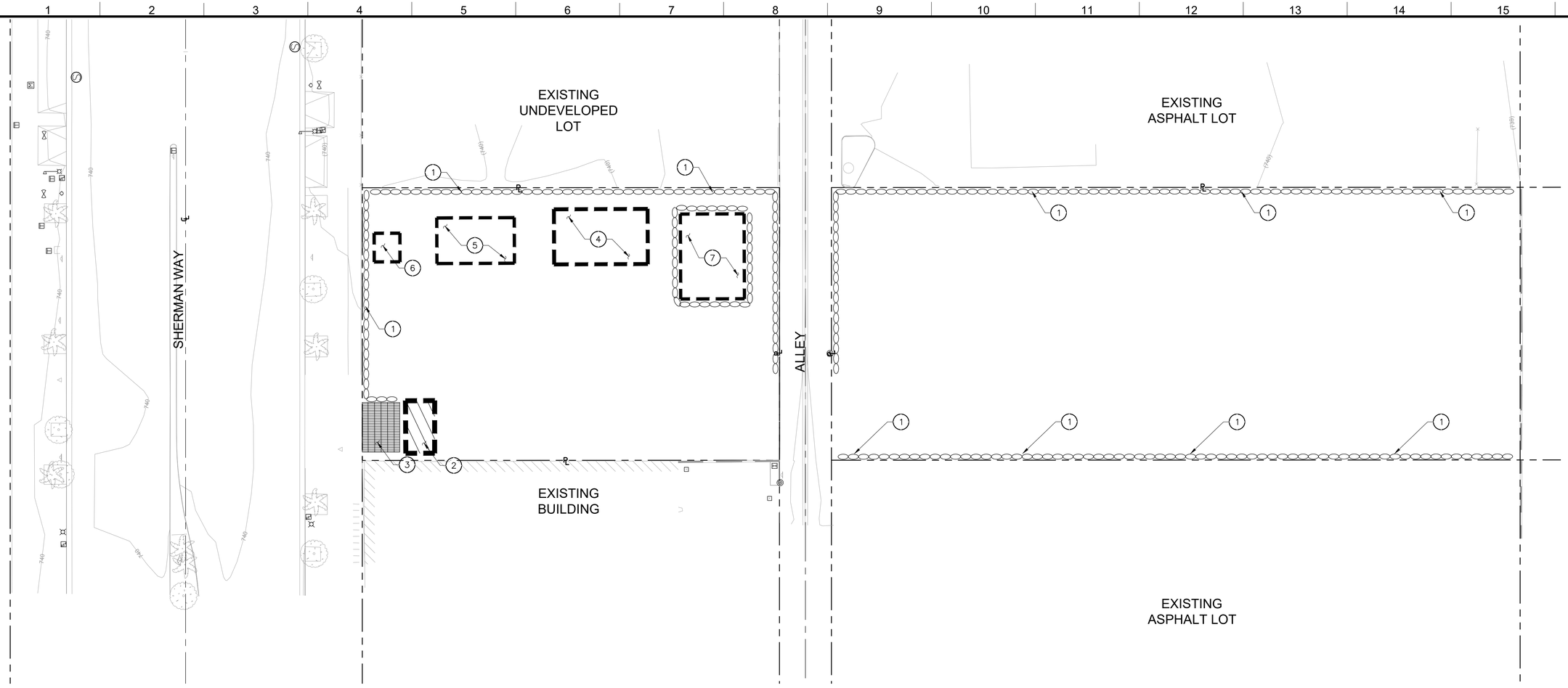
SHEET NAME
C504
SHEET 15 OF 17 SHEETS

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REVISION DATES
(DESIGN & PAGE ONLY)

Sheet Version 4.0

Z:\VCA PROJECTS 5\2103 TO XXX\2158-419 RESEDA SKATE FACILITY\DRAWINGS\SHEETS\C504.DWG 12/8/2021 4:04 PM



REMOVAL NOTES:

1. INSTALL GRAVEL BAGS UNTIL THE COMPLETION OF THE SITE CONSTRUCTION. REFER TO DETAIL 1 ON SHEET C601.
2. TIRE WASH PER DETAIL 5 ON SHEET C601.
3. STABILIZED CONSTRUCTION ENTRANCE/EXIT PER DETAIL 4 ON SHEET C601.
4. PROPOSED AREA FOR EQUIPMENT REPAIR/MAINTENANCE. CONTRACTOR TO VERIFY EXACT LOCATION AND COORDINATE WITH THE CPM. REFER TO DETAIL 2 ON SHEET C601.
5. PROPOSED AREA FOR MATERIAL STORAGE. CONTRACTOR TO VERIFY EXACT LOCATION AND COORDINATE WITH THE CPM. REFER TO DETAIL 3 ON SHEET C601.
6. PROPOSED AREA FOR TEMPORARY TOILETS. CONTRACTOR TO VERIFY EXACT LOCATION AND COORDINATE WITH THE CPM.
7. PROPOSED AREA FOR VEHICLE AND EQUIPMENT CLEANING. CONTRACTOR TO VERIFY EXACT LOCATION AND COORDINATE WITH THE CPM.

SHEET NOTES:

1. EROSION CONTROL LAYOUT IS FOR DIAGRAMMATIC PURPOSES ONLY. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING FINAL EROSION CONTROL LAYOUT.
2. LOCATION FOR ANY DESIGNATED STOCKPILES SHALL BE COORDINATED AND DETERMINED BY THE CONTRACTOR ON-SITE. CONTRACTOR SHALL APPLY ALL APPLICABLE BMP'S TO PROTECT THE STOCKPILE AS OUTLINED IN DETAIL 3 ON SHEET C601.
3. INSTALL 2" OF TEMPORARY CAB GRAVEL ON ALL ON-SITE CONSTRUCTION ROADWAYS TO STABILIZED AND CONTROL EROSION.
4. CONTRACTOR SHALL FROM TIME TO TIME MONITOR THE CONSTRUCTION SITE TO CLEAN AND SWEEP MATERIALS TRACKED OFF SITE.
5. ALL BMP'S, SILT FENCES, ETC., SHALL BE MONITORED AND MAINTAINED BY THE NTP1 CONTRACTOR FOR THE ENTIRE DURATION OF THE CONTRACT.
6. CONTRACTOR SHALL MONITOR WASTEWATER DISCHARGE (INCLUDING STORM RUNOFF) TO ENSURE IT MEETS STANDARDS SET BY APPROPRIATE LAWS, CODES, REGULATIONS, ORDINANCES AND PERMITS. PROVIDE A SETTLING BASIN AND OIL SEPARATOR PRIOR TO ITS DISCHARGE TO CITY OR COUNTRY SEWERS. PROVIDE A WATER SAMPLING STATION DOWNSTREAM OF BASIN FOR MONITORING OF WASTE WATER. DISPOSE OF WASTEWATER IN CLOSED CONDUITS SO AS NOT TO DAMAGE PUBLIC OR PRIVATE PROPERTY NOR CREATE A NUISANCE OR HEALTH HAZARD.
7. CONTRACTOR SHALL NOT DISCHARGE POLLUTANTS DOWNSTREAM OF THE SETTLING BASIN/OIL SEPERATOR. THESE POLLUTANTS INCLUDE LUBRICANTS, FUELS, CHEMICALS, AND BITUMENS. CONTROL USE OF LUBRICATING OILS, HYDRAULIC FLUIDS, GREASES, AND OTHER SUCH PRODUCTS. PROMPTLY CLEAN UP AND PROPERLY DISPOSE OF MATERIALS CONTAMINATED BY SPILLAGE OR LEAKAGE OF PRODUCTS.
8. THE CONTRACTOR SHALL MODIFY AS REQUIRED THE CURRENT APPROVED SWPPP/EROSION CONTROL PLANS FOR EACH PHASE OF THE PROJECT OR AS CONSTRUCTION ACTIVITIES PROGRESS THROUGH THE DURATION OF THE CONTRACT. THESE MODIFICATIONS SHALL BE REPORTED AND COORDINATED WITH BOTH THE QSD AND THE QSP. ANY MODIFICATIONS TO THE OVERALL DURATION OF CONSTRUCTION SCHEDULE FROM THAT AS SHOWN ON THE CURRENT SWPPP, SHALL ALSO BE REPORTED TO THE QSD. THE QSD SHALL THAN BE REQUIRED TO FILE AN EXTENSION OF CONSTRUCTION OR COI, (CHANGE OF INFORMATION), WITH THE STATE WATER RESOURCE CONTROL BOARD. ALL BMP'S SHALL BE MAINTAINED YEAR ROUND TO THE SATISFACTION OF THE QSD AND QSP.
9. CONTRACTOR SHALL PROTECT ALL EXISTING DRAIN INLETS WITHIN A 500-FT RADIUS FROM THE CENTER OF THE SITE TO PREVENT NON-STORMWATER RUNOFF FROM ENTERING THE STORM DRAIN SYSTEM.
10. FOR EROSION CONTROL GENERAL NOTES, AND MISCELLANEOUS REQUIREMENTS, SEE SHEET C601
11. CONTRACTOR SHALL APPLY SWPPP (STORMWATER POLLUTION PREVENTION PLAN) IF CONSTRUCTION DISTURBED AREA IS EQUAL OR OVER ONE ACRE.

SITE CONTROL PLAN

20 10 0 20 40

GRAPHIC SCALE
SCALE: 1"=20'

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REVISION DATES (DESIGN STAGE ONLY)

Sheet Version 4.0

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

REGISTERED PROFESSIONAL ENGINEER
VIRGILIO C. AGANAN
No. C36079
Exp. 6/30/22
CIVIL
STATE OF CALIFORNIA

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED •

BUREAU OF ENGINEERING

VERTICAL CONTROL: C.E.F.B. 43060 PGS. 37-44
HORIZONTAL CONTROL: C.E.F.B. 43060 PGS. 37-44

SHEET TITLE: EROSION CONTROL PLAN
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 & 18132 SHERMAN WAY, RESEDA CA 91335

DEPARTMENT OF PUBLIC WORKS

NO.	REVISIONS:	DATE:	BY:

CIP NO.

INDEX NO.

CITY OF LOS ANGELES

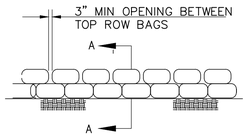
CITY ENGINEER: GARY LEE MOORE, P.E., ENV SP — DATE:
DESIGN GROUP — LIC. NO.: C36079
ENGINEER: VIRGILIO AGANAN
DESIGNED BY: VIRGILIO AGANAN
DRAWN BY: AUTUMN WAGGONER
CHECKED BY: VIRGILIO AGANAN
APPROVED BY:

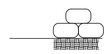
WORK ORDER NO.
E170121B

SHEET NAME
C600
SHEET 16 OF 17 SHEETS

VCA ENGINEERS, INC.
CIVIL ENGINEERS • LAND SURVEYORS
2151 S. Cornell Avenue, Suite 210, Alhambra, CA 91803
TEL (323) 726-0888 Fax (323) 726-0441

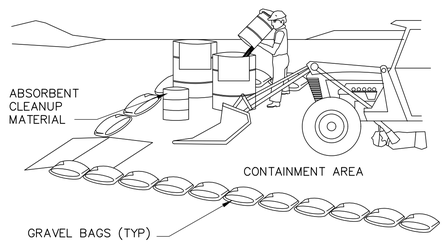
Z:\VCA PROJECTS 5\2103 TO XXX\2158-419 RESEDA SKATE FACILITY\DRAWINGS\SHEETS\C600.DWG 12/8/2021 4:04 PM





SECTION B-B

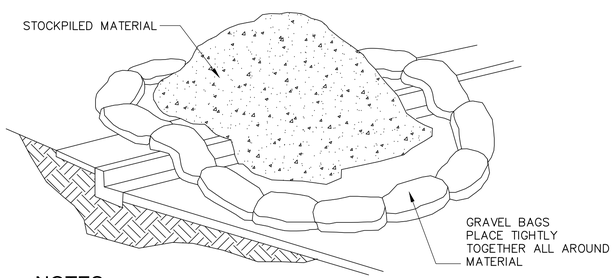
1 GRAVEL BAG DETAIL
NOT TO SCALE



NOTES:

1. LEAKING VEHICLES AND EQUIPMENT SHALL NOT BE ALLOWED ON-SITE. EQUIPMENT AND VEHICLES SHALL BE INSPECTED FREQUENTLY FOR LEAKS AND SHALL BE REPAIRED IMMEDIATELY. CLEAN UP SPILLS AND LEAKS PROMPTLY WITH ABSORBENT; DO NOT FLUSH WITH WATER.
2. VEHICLES AND EQUIPMENT SHALL BE MAINTAINED AND REPAIRED ON-SITE ONLY IN DESIGNATED AREAS. PREVENT RUN-ON AND RUN-OFF FROM DESIGNATED AREAS. CONTAINMENT DEVICES SHALL BE PROVIDED AND AREAS SHALL BE COVERED IF NECESSARY.
3. DESIGNATE ON-SITE VEHICLE AND EQUIPMENT MAINTENANCE AREAS, WAY FROM STORM DRAIN INLETS AND WATERCOURSES.
4. ALWAYS USE SECONDARY CONTAINMENT, SUCH AS A DRAIN PAN OR DROP CLOTH, TO CATCH SPILLS AND LEAKS WHEN REMOVING OR CHANGING FLUIDS.
5. LEGALLY DISPOSE OF USED OILS, FLUIDS, AND LUBRICANTS.
6. PROVIDE SPILL CONTAINMENT DIKES OR SECONDARY CONTAINMENT AROUND STORED OIL, FUEL, AND CHEMICAL DRUMS.
7. MAINTAIN ON ADEQUATE SUPPLY OF ABSORBENT SPILL CLEANUP MATERIALS IN DESIGNATED AREA.

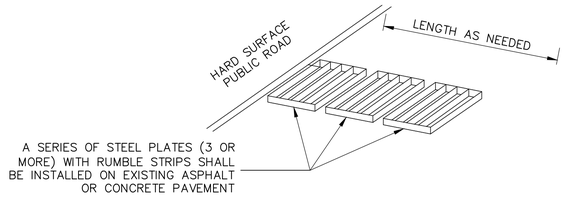
2 EQUIPMENT REPAIR/MAINTENANCE
NOT TO SCALE



NOTES:

1. DIRT AND OTHER CONSTRUCTION RELATED MATERIALS PLACED IN THE STREET OR ON OTHER IMPERVIOUS SURFACES MUST BE CONTAINED WITH SANDBAGS OR OTHER MEASURES TO PREVENT TRANSPORT TO THE STORMDRAIN SYSTEM.
2. ANY CONSTRUCTION MATERIAL STORED OR STOCKPILED ON-SITE SHALL BE PROTECTED FROM BEING TRANSPORTED BY THE FORCE OF WIND OR WATER.

3 MATERIAL STORAGE
NOT TO SCALE



NOTES:

1. SEDIMENTS AND OTHER MATERIALS SHALL NOT BE TRACKED FROM THE SITE BY VEHICLE TRAFFIC. THE CONSTRUCTION ENTRANCE ROADWAYS SHALL BE STABILIZED SO AS TO PREVENT SEDIMENTS FROM BEING DEPOSITED INTO THE PUBLIC ROADS. DEPOSITIONS MUST BE SWEPT UP IMMEDIATELY AND MAY NOT BE WASHED DOWN BY RAIN OR OTHER MEANS INTO THE STORM DRAIN SYSTEM.
2. STABILIZED CONSTRUCTION ENTRANCE SHALL BE:

   A. LOCATED AT ANY POINT WHERE TRAFFIC WILL BE ENTERING OR LEAVING A CONSTRUCTION SITE RD OR FROM A PUBLIC RIGHT OF WAY, STREET, ALLEY, AND SIDEWALK OR PARKING AREA.

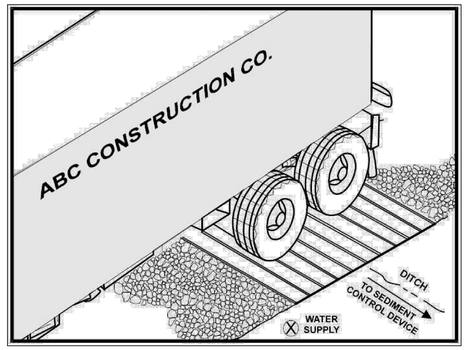
   B. A SERIES OF STEEL PLATES WITH "RUMBLE STRIPS", AND/OR MIN 4" COARSE AGGREGATE WITH LENGTH, WIDTH & THICKNESS AS NEEDED TO ADEQUATELY PREVENT ANY TRACKING ONTO PAVED SURFACES.

3. ADDING A WASH RACK WITH A SEDIMENT TRAP LARGE ENOUGH TO COLLECT ALL WASH WATER CAN GREATLY IMPROVE EFFICIENCY.
4. ALL VEHICLES ACCESSING THE CONSTRUCTION SITE SHALL UTILIZE THE STABILIZED CONSTRUCTION ENTRANCE SITES.

STREET MAINTENANCE

1. REMOVE ALL SEDIMENT DEPOSITED ON PAVED ROADWAYS IMMEDIATELY.
2. SWEEP PAVED AREAS THAT RECEIVE CONSTRUCTION TRAFFIC WHENEVER SEDIMENT BECOMES VISIBLE.
3. PAVEMENT WASHING WITH WATER IS PROHIBITED IF IT RESULTS IN A DISCHARGE TO THE STORM DRAIN SYSTEM.

4 STABILIZED CONSTRUCTION ENTRANCE / EXIT
NOT TO SCALE



NOTES:

1. THE TIRE WASH REQUIRES A SUPPLY OF WASH WATER.
2. A TURNOUT OR DOUBLEWIDE EXIT IS REQUIRED TO AVOID HAVING ENTERING VEHICLES DRIVE THROUGH THE WASH AREA.
3. DO NOT USE WHERE WET TIRE TRUCKS LEAVING THE SITE LEAVE THE ROAD DANGEROUSLY SLICK.
4. INCORPORATE WITH A STABILIZED CONSTRUCTION ENTRANCE/EXIT.
5. CONSTRUCT ON LEVEL GROUND WHEN POSSIBLE, ON A PAD OF COARSE AGGREGATE GREATER THAN 3 IN. BUT SMALLER THAN 6 IN. A GEOTEXTILE FABRIC SHOULD BE PLACED BELOW THE AGGREGATE.
6. WASH RACK SHOULD BE DESIGNED AND CONSTRUCTED/MANUFACTURED FOR ANTICIPATED TRAFFIC LOADS.

5 ENTRANCE/OUTLET TIRE WASH
NOT TO SCALE

OWNER STATEMENT OF UNDERSTANDING:

AS THE PROJECT OWNER OR AUTHORIZED AGENT OF THE OWNER, I HAVE READ AND UNDERSTAND THE REQUIREMENTS TO CONTROL STORM WATER POLLUTION FROM SEDIMENTS, EROSION, AND CONSTRUCTION MATERIALS, AND I CERTIFY THAT I WILL COMPLY WITH THESE REQUIREMENTS. I, OR MY REPRESENTATIVE, CONTRACTOR, DEVELOPER, OR ENGINEER, WILL MAKE CERTAIN THAT ALL BMP SHOWN ON THIS PLAN WILL BE FULLY IMPLEMENTED, AND ALL EROSION CONTROL DEVICES WILL BE KEPT CLEAN AND FUNCTIONING. PERIODIC INSPECTIONS OF THE BMPs WILL BE CONDUCTED AND A CURRENT LOG, SPECIFYING THE EXACT NATURE OF THE INSPECTION AND ANY REMEDIAL MEASURES, WILL BE KEPT AT THE CONSTRUCTION SITE AT ALL TIMES AND WILL BE AVAILABLE FOR THE REVIEW BY THE BUILDING OFFICIAL.

AS THE PROJECT OWNER OR AUTHORIZED AGENT OF THE OWNER, "I CERTIFY THAT THIS DOCUMENT AND ALL ATTACHMENTS WERE PREPARED UNDER MY DIRECTION OR SUPERVISION IN ACCORDANCE WITH A SYSTEM DESIGNED TO ASSURE THAT QUALIFIED PERSONNEL PROPERLY GATHER AND EVALUATE THE INFORMATION SUBMITTED. BASED ON MY INQUIRY OF THE PERSON OR PERSONS WHO MANAGE THE SYSTEM OR THOSE PERSONS DIRECTLY RESPONSIBLE FOR GATHERING THE INFORMATION, TO THE BEST OF MY KNOWLEDGE AND BELIEF, THE INFORMATION SUBMITTED IS TRUE, ACCURATE, AND COMPLETE. I AM AWARE THAT SUBMITTING FALSE AND/OR INACCURATE INFORMATION, FAILING TO UPDATE THE LOCAL SWPPP TO REFLECT CURRENT CONDITIONS, OR FAILING TO PROPERLY AND/OR ADEQUATELY IMPLEMENT THE LOCAL SWPPP MAY RESULT IN REVOCATION OF GRADING AND/OR OTHER PERMITS OR OTHER SANCTIONS PROVIDED BY THE LAW."

_____ _____
OWNER OR AUTHORIZED REPRESENTATIVE (PERMITEE) DATE

6 STATEMENT OF UNDERSTANDING
NOT TO SCALE

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

REGISTERED PROFESSIONAL ENGINEER
KRISTIN C. ADAMS
No. C36079
Exp. 6/30/22
CIVIL
STATE OF CALIFORNIA

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED •

BUREAU OF ENGINEERING
VERTICAL CONTROL: C.E.F.B. 43060 PGS. 37-44
HORIZONTAL CONTROL: C.E.F.B. 43060 PGS. 37-44
SHEET TITLE: EROSION CONTROL DETAILS
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 & 18132 SHERMAN WAY, RESEDA CA 91335

DEPARTMENT OF PUBLIC WORKS
CITY OF LOS ANGELES
GARY LEE MOORE, P.E., ENV SP
CITY ENGINEER
DESIGN GROUP
LIC. NO.: C36079
DATE:
ENGINEER: VIRGILIO AOANAN
DESIGNED BY: VIRGILIO AOANAN
DRAWN BY: AUTUMN WAGGONER
CHECKED BY: VIRGILIO AOANAN
APPROVED BY:

NO. REVISIONS: BY: DATE:

CIP NO.

INDEX NO.

VCA ENGINEERS, INC.
Civil & Structural Engineers
Civil & Structural Engineers, Suite 210, Alhambra, CA 91801
Tel. 626.284.9966 Fax. 626.284.9943

WORK ORDER NO.
E170121B

SHEET NAME
C601
SHEET 17 OF 17 SHEETS

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REVISION DATES (DESIGN STAGES ONLY)

Sheet Version 4.0

Z:\VCA PROJECTS 5\2103 TO XXX\2158-419 RESEDA SKATE FACILITY\DRAWINGS\SHEETS\C601.DWG 12/8/2021 4:04 PM

ABBREVIATIONS

ACRONYMS OF ABBREVIATION MAY INTERCHANGEABLY USED WITH OR WITHOUT SEPARATION DOTS (E.G. BOTH A.B. OR AB MEANS "ANCHOR BOLTS")

A.B. ANCHOR BOLTS
A.R. ANCHOR REINFORCEMENT (ALSO "AR")
ARCH. ARCHITECT OR ARCHITECTURAL
A.T.R. ALL THREADED ROD
AXO AXONOMETRIC VIEW

B.B. BASE BUILDING
B.N. BOUNDARY NAILING
BLLN BALLOON
BLK'G BLOCKING
BM BEAM
B.S. BOUNDARY SCREWS

CIP CAST IN PLACE
C&C COMPONENT AND CLADDING
CF COLD FORMED
CFS COLD FORMED STEEL
CJ CEILING JOIST
CLN COLUMN
CONC. CONCRETE
CONN. CONNECTION
CONT. CONTINUOUS
C.P.E. CONTINUOUS PANEL EDGES

Da ANCHOR DIAMETER
Dagg NOMINAL MAX SIZE OF COURSE AGGREGATE
Db OR db REBAR DIAMETER
DEVEL. DEVELOPMENT
DFL DOUGLAS FIR-LARCH
DJ DECK JOISTS
DO DO OVER
DWG'S DRAWINGS

E.N. EDGE NAILING
EA EACH
E.O.R. ENGINEER OF RECORD
E.S. EDGE SCREWS

FJ FLOOR JOISTS
F.N. FIELD NAILING
FRM'G FRAMING
FTG FOOTING
FRT FIRE RETARDANT TREATED
F.S. FIELD SCREWS

GC GENERAL CONTRACTOR
GL GRID LINE
GLB GLULAM BEAM

Ld TENSION DEVELOPMENT LENGTH
Ldc COMPRESSION DEVELOPMENT LENGTH
Ldh DEVELOPMENT LENGTH OF STD HOOK
Ldt DEVELOPMENT LENGTH OF HEADED BARS
Lsc COMPRESSION LAP SPLICE
Lst TENSION LAP SPLICE
LB LOAD BEARING
L.G. LIGHT GAUGE
L.S. LAP SPLICE
LVL LAMINATED VENEER LUMBER
L.W. LIGHT WEIGHT

MAX MAXIMUM
M.B. MACHINE BOLTS
M&M MEANS AND METHODS
MIN MINIMUM

NLB NON LOAD BEARING

O.C. ON CENTER

P.T. PRESERVATIVE TREATED
PL PLATE/PROPERTY LINE
PLYWD PLYWOOD
PSL PARALLAM

RBS REDUCED BEAM SECTION
REINF. REINFORCEMENT
REQ'D REQUIRED
RJ ROOF JOISTS
RR ROOF RAFTERS

S.A.D. SEE ARCHITECTURAL DRAWINGS
SCL STRUCTURAL COMPOSITE LUMBER (SAME AS ENGINEERED LUMBER)
S.E.O.R. STRUCTURAL ENGINEER OF RECORD (SAME AS E.O.R.)
S.O.G. SLAB ON GRADE
SCHED. SCHEDULE
SHT'G SHEATHING
SIM. SIMILAR
S.M.D. STEEL METAL DECK
SMS SHEET METAL SCREWS
SN SIDE NAILER
SS SELECT STRUCTURAL
STD STANDARD

STAGG. STAGGERED

T&B TOP AND BOTTOM
T&G TONGUE AND GROOVE
T.N. TOP NAILER
TYP. TYPICAL

U.O. UNLESS NOTED OTHERWISE
U.S.P. UNDER SEPARATE PERMIT

V.I.F. VERIFY IN FIELD

WD WOOD
W.I.S. WELDED NELSON STUDS
W.T.S. WELDED THREADED STUDS
W.S.P WOOD STRUCTURAL PANEL

STRUCTURAL OBSERVATION

1. PERIODIC STRUCTURAL OBSERVATION SHALL BE PROVIDED BY SEOR PER THE STRUCTURAL OBSERVATION FORM BELOW.
2. DEPUTY INSPECTOR MUST PERFORM INSPECTION BEFORE STRUCTURAL ENGINEER PERFORMS OBSERVATION. DEPUTY INSPECTOR'S REPORT MUST BE AVAILABLE AT THE TIME OF OBSERVATION. IF DEPUTY INSPECTION IS NOT COMPLETED, STRUCTURAL OBSERVATION REPORT WILL LIST MISSING INSPECTION AS DEFICIENCY.
3. CONTRACTOR SHALL KEEP LATEST ISSUED DRAWINGS, RFI'S RESPONSES, AND SKETCHES ON SITE, AND SHALL MAKE SUCH DOCUMENTS AVAILABLE TO THE STRUCTURAL OBSERVER AND DEPUTY INSPECTOR.
4. CONTRACTOR SHALL NOTIFY ENGINEER 3 BUSINESS DAYS BEFORE REQUIRED OBSERVATIONS. DELINQUENT NOTIFICATION MAY REQUIRE DEMOLITION OF COVERING MATERIAL TO FACILITATE OBSERVATION.
6. STRUCTURAL OBSERVATION IS THE VISUAL OBSERVATION AT THE CONSTRUCTION SITE OF THE ELEMENTS AND CONNECTIONS OF THE STRUCTURAL SYSTEM AT SIGNIFICANT CONSTRUCTION STAGES AND THE COMPLETE STRUCTURE FOR GENERAL CONFORMANCE TO THE APPROVED PLANS AND SPECIFICATIONS.
7. STRUCTURAL OBSERVATIONS PERFORMED BY STRUCTURAL OBSERVER DURING CONSTRUCTION ARE NOT THE CONTINUOUS OR PERIODIC SPECIAL INSPECTION SERVICES PERFORMED BY A LICENSED DEPUTY INSPECTOR, NOR THE INSPECTION BY THE CITY INSPECTOR, AND DO NOT WAIVE THE RESPONSIBILITY FOR THE SPECIAL INSPECTIONS OR CITY INSPECTIONS.
8. STRUCTURAL OBSERVATIONS DO NOT CONSTITUTE QUALITY CONTROL, DO NOT GUARANTEE CONTRACTOR'S PERFORMANCE, AND SHALL NOT BE CONSIDERED AS SUPERVISION OF CONSTRUCTION.
9. THE OWNER SHALL EMPLOY A STATE OF CALIFORNIA REGISTERED CIVIL OR STRUCTURAL ENGINEER OR LICENSED ARCHITECT – THE STRUCTURAL OBSERVER – TO PERFORM THE STRUCTURAL OBSERVATIONS. THE DEPARTMENT OF BUILDING AND SAFETY OF AUTHORITY OF JURISDICTION REQUIRES THE USE OF THE ENGINEER OR HIS/HER DESIGNEE RESPONSIBLE FOR THE STRUCTURAL DESIGN WHO ARE INDEPENDENT OF THE CONTRACTOR
10. THE OWNER OR OWNER'S REPRESENTATIVE SHALL COORDINATE AND CALL FOR A MEETING BETWEEN THE ENGINEER OR ARCHITECT RESPONSIBLE FOR THE STRUCTURAL DESIGN, STRUCTURAL OBSERVER, CONTRACTOR, AFFECTED SUBCONTRACTORS AND DEPUTY INSPECTORS. THE PURPOSE OF THE MEETING SHALL BE TO IDENTIFY THE MAJOR STRUCTURAL ELEMENTS AND CONNECTIONS THAT AFFECT THE VERTICAL AND LATERAL LOAD SYSTEMS OF THE STRUCTURE AND TO REVIEW SCHEDULING OF THE REQUIRED OBSERVATIONS.
11. THE STRUCTURAL OBSERVER SHALL PERFORM SITE VISITS AT THOSE STEPS IN THE PROGRESS OF THE WORK THAT ALLOW FOR CORRECTION OF DEFICIENCIES WITHOUT SUBSTANTIAL EFFORT OR UNCOVERING OF THE WORK INVOLVED. AT A MINIMUM, THE LISTED SIGNIFICANT CONSTRUCTION STAGES ON THE FOLLOWING STRUCTURAL OBSERVATION/SIGNIFICANT CONSTRUCTION STAGES TABLE REQUIRE A SITE VISIT AND AN OBSERVATION REPORT FROM THE STRUCTURAL OBSERVER.
12. A FINAL OBSERVATION REPORT AND THAT OF THE REGISTERED DEPUTY INSPECTOR MUST BE SUBMITTED WHICH SHOWS THAT ALL OBSERVED DEFICIENCIES WERE RESOLVED AND STRUCTURAL SYSTEM GENERALLY CONFORMS WITH THE APPROVED PLANS AND SPECIFICATIONS. THE DEPARTMENT OF BUILDING AND SAFETY (LADBS) WILL NOT ACCEPT THE STRUCTURAL WORK WITHOUT THIS FINAL OBSERVATION REPORT AND THAT OF THE REGISTERED DEPUTY INSPECTOR (WHEN PROVIDED) AND THE CORRECTION OF SPECIFIC DEFICIENCIES NOTED DURING NORMAL BUILDING INSPECTION.

LA DBS DEPARTMENT OF BUILDING AND SAFETY

Los Angeles Regional Uniform Code Program
Committee I-3: Structural Observation

LARUCP Los Angeles Regional Uniform Code Program

STRUCTURAL OBSERVATION PROGRAM
AND DESIGNATION OF THE
STRUCTURAL OBSERVER

PROJECT ADDRESS: _____ PERMIT APPL. NO.: _____

Description of Work: _____

Owner: _____ Architect: _____ Engineer: _____

STRUCTURAL OBSERVATION
(Only checked items are required)

Firm or Individual to be responsible for the Structural Observation:
Name: Labib Funk & Associates. Phone: (213) 239.9700 Calif. Registration: S6191

FOUNDATION		WALL		FRAME		DIAPHRAGM / SLAB / S.O.G.	
Footings, Stem Walls, Piers	☒	Concrete	☒	Steel Moment Frame	☒	Concrete	☒
Mat Foundation	☐	Masonry	☒	Steel Braced Frame	☒	Steel Deck	☒
Caissons, Piles, Grade Beams	☐	Wood	☐	Concrete Moment Frame	☐	Wood	☐
Step'g / Retain'g Found. - Hillside Special Anchors	☐	Hardy Frames Strong Walls	☐	Masonry Frame	☐		☐
Others	☐	Others	☐	Steel General	☒	Others	☐

DECLARATION BY OWNER

I, the Owner of the project, declare that the above listed firm or individual is hired by me to be the Structural Observer

_____
Signature Date

DECLARATION BY ARCHITECT OR ENGINEER OF RECORD (required if the Structural Observer is different from the Architect or Engineer of Record)

I, the Architect or Engineer of record for the project, declare that the above listed firm or individual is designated by me to be responsible for the Structural Observation

_____
Signature License No. Date

STATEMENT OF SPECIAL INSPECTION

1. CONTINUOUS AND PERIODIC SPECIAL INSPECTION IS REQUIRED FOR THE WORK AS DESCRIBED IN CBC 2019 CHAPTER 17 & LABC 2020 CHAPTER 17. SEE INSPECTION SCHEDULE BELOW. ONLY CHECKED ITEMS ARE REQUIRED.
2. APPROVAL BY THE INSPECTOR DOES NOT MEAN APPROVAL OF FAILURE TO COMPLY WITH THE PLANS OR SPECIFICATIONS. ANY DETAIL THAT FAILS TO BE CLEAR OR IS AMBIGUOUS MUST BE REFERRED TO THE STRUCTURAL ENGINEER FOR INTERPRETATION OR CLARIFICATION.
3. FOR VERIFICATION AND INSPECTION OF SOILS SEE SOILS REPORT.
4. CONTINUOUS SPECIAL INSPECTION PER AWS D1.1 IS REQUIRED FOR ALL STRUCTURAL STEEL WELDING, EXCEPT FOR SINGLE PASS FILLET WELDS NOT EXCEEDING $^5/_{16}$" IN SIZE. WELDING INSPECTORS SHALL BE REGISTERED AND/OR CERTIFIED BY THE JURISDICTION HAVING AUTHORITY AND SHALL AT A MINIMUM BE AWS Q.C.-1 CERTIFIED. IN ADDITION, WELDING INSPECTORS SHALL BE A CITY OF LOS ANGELES REGISTERED DEPUTY STRUCTURAL STEEL INSPECTOR FOR WORK PERFORMED WITHIN THE CITY OF LOS ANGELES.
5. STRUCTURAL WOOD. PERIODIC SPECIAL INSPECTION IS REQUIRED FOR WOOD SHEAR WALLS, SHEAR PANELS, AND DIAPHRAGMS, INCLUDING NAILING, BOLTING, ANCHORING, AND OTHER FASTENING OF COMPONENTS OF THE SEISMIC FORCE RESISTING SYSTEM, INCLUDING WOOD SHEAR WALLS, WOOD DIAPHRAGMS, DRAG STRUTS, BRACES, SHEAR PANELS, AND HOLDOWNS. EXCEPTION: SPECIAL INSPECTION IS NOT REQUIRED FOR WOOD SHEAR WALLS, SHEAR PANELS AND DIAPHRAGMS, INCLUDING NAILING, BOLTING, ANCHORING AND OTHER FASTENING TO OTHER COMPONENTS OF THE SEISMIC-FORCE-RESISTING SYSTEM, WHERE THE FASTENER SPACING OF THE SHEATHING IS MORE THAN 4 INCHES ON CENTER (O.C.). INSPECTIONS SHALL BE PERFORMED BEFORE COVERING.
6.
7. CONTRACTORS RESPONSIBLE FOR CONSTRUCTION OF A WIND OR SEISMIC FORCE RESISTING SYSTEM/COMPONENT LISTED IN THIS STATEMENT OF SPECIAL INSPECTION SHALL SUBMIT A WRITTEN STATEMENT OF RESPONSIBILITY TO THE LADBS INSPECTORS AND THE OWNER PRIOR TO THE COMMENCEMENT OF WORK ON SUCH A SYSTEM OR COMPONENT PER SEC 1704.4.
8. WHERE FABRICATION OF MEMBERS AND ASSEMBLIES IS PERFORMED ON THE PREMISES OF A FABRICATOR'S SHOP, SPECIAL INSPECTION OF THE FABRICATED ITEMS SHALL BE REQUIRED BY THIS SECTION, UNLESS THE FABRICATOR IS REGISTERED AND APPROVED TO PERFORM SUCH WORK WITHOUT SPECIAL INSPECTION. APPROVAL SHALL BE BASED UPON REVIEW OF THE FABRICATOR'S WRITTEN PROCEDURAL AND QUALITY CONTROL MANUALS AND PERIODIC AUDITING OF FABRICATION PRACTICES BY AN APPROVED SPECIAL INSPECTION AGENCY. AT COMPLETION OF FABRICATION, THE APPROVED FABRICATOR SHALL SUBMIT A CERTIFICATE OF COMPLIANCE TO THE BUILDING OFFICIAL STATING THAT THE WORK WAS PERFORMED IN ACCORDANCE WITH THE APPROVED CONSTRUCTION DOCUMENTS. CONTRACTOR SHALL BE RESPONSIBLE OF VERIFYING APPROVAL OF FABRICATOR.
9. CONTINUOUS SPECIAL INSPECTION BY A REGISTERED DEPUTY INSPECTOR IS REQUIRED FOR FIELD WELDING, POST-INSTALLED ADHESIVE ANCHORS INSTALLED HORIZONTALLY OR UPWARDLY INCLINED TO RESIST SUSTAINED TENSION LOADS, SHOTCRETE PLACEMENT, CONCRETE STRENGTH fc > 2,500 PSI, SPRAYED-ON FIREPROOFING, ENGINEERED MASONRY, HIGH-LIFT GROUTING, HIGH LOAD DIAPHRAGMS AND SPECIAL MOMENT-RESISTING CONCRETE FRAMES, AND HELICAL PILE FOUNDATIONS.

INSPECTION SCHEDULE

TYPE OF WORK	CODE REFERENCE	REMARKS	
CONCRETE WORK	CBC TABLE 1705.3		☒
SHOTCRETE WORK	CBC TABLE 1705.3		☐
REINFORCING STEEL	CBC TBL 1705.2.2 1705.3		☒
POST INSTALLED ANCHORS	CBC TABLE 1705.3	SEE ALSO ICC APPROVAL	☒
STRUCTURAL STEEL	CBC 1705.2		☒
STRUCTURAL STEEL WELDING	CBC 1705.2		☒
HIGH STRENGTH BOLTING	CBC 1705.2		☒
MASONRY WORK	CBC 1705.4		☒
HIGH LOAD DIAPHRAGMS	CBC 1705.5.1		☐
STRUCTURAL WOOD	CBC 1705.10.1 & 1705.11.2	SEE NOTE ABOVE	☐
COLD FORMED STEEL	CBC 1705.10.2 & 1705.11.3		☒
DRIVEN DEEP FOUND. ELEMENT	CBC TABLE 1705.7		☐
CAST IN PLACE DEEP FOUND.	CBC TABLE 1705.8		☐
SOIL CONDITION	CBC TABLE 1705.6	SEE SOILS REPORT FOR COMPLIANCE	☒

CODE

1. BUILDING SHALL COMPLY WITH THE LOS ANGELES BUILDING CODE.
2. VERTICAL LIVE LOADS:
   A. ROOF 20 PSF REDUCIBLE
3. LATERAL LOADS:

   RISK CATEGORY: III

   A. WIND:
      BASIC WIND SPEED: 101 MPH
      EXPOSURE TYPE: B

   B. SEISMIC:

      EXPECTED INTERSTORY DRIFT FOR EACH STORY IS AS OUTLINED BELOW. ALL NON-STRUCTURAL ELEMENTS OF THE BUILDING INCLUDING BUT NOT LIMITED TO FINISHES, GLAZING, MEP, ETC. SHALL TAKE INTO ACCOUNT THIS PARAMETER.

      SITE CLASS: D
      SEISMIC DESIGN CATEGORY: D
      SEISMIC IMPORTANCE FACTOR, Ie: 1.25
      SS = 1.896
      S1 = 0.645
      FA = 1.0
      FV = 1.7
      SDS = 1.264
      SD1 = –
      RESPONSE MODIFICATION FACTORS
      ORDINARY MOMENT FRAMES: R = 3.5
      ORDINARY CONCENTRIC BRACE FRAME: R = 3.25
      EQUIVALENT STATIC FORCE METHOD USED FOR DESIGN.

FOUNDATIONS

1. THE DESIGN OF THE FOUNDATION SYSTEM IS BASED UPON THE CRITERIA AND RECOMMENDATIONS CONTAINED IN THE GEOTECHNICAL INVESTIGATION REPORT TITLED GEOTECHNICAL ENGINEERING REPORT & SUPPLEMENTAL GEOTECHNICAL REPORT, BY BUREAU OF ENGINEERING GEOTECHNICAL ENGINEERING DIVISION. DATED 08/28/19 & 12/21/20, PROJECT GED FILE#19-080.
2. THE GEOTECHNICAL INVESTIGATION REPORT IS PART OF THE CONSTRUCTION SET, AND ITS RECOMMENDATIONS SHALL BE FOLLOWED AND SHALL BE CONSIDERED MINIMUM REQUIREMENTS UNLESS MORE STRINGENT REQUIREMENTS ARE PRESENTED IN THE SPECIFICATIONS OR ON THE DRAWINGS.
3. PER GEOTECHNICAL INVESTIGATION REPORT, THE ALLOWABLE SOIL BEARING PRESSURES ARE AS FOLLOWS:

   A. FOOTING UNDERLAIN BY COMPACTED FILL: 2500 PSF

   B. FOOTING UNDERLAIN BY NATIVE SOIL: 2000 PSF

4. REMOVE LOOSE SOIL AND STANDING WATER FROM FOUNDATION EXCAVATIONS PRIOR TO PLACING CONCRETE. THE GEOTECHNICAL ENGINEER SHALL INSPECT AND APPROVE ALL EXCAVATIONS, SOIL COMPACTION WORK PRIOR TO PLACEMENT OF ANY REBAR OR CONCRETE, SHORING INSTALLATIONS, BACKFILL MATERIALS AND BACK FILLING PROCEDURES.
5. LOCATE AND PROTECT EXISTING UTILITIES TO REMAIN DURING AND/OR AFTER CONSTRUCTION.
6. REMOVE ABANDONED FOOTINGS, UTILITIES, ETC. WHICH INTERFERE WITH NEW CONSTRUCTION, UNLESS OTHERWISE INDICATED.
7. NOTIFY THE OWNER'S REPRESENTATIVE IF ANY BURIED STRUCTURES NOT INDICATED, SUCH AS CESSPOOLS, CISTERNS, FOUNDATIONS, ETC., ARE FOUND.
8. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR EXCAVATION PROCEDURES INCLUDING LAGGING, SHORING, UNDERPINNING AND PROTECTION OF EXISTING CONSTRUCTION.
9. PLACE BACKFILL BEHIND RETAINING WALLS AFTER CONCRETE OR MASONRY HAS ATTAINED FULL DESIGN STRENGTH. BRACE BUILDING AND PIT WALLS BELOW GRADE FROM LATERAL LOADS UNTIL ATTACHED FLOORS AND SLABS ON GRADE ARE COMPLETE AND HAVE ATTAINED FULL DESIGN STRENGTH.

COLD FORMED STEEL (CFS)

1. FOLLOWING NOTES APPLY TO METAL STUDS INDICATED ON STRUCTURAL DRAWINGS. FOR NON-LOAD BEARING METAL STUDS AND CEILINGS SEE ARCHITECTURAL DRAWINGS AND SPECIFICATIONS.
2. COLD FORMED STEEL FRAMING CONSTRUCTION SHALL BE IN ACCORDANCE WITH AISI "SPECIFICATIONS FOR DESIGN OF COLD FORMED STEEL STRUCTURAL MEMBERS" LATEST EDITION.
3. COLD FORMED STEEL FRAMING SHALL COMPLY WITH "PRODUCT TECHNICAL INFORMATION" PREPARED BY "STEEL STUD MANUFACTURER ASSOCIATION" (SSMA) AND WITH ICC-ES EVALUATION REPORT ESR-3064P
4. U.N.O. ALL COLD FORMED STEEL FRAMING SHALL BE GALVANIZED CONFORMING TO ASTM A123 COATING CLASS G60.
5. COLD FORMED STEEL FRAMING SHALL CONFORM WITH THE FOLLOWING:

   A. 54 MILS (16 GAUGE) AND THICKER:
      ASTM A653, GRADE 50, (Fy_min.= 50,000 psi, Fu_min.=65,000 psi)

   B. 43 MILS (18 GAUGE) AND THINNER:
      ASTM A653, GRADE 33, (Fy_min.= 33,000 psi, Fu_min.=45,000 psi)

6. DOUBLE VERTICAL STUDS SHALL BE FASTENED TOGETHER ON BOTH FLANGES WITH SHEET METAL SCREWS.
7. TOP & BOTTOM TRACKS SHALL BE SAME GAUGE AS WALL STUD OR 20 GA.MIN. WHICHEVER IS THICKER MATERIAL.
8. DOUBLE JOIST ARE BACK TO BACK U.N.O.
9. ALL METAL STUDS AND JOISTS SHALL HAVE STIFFENED FLANGES.
10. CUT FRAMING COMPONENTS, SUCH AS BRACING, SQUARELY OR AT AN ANGLE TO FIT TIGHT AGAINST ABUTTING MEMBERS. HOLD MEMBERS FIRMLY IN POSITION UNTIL PROPERLY FASTENED.
11. ALL BEARING STUDS MUST BE FULLY ATTACHED TO THE WALL LEDGER. ALL STUDS SHALL BE SPACED AT SAME SPACING AS JOIST (IN LINE FRAMING). ALL BEARING STUDS, COLUMNS AND BUILT UP STUDS SHALL HAVE CONTINUOUS BEARING DOWN TO FOUNDATION U.N.O. SOLID BLOCKING AT FLOORS SHALL BE PROVIDED.
12. CUTTING FLANGES AND STIFFENER LIPS OF LOAD BEARING STUDS IS PROHIBITED, NO STUD NOTCHING IS PERMITTED IN BEARING WALLS U.N.O.
13. OPENING IN STUD/JOIST WEBS OTHER THAN THE STANDARD PUNCHOUTS BY MANUFACTURER ARE PROHIBITED UNLESS SPECIFICALLY DESIGNED AND DETAILED BY ENGINEER. NO PUNCHOUT SHALL BE ALLOWED WITHIN 24" OF THE SUPPORT OR POINT LOAD.
14. BRIDGING SHALL BE PROVIDED FOR ALL JOISTS @ 8'-0" O.C. MAX.
15. ATTACH STUDS USING PLUG, BUTT OR SEAM WELDS, UNLESS NOTED OTHERWISE. WHERE STUDS ARE BURNED THROUGH BY WELDING, PROVIDE SUITABLE STITCH PLATE OF SAME GAUGE. SPLICES IN AXIAL LOADED STUDS OR BRACES ARE NOT PERMITTED. PROVIDE BUTT WELDS OR SPLICES AT JOINTS IN TRACK. WIRE TYING OF FRAMING COMPONENTS IS NOT PERMITTED.
16. PREFABRICATED PANELS SHALL BE SQUARED AND BRACED TO AVOID RACKING. LIFT PREFABRICATED PANELS IN A MANNER SO AS NOT TO CAUSE LOCAL DISTORTION OF ANY MEMBER.
17. ALL SHEET METAL SCREWS SHALL EXTEND THROUGH METAL FRAMING AND STRUCTURAL STEEL A MINIMUM OF $^1/_4$" OR 3 EXPOSED THREADS WHICHEVER IS GREATER.
18. ALL CFS TO CFS OR CFS TO STRUCTURAL STEEL FASTENERS INDICATED ON THESE DRAWINGS SHALL BE SELF-DRILLING/SELF-TAPPING STEEL SCREWS PER SIMPSON STRONG-TIE (ICC-ESR 3006 & LABC SUPPLEMENT). PROVIDE SCREWS ACCORDING TO THE THICKER MEMBER BEING CONNECTED AS FOLLOWS:

   A. "FPHSD" #10 FOR THICKNESS UP TO 54 MILS (16 GAUGE)
   B. "FPHSD" #12 FOR THICKNESS UP TO 97 MILS (12 GAUGE)
   C. "X METAL SCREWS" FOR THICKNESS GREATER THAN 97 MILS

19. ALL COLD-FORMED STEEL TO STRUCTURAL STEEL FASTENERS SHALL BE SIMPSON PDPA (ESR 2138 & LABC SUPPLEMENT)

GENERAL

1. ALL NEW CONSTRUCTION SHALL COMPLY WITH THE CONTRACT DOCUMENTS AND THE 2019 CALIFORNIA BUILDING CODE/2020 LOS ANGELES BUILDING CODE.
2. REFERENCE TO CODES, RULES, REGULATIONS, STANDARDS, MANUFACTURER'S INSTRUCTIONS OR REQUIREMENTS OF REGULATORY AGENCIES ARE TO THE LATEST PRINTED EDITION OF EACH IN EFFECT AT THE DATE OF SUBMISSION OF BID UNLESS THE DOCUMENT DATE IS SHOWN.
3. TYPICAL DETAILS AND GENERAL NOTES APPLY TO ALL PARTS OF THE WORK EXCEPT WHERE SPECIFICALLY DETAILED OR UNLESS NOTED OTHERWISE (U.N.O.)
4. THE STRUCTURAL DRAWINGS ILLUSTRATE THE NEW STRUCTURAL MEMBERS. REFER TO ARCHITECTURAL, MECHANICAL AND ELECTRICAL DRAWINGS FOR NON-STRUCTURAL ITEMS WHICH REQUIRE SPECIAL PROVISIONS DURING THE CONSTRUCTION OF THE STRUCTURAL MEMBERS.
5. REFER TO ARCHITECTURAL DRAWINGS FOR FLOOR DEPRESSIONS, EDGE OF SLAB, OPENINGS, SLOPES, DRAINS, CURBS, PADS, EMBEDDED ITEMS, NON-BEARING PARTITIONS, ETC. REFER TO MECHANICAL AND ELECTRICAL DRAWINGS FOR SLEEVES, OPENINGS, AND HANGERS FOR PIPES, DUCTS AND EQUIPMENT.
6. DRAWING DIMENSIONS ARE TO FACE OF STRUCTURE, JOINT CENTERLINE OR COLUMN GRID CENTERLINE UNLESS NOTED OTHERWISE. DO NOT SCALE THE DRAWINGS.
7. THE CONTRACTOR SHALL VERIFY AND BE RESPONSIBLE FOR COORDINATING THE WORK OF ALL TRADES AND SHALL VERIFY ALL DIMENSIONS AND CONDITIONS WHICH IMPACT THE WORK, FIELD VERIFY SIZES, ELEVATIONS, HOLE LOCATIONS, ETC. PRIOR TO FABRICATION. THE LANGUAGE "BY OTHERS" USED IN THIS STRUCTURAL DRAWING SET INDICATES ELEMENTS OR PARTS OF WORK NOT WITHIN SEOR SCOPE AND SHOWN OR REFERENCED FOR EASE OF COORDINATION ONLY. SUCH LANGUAGE SHALL NOT IMPLY THAT SUCH ELEMENTS OR PARTS OF WORK ARE EXCLUDED FROM THE CONTRACTOR'S SCOPE OF WORK.
8. CONTRACTOR SHALL CAREFULLY REVIEW THE DRAWINGS TO IDENTIFY THE SCOPE OF WORK REQUIRED, VISIT THE SITE TO RELATE THE SCOPE OF WORK TO EXISTING CONDITIONS AND DETERMINE THE EXTENT TO WHICH THOSE CONDITIONS AND PHYSICAL SURROUNDINGS WILL IMPACT THE WORK.
9. EXISTING CONDITIONS AS SHOWN ON THESE PLANS ARE FOR REFERENCE ONLY. CONTRACTOR IS REQUIRED TO FIELD VERIFY ALL EXISTING CONDITIONS PRIOR TO CONSTRUCTION. CONTRACTOR SHALL REPORT CONDITIONS THAT CONFLICT WITH THE CONTRACT DOCUMENTS TO THE OWNER'S REPRESENTATIVE. DO NOT DEVIATE FROM THE CONTRACT DOCUMENTS WITHOUT WRITTEN DIRECTION FROM THE OWNER'S REPRESENTATIVE.
10. THE CONTRACTOR SHALL RESOLVE ANY CONFLICTS ON THE DRAWINGS OR IN THE SPECIFICATIONS WITH THE OWNER'S REPRESENTATIVE BEFORE PROCEEDING WITH THE WORK.
11. ANY DEVIATION, MODIFICATION & SUBSTITUTION FROM THE APPROVED SET OF STRUCTURAL DRAWINGS SHALL BE SUBMITTED TO THE OWNER'S REPRESENTATIVE FOR REVIEW/APPROVAL PRIOR TO ITS USE OR INCLUSION ON THE SHOP DRAWINGS & PRIOR TO PROCEEDING WITH THE WORK.
12. THE CONTRACTOR SHALL PROVIDE ALL NECESSARY CONCRETE FORMWORK SHORING/RE-SHORING, EXCAVATION SHORING, DEMOLITION SHORING, BRACES, GUYS, HOIST BEAMS, ETC., REQUIRED TO SUPPORT ANY AND ALL LOADS THE BUILDING STRUCTURE AND COMPONENTS, EARTHWORK, OTHER STRUCTURES, AND UTILITIES ARE SUBJECTED TO DURING CONSTRUCTION. CONCRETE FORMWORK/CONCRETE RE-SHORING, DEMOLITION, AND EXCAVATION SHORING SYSTEMS MUST BE DESIGNED AND STAMPED BY A CIVIL OR STRUCTURAL ENGINEER LICENSED BY THE LOCAL JURISDICTION AND RETAINED BY THE CONTRACTOR. VISITS TO THE SITE BY SEOR DOES NOT INCLUDE OBSERVATION OF THE ABOVE NOTED ITEMS.
13. THE CONTRACTOR SHALL BE RESPONSIBLE OF DEWATERING WHEN SO REQUIRED PER SOILS REPORT OR AS WARRANTED BY FIELD CONDITIONS.
14. THE CONTRACTOR SHALL PROVIDE MEANS, METHOD, TECHNIQUES, SEQUENCE AND PROCEDURE OF CONSTRUCTION AS REQUIRED. SITE VISITS PERFORMED BY SEOR DO NOT INCLUDE INSPECTIONS OF MEANS AND METHODS OF CONSTRUCTION PERFORMED BY THE CONTRACTOR.
15. THE CONTRACTOR SHALL PROTECT ALL WORK, MATERIALS AND EQUIPMENT FROM DAMAGE AND SHALL PROVIDE PROPER STORAGE FACILITIES FOR MATERIALS AND EQUIPMENT DURING CONSTRUCTION.
16. A COPY OF ANY REQUIRED LOS ANGELES RESEARCH REPORT AND/OR CONDITIONS OF LISTING SHALL BE MADE AVAILABLE AT THE JOB SITE.
17. ATTACHMENT OF NON-STRUCTURAL COMPONENTS SPECIFIED BY OTHERS TO STRUCTURAL ELEMENTS SHALL BE SPECIFIED BY THE NON-STRUCTURAL COMPONENT DESIGNER/SPECIFIER/INSTALLER. DESIGNER OF NON-STRUCTURAL ELEMENTS SHALL AT A MINIMUM SPECIFY THE CONNECTION TO THE STRUCTURE INCLUDING BUT NOT LIMITED TO: ANY TYPE OF CONNECTING HARDWARE, WIRE, HANGERS, FASTENERS, CLIPS, UNISTRUT MEMBERS. ATTACHMENT AND BRACING OF NON STRUCTURAL COMPONENTS SHALL MEET THE APPLICABLE BUILDING CODES. NON STRUCTURAL ELEMENTS SHALL INCLUDE, BUT NOT LIMITED TO: MEP AND HVAC EQUIPMENT & THEIR SUPPORTING PADS, INDUSTRIAL KITCHEN EQUIPMENT, PLATFORMS, FRAMES, ETC.; DUCTWORK, PIPES, CONDUITS, ARTWORK, GRILLES, GRATING, METAL SCREENS, ELEVATOR RAILS, STONE FINISH TILES, STONE CAPS, BRICK VENEER.
18. SPECIFICATIONS RELATED TO WATERPROOFING, INCLUDING BUT NOT LIMITED TO MEMBRANES, WATERSTOPS, SEALANTS, FLASHING, VAPOR BARRIER, ARE AS SPECIFIED BY ARCHITECT/WATER PROOFING CONSULTANT, AND ARE EXCLUDED FROM SEOR SCOPE.
19. ALLOW 10 BUSINESS DAYS FOR PROCESSING SHOP DRAWINGS AND SUBMITTALS AFTER RECEIPT. ALLOW 5 BUSINESS DAYS FOR RESPONDING TO REQUESTS FOR INFORMATION (RFI'S). PROVIDE 3 BUSINESS DAYS NOTICE FOR STRUCTURAL OBSERVATIONS.

Burnett + Young Structural Engineers
Labib Funk + Associates Structural Civil Engineers
319 Main Street
El Segundo, CA 90245
t: 213/ 239 9700
f: 213/ 239 9699
LFA #19927

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Design Standards

REGISTERED PROFESSIONAL ENGINEER
FABIO ZANOLI
No. 34491
CIVIL
STRUCTURAL
STATE OF CALIFORNIA
SIGN DATE: 11/10/2021

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED

BUREAU OF ENGINEERING
VERTICAL CONTROL:
HORIZONTAL CONTROL:
SHEET TITLE: GENERAL NOTES
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

DEPARTMENT OF PUBLIC WORKS

NO.	REVISIONS:	DATE:	BY:
1	100% DESIGN DEVELOPMENT	02/15/21	
2	50% CONSTRUCTION DOCUMENTS	03/30/21	
3	100% CONSTRUCTION DOCUMENTS - PERMIT SET	11/10/21	

CIP NO.
INDEX NO.

CITY OF LOS ANGELES
CITY ENGINEER
GARY LEE MOORE, P.E., ENV SP
DATE:
DESIGN GROUP
ENGINEER:
DESIGNED BY:
DRAWN BY:
CHECKED BY:
APPROVED BY:

WORK ORDER NO.
E170121B

SHEET NAME
S0.01
SHEET X OF X SHEETS

REVISION DATES (DESIGN STAGES ONLY)

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

Sheet Version 4.0

\\LFAFS2\DRAFTING19\19927 - RESEDA SKATE FACILITY\JLA S\S D\S001 - S002_19927.DWG 11/24/2021 10:42 AM

STRUCTURAL STEEL WELDING

1. ALL WELDING SHALL BE IN STRICT CONFORMANCE WITH THE LATEST EDITION OF AWS D1.1 AND THE 2019 CALIFORNIA BUILDING CODE.
2. ALL WELDS WITHIN MEMBERS DESIGNATED AS PART OF THE LATERAL FORCE RESISTING SYSTEM SHALL CONFORM TO THE DETAILING, MATERIALS, WORKMANSHIP, TESTING AND INSPECTION REQUIREMENTS PER AWS D1.8.
3. ALL WELDING ELECTRODES (FILLER METAL) SHALL BE E7XXX (70 KSI), U.N.O., AND SHALL BE LOW HYDROGEN TYPES. FOR WELDING OF REBAR SEE "REINFORCEMENT" SECTION. FIELD WELDING OF FULL AND PARTIAL PENETRATION WELDS OF THE STEEL MOMENT FRAME CONNECTIONS BETWEEN MOMENT FRAME BEAMS AND MOMENT FRAME COLUMNS SHALL BE BY SHIELDED METAL ARC PROCESS USING LOW HYDROGEN ELECTRODES
4. ALL WELDS SHALL HAVE A FILLER METAL WITH CHARPY V-NOTCH TOUGHNESS OF 20 FT/LBS AVERAGE AT -20 DEGREES FAHRENHEIT AND 40 FT/LBS @ 70 DEGREES FAHRENHEIT. PROVIDE MANUFACTURER'S CERTIFICATION.
5. LENGTHS OF WELDS ARE EFFECTIVE LENGTHS AS SPECIFIED IN THE APPLICABLE CODE. WHERE LENGTH OF WELD IS NOT SHOWN IT SHALL BE FULL LENGTH OF JOINT. ALL BUTT WELDS SHALL BE FULL PENETRATION, UNLESS NOTED OTHERWISE.
6. CONTRACTOR SHALL PROVIDE FIELD WELDING AS REQUIRED FOR CONSTRUCTION. WHERE FIELD WELDING IS NOTED, THE DESIGNATION IS GIVEN AS A SUGGESTED CONSTRUCTION PROCEDURE ONLY.
7. ALL SHOP WELDS SHALL BE PERFORMED BY A LOS ANGELES CITY LICENSED FABRICATOR.
8. ALL WELDERS SHALL BE QUALIFIED FOR THE WORK THEY WILL BE DOING & SHALL HAVE CURRENT CERTIFICATIONS BY AWS & THE CITY OF LOS ANGELES.
9. FACES OF FILLET WELDS EXPOSED TO VIEW SHALL HAVE AS-WELDED SURFACES THAT ARE REASONABLY SMOOTH AND UNIFORM. NO FINISHING OR GRINDING SHALL BE REQUIRED, EXCEPT WHERE CLEARANCES OR FIT OF OTHER ITEMS MAY SO NECESSITATE.
10. ALL PARTIAL AND FULL PENETRATION WELDS WHICH ARE EXPOSED TO VIEW SHALL BE GROUND SMOOTH AND FLUSH WITH FINISH SURFACE OF STEEL. HOLES SHALL BE FILLED WITH WELD METAL OR BODY SOLDER AND SMOOTHED BY GRINDING OR FILING.
11. CLEAN GROOVE PREPARATION THERMAL CUTS BY GRINDING.
12. WELDS SHALL BE TERMINATED AT THE END OF A JOINT IN A MANNER THAT WILL ENSURE SOUND WELDS. WHENEVER NECESSARY THIS SHALL BE DONE BY USE OF EXTENSION BARS AND RUN OFF TABS.
13. ALL WELDED JOINTS SHALL BE PRE-QUALIFIED PER THE LATEST EDITION OF AWS D1.1. NON PRE- QUALIFIED WELDED JOINTS SHALL BE QUALIFIED BY TEST & PROCEDURE QUALIFICATION TEST RECORD INCLUDED PER THE LATEST EDITION OF AWS D1.1.
14. THE CONTRACTOR SHALL SUBMIT ALL WELDING PROCEDURE SPECIFICATIONS (WPS) TO BE USED ON THE PROJECT PER THE LATEST EDITION OF AWS D1.1. THE WPS SHALL INCLUDE ALL MANUFACTURER'S DATA SHEETS FOR ALL WELDING MATERIALS TO BE USED. THE DATA SHEETS SHALL DESCRIBE THE PRODUCTS, LIMITATIONS OF USE, RECOMMENDED WELDING PARAMETERS, AND STORAGE AND EXPOSURE REQUIREMENTS.
15. ELECTRODES SHALL BE RECEIVED AND STORED IN THE ORIGINAL, UNDAMAGED MANUFACTURER PACKAGING, UNTIL READY FOR USE. WHEN WELDING IS TO BE SUSPENDED FOR MORE THAN 8 HOURS, ELECTRODES SHALL BE REMOVED FROM THE MACHINES AND STORED IN AN ELECTRODE WIRE OVEN MAINTAINED AT A TEMPERATURE BETWEEN 250 DEGREES AND 550 DEGREES OR AS RECOMMENDED BY THE MANUFACTURER. ELECTRODES NOT CONSUMED WITHIN 24 HOURS OF ACCUMULATED EXPOSURE OUTSIDE CLOSED OR HEATED STORAGE SHALL NOT BE USED.
16. ALL BOTTOM FLANGE BACKING BARS SHALL BE REMOVED. FOLLOWING REMOVAL OF BACKING, THE ROOT PASS SHALL BE BACKGOUGED TO SOUND WELD METAL AND BACKWELDED UNTIL FLUSH OR WITH SLIGHT REINFORCEMENT. THE SURFACE SHALL BE GROUND SMOOTH TO A SURFACE ROUGHNESS NOT TO EXCEED 500 MICROINCHES.
17. DISCONTINUITIES IN WELD CREATED BY ERRORS OR BY FABRICATION OR ERECTION OPERATIONS, SUCH AS TACK WELDS, ERECTION GOUGING AND FRAME CUTTING, SHALL BE REPAIRED AS REQUIRED BY ENGINEER OF RECORD.

METAL DECK

1. STEEL DECK SHALL HAVE MINIMUM PROPERTIES AND BE THE TYPE AS INDICATED ON DRAWINGS.
2. ALL FLOOR AND ROOF DECK TO BE GALVANIZED IN ACCORDANCE WITH ASTM A653 COATING CLASS G90. REPAIR DAMAGED COATING.
3. UNLESS OTHERWISE NOTED ON THE STRUCTURAL DRAWINGS, MINIMUM DECK ATTACHMENT IS AS FOLLOWS: 1/2" EFFECTIVE DIAMETER PUDDLE WELDS AT 12" O.C. AT TRANSVERSE AND PERIMETER SUPPORTS. 1/2" EFFECTIVE DIAMETER PUDDLE WELDS AT 16" O.C. AT LONGITUDINAL SUPPORTS. 3/16" BUTTON PUNCH OR 1-1/2" TOP SEAM WELD AT 36" O.C. AT SIDE LAP CONNECTIONS.
4. ALL STEEL DECK SHALL BE CONTINUOUS OVER AT LEAST TWO SPANS EXCEPT ON SINGLE SPANS WHICH ARE SPECIFICALLY NOTED.
5. ALL WELDING OF STEEL DECK SHALL BE PERFORMED BY LIGHT GAUGE WELDERS CERTIFIED BY CITY.
6. STEEL DECK SHALL BE MANUFACTURED BY "VERCO" (ICC-ESR 1735P, LA RR #23789).
7. PROVIDE WELDS WASHERS IN ACCORDANCE WITH AWSD1.3 FOR ALL STEEL DECKS LIGHTER THAN 22 GAUGE.
8. MINIMUM BEARING OF DECKING ON SUPPORTS SHALL BE 2".

STRUCTURAL STEEL

1. FABRICATION AND ERECTION OF STRUCTURAL STEEL SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF AISC SPECIFICATIONS FOR STRUCTURAL STEEL BUILDINGS, AND THE LATEST EDITION OF AISC SEISMIC PROVISIONS FOR STRUCTURAL STEEL BUILDINGS. WHERE THE STRUCTURAL STEEL IS EXPOSED, FABRICATION AND ERECTION SHALL ALSO BE IN ACCORDANCE WITH AISC CODE OF STANDARD PRACTICE FOR ARCHITECTURALLY EXPOSED STRUCTURAL STEEL.
2. STRUCTURAL STEEL SHALL CONFORM TO THE FOLLOWING ASTM DESIGNATION:

a. ALL WIDE FLANGE SHAPES	A992, GRADE 50
b. STEEL ANGLES	A36
c. ALL PLATES WHERE GRADE 50 IS SPECIFIED PROVIDE	A36 A572
d. HSS (RECTANGULAR AND SQUARE)	A500, GRADE C
e. HSS (ROUND)	A500, GRADE B
f. PIPE	A53, GRADE B
g. CHANNELS (C AND MC SECTIONS)	A36
h. ALL OTHER STRUCTURAL SECTIONS	A572, GRADE 50

3. ALL STEEL SHALL BE PROVIDED BY A CITY OF LOS ANGELES LICENSED FABRICATOR.
4. WHEN FABRICATING BEAMS PLACE NATURAL CAMBER UP.
5. ALL FLANGE STIFFENER PLATES SHALL BE ORIENTED SO THAT ROLLING DIRECTION OF PLATE IS PARALLEL WITH DIRECTION OF PRINCIPAL STRESS.
6. SPLICE MEMBERS ONLY WHERE INDICATED.
7. MECHANICAL FASTENING AND THREADED PARTS
   A. BOLTS AND THREADED PARTS SHALL CONFORM TO THE FOLLOWING ASTM DESIGNATION:

a. HIGH STRENGTH BOLTS	F3125, GR A325X
b. HEADED AND BENT ANCHOR BOLTS U.N.O.	F1554, GR36
c. ALL THREADED RODS U.N.O.	F1554, GR36
d. TIE RODS	F1554, GR36
e. ANCHORS AT NON-MOMENT FRAME COLUMN BASE PL	F1554, GR55
f. ANCHORS AT MOMENT FRAME COLUMN BASE PL	F1554, GR105
g. NUTS FOR BOLTS AND MACHINE BOLTS	A563
h. HARDENED WASHERS	F436
i. UNHARDENED WASHERS	F844
j. PLAIN WASHERS	ANSI B18.22.1
k. BEVELED WASHERS	ANSI B18.23.1

   B. HIGH STRENGTH BOLTS SHALL BE INSTALLED IN ACCORDANCE WITH THE LATEST EDITION OF "AISC SPECIFICATIONS FOR STRUCTURAL JOINTS USING HIGH STRENGTH BOLTS" BY RCSC. HIGH STRENGTH BOLTS SHALL BE BEARING TYPE WITH THREADS EXCLUDED FROM THE FROM THE SHEAR PLANES (I.E. A325-X).
   C. ALL JOINTS U.NO. SHALL BE BE SNUG-TIGHTENED JOINTS. JOINTS AT ALL LFRS ELEMENTS SHALL BE PRE-TENSIONED W/ CLASS A FAYING SURFACE.
   D. ALL BOLTED CONNECTIONS SHALL HAVE A MINIMUM OF TWO $^{3}/_{4}$"ø BOLTS.
   E. ALL HOLES SHALL BE STANDARD DIAMETER.
   F. PROVIDE BEVELED WASHERS ON ALL CONNECTIONS WHERE SLOPE SURFACE EXCEEDS 1:20.
   G. WELDING OF FASTENERS OR THREADED PARTS SHALL BE ALLOWED ONLY WHERE SPECIFICALLY SHOWN ON THE STRUCTURAL DRAWINGS. IN SUCH INSTANCES, WELDABLE FASTENERS OR THREADED PARTS SHALL BE PROVIDED, AND SHALL CONFORM TO SUPPLEMENTARY REQUIREMENT S1 WHENEVER SUCH REQUIREMENT IS AVAILABLE FOR A GIVEN ASTM SPECIFICATION. FOR WELDING OF REBAR SEE "REINFORCEMENT" SECTION
8. AFTER FABRICATION, ALL STEEL SHALL BE CLEANED FREE OF RUST, LOOSE MILL SCALE AND OIL.
9. PROVIDE FILLS AT SPLICES OF PARTS HAVING MORE THAN 1/8" DIFFERENCE IN THICKNESS.
10. HEADED ANCHOR STUDS AND THREADED STUDS SHALL BE NELSON GRANULAR FLUX-FILLED, AND SHALL BE MADE FROM COLD FINISHED LOW CARBON STEEL, CONFORMING TO A-108, GRADES 1015 - 1020 WITH A MINIMUM TENSILE STRENGTH OF 60,000 PSI. (COLA RR 2729). STUD WELDING INSPECTION AND TESTING SHALL CONFORM TO AWS D1.1.
11. DEFORMED BAR ANCHOR STUDS SHALL BE NELSON D2L GRANULAR FLUX-FILLED REBAR STUDS OR APPROVED EQUAL, AND SHALL BE MADE OF LOW CARBON COLD ROLLED STEEL WITH A MINIMUM TENSILE STRENGTH OF 80,000 PSI. STUD WELDING INSPECTION AND TESTING SHALL CONFORM TO AWS D1.1.
12. HOT DIP GALVANIZE IN ACCORDANCE WITH ASTM A123 AND ASTM A153 STRUCTURAL STEEL AND FASTENERS THAT ARE PERMANENTLY EXPOSED TO THE WEATHER. REPAIR GALVANIZING AFTER WELDING IN ACCORDANCE WITH ASTM A780.
13. THE FULL DESIGN AND LOAD CARRYING CAPACITY OF THE STEELWORK SHALL NOT BE IMPAIRED DUE TO FABRICATION, SHIPMENT, OR ERECTION PROCEDURES, THROUGHOUT THE COMPLETE PROCESS. THE STABILITY OF ALL INDIVIDUAL MEMBERS AND ASSEMBLIES SHALL BE MAINTAINED.
14. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE CONTROL OF ALL ERECTION PROCEDURES AND SEQUENCES WITH RELATION TO TEMPERATURE DIFFERENTIALS AND WELD SHRINKAGE.
15. ALL ADDITIONAL STEEL REQUIRED FOR ERECTION PURPOSES SHALL BE PROVIDED AT NO ADDITIONAL COST AND SHALL BE REMOVED UNLESS APPROVED BY THE OWNER'S REPRESENTATIVE IN WRITING.
16. ALL BOLTS USED AS A PART OF THE SEISMIC FORCE RESISTING SYSTEM SHALL BE FULLY TENSIONED HIGH STRENGTH BOLTS.

CONCRETE

1. CONCRETE IS REINFORCED AND CAST-IN-PLACE UNLESS OTHERWISE NOTED. WHERE REINFORCING IS NOT SPECIFICALLY SHOWN OR WHERE DETAILS ARE NOT GIVEN, PROVIDE REINFORCING SIMILAR TO THAT SHOWN FOR SIMILAR CONDITIONS, SUBJECT TO REVIEW BY THE OWNER'S REPRESENTATIVE.
2. ALL PHASES OF WORK PERTAINING TO THE CONCRETE CONSTRUCTION SHALL CONFORM TO THE LATEST EDITION OF ACI 318 "BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE", AND THE LATEST EDITION OF ACI 117 "SPECIFICATIONS FOR TOLERANCES FOR CONCRETE CONSTRUCTION AND MATERIALS"
3. ALL STRUCTURAL CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH AT 28 DAYS AND A MAX WATER CEMENT RATIO, W/C, AS FOLLOWS:

LOCATION	STRENGTH	W/C	TYPE OF CONCRETE
ALL LOCATIONS U.N.O.	4,000 PSI	0.50	NORMAL WEIGHT
SLAB ON GRADE	4,500 PSI	0.45	NORMAL WEIGHT
FILL ON METAL DECK	3,000 PSI	0.55	LIGHT WEIGHT

4. NO MORE THAN ONE GRADE OF CONCRETE SHALL BE ON THE JOB SITE AT ANY ONE TIME.
5. ALL STRUCTURAL CONCRETE MIXES SHALL BE DESIGNED BY AN APPROVED LABORATORY AND SHALL BE STAMPED AND SIGNED BY A CIVIL ENGINEER LICENSED IN CALIFORNIA.
6. CONCRETE MIX PROPORTIONING SHALL MEET STATISTICAL STRENGTH REQUIREMENTS OF ACI 301 AND ACI 214R. MIX DESIGNS SHOWING COMPLIANCE WITH STRENGTH REQUIREMENTS TO BE SUBMITTED TO SEOR FOR REVIEW.
7. CONCRETE STRENGTH TEST REPORTS SHALL BE IN COMPLIANCE WITH ACI 318 AND SHALL BE SUBMITTED TO SEOR
8. CONCRETE MIXES SHALL BE PREPARED WITH TYPE II/V PORTLAND CEMENT CONFORMING TO ASTM C150.
9. CONCRETE MIX DESIGNS CONTAINING FLY ASH MAY BE USED. FLY ASH SHALL CONFORM WITH ASTM C618 AND MAY REPLACE UP TO 15% PORTLAND CEMENT CONTENT BY WEIGHT FOR ELEVATED SLAB OR 25% FOR OTHER CASES. WHERE CONCRETE IS VISUALLY EXPOSED VERIFY WITH THE PROJECT ARCHITECT THE USE OF FLY ASH.
10. NORMAL WEIGHT CONCRETE AGGREGATES SHALL CONFORM TO ASTM C33. LIGHT WEIGHT CONCRETE AGGREGATES SHALL CONFORM TO ASTM C330.
11. WATER USED IN MIXING CONCRETE SHALL CONFORM WITH ASTM C1602.
12. THOROUGHLY CLEAN AND ROUGHEN ALL HARDENED CONCRETE AND MASONRY SURFACES TO RECEIVE NEW CONCRETE. INTERFACE SHALL BE ROUGHENED TO A FULL AMPLITUDE OF 1/4" WITH EXPOSED AGGREGATE UNLESS NOTED OTHERWISE.
13. KEY AND DOWEL POUR JOINTS AS SHOWN ON THE PLANS. ANY DEVIATION FROM POUR JOINTS SHOWN ON THE PLANS MUST BE APPROVED BY THE OWNER'S REPRESENTATIVE.
14. WHERE ELEMENTS SUCH AS, BUT NOT LIMITED TO, CONDUITS, PIPES, AND DUCTWORK, ARE TO BE PLACED WITHIN OR THRU CONCRETE MEMBERS, DIRECT CONTACT OF SUCH MEMBERS WITH CONCRETE SHALL BE PREVENTED AS REQUIRED BY DESIGNER/SPECIFIER/SUPPLIER/INSTALLER OF SUCH ELEMENTS, AND AS NEEDED TO COMPLY WITH PLUMBING CODE AND/OR TO AVOID DAMAGE OF SUCH ELEMENTS. TYPICAL MEANS TO AVOID DIRECT CONTACT WITH CONCRETE SUCH AS SLEEVES, LAYERS OF COMPRESSIBLE MATERIALS, AIR GAPS, ETC. SHALL BE SPECIFIED BY, OR OBTAINED BY GC FROM, DESIGNER/SPECIFIER/SUPPLIER/INSTALLER OF SUCH ELEMENTS. REBAR DISPLACED BY SUCH ELEMENTS SHALL BE ARRANGED AS CLOSE AS PRACTICALLY POSSIBLE AROUND THE EMBEDDED ELEMENTS AND SHALL NOT BE INTERRUPTED.
15. NON-SHRINK CEMENT GROUT SHALL HAVE A MINIMUM 28 DAY COMPRESSIVE STRENGTH OF 7000 PSI. USE "QUIKRETE" (LARR #25451) OR "RAPID SET" (LARR #24654).
16. DEFECTIVE CONCRETE (VOIDS, ROCK POCKETS, HONEYCOMBS, CRACKING, ETC.) SHALL BE REMOVED AND REPLACED AS DIRECTED BY THE OWNER'S REPRESENTATIVE.
17. WHEN WATER OVER 3" IN DEPTH IS PRESENT IN THE DRILLED PILE HOLES:
    A. A CONCRETE MIX WITH A STRENGTH OF 1,000 PSI GREATER THAN THE SPECIFICATIONS LISTED ABOVE WITH A MINIMUM OF 5,000 PSI AND MAX W/C = 0.42 WILL BE USED.
    B. AN ADMIXTURE THAT REDUCES THE PROBLEM OF SEGREGATION OF PASTE/AGGREGATES AND DILUTION OF PASTE SHALL BE INCLUDED.
18. TO MINIMIZE CONCRETE SHRINKAGE CRACKING IN CONCRETE SLABS, THE MAXIMUM SIZE OF CONCRETE POURS FOR SLABS ON GRADE, FORMED SLABS, AND SLABS ON METAL DECK, IS 200 FEET IN ANY DIRECTION. THE RATIO OF THE PLAN LENGTH (LONGER DIRECTION) TO WIDTH (SHORTER DIRECTION) DIMENSIONS SHALL NOT EXCEED 2 TO 1.
19. FORM WORK SHALL BE REMOVED IN A MANNER THAT MAINTAINS THE STRENGTH AND STABILITY OF THE STRUCTURE AT ALL TIMES.
    FORM WORK OF ELEVATED NON P.T. SLABS SHALL NOT BE REMOVED BEFORE ALL CONDITIONS BELOW ARE MET:
    A. THE SPECIFIED COMPRESSIVE STRENGTH IS REACHED
    B. FORM WORK IS LEFT IN PLACE AT LEAST 28 DAYS AFTER CONCRETE POUR, EXCEPT THAT FORM WORK CAN BE REMOVED 14 DAYS AFTER CONCRETE POUR IF FOLLOWED BY IMMEDIATE RE-SHORING OF THE SLAB ON THE SAME DAY. RE-SHORING SHALL BE MAINTAINED IN PLACE A MIN OF 28 DAYS AFTER CONCRETE POUR.
    C. NO STRIPPING OF FORMS IS ALLOWED BEFORE CONCRETE HAS CURED SUFFICIENTLY TO PREVENT SPALLING, CHIPPING OR OTHER DAMAGE DUE TO FORM REMOVAL.
20. FOAM USED IN OVER-FRAMING & BUILT UP SLAB APPLICATIONS SHALL CONFORM TO ASTM D6817 AND SHALL HAVE THE FOLLOWING PROPERTIES AT A MINIMUM:
    A. TYPICAL FLOOR AREAS: 7PSI COMPRESSIVE RESISTANCE AT 1% DEFORMATION.
    B. LOADING DOCKS, SIDEWALKS, AND OTHER HEAVILY LOADED AREAS: 15PSI COMPRESSIVE RESISTANCE AT 1% DEFORMATION.
    C. INSULATING FOAM AT NON-OCCUPIABLE ROOFS: 15PSI COMPRESSIVE RESISTANCE AT 10% DEFORMATION.

REINFORCEMENT CONTINUED

15. ALL MECHANICAL, PLUMBING AND ELECTRICAL EQUIPMENT PADS LESS THAN 4" THICK SHALL BE REINFORCED WITH AT LEAST ONE (1) LAYER OF 6X6/W2.9XW2.9 WELDED WIRE FABRIC AND HAVE HOOKED DOWELS (#3 AT 12' ON CENTERS) INTO THE STRUCTURAL SLAB. UNLESS NOTED OTHERWISE. FOR PADS GREATER THAN 4 INCHES THICK, USE REINFORCING AS SHOWN IN THE TYPICAL DETAILS.
16. ADDITIONAL REINFORCEMENT SHALL BE PROVIDED AROUND ALL SLAB AND WALL OPENINGS INCLUDING DIAGONAL BARS WITHOUT EXCEPTION.
17. ALL STRUCTURAL CONCRETE ELEMENTS REQUIRE REINFORCEMENT SINCE NO PLAIN CONCRETE ELEMENTS ARE USED. ALL CONCRETE SLABS SHALL HAVE A MINIMUM REINFORCEMENT PERCENTAGE OF 0.18 EACH WAY CONTINUOUS.
18. REINFORCING STEEL SHOP DRAWINGS SHALL INCLUDE SLAB OPENINGS, DEPRESSIONS, SLOPES, CURBS, DRAINS, AND SLAB EDGE LOCATIONS FROM ALL MEP TRADES. GENERAL CONTRACTOR IS RESPONSIBLE TO COORDINATE AND INDICATE ALL SLAB OPENINGS ON PLAN AND SUBMIT TO THE STRUCTURAL ENGINEER PRIOR TO SUBMITTAL OF REINFORCING SHOP DRAWINGS.
19. CONTRACTOR SHALL FURNISH MISCELLANEOUS REBAR IN ADDITION TO THE REBAR SPECIFIED ON THE STRUCTURAL DRAWINGS, WHICH SHALL BE INSTALLED AT EOR'S DISCRETION DURING CONSTRUCTION. THE AMOUNT OF ADDITIONAL REBAR SHALL BE 5 TONS OR 2% OF THE REBAR WEIGHT SPECIFIED PER STRUCTURAL DRAWINGS, WHICHEVER IS GREATER.

MASONRY

1. COMPRESSIVE STRENGTH f'm:
   MIN SPECIFIED MASONRY COMPRESSIVE STRENGTH SHALL BE f'm = 1,900 PSI, UNLESS OTHERWISE SPECIFIED ON THE PLANS.
2. BLOCKS:
   BLOCKS SHALL BE CONCRETE MASONRY MEDIUM WEIGHT UNITS CONFORMING TO ASTM C-90 GRADE N-1. USE UNITS OPEN ONE END, AND BOND BEAM UNITS AT HORIZONTAL REINFORCING. WHEN BLOCKS ARE EXPOSED OBTAIN APPROVAL OF SUBMITTAL FROM ARCHITECT. UNITS SHALL ATTAIN A MINIMUM NET AREA COMPRESSIVE STRENGTH AS REQUIRED TO MEET THE SPECIFIED MASONRY COMPRESSIVE STRENGTH AS FOLLOWS:
   A. 1,900 PSI FOR SPECIFIED f'm UP TO 1,900 PSI
   B. 2,000 PSI FOR SPECIFIED f'm UP TO 2,000 PSI
   C. 2,600 PSI FOR SPECIFIED f'm UP TO 2,250 PSI
   D. 3,250 PSI FOR SPECIFIED f'm UP TO 2,500 PSI
   E. 3,900 PSI FOR SPECIFIED F'M UP TO 2,750 PSI
   F. 4,500 PSI FOR SPECIFIED F'M UP TO 3,000 PSI
3. MORTAR:
   A. CONFORMING TO ASTM C-270, TYPE [S].
   B. MIX PROPORTIONS SHALL CONFORM TO ASTM C-270.
   C. AGGREGATES SHALL CONFORM TO ASTM C-144.
4. GROUT:
   A. CONFORMING TO ASTM C-476.
   B. ATTAINS THE MASONRY COMPRESSIVE STRENGTH f'm OR 2,000 PSI AT 28 DAYS, WHICHEVER IS GREATER.
   C. MIX PROPORTIONS SHALL CONFORM TO ASTM C-476
   D. AGGREGATES SHALL CONFORM TO ASTM C-404.
   E. USE COARSE GROUT IN GROUT SPACES 2 INCHES OR MORE IN WIDTH AND IN CELLS TO BE GROUTED SOLID.
5. CEMENT: ASTM C-150, LOW ALKALI, TYPE I OR II PORTLAND CEMENT. (MASONRY CEMENT AND PLASTIC CEMENT SHALL NOT BE USED.)
6. ADMIXTURES: DO NOT USE ANY ADMIXTURES IN MORTAR OR GROUT WITHOUT APPROVAL BY THE ARCHITECT.
7. MEASURE MATERIALS FOR MORTAR AND GROUT IN CALIBRATED DEVICES. SHOVEL MEASUREMENTS ARE NOT ACCEPTABLE.
8. REINFORCING STEEL:
   A. REBAR: ASTM A-615, GRADE 60 (FY=60KSI).
   B. JOINT REINFORCEMENT: ASTM A-951
10. LAP REINFORCING STEEL AT SPLICES WITH A MINIMUM 48 BAR DIAMETERS, UNLESS NOTED OTHERWISE. WHERE CLEAR DISTANCE BETWEEN BARS AT ADJACENT SPLICES IS 3 INCHES OR LESS, INCREASE LAP LENGTH 30% UNLESS SPLICES ARE STAGGERED AT LEAST 24 BAR DIAMETERS.
11. DOWELS FOR WALLS AND COLUMNS SHALL MATCH SIZE AND SPACING OF WALL AND COLUMN REINFORCING STEEL.
12. MASONRY WORK SHALL CONFORM TO THE LATEST ADOPTED EDITION OF THE LABC. AND SPECIFICATIONS OF THE LATEST EDITION THE MSJC.
13. CONCRETE BLOCK UNITS ARE TO BE STAGGERED & TO HAVE VERTICAL CONTINUITY OF CELLS UNOBSTRUCTED.
14. IF WORK IS STOPPED AN HOUR OR LONGER, PROVIDE HORIZONTAL CONSTRUCTION JOINT BY STOPPING GROUT 1 1/2" BELOW TOP OF MASONRY UNIT
15. SPECIAL INSPECTION IS REQUIRED FOR ALL MASONRY WORK.
16. GROUT ALL MASONRY WALLS SOLID.
17. GROUTING LIFTS SHALL NOT EXCEED 5'-0" IN HEIGHT IN ACCORDANCE WITH MSJC SPECIFICATIONS, EXCEPT AS NOTED BELOW.
18. GROUTING LIFTS GREATER THAN 5'-0" AND NOT MORE THAN 12'-8" (HIGH LIFT GROUT) CAN BE PLACED PROVIDED THAT:
    A. THE MASONRY HAS CURED FOR AT LEAST 4 HOURS
    B. THE GROUT SLUMP IS MAINTAINED BETWEEN 10 AND 11 IN
    C. NO INTERMEDIATE REINFORCED BOND BEAMS ARE PLACED BETWEEN THE TOP AND BOTTOM OF THE POUR HEIGHT
    D. CLEANOUTS ARE PROVIDED AT THE BOTTOM COURSE OF MASONRY.
19. THE CLEAR DISTANCE BETWEEN THE SURFACE OF A BAR AND ANY SURFACE OF A MASONRY UNIT SHALL BE NOT LESS THAN 1/4" FOR FINE COARSE GROUT AND NOT LESS THAN 1/2" FOR COURSE GROUT.
20. SECURE REBAR AGAINST DISPLACEMENT PRIOR TO GROUTING AT INTERVALS NOT GREATER THAN 200 BAR DIAMETERS.
21. TERMINATE HORIZONTAL BARS WITH A STANDARD HOOK AT THE JAMBS OF WALL OPENINGS.

REINFORCEMENT

1. ALL REINFORCING BARS SHALL CONFORM TO ASTM A-615, GRADE 60, UNLESS NOTED OTHERWISE ON THE DRAWINGS AND BELOW:
   A. SPIRALS SHALL BE COLD DRAWN BARS CONFORMING TO ASTM A-82.
   B. FOR SLABS AND FOUNDATIONS A HIGHER GRADE THAN GRADE 60 MAY BE PROVIDED AT CONTRACTOR'S OPTION AND AT NO ADDITIONAL COST TO THE CLIENT, PROVIDED THAT REBAR SIZE AND SPACING SHALL NOT BE ALTERED. IF ALTERATION TO REBAR SIZE AND SPACING IS SOUGHT, THESE MUST BE APPROVED IN WRITING BY SEOR. ENGINEERING AND PERMITTING FEES SHALL BE PAID BY CONTRACTOR WITHOUT ADDITIONAL COST TO THE CLIENT.
   C. MOMENT FRAME LONGITUDINAL REBAR, COLUMN LONGITUDINAL REBAR, SHEAR WALL VERTICAL REBAR, AND COUPLING BEAM LONGITUDINAL REBAR SHALL BE ASTM A-706, GRADE 60. ASTM A-615, GRADE 60 REINFORCEMENT SHALL BE PERMITTED IN THESE STRUCTURAL ELEMENTS PROVIDED THE FOLLOWING CONDITIONS ARE MET:
      a. THE ACTUAL YIELD STRENGTH BASED ON MILL TESTS DOES NOT EXCEED THE SPECIFIED YIELD STRENGTH BY MORE THAN 18,000 PSI.
      b. THE MINIMUM ELONGATION IN 8 INCHES SHALL BE AS FOLLOWS:
         - NO.3 THROUGH NO.6 = 14 PERCENT
         - NO.7 THROUGH NO.11 = 12 PERCENT
         - NO.14 THROUGH NO.18 = 10 PERCENT
   D. SMOOTH DOWELS IN SLAB ON GRADE: ASTM A36, 36 KSI
2. WELDING OF REINFORCEMENT (INCLUDING TACK WELDING) SHALL NOT BE DONE UNLESS SPECIFICALLY SHOWN ON THE DRAWINGS. WHERE SHOWN ON THE DRAWINGS, THE FOLLOWING SHALL APPLY:
   A. WELDED REBAR SHALL COMPLY WITH ASTM A-706 [Fy=60 KSI]
   B. WELDING SHALL CONFORM TO AWS D1.4
   C. WELDING OF REINFORCING STEEL SHALL BE PERFORMED BY WELDERS CERTIFIED BY THE CITY OF LA
   D. USE E90XX ELECTRODES
3. WELDED WIRE FABRIC SHALL BE MADE OF COLD DRAWN WIRE AND SHALL CONFORM TO ASTM A-185 [Fy=65 KSI]. MINIMUM LAP AT SPLICES OF 12 INCHES. PROVIDE MESH IN FLAT SHEETS ONLY. ROLLED MESH IS NOT ACCEPTABLE. OFFSET END-LAPS IN ADJACENT SHEETS TO PREVENT CONTINUOUS LAPS.
4. REINFORCING STEEL SHALL HAVE THE FOLLOWING CONCRETE COVER. SEE ACI FOR TOLERANCES:

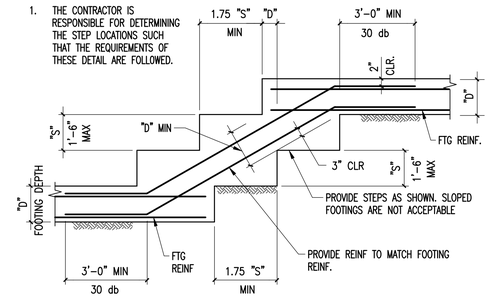
A. CONCRETE PILES	2 1/2"
B. CONCRETE POURED AGAINST EARTH (OTHER THAN PILES)	3"
C. CONCRETE NOT FORMED IN CONTACT WITH EARTH	3"
D. FORMED CONCRETE IN CONTACT WITH EARTH	2"
E. CONCRETE EXPOSED TO WEATHER (#6 AND LARGER)	2"
F. CONCRETE EXPOSED TO WEATHER (#5 AND SMALLER)	1-1/2"
G. SLABS (INCLUDING SLAB SUPPORTING EARTH), WALLS, AND JOISTS NOT EXPOSED TO WEATHER (#11 AND SMALLER)	1"
H. OTHER CONCRETE NOT EXPOSED TO WEATHER	1-1/2"

5. #5 AND LARGER REINFORCING BARS SHALL NOT BE SPLICED EXCEPT AS LOCATED AND DETAILED ON THE DRAWINGS. #4 AND SMALLER BARS WITH LENGTHS NOT SHOWN SHALL BE CONTINUOUS. PROVIDE CLASS 'B' SPLICE UNLESS NOTED OTHERWISE. ALL BARS IN MASONRY SHALL BE CONTINUOUS. LAPPING 48 BAR DIAMETERS, 2'-0" MINIMUM. HORIZONTAL WALL SPLICES SHALL BE STAGGERED. VERTICAL BARS SHALL NOT BE SPLICED EXCEPT AT HORIZONTAL SUPPORTS, SUCH AS FLOOR OR ROOF, UNLESS DETAILED OTHERWISE. ALL BARS ENDING AT THE FACE OF A WALL, COLUMN, OR BEAM SHALL EXTEND TO WITHIN 2" OF THE FAR FACE AND HAVE A 90 DEGREE HOOK, UNLESS OTHERWISE SHOWN.
6. BARS SHALL BE FIRMLY SUPPORTED AND ACCURATELY PLACED AS REQUIRED BY THE ACI STANDARDS, USING TIE AND SUPPORT BARS IN ADDITION TO REINFORCEMENT SHOWN WHERE NECESSARY FOR FIRM AND ACCURATE PLACING. PROVIDE DOWELS TO MATCH ALL REINFORCEMENT AT POUR JOINTS, UNLESS SHOWN OR NOTED OTHERWISE. ALL DOWELS AND BOLTS SHALL BE ACCURATELY SET IN PLACE BEFORE PLACING CONCRETE. NO WELDING OF REINFORCEMENT (INCLUDING TACK WELDING) SHALL BE DONE UNLESS SHOWN ON THE DRAWINGS OR APPROVED BY THE ENGINEER. ALL SLAB AND BEAM REINFORCEMENT SHALL BE CHAIRED UP.
7. IN WALL REINFORCING, CURTAINS CONTAINING VERTICAL AND HORIZONTAL BARS OF THE SAME SIZE, VERTICAL BARS SHALL BE PLACED CLOSEST TO THE WALL SURFACE. IN CURTAINS WHICH VERTICAL AND HORIZONTAL BARS ARE OF DIFFERENT SIZES OR SPACING, THE LAYER WITH THE MOST STEEL SHALL BE PLACED CLOSEST TO THE NEAR SURFACE, UNLESS NOTED OTHERWISE ON PLAN.
8. ALL BARS INTERRUPTED BY STRUCTURAL STEEL SHALL EXTEND TO WITHIN 1" OF STRUCTURAL STEEL FLANGE OR WEB AND HAVE A 90 DEGREE HOOK, UNLESS OTHERWISE SHOWN.
9. DRAWINGS SHOW TYPICAL REINFORCING CONDITIONS. CONTRACTOR SHALL PREPARE DETAILED PLACEMENT DRAWINGS OF ALL CONDITIONS SHOWING QUANTITY, SPACING, SIZES, CLEARANCES, LAPS, INTERSECTIONS, AND COVERAGE REQUIRED BY THE STRUCTURAL DETAILS, APPLICABLE CODE, AND TRADE STANDARDS. CONTRACTOR SHALL NOTIFY REINFORCING INSPECTOR OF ANY ADJUSTMENTS FROM TYPICAL CONDITIONS WHICH ARE PROPOSED IN PLACEMENT DRAWINGS TO FACILITATE FIELD PLACEMENT OF REINFORCING STEEL AND CONCRETE.
10. ALL PRINCIPAL REBAR SHALL TERMINATE WITH A STANDARD HOOK MINIMUM UNLESS SPECIFICALLY DETAILED OT

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

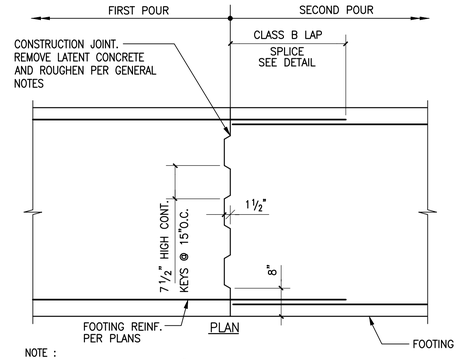
NOTES:

1. THE CONTRACTOR IS RESPONSIBLE FOR DETERMINING THE STEP LOCATIONS SUCH THAT THE REQUIREMENTS OF THESE DETAIL ARE FOLLOWED.



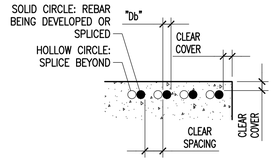
LEGEND:
db = BAR DIAMETER.

TYP. STEPPED FOOTING DETAIL (10 / -)
SCALE: N.T.S.

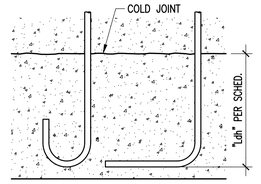


NOTE :
WELDED SPLICES REQUIRED FOR #14 AND LARGER BARS. WHERE CONTINUOUS FOOTING IS UNDER A WALL, LOCATE CONSTRUCTION JOINT AT 1/4 OF THE CLEAR OPENING WIDTH ABOVE FROM FACE OF OPENING, OR IN MIDDLE 1/3 OF THE DISTANCE BETWEEN COLUMNS.

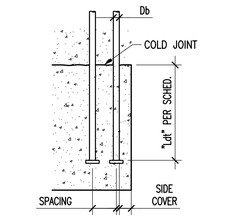
CONT. FTG. CONSTRUCTION JOINT (7 / -)
SCALE: N.T.S.



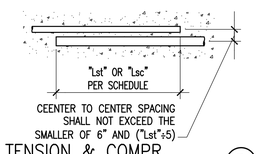
CLEAR COVER & CLEAR SPACING (A)



DEVELOPMENT OF STANDARD HOOK "Ldh" (B)



DEVELOPMENT OF HEADED BAR "Ldt" (C)



TENSION & COMPR. LAP SPLICE "Lst" & "Lsc" (D)

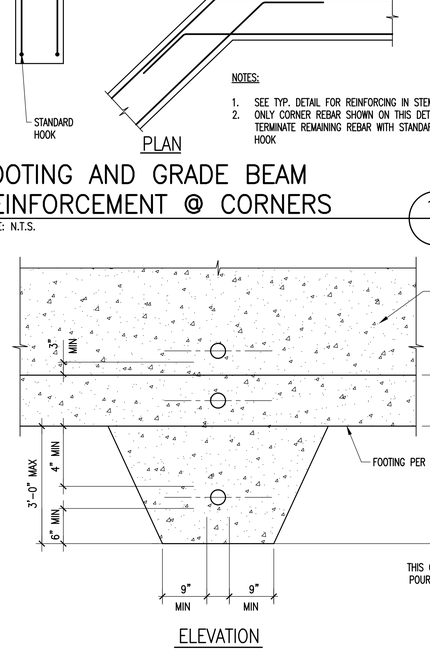
		DEVELOPMENT OF LONGITUDINAL REBAR (IN) SEE MODIFICATION FACTORS PER NOTE 2																LAP SPLICE OF LONGITUDINAL REBAR (IN) SEE MODIFICATION FACTORS PER NOTE 2																	
		TENSION DEVEL. LENGTH "Ld"						DEVEL. LENGTH "Ldh" STD HOOK						DEVEL. LENGTH "Ldt" HEADED BARS						COMPRESSION DEVEL. LENGTH "Ldc"						TENSION LAP SPLICE "Lst"												COMPRESSION LAP SPLICE "Lsc"			
																		CLASS A				CLASS B (2)				REDUCED CLASS B(2)				REBAR GRADE KSI			
																														60	75	80	100
"Db" (IN)	f'c NORMAL WEIGHT (PSI)	3,000	3,500	4,000	4,500	5,000	6,000	3,000	3,500	4,000	4,500	5,000	6,000	3,000	3,500	4,000	4,500	5,000	6,000	3,000	3,500	4,000	4,500	5,000	6,000	3,000	3,500	4,000	4,500	5,000	6,000	LESS THAN 3,000	3,000 AND HIGHER		
0.375	#3	17	16	15	14	13	12	6	6	6	6	6	6	7	7	6	6	6	6	8	8	8	8	8	8	22	20	19	18	17	16	–	–	–	–
0.500	#4	22	21	19	18	17	17	8	8	7	7	6	6	9	9	8	8	7	7	9	8	8	8	8	8	29	27	25	24	23	22	–	–	–	–
0.625	#5	28	26	24	23	22	21	10	9	9	8	8	8	11	11	10	9	9	8	11	10	9	9	8	8	36	33	31	30	28	27	–	–	–	–
0.750	#6	33	31	29	27	26	25	14	12	11	10	10	9	14	13	12	11	11	10	13	12	11	11	10	10	43	40	37	35	34	32	31	33	31	29
0.875	#7	48	45	42	40	38	36	19	14	13	12	11	11	19	16	15	14	13	12	15	14	13	12	12	11	63	58	54	51	49	47	45	49	45	42
1.000	#8	55	51	48	45	43	41	39	16	15	14	13	12	19	18	17	16	15	14	17	16	15	14	14	14	72	66	62	59	56	53	51	57	53	50
1.128	#9	62	58	54	51	48	46	44	18	17	15	15	14	20	19	18	17	16	15	19	18	17	16	15	15	81	75	70	66	63	60	57	66	61	57
1.270	#10	70	65	61	57	54	52	50	20	19	17	16	16	23	21	20	19	18	17	21	20	19	18	17	17	91	84	79	74	71	67	64	74	68	64
1.410	#11	78	72	67	64	60	58	55	22	21	19	18	17	25	23	22	21	20	19	24	22	21	19	19	19	101	93	87	82	78	75	71	84	76	71
1.693	#14	93	86	81	76	72	69	66	26	25	23	22	21	20	19	NOT ALLOWED				28	26	25	23	23	23	LAP SPLICE NOT ALLOWED SEE NOTES									
2.257	#18	124	115	108	101	96	92	88	35	33	30	29	27	26	25					38	35	33	31	30	30										

CLASS "A" LAP SPLICE LENGTHS SHALL BE SAME AS "Ld"
CLASS "B" LAP SPLICE LENGTHS SHALL BE SAME AS "Lst"
U.N.O. ALL BARS SHALL BE CLASS "B"

NOTES:

1. REBAR SHALL BE ALWAYS DEVELOPED ACROSS COLD JOINTS. SPLICES SHALL OCCUR ONLY WHERE SHOWN ON DETAILS. UNLESS OTHERWISE NOTED ELSEWHERE IN THE DRAWING SET, THE FOLLOWING SHALL APPLY:
   A. MIN DEVELOPMENT LENGTH ACROSS A COLD JOINT OF STRAIGHT REBAR SHALL BE "Ld"
   B. MIN DEVELOPMENT LENGTH ACROSS A COLD JOINT OF HOOKED REBAR SHALL BE "Ldh"
   C. LAP SPLICE SHALL BE CLASS B TENSION LAP SPLICE "Lst"
2. ALL THE DEVELOPMENT LENGTHS AND LAP SPLICES SHALL BE MODIFIED AS FOLLOWS:
   A. CASTING POSITION: IF MORE THAN 12 IN OF FRESH CONCRETE IS PLACED BELOW HORIZONTAL TOP REBAR, SCHEDULED VALUES OF "Ld" AND "Lst" SHALL BE MULTIPLIED BY 1.3.
   B. LIGHT WEIGHT CONCRETE: IF LIGHT WEIGHT CONCRETE IS USED, ALL THE DEVELOPMENT LENGTHS AND TENSION LAP SPLICE SCHEDULED VALUES SHALL BE MULTIPLIED BY 1.33. HEADED BARS ARE NOT ALLOWED IN LIGHT WEIGHT CONCRETE. COMPRESSION LAP SPLICE "Lsc" DO NOT NEED TO BE INCREASED
   C. GRADE OF STEEL: EXCEPT "Lsc", SCHEDULED LENGTHS APPLY TO REBAR WITH GRADE 60 KSI. WHERE REBAR WITH HIGHER STRENGTH IS SPECIFIED OR APPROVED AS A SUBSTITUTION, THE SPLICES PER TABLE ABOVE SHALL BE INCREASED PROPORTIONALLY TO THE HIGHER STRENGTH. FOR EXAMPLE, FOR GRADE 80, THE LENGTHS SHALL BE MULTIPLIED BY 80/60 = 1.33. HEADED BARS WITH GRADE GREATER THAN 60 KSI SHALL NOT BE PERMITTED.
   D. EPOXY COATING: SCHEDULED LENGTHS APPLY TO UNCOATED OR ZINC COATED (GALVANIZED) REBAR. IF EPOXY COATING IS SPECIFIED, SCHEDULED VALUED SHALL BE MULTIPLIED BY 1.2 FOR "Ldh", "Ldt" AND BY 1.5 FOR "Ld", "Lst". Ldc AND Lsc DO NOT NEED TO BE INCREASED:
   E. CONFINEMENT: SCHEDULED VALUES OF "Ld" AND "Lst" SHALL BE MULTIPLIED BY 1.5 FOR:
      - MEMBERS WITH TIES (SUCH AS COLUMNS, PILES, BEAMS, ETC.) WITH LONGITUDINAL REBAR WITH "CLEAR COVER" LESS THAN "Db" OR WITH "CLEAR SPACING" LESS THAN "Db"
      - MEMBERS WITHOUT TIES (SUCH AS WALLS, SLAB, FOOTINGS, ETC.) WITH LONGITUDINAL REBAR WITH "CLEAR SPACING" LESS THAN 2 x "Db" SCHEDULED VALUES OF "Lsc" SHALL BE MULTIPLIED BY 1.33 WHEN OCCURRING AT WALLS
3. HEADED DEFORMED BARS SHALL BE PERMITTED IF ALL FOLLOWING CONDITIONS ARE MET (SEE INSET DETAIL):
   - PROVIDE HRC555 HEADED DEFORMED BAR (RESEARCH REPORT ER 177) OR APPROVED EQUIVALENT
   - SIDE COVER IS AT LEAST 2xDb
   - REBAR SPACING IS AT LEAST 4xDb
4. WHERE REBAR OF DIFFERENT SIZE ARE LAP SPLICED, FOLLOWING SHALL APPLY:
   A. LAP SPLICE SHALL BE THE GREATER OF Ld OF LARGER BAR AND Lst OF SMALLER BAR (TENSION)
   B. LAP SPLICE SHALL BE THE GREATER OF Ldc OF LARGER BAR AND Lsc OF SMALLER BAR (COMPRESSION).
   C. TENSION SHALL BE ASSUMED UNLESS NOTED OTHERWISE ELSEWHERE IN THIS SET.
5. FOR LAP OF BUNDLED REBAR CONTACT E.O.R.
6. LAP SPLICE FOR #14 AND #18 ARE NOT ALLOWED. PROVIDE MECHANICAL OR WELDED SPLICES DEVELOPING 1.25Fy FOR THESE SPLICES. SUBMIT SELECTED SPLICE SYSTEM TO E.O.R. FOR APPROVAL.
7. REDUCED CLASS B LAP SPLICE SHALL APPLY AT COLUMNS AND SHEAR WALL BOUNDARY MEMBERS WHERE SPECIFICALLY IDENTIFIED ON DRAWINGS

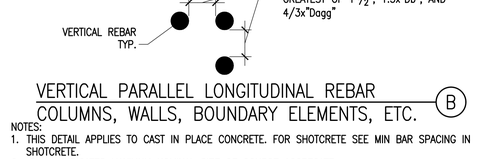
DEVELOPMENT AND SPLICE OF REBAR IN CONCRETE (2 / -)
SCALE: N.T.S.



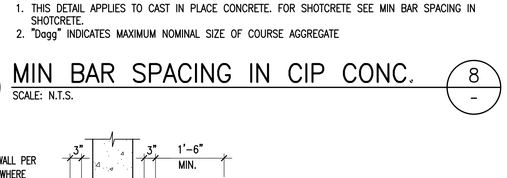
NOTES:

1. SEE TYP. DETAIL FOR REINFORCING IN STEM WALL
2. ONLY CORNER REBAR SHOWN ON THIS DETAIL. TERMINATE REMAINING REBAR WITH STANDARD HOOK

FOOTING AND GRADE BEAM REINFORCEMENT @ CORNERS (11 / -)
SCALE: N.T.S.



HORIZONTAL PARALLEL LONGITUDINAL REBAR BEAMS, SLABS, ETC. (A)



VERTICAL PARALLEL LONGITUDINAL REBAR COLUMNS, WALLS, BOUNDARY ELEMENTS, ETC. (B)

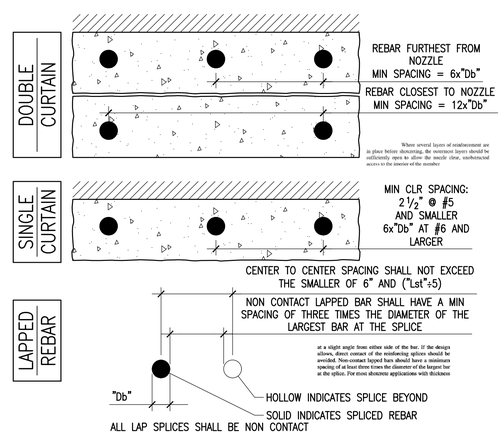
NOTES:
1. THIS DETAIL APPLIES TO CAST IN PLACE CONCRETE. FOR SHOTCRETE SEE MIN BAR SPACING IN SHOTCRETE.
2. "Dagg" INDICATES MAXIMUM NOMINAL SIZE OF COURSE AGGREGATE

MIN BAR SPACING IN CIP CONC. (8 / -)
SCALE: N.T.S.

NOTES:

1. THIS DETAIL ADDRESSES DISPLACEMENT OF CONCRETE TO ALLOW FOR PIPE THRU FOOTINGS AND STEM WALLS. REFER TO PLUMBING ENGINEER/INSTALLER FOR SLEEVES OR COMPRESSIBLE WRAPS ETC. TO PREVENT DIRECT CONTACT OF PIPE WITH CONCRETE PER PLUMBING CODE.
2. PENETRATIONS THRU FOOTING SHALL BE ALLOWED ONLY IF ALL FOLLOWING ARE VERIFIED:
   A. FOOTING THICKNESS IS 24" OR MORE
   B. A MIN THICKNESS OF 8" CONCRETE ABOVE OR BELOW PIPE IS MAINTAINED
   C. POSTS, COLUMNS, AND HOLDOWNS, DO NOT LAND WITHIN 24" ON EITHER SIDE OF PENETRATION
   D. REBAR ARE NOT DISPLACED

TYP. PIPE THRU FOUNDATION DETAIL (9 / -)
SCALE: N.T.S.



MIN BAR SPACING IN SHOTCRETE (6 / -)
SCALE: N.T.S.

STANDARD HOOK GEOMETRY FOR LONGITUDINAL REBAR

TYPE OF STANDARD HOOK	BAR SIZE	MIN. INSIDE BENDING DIAMETER	STRAIGHT EXTENSION ℓ_{ext}	TYPE OF STANDARD HOOK
90° HOOK	#3 THRU #8	6d_b	12d_b	90°, DIA, ℓ_{ext}, ℓ_{dh}
	#9 THRU #11	8d_b		
	#14 AND #18	10d_b		
135° HOOK	NA			
180° HOOK	#3 THRU #8	6d_b	GREATER OF 4d_b AND 2½"	180°, DIA, ℓ_{ext}, ℓ_{dh}
	#9 THRU #11	8d_b		
	#14 AND #18	10d_b		

STANDARD HOOK GEOMETRY FOR STIRRUPS, TIES, AND HOOKS

BAR SIZE	MIN. INSIDE BENDING DIAMETER	STRAIGHT EXTENSION ℓ_{ext}	TYPE OF STANDARD HOOK
#3 THRU #5	4d_b	GREATER OF 6d_b AND 3"	90°, DIA, ℓ_{ext}
#6 THRU #8	6d_b	12d_b	
#3 THRU #5	4d_b	GREATER OF 6d_b AND 3"	135°, DIA, ℓ_{ext}
#6 THRU #8	6d_b		
#3 THRU #5	4d_b	GREATER OF 4d_b AND 2½"	180°, DIA, ℓ_{ext}
#6 THRU #8	6d_b		

STANDARD HOOKS (3 / -)
SCALE: N.T.S.

CITY OF LOS ANGELES
GARY LEE MOORE, P.E., ENV SP
CITY ENGINEER
DESIGN GROUP
DATE:
ENGINEER:
DESIGNED BY:
DRAWN BY:
CHECKED BY:
APPROVED BY:

LFA
Labib Funk + Associates
Structural | Civil Engineers
Burnett + Young
Shoring Engineers
319 Main Street
El Segundo, CA 90245
t: 213/ 239 9700
f: 213/ 239 9699
LFA #19927

CITY OF LOS ANGELES
DEPARTMENT OF PUBLIC WORKS
BUREAU OF ENGINEERING
VERTICAL CONTROL:
HORIZONTAL CONTROL:
SHEET TITLE: TYPICAL DETAILS
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

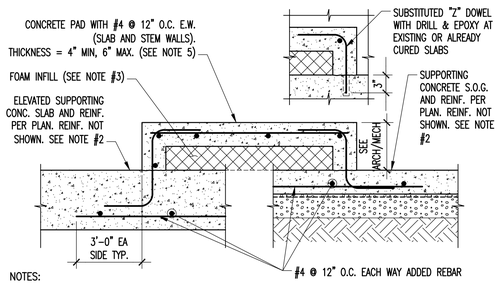
REGISTERED PROFESSIONAL ENGINEER FABIO ZANOZI No. 94491 CIVIL STATE OF CALIFORNIA
• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED
SIGN DATE: 11/10/2021

NO.	REVISIONS:	DATE:	BY:
1	100% DESIGN DEVELOPMENT	02/15/21	
2	50% CONSTRUCTION DOCUMENTS	03/30/21	
3	100% CONSTRUCTION DOCUMENTS - PERMIT SET	11/10/21	

CIP NO.
INDEX NO.
WORK ORDER NO. E170121B
SHEET NAME S1.01
SHEET X OF X SHEETS

REVISION DATES (DESIGN STAGES ONLY)

Sheet Version 4.0

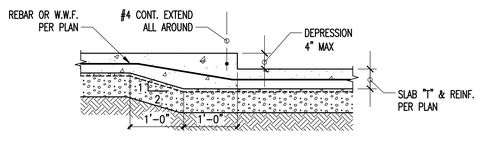


NOTES:

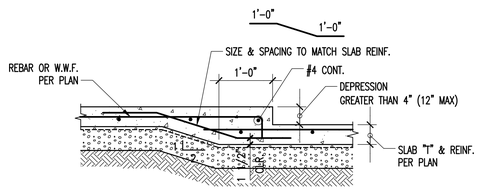
1. THIS DETAIL ADDRESSES THE CONSTRUCTION OF CONCRETE MECHANICAL AND HOUSEKEEPING PAD.
2. SUPPORTING SLAB:
   - SLAB ON GRADE: THIS DETAIL CAN BE UTILIZED AT ALL LOCATIONS
   - ELEVATED SLAB: THIS DETAIL CAN BE UTILIZED ONLY WHERE EXPRESSLY INDICATED ON THE STRUCTURAL FLOOR PLANS. IF NOT SHOWN, OBTAIN S.E.O.R. APPROVAL PRIOR TO ERECTION
3. AT CONTRACTOR'S DISCRETION, FOAM CAN BE SUBSTITUTED WITH CONCRETE IF THE SUPPORTING SLAB IS ON GRADE. THIS SUBSTITUTION IS NOT ALLOWED FOR ELEVATED SUPPORTING SLAB.
4. CONCRETE PAD CONFIGURATION, ANCHOR BOLT SIZE, PROJECTION AND LOCATION SHALL CONFORM TO EQUIPMENT MANUFACTURER'S REQUIREMENTS.
5. THICKEN PAD AS REQUIRED FOR HOLD-DOWN ANCHOR EMBEDMENT.

MECH. PAD FOR LIGHT EQUIPMENT 10/-

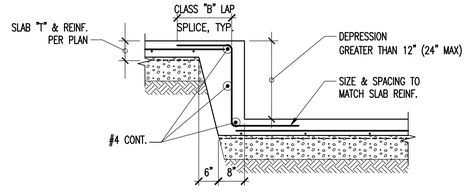
SCALE: N.T.S.



DEPRESSION <=4" A



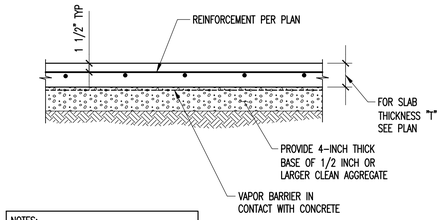
DEPRESSION >4" & <=12" B



DEPRESSION >12" & <=24" C

SLAB ON GRADE DEPRESSION 5/-

SCALE: N.T.S.

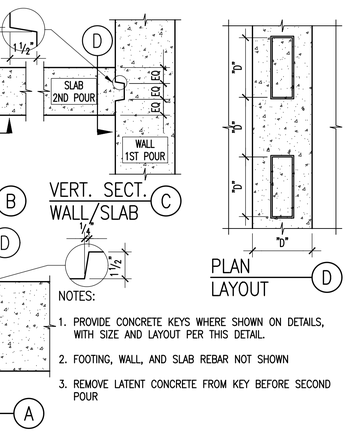


NOTES:
1. SEE SOILS REPORT FOR ADDITIONAL SUBGRADE PREPARATION REQUIREMENTS
2. VAPOR BARRIERS SPECS NOT PER JLA

TYPICAL SLAB ON GRADE 1/-

SCALE: N.T.S.

CONTROL JOINT
(WHERE CONTINOUS POUR IS USED) A

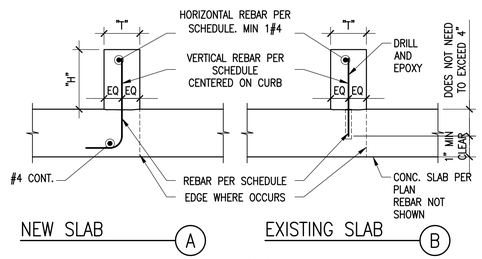


NOTES:

1. PROVIDE CONCRETE KEYS WHERE SHOWN ON DETAILS, WITH SIZE AND LAYOUT PER THIS DETAIL.
2. FOOTING, WALL, AND SLAB REBAR NOT SHOWN
3. REMOVE LATENT CONCRETE FROM KEY BEFORE SECOND POUR

KEY IN CONCRETE 12/-

SCALE: N.T.S.



NEW SLAB A EXISTING SLAB B

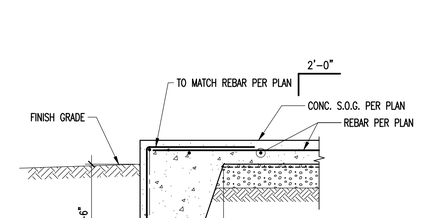
CURB SIZE AND REINF. SCHEDULE			
"H"	"T"	VERT.	HOR.
H≤6"	4"≤T≤8"	#3 @ 18" O.C.	NA
6"<H≤8"	6"≤T≤8"	#3 @ 18" O.C.	NA
8"<H≤18"	6"≤T≤8"	#4 @ 18" O.C.	#4 @ 12" O.C.

NOTES:

1. FOR CURB LOCATION, "T" AND "H" DIMENSIONS S.A.D. FOR SIZE LIMITATION AND REINFORCEMENT SEE SCHEDULE.
2. AT CONTRACTOR DISCRETION, CURB MAY BE POURED MONOLITHICALLY WITH SLAB. WHEN POURED SUBSEQUENTLY, OR AT (E) SLAB, ROUGHEN SLAB SURFACE PRIOR TO POUR CURB.
3. EXPANSIVE OR HYDROPHILIC WATERSTOPS AT CURBS ARE NOT ALLOWED

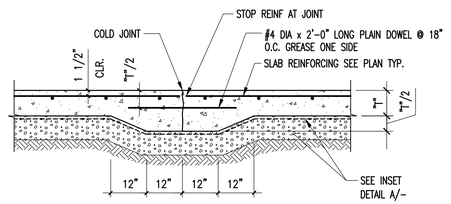
CONCRETE CURB DETAIL 9/-

SCALE: N.T.S.



SLAB ON GRADE EDGE DETAIL 6/-

SCALE: N.T.S.



TYPICAL CONSTRUCTION JOINT B

NOTES:

1. CONTROL JOINTS TO BE LOCATED AT COLUMN CENTER LINES AND AT 20'-0" O.C. MAX. AND EVERY 400 SQUARE FEET.
2. IF SAW-CUT CONTROL JOINT TO BE USED, SAW-CUT WITHIN 24 HOURS OF POUR.
3. SEE PLAN FOR "T".

JOINTS AT SLAB ON GRADE 3/-

SCALE: N.T.S.

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REVISION DATES (DESIGN STAGE ONLY)

Sheet Version 4.0

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

REGISTERED PROFESSIONAL ENGINEER FABIO ZANOLI No. 84491 CIVIL STATE OF CALIFORNIA

SIGN DATE: 11/10/2021

THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED

DEPARTMENT OF PUBLIC WORKS
BUREAU OF ENGINEERING

VERTICAL CONTROL:
HORIZONTAL CONTROL:
SHEET TITLE: TYPICAL DETAILS
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

NO.	REVISIONS:	DATE:	BY:
1	100% DESIGN DEVELOPMENT	02/15/21	
2	50% CONSTRUCTION DOCUMENTS	03/30/21	
3	100% CONSTRUCTION DOCUMENTS - PERMIT SET	11/10/21	

CIP NO.

INDEX NO.

CITY OF LOS ANGELES
GARY LEE MOORE, P.E., ENV SP — CITY ENGINEER
DESIGN GROUP — DATE:
ENGINEER:
DESIGNED BY:
DRAWN BY:
CHECKED BY:
APPROVED BY:

319 Main Street
El Segundo, CA 90245
t: 213/ 239 9700
f: 213/ 239 9699
LFA #19927

LFA Bunnett + Young Structural Engineers / Labib Funk + Associates Civil Engineers

WORK ORDER NO.
E170121B

SHEET NAME
S1.02
SHEET X OF X SHEETS

\\LFAFS2\DRAFTING19\19927 - RESEDA SKATE FACILITY\JLA S\S D\S101 - S104_19927.DWG 11/24/2021 10:43 AM

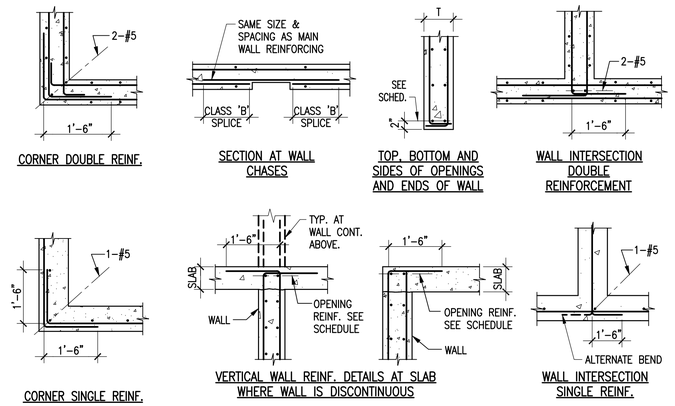
NOTES:

WHERE REINFORCING IS NOT SHOWN OTHERWISE ON SECTIONS, DETAILS OR WALL ELEVATIONS.

MINIMUM REINFORCEMENT IN CONCRETE WALLS		
WALL THICKNESS 'T'	REINFORCING EACH WAY	OPENING REINF.
6"	#4 @ 12" @ C.L.	1–#5
8"	#4 @ 10" @ C.L.	2–#5
10"	#4 @ 16" E.F.	2–#6
12"	#4 @ 12" E.F.	2–#6
14"	#4 @ 12" E.F.	2–#7
16"	#5 @ 15" E.F.	2–#7
18"	#5 @ 14" E.F.	2–#8
20"	#5 @ 12" E.F.	2–#8

NOTES:

1. FOR PLACEMENT OF VERTICAL BARS RELATIVE TO HORIZONTAL BARS, SEE REINFORCING NOTES IN GENERAL NOTES.
2. MAXIMUM OPENING 8'–0".



TYPICAL CONCRETE WALL DETAILS

SCALE: N.T.S.

1
–

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REVISION DATES (DESIGN STAGE ONLY)

Sheet Version 4.0

LFA
Labib Funk + Associates
Structural | Civil Engineers
Burnett + Young
Shoring Engineers
319 Main Street
El Segundo, CA 90245
t: 213/ 239 9700
f: 213/ 239 9699
LFA #19927

CITY OF LOS ANGELES

GARY LEE MOORE, P.E., ENV SP

CITY ENGINEER

DESIGN GROUP

DATE:

ENGINEER:

DESIGNED BY:

DRAWN BY:

CHECKED BY:

APPROVED BY:

DEPARTMENT OF PUBLIC WORKS

NO.	REVISIONS:	DATE:	BY:
	100% DESIGN DEVELOPMENT	02/15/21	
	50% CONSTRUCTION DOCUMENTS	03/30/21	
	100% CONSTRUCTION DOCUMENTS - PERMIT SET	11/10/21	

INDEX NO.

CIP NO.

BUREAU OF ENGINEERING

VERTICAL CONTROL:

HORIZONTAL CONTROL:

SHEET TITLE: TYPICAL DETAILS

PROJECT: RESEDA SKATE FACILITY

ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED

REGISTERED PROFESSIONAL ENGINEER
FABIO ZANGOLI
No. 64191
CIVIL
STATE OF CALIFORNIA

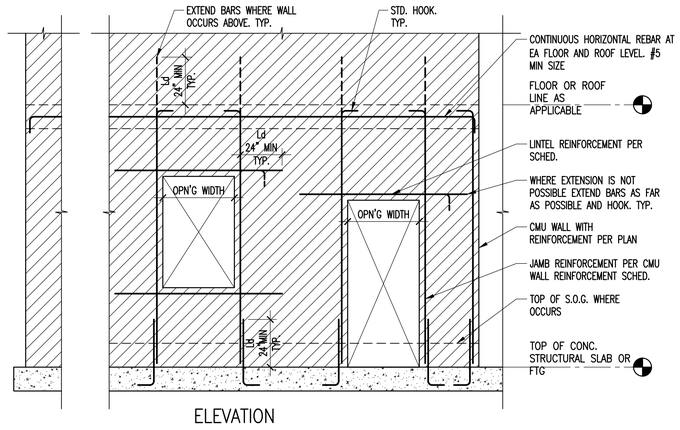
SIGN DATE: 11/10/2021

WORK ORDER NO.
E170121B

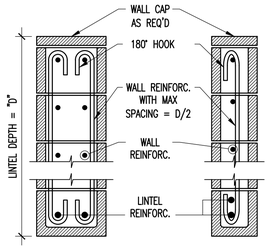
SHEET NAME
S1.03

SHEET X OF X SHEETS

\\LFAFS2\DRAFTING19\19927 - RESEDA SKATE FACILITY\JLA S\S D\S101 - S104_19927.DWG 11/24/2021 10:43 AM



ELEVATION

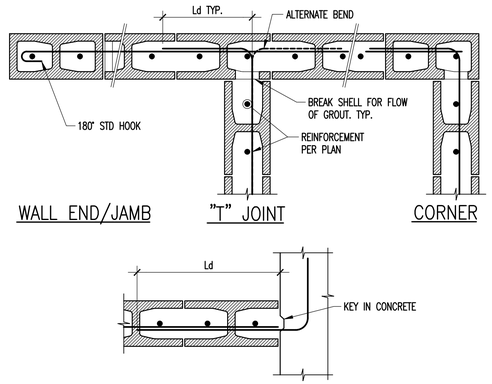


LINTEL REINFORCEMENT SCHEDULE

OPN'G WIDTH	MIN. DEPTH "D"	REINFORCEMENT
UP TO 5'-0"	12"	2-#4
5'-1" TO 7'-0"	18"	2-#5
7'-1" TO 10'-0"	24"	2-#6

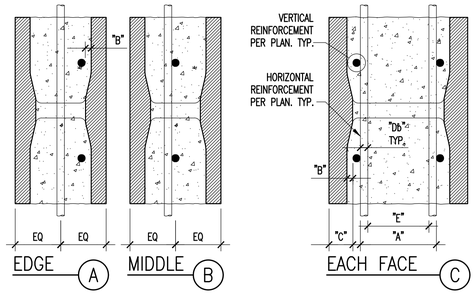
TYP. MINIMUM REINFORCING AT CMU WALL OPENINGS & LINTEL DETAIL (7)

SCALE: N.T.S.



"T" JOINT @ CONC. WALL

ONE LAYER OF REBAR (B)

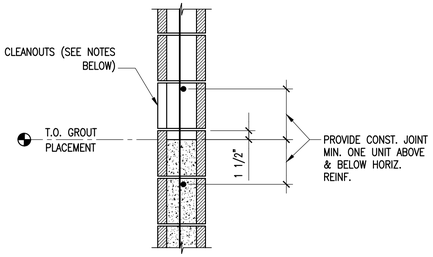


A = MIN. CLEAR SPACING AT VERT. REINF. = 1 1/2" OR 1 1/2 x "Db" WHICHEVER IS LARGER
B = 1/2" MIN
C = MIN. CLEAR COVER:
- EXPOSED TO EARTH/WEATHER: 1 1/2" FOR #5 OR SMALLER, 2" FOR #6 OR LARGER
- NOT EXPOSED TO EARTH/WEATHER: 1 1/2"

"Db" = DIAMETER OF LARGER BAR
E = MIN. CLEAR SPACING AT HORIZ. REINF. = 1" OR "Db" WHEREVER IS LARGER

TYP. REINF. PLACEMENT IN CMU (1)

SCALE: N.T.S.

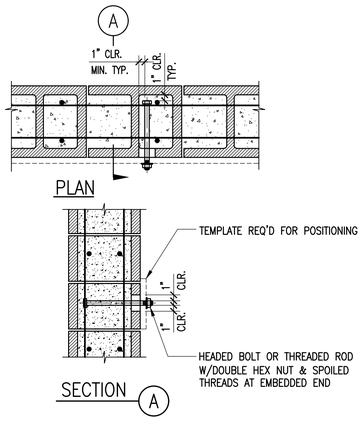


NOTES:

1. PROVIDE CONSTRUCTION JOINTS WHEN GROUTING IS STOPPED FOR MORE THAN 1 HOUR
2. PROVIDE CLEANOUTS IN THE BOTTOM COURSE OF MASONRY FOR FOR EACH GROUT POUR WHEN GROUT POUR HEIGHT EXCEED 5'-0"
3. PROVIDE CLEANOUTS AT EVERY VERTICAL REBAR, BUT NOT MORE THAN 32" O.C.
4. CONSTRUCT CLEANOUTS WITH AN OPENING OF SUFFICIENT SIZE TO PERMIT REMOVAL OF DEBRIS. THE MINIMUM OPENING DIMENSION SHALL BE 3 IN

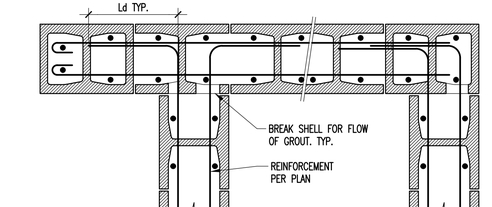
HORIZONTAL CONSTRUCTION JOINT AND CLEANOUTS (11)

SCALE: N.T.S.

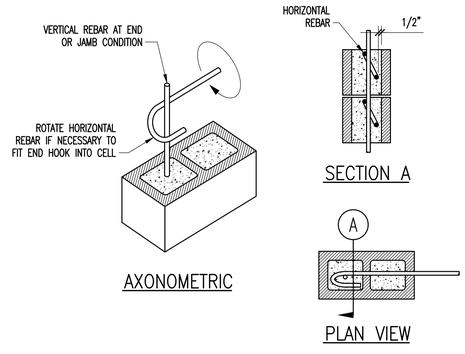


EMBEDDED BOLTS (8)

SCALE: N.T.S.



TWO LAYERS OF REBAR (A)



CMU END AND INTERSECTION DET. (5)

SCALE: N.T.S.

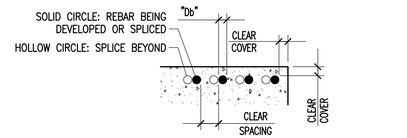
HOOK ARRANGEMENT AT WALL END (2)

SCALE: N.T.S.

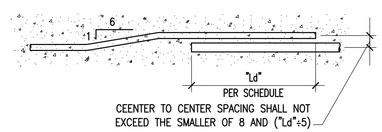
BAR GRADE 60	STANDARD HOOK GEOMETRY FOR LONGITUDINAL REBAR				STANDARD HOOK GEOMETRY FOR STIRRUPS, TIES, AND HOOKS			
TYPE OF STANDARD HOOK	BAR SIZE	MIN. INSIDE BENDING DIAMETER	STRAIGHT EXTENSION ℓ_{ext}	TYPE OF STANDARD HOOK	BAR SIZE	MIN. INSIDE BENDING DIAMETER	STRAIGHT EXTENSION ℓ_{ext}	TYPE OF STANDARD HOOK
90° HOOK	#3 THRU #8	6d_b	12d_b	90°, DIA, ℓ_{ext}, ℓ_{dh}	#3 THRU #5	4d_b	GREATER OF 6d_b AND 2 1/2"	90°, DIA, ℓ_{ext}
	#9 THRU #11	8d_b			#6 THRU #8	6d_b	6d_b	
135° HOOK	NA				#3 THRU #5	4d_b	6d_b	135°, DIA, ℓ_{ext}
					#6 THRU #8	6d_b		
180° HOOK	#3 THRU #8	6d_b	GREATER OF 4d_b AND 2 1/2"	180°, DIA, ℓ_{ext}, ℓ_{dh}	#3 THRU #5	6d_b	GREATER OF 4d_b AND 2 1/2"	180°, DIA, ℓ_{ext}
	#9 THRU #11	8d_b	4d_b		#6 THRU #8	6d_b		

STANDARD HOOKS IN MASONRY (9)

SCALE: N.T.S.



CLEAR COVER & CLEAR SPACING (A)



OFFSET, DEVEL./TENSION LAP SPLICE "Ld" (B)

DEVELOPMENT LENGTH / LAP SPLICE "Ld" OF LONGITUDINAL REBAR (IN)

CMU BLOCK SIZE		6" BLOCK						8" BLOCK						12" BLOCK		
BAR PLACEMENT		EDGE/ONE SIDE			MIDDLE			EDGE/ONE SIDE			MIDDLE			EACH FACE		
"Db" (IN)	f'm CMU (PSI)	1,900	2,500	3,000	1,900	2,500	3,000	1,900	2,500	3,000	1,900	2,500	3,000	1,900	2,500	3,000
0.375	#3	17	15	14	12	12	12	15	13	12	12	12	12	15	13	12
0.500	#4	30	26	24	20	17	16	26	23	21	14	12	12	26	23	21
0.625	#5	47	41	28	32	28	26	40	35	32	22	20	18	40	35	32
0.750	#6	88	77	70	64	56	51	75	66	60	43	38	34	75	66	60
0.875	#7	119	104	95	92	81	74	102	89	81	61	53	49	102	89	81
1.000	#8	179	156	143	149	130	118	154	134	123	96	84	76	154	134	123
1.128	#9	228	199	182	203	177	162	196	171	156	128	111	102	196	171	156

REBAR

NOTES:

1. LENGTHS SHOWN ARE FOR GRADE 60 UNCOATED BARS.
   A. GRADE OF STEEL: WHERE REBAR WITH HIGHER STRENGTH IS SPECIFIED OR APPROVED AS A SUBSTITUTION, THE SPLICES PER TABLE ABOVE SHALL BE INCREASED PROPORTIONALLY TO THE HIGHER STRENGTH. FOR EXAMPLE, FOR GRADE 80, THE LENGTHS SHALL BE MULTIPLIED BY 80/60 = 1.33.
   B. EPOXY COATING: SCHEDULED LENGTHS APPLY TO UNCOATED OR ZINC COATED (GALVANIZED) REBAR. IF EPOXY COATING IS SPECIFIED, SCHEDULED VALUED SHALL BE MULTIPLIED BY 1.5.
2. WHERE REBAR OF DIFFERENT SIZE ARE DEVELOPED OR LAP SPLICED, DEVELOPMENT LENGTH OR LAP SPLICE SHALL BE THE "Ld" OF LARGER BAR.
3. BAR BUNDLES ARE NOT ALLOWED.
4. HOOKED BARS: DEVELOPMENT LENGTH "Ldh" SHALL BE EQUAL TO 13 x "Db".
5. FOR INTERMEDIATE f'm VALUES, USE "Ld" FOR THE LOWER f'm.

DEVELOPMENT AND SPLICE OF REBAR IN MASONRY (3)

SCALE: N.T.S.

12

LFA
Labib Funk + Associates
Structural | Civil Engineers
Burnett + Young
Storing Engineers
319 Main Street
El Segundo, CA 90245
t: 213/ 239 9700
f: 213/ 239 9699
LFA #19927

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

REGISTERED PROFESSIONAL ENGINEER
FABIO ZANOZI
No. 34491
CIVIL
STRUCTURAL
STATE OF CALIFORNIA

SIGN DATE: 11/10/2021

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED •

BUREAU OF ENGINEERING

VERTICAL CONTROL:
HORIZONTAL CONTROL:
SHEET TITLE: TYPICAL DETAILS
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

DEPARTMENT OF PUBLIC WORKS

NO.	REVISIONS:	DATE:	BY:
1	100% DESIGN DEVELOPMENT	02/15/21	
2	50% CONSTRUCTION DOCUMENTS	03/30/21	
3	100% CONSTRUCTION DOCUMENTS - PERMIT SET	11/10/21	

CIP NO.

INDEX NO.

CITY OF LOS ANGELES

CITY ENGINEER
GARY LEE MOORE, P.E., ENV SP
DATE:
DESIGN GROUP
ENGINEER:
DESIGNED BY:
DRAWN BY:
CHECKED BY:
APPROVED BY:

WORK ORDER NO.
E170121B

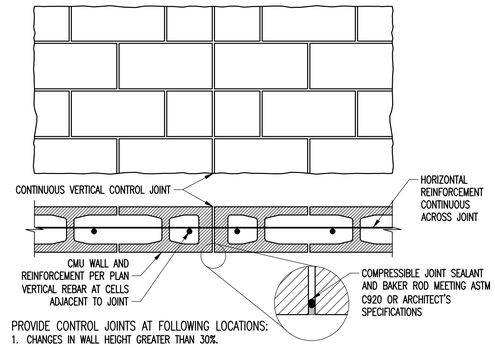
SHEET NAME
S1.11
SHEET X OF X SHEETS

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REVISION DATES (DESIGN STAGE ONLY)

Sheet Version 4.0

\\LFAFS2\DRAFTING19\19927 - RESEDA SKATE FACILITY\JLA S\S D\S111 - S112_19927.DWG 11/24/2021 10:43 AM

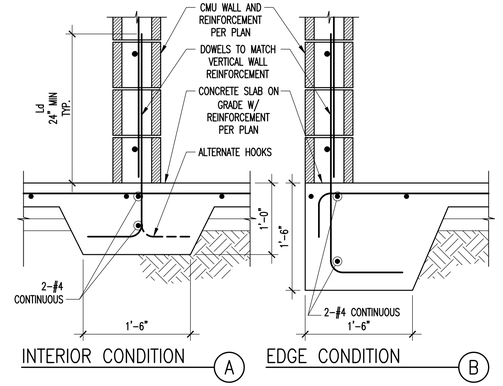


PROVIDE CONTROL JOINTS AT FOLLOWING LOCATIONS:

1. CHANGES IN WALL HEIGHT GREATER THAN 30%.
2. CHANGES IN WALL THICKNESS.
3. 2'-0" ONE SIDE OF OPENING LESS THAN OR EQUAL TO 6'-0" IN WIDTH.
4. 2'-0" EACH SIDE OF OPENING GREATER THAN 6'-0" IN WIDTH.
5. ADJACENT TO CORNERS OR WALL INTERSECTIONS WITHIN A DISTANCE EQUAL TO 1/2 CONTROL JOINT SPACING.
6. CONTROL JOINT SPACING, UNLESS DETERMINED BY ABOVE CRITERIA, IS 26'-0" MAX FOR BUILDING WALLS.
7. CONTROL JOINT SHALL BE COORDINATED WITH ARCHITECTURAL BLOCK PATTERN.

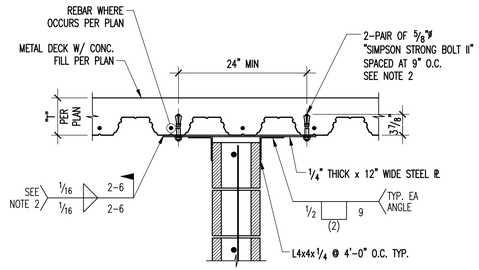
CONTINUOUS CONTROL JOINT — 4/-

SCALE: N.T.S.



NON BEARING CMU ON S.O.G. — 1/-

SCALE: N.T.S.



NOTES:
1. PROVIDE STAINLESS STEEL ANCHORS FOR EXTERIOR APPLICATIONS
2. CONNECT STEEL ℄ TO METAL DECK AND CONCRETE FILL WITH EITHER:
- TWO PAIRS OF EXPANSION ANCHORS AS SHOWN IF "T" IS EQUAL OR MORE THAN 6 1/4"
OR
- STITCH WELDS AS SHOWN IF "T" IS LESS THAN 6 1/4"

NON BEARING CMU – TOP OF WALL AT METAL DECK WITH CONC. FILL PARALLEL TO CORRUGATIONS — 5/-

SCALE: N.T.S.

MINIMUM REINFORCEMENT IN CONCRETE BLOCK WALL UNLESS NOTED OTHERWISE ON PLANS			
WALL THICKNESS	HORIZONTAL REINFORCING	VERTICAL REINFORCING	JAMB, HEAD, SILL & END OF WALL REINF
6" BLOCK	#4 @ 24" O.C.	#4 @ 24" O.C.	1–#5
8" BLOCK	#4 @ 24" O.C.	#5 @ 16" O.C.	2–#6
12" BLOCK	#4 @ 24" E.F.	#5 @ 16" E.F.	2–#6

BLOCK WALL REINF. SCHEDULE — 2/-

SCALE: N.T.S.

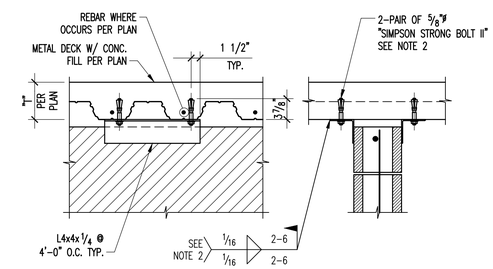
Table 1.18.2 — Level B Quality Assurance

MINIMUM TESTS		
Verification of Slump flow and VSI as delivered to the site in accordance with Article 1.5 B.1.b.3 for self-consolidating grout		
Verification of f'_m and f'_{AAC} prior to construction, except where specifically exempted by this Code		
MINIMUM INSPECTION		
Inspection Task	**Frequency (a)**	
	Continuous	Periodic
1. Verify compliance with the approved submittals		X
2. As masonry construction begins, verify that the following are in compliance:		
a. Proportions of site-prepared mortar		X
b. Construction of mortar joints		X
c. Grade and size of prestressing tendons and anchorages		X
d. Location of reinforcement, connectors, and prestressing tendons and anchorages		X
e. Prestressing technique		X
3. Prior to grouting, verify that the following are in compliance:		
a. Grout space		X
b. Grade, type, and size of reinforcement and anchor bolts, and prestressing tendons, and anchorages		X
c. Placement of reinforcement, connectors, and prestressing tendons and anchorages		X
d. Proportions of site-prepared grout and prestressing grout for bonded tendons		X
e. Construction of mortar joints		X
4. Verify during construction:		
a. Size and location of structural elements		X
b. Type, size, and location of anchors, including other details of anchorage of masonry to structural members, frames, or other construction		X
c. Welding of reinforcement	X	
d. Preparation, construction, and protection of masonry during cold weather (temperature below 40°F (4.4°C)) or hot weather (temperature above 90°F (32.2°C))		X
e. Application and measurement of prestressing force	X	
f. Placement of grout and prestressing grout for bonded tendons is in compliance	X	
5. Observe preparation of grout specimens, mortar specimens, and/or prisms		X

(a) Frequency refers to the frequency of inspection, which may be continuous during the task listed or periodically during the listed task, as defined in the table.

CMU QUALITY ASSURANCE — 12/-

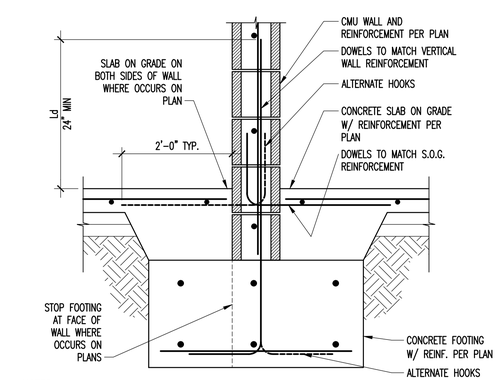
SCALE: N.T.S.



NOTES:
1. PROVIDE STAINLESS STEEL ANCHORS FOR EXTERIOR APPLICATIONS
2. CONNECT STEEL ℄ TO METAL DECK AND CONCRETE FILL WITH EITHER:
- TWO PAIRS OF EXPANSION ANCHORS AS SHOWN IF "T" IS EQUAL OR MORE THAN 6 1/4"
OR
- STITCH WELDS AS SHOWN IF "T" IS LESS THAN 6 1/4"

NON BEARING CMU – TOP OF WALL AT METAL DECK WITH CONC. FILL PERPENDICULAR TO CORRUGATIONS — 6/-

SCALE: N.T.S.



NOTES:
1. DETAIL APPLIES TO FOOTING CENTERED ON THE WALL OR ALIGNED TO THE FACE OF THE WALL AS SPECIFIED ON PLANS

BEARING CMU – FOUNDATION — 3/-

SCALE: N.T.S.

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REVISION DATES (DESIGN STAGE ONLY)

Sheet Version 4.0

\\LFAFS2\DRAFTING19\19927 - RESEDA SKATE FACILITY\JLA S\S D\S111 - S112_19927.DWG 11/24/2021 10:43 AM

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Designation

REGISTERED PROFESSIONAL ENGINEER FABIO ZANOZI No. 34491 CIVIL ENGINEERING STATE OF CALIFORNIA

SIGN DATE: 11/10/2021

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED •

BUREAU OF ENGINEERING

VERTICAL CONTROL:
HORIZONTAL CONTROL:
SHEET TITLE: TYPICAL DETAILS
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

DEPARTMENT OF PUBLIC WORKS

NO.	REVISIONS:	DATE:	BY:
1	100% DESIGN DEVELOPMENT	02/15/21	
2	50% CONSTRUCTION DOCUMENTS	03/30/21	
3	100% CONSTRUCTION DOCUMENTS - PERMIT SET	11/10/21	

CIP NO.

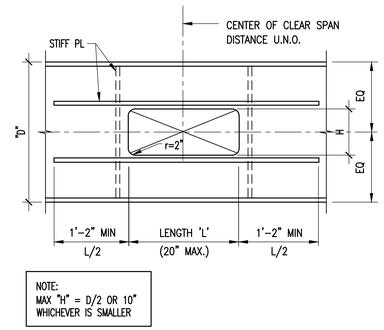
INDEX NO.

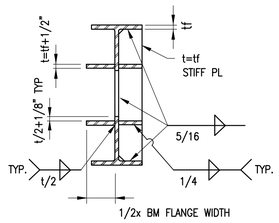
CITY OF LOS ANGELES
GARY LEE MOORE, P.E., ENV SP — CITY ENGINEER
DESIGN GROUP — DATE
ENGINEER:
DESIGNED BY:
DRAWN BY:
CHECKED BY:
APPROVED BY:

LFA — Labib Funk + Associates — Structural | Civil Engineers
Burnett + Young — Shoring Engineers
319 Main Street
El Segundo, CA 90245
t: 213/ 239 9700
f: 213/ 239 9699
LFA #19927

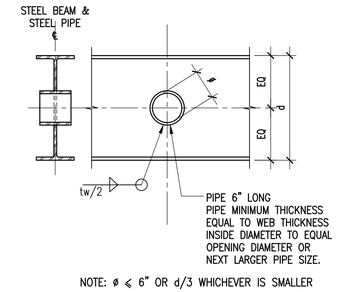
WORK ORDER NO.
E170121B

SHEET NAME
S1.12
SHEET X OF X SHEETS





RECTANGULAR OPENING (A)



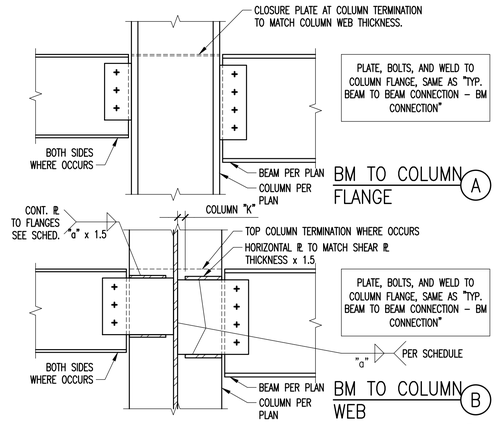
NOTE: ø ≤ 6" OR d/3 WHICHEVER IS SMALLER

CIRCULAR OPENING (B)

OPENING IN STEEL BEAM

SCALE: N.T.S.

7 / -



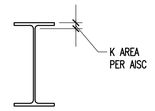
TYP. BEAM TO WF COLUMN

SCALE: N.T.S.

4 / -

NOTES:

1. BEAM PREP AND WELDED JOINT TO COMPLY WITH PRE-QUALIFIED AWS AND AISC DETAILING REQUIREMENTS
2. FIELD WELD CONNECTION PLATES WHERE (N) MEMBERS CONNECT TO (E) MEMBERS.
3. AT W6 BEAMS PROVIDE 1 7/8" SPACING BETWEEN BOLTS
4. ALL HOLES SHALL BE STANDARD HOLES
5. OBTAIN APPROVAL FROM PROJECT ARCHITECT FOR ADDED ERECTION PLATES AND BOLTS AT ARCHITECTURALLY EXPOSED STRUCTURAL STEEL



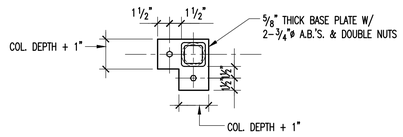
BEAM CONNECTION SCHEDULE

BEAM/ GIRDER	CONNECTION BOLT – A325X			
	NO. OF BOLTS	SIZE OF BOLTS	PLATE THICK. "t"	WELD SIZE "a", "b"
W6	2 (3)	5/8"ø	3/8"	5/16"
W8, W10	2	7/8"ø	3/8"	5/16"
W12, W14	3	7/8"ø	3/8"	3/8"
W16, W18	4	7/8"ø	1/2"	3/8"
W21	5	7/8"ø	1/2"	3/8"
W24	6	7/8"ø	1/2"	3/8"
W27	7	7/8"ø	1/2"	3/8"
W30	8	7/8"ø	5/8"	3/8"
W33	9	7/8"ø	5/8"	3/8"
W36	10	7/8"ø	5/8"	3/8"

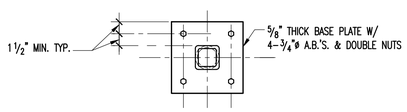
BEAM CONNECTION SCHEDULE

SCALE: N.T.S.

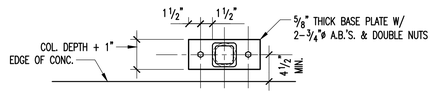
1 / -



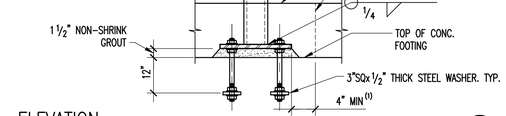
PLAN AT CORNER WALL CONDITIONS (D)



PLAN AT INTERIOR WALL CONDITIONS (B)



PLAN AT EXTERIOR WALL CONDITIONS (C)



ELEVATION (A)

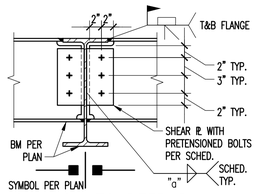
NOTES:

1. AT EDGE CONDITIONS, A MIN 4" CONCRETE COVER ALL AROUND THE BASE PLATE SHALL BE PROVIDED

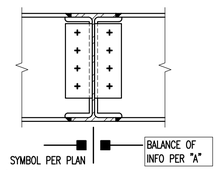
ISOLATED HSS–PIPE COL. BASE ℄

SCALE: N.T.S.

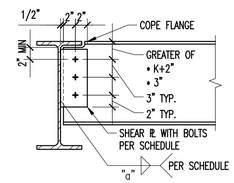
8 / -



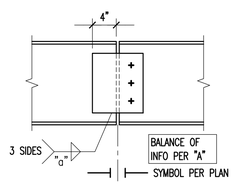
SHALLOW TO DEEP BM (A)



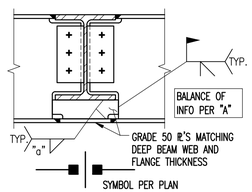
SAME SIZE BM (B)



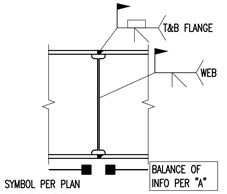
BEAM CONNECTION (A)



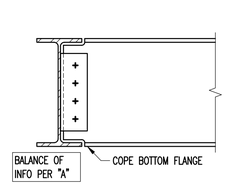
BEAM SPLICE (B)



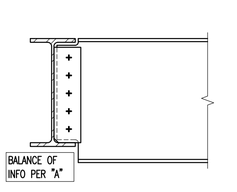
DEEP TO SHALLOW BM (C)



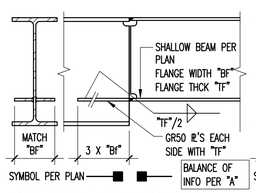
BM SPLICE (D)



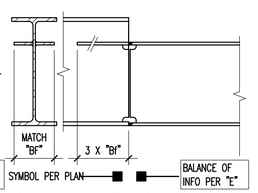
BM TO SAME SIZE BM (C)



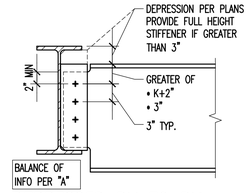
DEEP TO SHALLOW BM (D)



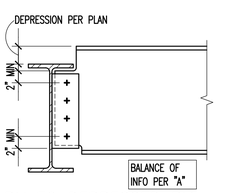
DIFFERENT BM SPLICE (E)



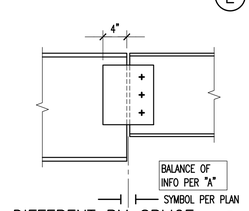
DIFFERENT BM SPLICE (F)



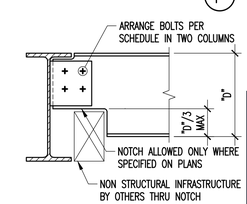
DEPRESSED BM TO BM (E)



BM TO DEPRESSED BM (F)



DIFFERENT BM SPLICE (G)



NOTCH AT BM (H)

BEAM TO BEAM RIGID CONNECTION

SCALE: N.T.S.

6 / -

TYP. BEAM TO BEAM CONNECTION

SCALE: N.T.S.

3 / -

319 Main Street
El Segundo, CA 90245
t: 213/ 239 9700
f: 213/ 239 9699
LFA #19927

LFA
Labib Funk + Associates
Structural | Civil Engineers
Burnett + Young
Shoring Engineers

CITY OF LOS ANGELES
DEPARTMENT OF PUBLIC WORKS
BUREAU OF ENGINEERING

CITY ENGINEER:
GARY LEE MOORE, P.E., ENV SP
DESIGN GROUP
DATE:

NO.	REVISIONS:	DATE:	BY:
1	100% DESIGN DEVELOPMENT	02/15/21	
2	50% CONSTRUCTION DOCUMENTS	03/30/21	
3	100% CONSTRUCTION DOCUMENTS - PERMIT SET	11/10/21	

ENGINEER:
DESIGNED BY:
DRAWN BY:
CHECKED BY:
APPROVED BY:

CIP NO.

INDEX NO.

VERTICAL CONTROL:
HORIZONTAL CONTROL:

SHEET TITLE: TYPICAL DETAILS

PROJECT: RESEDA SKATE FACILITY

ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

WORK ORDER NO.
E170121B

SHEET NAME
S1.21
SHEET X OF X SHEETS

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

REGISTERED PROFESSIONAL ENGINEER
FABIO ZANOZI
No. 34491
CIVIL
STRUCTURAL
STATE OF CALIFORNIA

SIGN DATE: 11/10/2021

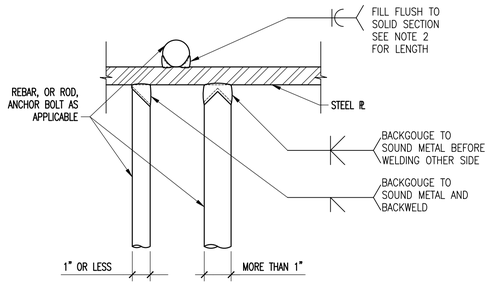
• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED •

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REVISION DATES
(DESIGN STAGE ONLY)

Sheet Version 4.0

\\LFAFS2\DRAFTING19\19927 - RESEDA SKATE FACILITY\JLA S\S D\S121 - S123_19927.DWG 11/24/2021 10:43 AM



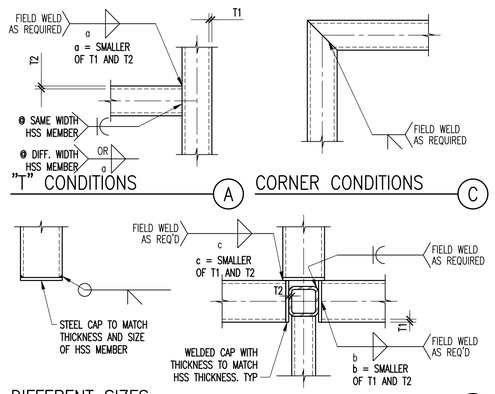
NOTES:

1. THIS DETAIL ADDRESSES WELDING REQUIREMENTS OF BAR, ROD, OR ANCHOR BOLT TO A STEEL PL WHERE SUCH WELD IS CALLED OUT ON THE PLANS OR DETAILS.
2. UNLESS LENGTH OF FLARE BEVELED WELD IS CALLED OUT ON THE DETAIL, PROVIDE WELD ALONG ENTIRE OVERLAPPING LENGTH.
3. CONTRACTOR SHALL SELECT WELDABLE REBAR OR RODS AS SPECIFIED ON GENERAL NOTES

REBAR OR ROD WELDED TO PL

SCALE: N.T.S.

10 / –



"T" CONDITIONS (A)

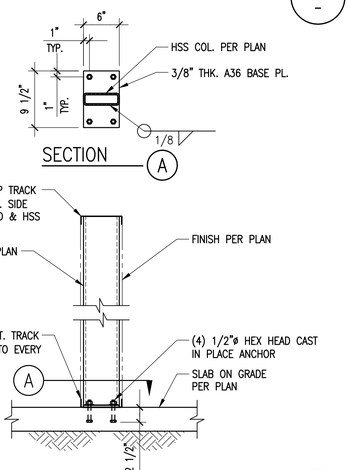
CORNER CONDITIONS (C)

DIFFERENT SIZES (B)

HSS MEMBERS CONNECTION

SCALE: N.T.S.

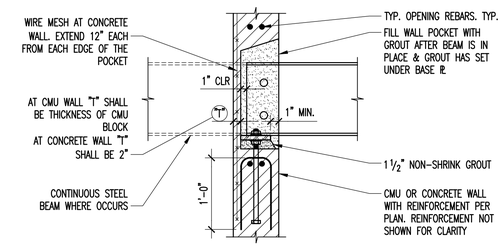
11 / –



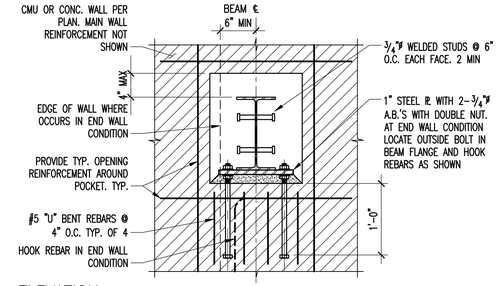
SECTION

N.T.S.

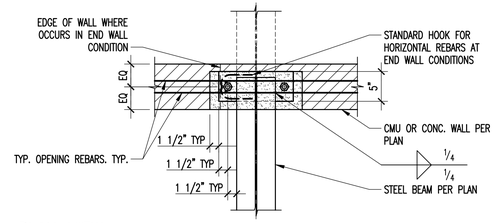
12 / –



SIDE VIEW (C)



ELEVATION (B)



PLAN VIEW (A)

STEEL BEAM PERPENDICULAR TO CONC. OR CMU WALL CONNECTION. WALL UP TO 8 INCH

SCALE: N.T.S.

2 / –

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REVISION DATES (DESIGN STAGE ONLY)

Sheet Version 4.0

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

REGISTERED PROFESSIONAL ENGINEER FABIO ZANOZI No. 34491 CIVIL STRUCTURAL STATE OF CALIFORNIA

SIGN DATE: 11/10/2021

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED •

BUREAU OF ENGINEERING

VERTICAL CONTROL:
HORIZONTAL CONTROL:

SHEET TITLE: TYPICAL DETAILS

PROJECT: RESEDA SKATE FACILITY

ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

DEPARTMENT OF PUBLIC WORKS

NO.	REVISIONS:	DATE:	BY:
1	100% DESIGN DEVELOPMENT	02/15/21	
2	50% CONSTRUCTION DOCUMENTS	03/30/21	
3	100% CONSTRUCTION DOCUMENTS - PERMIT SET	11/10/21	

CIP NO.

INDEX NO.

CITY OF LOS ANGELES

CITY ENGINEER
GARY LEE MOORE, P.E., ENV SP
DATE:

DESIGN GROUP

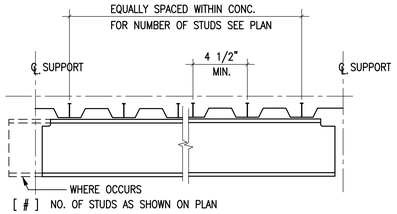
ENGINEER:
DESIGNED BY:
DRAWN BY:
CHECKED BY:
APPROVED BY:

LFA
Labib Funk + Associates
Structural | Civil Engineers
Burnett + Young
Shoring Engineers
319 Main Street
El Segundo, CA 90245
t: 213/ 239 9700
f: 213/ 239 9699
LFA #19927

WORK ORDER NO.
E170121B

SHEET NAME
S1.22
SHEET X OF X SHEETS

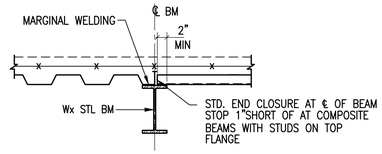
\\LFAFS2\DRAFTING19\19927 - RESEDA SKATE FACILITY\JLA S\S D\S121 - S123_19927.DWG 11/24/2021 10:43 AM



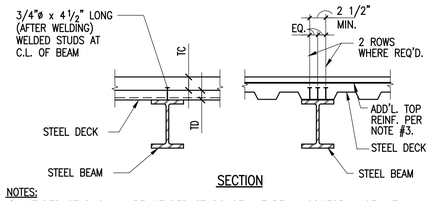
BEAM ELEVATION

NOTE:

1. ALL DECKS SHALL BE REINFORCED WITH MINIMUM OF 1 LAYER WWF 6x6–W2.9xW2.9
2. SEE PLAN FOR DECKS WITH SPECIAL LOADING.



TYP. DETAIL AT CHANGE IN DECK DIRECTION



SECTION

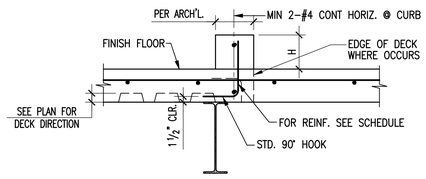
NOTES:

1. WELDED STUD SHALL BE HEADED STUDS OF A TYPE IN CONFORMANCE WITH THE DESIGN CODES AND THE SPECIFICATIONS.
2. WHERE STUDS ARE NOT INDICATED ON FRAMING PLANS PROVIDE WELDED STUD SHEAR CONNECTORS @ 12" O.C. MAX. SPACING.

TYPICAL METAL DECK DETAILS

SCALE: N.T.S.

1



CURB REINFORCING SCHEDULE		
MAX. "H"	VERTICAL	HORIZ.
12"	#4 @ 18"	
24"	#4 @ 12"	#4 @ 12"

REINF. TO BE PLACED IN CURB WALL ℄

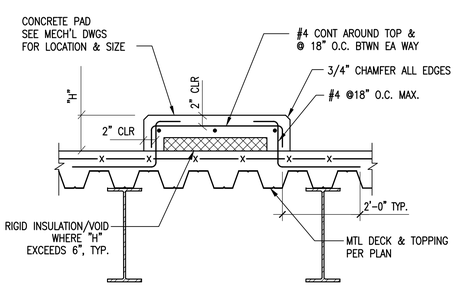
NOTE:

1. SEE ARCH'L DWGS FOR CURB LOCATION & SIZE
2. PROVIDE 2 CURTAIN REINF. FOR CURBS 12" WIDE.

TYP. CURB DETAIL

SCALE: NTS

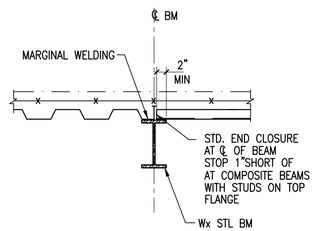
11



TYP. MECH'L PAD ON DECK

SCALE: NTS

12

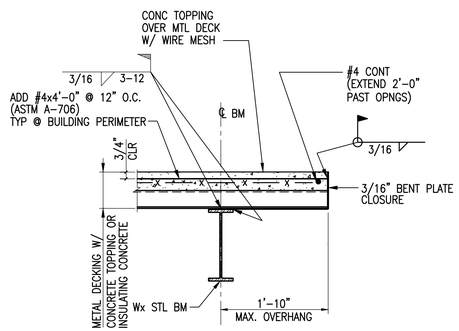


SECTION

TYP. DETAIL AT CHANGE IN DECK DIRECTION

NOT TO SCALE

9

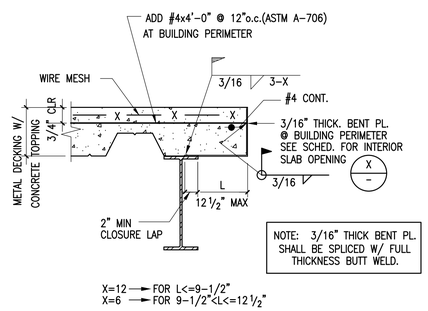


SECTION

DECK PERPENDICULAR TO SLAB EDGE

NOT TO SCALE

6



SECTION

9A

TYPICAL BUILDING EXTERIOR METAL DECK PARALLEL TO SLAB EDGE

NOT TO SCALE

3

LFA
Labib Funk + Associates
Structural Civil Engineers
Burnett + Young
Shoring Engineers
319 Main Street
El Segundo, CA 90245
t: 213/ 239 9700
f: 213/ 239 9699
LFA #19927

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

REGISTERED PROFESSIONAL ENGINEER
FABIO ZANOZI
No. 34491
CIVIL
STRUCTURAL
STATE OF CALIFORNIA

SIGN DATE: 11/10/2021

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED •

DEPARTMENT OF PUBLIC WORKS
BUREAU OF ENGINEERING

VERTICAL CONTROL:
HORIZONTAL CONTROL:

SHEET TITLE: TYPICAL DETAILS

PROJECT: RESEDA SKATE FACILITY

ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

NO.	REVISIONS:	DATE:	BY:
1	100% DESIGN DEVELOPMENT	02/15/21	
2	50% CONSTRUCTION DOCUMENTS	03/30/21	
3	100% CONSTRUCTION DOCUMENTS - PERMIT SET	11/10/21	

CITY ENGINEER:
DATE:
DESIGN GROUP

ENGINEER: GARY LEE MOORE, P.E., ENV SP
DESIGNED BY:
DRAWN BY:
CHECKED BY:
APPROVED BY:

CIP NO.

INDEX NO.

WORK ORDER NO. E170121B

SHEET NAME S1.31
SHEET X OF X SHEETS

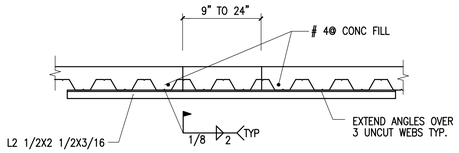
CITY OF LOS ANGELES

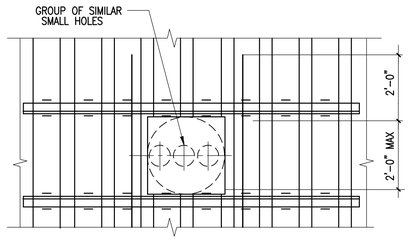
REVISION DATES (DESIGN STAGES ONLY)

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

Sheet Version 4.0

\\LFAFS2\DRAFTING19\19927 - RESEDA SKATE FACILITY\JLA S\S D\S131 - S132_19927.DWG 11/24/2021 10:43 AM



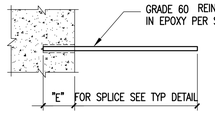


TYP. OPENING IN FLOOR & ROOF DECK

SCALE: NTS

7

NOTE: USE OF TWO L2x2x1/4 TACK WELDED PERPENDICULAR TO DECK ON TOP IS ACCEPTABLE AS A SUBSTITUTE

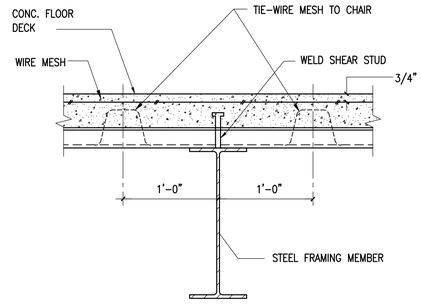


NOTES:
1. SCHEDULE APPLIES TO REINFORCING BARS TERMINATING IN STRUCTURAL CONCRETE.
2. EPOXY DOWELS/ANCHORS SHALL BE INSTALLED ACCORDING TO THE MANUFACTURER'S RECOMMENDATIONS.
3. DIAMETER OF HOLES AND EMBEDMENT FOR EPOXY-SET DOWELS SHALL BE PER EPOXY MANUFACTURER'S RECOMMANDATIONS (UNO).
4. ENSURE END OF DRILLED HOLE FOR EPOXY-SET DOWELS IS MIN. 1 1/2" CLEAR OF FAR SIDE OF CONCRETE WALL OR SLAB
5. FOR EMBEDMENT "E" SEE ICBO TABLES FOR SPECIFIED EPOXY PRODUCT.

DOWEL SCHEDULE U.N.O

SCALE: NTS

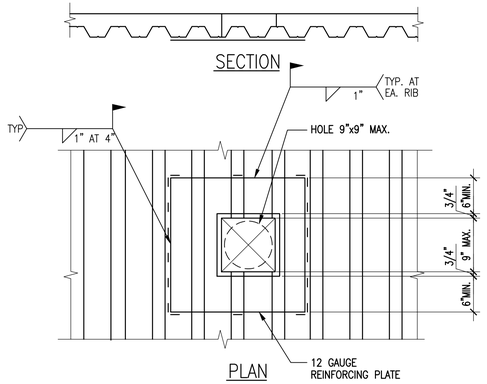
4



TYPICAL SLAB DETAIL

SCALE: NTS

1



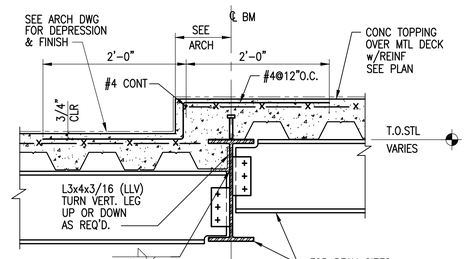
NOTE: USE OF TWO L2x2x1/4 TACK WELDED PERPENDICULAR TO DECK ON TOP IS ACCEPTABLE AS A SUBSTITUTE

TYP. OPENING IN FLOOR & ROOF DECK

SCALE: NTS

(MAX. OPENING SIZE 9"x9")

8

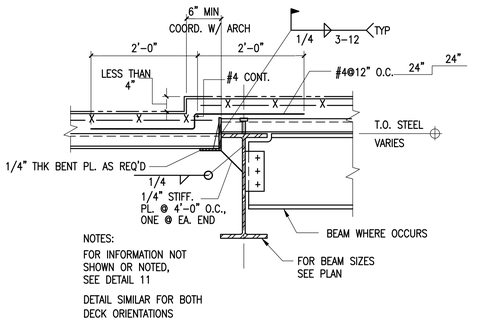


SECTION

TYP. SLAB DEPRESSION

NOT TO SCALE

5



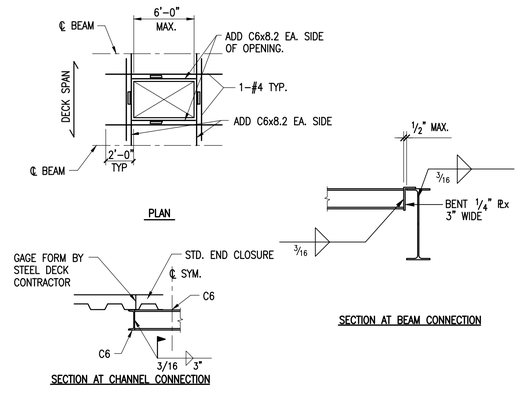
NOTES:
FOR INFORMATION NOT SHOWN OR NOTED, SEE DETAIL 11

DETAIL SIMILAR FOR BOTH DECK ORIENTATIONS

TYP. DETAIL WHERE PARALLEL DECK DOES NOT LAND ON BM

NOT TO SCALE

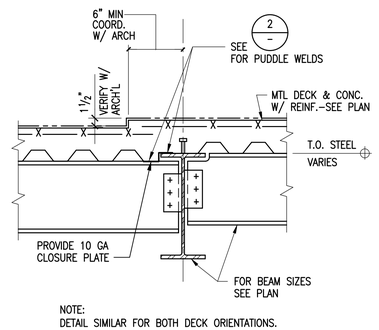
2



TYP. LARGE DECK OPENING

SCALE: NTS

9

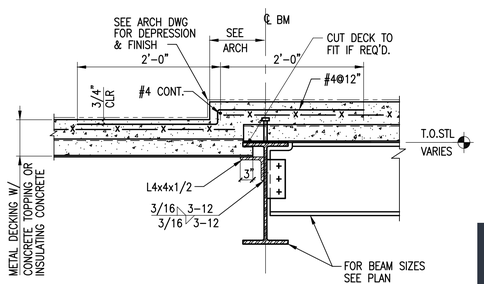


NOTE:
DETAIL SIMILAR FOR BOTH DECK ORIENTATIONS.

TYP. SLAB DEPRESSION

NOT TO SCALE

6



SECTION

TYP. SLAB DEPRESSION

NOT TO SCALE

3

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REVISION DATES (DESIGN STAGES ONLY)

Sheet Version 4.0

\\LFAFS2\DRAFTING19\19927 - RESEDA SKATE FACILITY\JLA S\S D\S131 - S132_19927.DWG 11/24/2021 10:43 AM

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

REGISTERED PROFESSIONAL ENGINEER
FABIO ZANOLI
No. 34491
CIVIL
STRUCTURAL
STATE OF CALIFORNIA

SIGN DATE: 11/10/2021

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED •

BUREAU OF ENGINEERING

VERTICAL CONTROL:
HORIZONTAL CONTROL:

SHEET TITLE: TYPICAL DETAILS

PROJECT: RESEDA SKATE FACILITY

ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

DEPARTMENT OF PUBLIC WORKS

NO.	REVISIONS:	DATE:	BY:
	100% DESIGN DEVELOPMENT	02/15/21	
	50% CONSTRUCTION DOCUMENTS	03/30/21	
	100% CONSTRUCTION DOCUMENTS - PERMIT SET	11/10/21	

CIP NO.

INDEX NO.

CITY OF LOS ANGELES
GARY LEE MOORE, P.E., ENV SP
CITY ENGINEER

DESIGN GROUP | DATE:

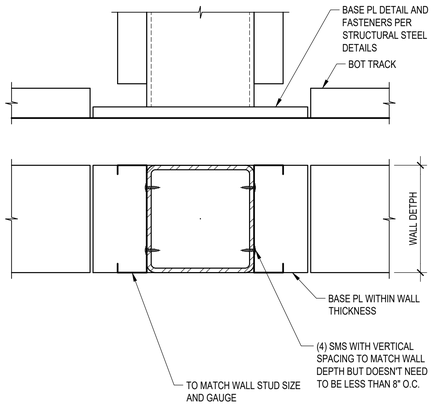
ENGINEER:
DESIGNED BY:
DRAWN BY:
CHECKED BY:
APPROVED BY:

LFA
Labib Funk + Associates
Structural | Civil Engineers
Burnett + Young
Shoring Engineers

319 Main Street
El Segundo, CA 90245
t: 213/ 239 9700
f: 213/ 239 9699
LFA #19927

WORK ORDER NO.
E170121B

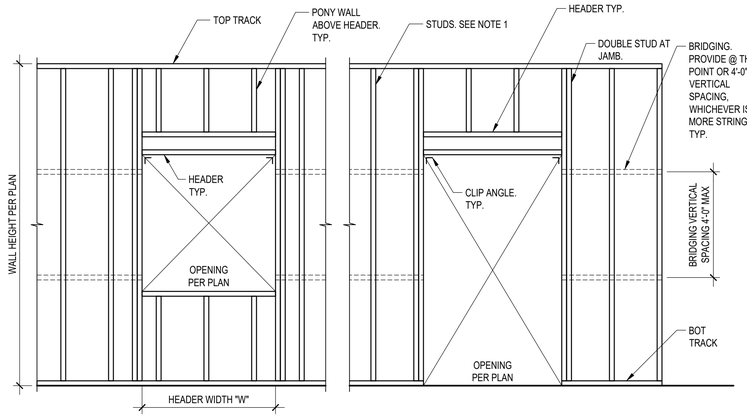
SHEET NAME
S1.32
SHEET X OF X SHEETS



STEEL POST WITHIN WALL CONN.

SCALE: N.T.S.

-



COLD FORMED WALL ASSEMBLY

B

NOTES

1. COLD FORMED STEEL SHALL COMPLY WITH "STEEL STUD MANUFACTURERS ASSOCIATION (SSMA)". ICC-ESR-3064P
2. FOR STUD SIZE, SPACING AND GAUGE SEE PLANS. IF NOT NOTED ON PLAN, PROVIDE SIZES PER SCHEDULE THIS DETAIL.
3. UNLESS OTHERWISE NOTED ALL THE FRAMING MEMBERS SHALL HAVE THE SAME DEPT AND GAUGE OF THE STUDS, AND TRACKS SHALL HAVE A MIN 1 1/2" FLANGE.
4. FASTENERS CONNECTING COLD FORMED MEMBERS TO COLD FORMED MEMBERS SHALL BE SELF DRILLING AND SELF TAPPING SIMPSON "QUIK DRIVE" SHEET METAL SCREWS (SMS). (LA RR 25670).

   PROVIDE SMS SCREWS ACCORDING TO THE THICKNESS OF THE CONNECTING MEMBERS AS FOLLOWS (REFER TO THICKEST MEMBER):

   A. # 8 SMS FOR THICKN. UP TO 18 GAUGE
   B. #10 SMS FOR THICKN. UP TO 16 GAUGE
   C. #12 SMS FOR THICKN. EXCEDING 16 GAUGE
   D. #12 X SCREWS FOR CONNECTION TO STRUCTURAL STEEL

   PROVIDE A MIN 1/2" EDGE DISTANCE FOR ALL THE SCREWS.
4. UNLESS OTHERWISE NOTED ON PLANS PROVIDED HEADERS WITH SIZES PER SCHEDULE THIS DETAIL.

COLD FORMED CONSTRUCTION - NOTES

A

FASTENER SCHEDULE				
WALL CONSTRUCTION	MAX WALL HEIGHT	SHOTPINS - UNDERSIDE OF CONC. FILLED STEEL DECK	SHOTPINS - DIRECTLY INTO CONCRETE	SELF TAP SCREWS
SINGLE LAYER OF GYPBOARD EA FACE	UP TO 12'-0"	48" O.C.	32" O.C.	48" O.C.
	UP TO 16'-0"	48" O.C.	24" O.C.	48" O.C.
	UP TO 20'-0"	48" O.C.	16" O.C.	36" O.C.
DOUBLE LAYER OF GWB EA FACE OR SINGLE LAYER EA FACE AND TILES	UP TO 12'-0"	48" O.C.	20" O.C.	48" O.C.
	UP TO 16'-0"	36" O.C.	16" O.C.	32" O.C.
	UP TO 20'-0"	32" O.C.	12" O.C.	24" O.C.

NOTES:

1. FASTENERS:
   A. FASTENERS CONNECTING COLD FORMED MEMBERS TO COLD FORMED MEMBERS, STRUCTURAL STEEL MEMBERS, AND METAL DECK WITHOUT CONCRETE FILL, SHALL BE SELF DRILLING AND SELF TAPPING SHEET METAL SCREWS (SMS) MATCHING THE "FASTENERS CONNECTING COLD FORMED MEMBERS" PER "TYPICAL COLD FORMED WALL CONSTRUCTION" DETAIL.
   B. FASTENERS CONNECTING COLD FORMED MEMBERS TO CONCRETE, CMU, AND METAL DECK AND CONCRETE FILL SHALL BE SHOTPINS PDPA-75 BY SIMPSON STRONG TIE (ICC-ESR 2138 AND LA RR 25469) DO NOT DAMAGE EXISTING REBAR OR TENDONS WHEN INSTALLING SHOTPINS. NOTIFY ENGINEER IF SHOTPINS CANNOT BE INSTALLED DUE TO CONFLICT WITH EXISTING REBAR OR TENDONS.
2. FOR WALL ASSEMBLIES OTHER THAN WHAT SHOWN ON THE SCHEDULE INCLUDING STONE VENEER CONTACT STRUCTURAL ENGINEER TO CONFIRM FASTENER SPACING.

CF FASTENERS SCHED. AND NOTES

SCALE: N.T.S.

-

STUD SIZE U.N.O. ON PLANS		
MAX WALL HEIGHT	NON SUPPORTING CEILING FRAMING	SUPPORTING CEILING FRAMING
UP TO 8'-0"	362S125-27 @ 16"O.C.	362S125-27 @ 16"O.C.
UP TO 10'-0"	362S125-27 @ 16"O.C.	362S125-30 @ 16"O.C.
UP TO 12'-0"	362S125-30 @ 16"O.C.	362S162-33 @ 16"O.C.
UP TO 14'-0"	362S137-33 @ 16"O.C.	362S162-33 @ 16"O.C.
UP TO 16'-0"	400S162-33 @ 16"O.C.	400S200-33 @ 16"O.C.
UP TO 18'-0"	550S137-33 @ 16"O.C.	550S162-33 @ 16"O.C.
UP TO 20'-0"	550S162-33 @ 16"O.C.	550S200-33 @ 16"O.C.
UP TO 22'-0"	550S200-33 @ 16"O.C.	550S162-43 @ 16"O.C.
UP TO 24'-0"	600S162-43 @ 16"O.C.	600S162-43 @ 16"O.C.

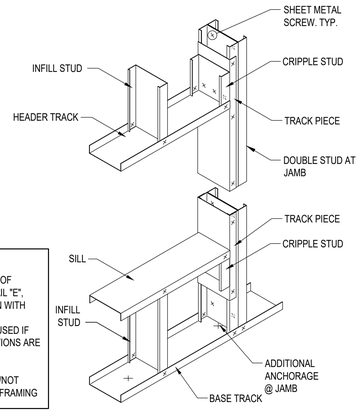
COLD FORMED WALL SCHEDULE U.N.O. ON PLAN

C

HEADER SCHEDULE - SEE "CF BOX BEAM ASSEMBLIES" FOR BUILT UP ASSEMBLY		
MAX SPAN	STUD ASSEMBLY	TOP AND BOT TRACK
4'-0"	(2) 362S162-33	• GAGE: MATCH STUD ASSEMBLY • WIDTH: MATCH WALL • LEGS: 1 1/4" MIN
8'-0"	(2) 600S162-33	
12'-0"	(2) 1000S162-43	

HEADER SCHEDULE U.N.O. ON PLAN

D

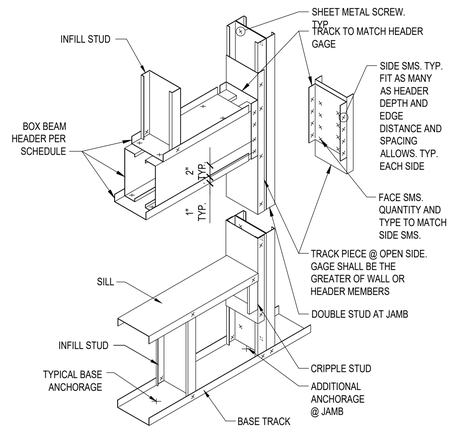


NOTES:

1. PROVIDE CONSTRUCTION OF OPENING PER INSET DETAIL "E", "OPENING CONSTRUCTION WITH HEADER".
2. INSET DETAIL "F" MAY BE USED IF BOTH FOLLOWING CONDITIONS ARE MET:
   - MAX SPAN = 3'-0"
   - WALL IS NOT BEARING/NOT SUPPORTING CEILING FRAMING

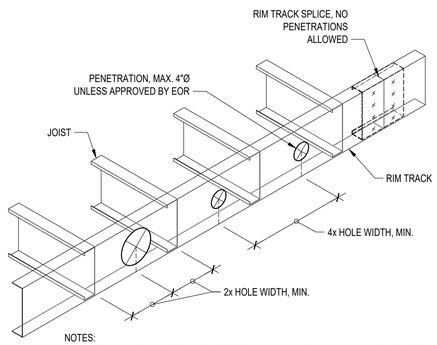
OPENING CONSTRUCTION

F



OPENING CONSTRUCTION WITH HEADER

E



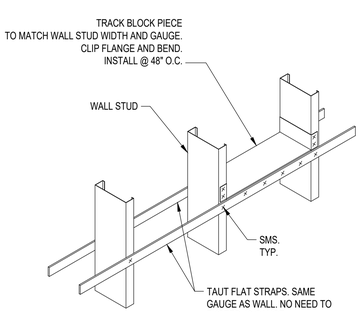
NOTES:

1. AT RIM JOISTS THAT ARE ATTACHED TO EACH WALL STUD AND DO NOT SUPPORT OTHER FRAMING, 4" PENETRATIONS ARE ACCEPTABLE IN ANY BAY.
2. DIMENSION TOLERANCE IS = 1/2"
3. LOCATE HOLE IN CENTER THIRD OF BEAM DEPTH.
4. SPACING BASED ON LARGER OF TWO ADJACENT PENETRATIONS.
5. THIS DETAIL IS BASED ON RIM TRACK BEING THE SAME MINIMUM GAUGE AS THE JOISTS.
6. NOTIFY SEOR WHERE THIS DETAIL CANNOT BE SATISFIED.

RIM TRACK PENETRATION DETAIL

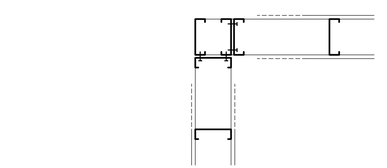
SCALE: N.T.S.

5

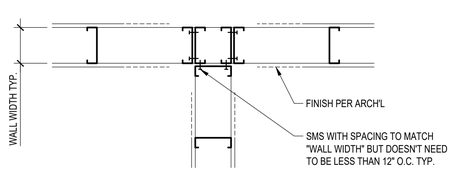


BRIDGING

G



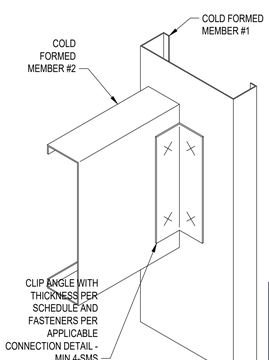
I2



T WALL INTERSECTION PLAN

I1

CLIP ANGLE THICKN. SCHEDULE	
DESIGNATION THICKNESS OF THICKER MEMBER BEING CONNECTED (MILS)	CLIP ANGLE MIN THICKNESS (MILS)
18	33
27	33
30	43
33	54
43	68
54	97
68	118
97	118
118	118



TYPICAL CLIP ANGLE

H

TYPICAL COLD FORMED WALL CONSTRUCTION

SCALE: N.T.S.

-

319 Main Street
El Segundo, CA 90245
t: 213/ 239 9700
f: 213/ 239 9699
LFA #19927

Burnett + Young
Shoring Engineers

Labib Funk + Associates
Structural | Civil Engineers

CITY OF LOS ANGELES
DEPARTMENT OF PUBLIC WORKS
BUREAU OF ENGINEERING

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

REGISTERED PROFESSIONAL ENGINEER
FABIO ZANOZI
No. 34491
CIVIL
STRUCTURAL
MECHANICAL
STATE OF CALIFORNIA

SIGN DATE: 11/10/2021

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED

VERTICAL CONTROL:
HORIZONTAL CONTROL:

SHEET TITLE: TYPICAL DETAILS

PROJECT: RESEDA SKATE FACILITY

ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

NO.	REVISIONS:	DATE:	BY:
1	100% DESIGN DEVELOPMENT	02/15/21	
2	50% CONSTRUCTION DOCUMENTS	03/30/21	
3	100% CONSTRUCTION DOCUMENTS - PERMIT SET	11/10/21	

CIP NO.

INDEX NO.

CITY ENGINEER:
DATE:

GARY LEE MOORE, P.E., ENV SP
DESIGN GROUP

ENGINEER:
DESIGNED BY:
DRAWN BY:
CHECKED BY:
APPROVED BY:

WORK ORDER NO.
E170121B

SHEET NAME
S1.41
SHEET X OF X SHEETS

REVISION DATES (DESIGN STAGES ONLY)

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

Sheet Version 4.0

\\LFAFS2\DRAFTING19\19927 - RESEDA SKATE FACILITY\JLA S\S D\S141_19927.DWG 11/24/2021 10:43 AM

STANDARD QUALITY ASSURANCE PLAN

I. PURPOSE

The Standard Quality Assurance Plan (hereinafter referred to as "Standard QA Plan") for steel moment frames provides specifications, procedures, and illustrative details to comply with the requirements of the 2017 Los Angeles Building Code. The quality assurance requirements described in this Standard QA Plan are intended to promote public safety and welfare by standardizing inspections, tests, and all other applicable measures that ensure substantial compliance with the code performance objectives of steel moment frame connections.

II. HOW TO USE THIS STANDARD QA PLAN

To use the Standard QA Plan, follow the steps outlined below:

1. *Standard QA Plan shall be attached to or incorporated in the structural plan.*
2. *Where the Standard QA Plan is attached to the structural plan, the Engineer of Record shall:*
   a. *Identify the type of steel moment frame to be used in the building or structure by placing an "X" mark in the box below:*

      SPECIAL MOMENT FRAME (SMF)

      INTERMEDIATE MOMENT FRAME (IMF)

      ORDINARY MOMENT FRAME (OMF)

   b. *Place a NOTE on the structural plan stating "All specifications, tables, and notes in the City of Los Angeles' Standard Quality Assurance Plan for Steel Moment Frames shall be part of this approved structural plan."*
   c. *Sign and stamp the Standard QA Plan in the box provided at the lower right corner of each sheet.*
3. *Where the Standard QA Plan is incorporated directly in the structural plan, the Engineer of Record shall place a NOTE on the structural plan to clearly indicate the type of steel moment frame to be used in the building or structure.*
4. *All of the quality assurance requirements listed in the Standard QA Plan shall be applied to special moment frames, intermediate moment frames, and ordinary moment frames, unless noted otherwise herein.*
5. *Organize and submit all reports required in Table 1 on Sheet 2 to the City Building Inspector in a timely manner for review and approval.*
6. *The procedures, specifications and illustrative details as described in the Standard QA Plan shall not exempt the Engineer of Record from using engineering judgment in determining the suitability of applying the Standard QA Plan to any welded connections. Any deviations in the quality assurance requirement as specified in the Standard QA Plan shall comply with Part III Item 5 of the Standard QA Plan.*

III. GENERAL REQUIREMENTS

1. Referenced Documents

The design and construction of steel moment frames shall be in compliance with the following:

a. City of Los Angeles Building Code, 2017 Edition (hereinafter referred to as "LABC").
b. AISC Seismic Provisions for Structural Steel Buildings, Part I dated June 22, 2010 (hereinafter referred to as "AISC Seismic").
c. AWS D1.1/D1.1M:2010 and AWS D1.8/D1.8M:2009 Structural Welding Code - Steel (hereinafter referred to as "AWS").

2. Material Specifications

a. Structural steel shall comply with the following ASTM standard specifications:
   i. Wide flange shapes.....ASTM A36, A529(50), A572(42)(50), A588, A913(50), A992 (50)
      note: minimum yield stress shall not exceed 50 ksi, except column per AISC 341 sec 6.1
   ii. Continuity, doubler and column base plates, shear tabs....i above or ASTM A283/A283M Grade D
   iii. Anchor rods at column base plates..ASTM F1554 or per AISC360-10 A4
   iv. Fabricate and erect structural steel in compliance with the AISC 360-10 "Specification for Structural Steel buildings" (hereinafter referred to as "AISC Specification") .
   v. Steel having dual ASTM designation shall be clearly identified on each specific plan detail.
b. High strength bolts shall comply with the following requirements and ASTM standard specifications:
   i. High strength bolts, nuts, and washers.....ASTM A325, A490
   ii. Installed bolts in accordance with the "Specifications for Structural Joints using ASTM A325 or A490 Bolts."
   iii. Tighten bolts to a snug tight condition then further tighten to the minimum specified tension and verify using a calibrated tension measuring device. Twist-Off and Direct-Tension Indicator methods shall also be permitted
   iv. Slip critical high strength bolts are required.
   v. All faying surfaces of connections with high strength fasteners shall be prepared as required for Class A per the AISC Seismic Section 7.2.
c. Filler metal properties and specifications shall be as follows:
   i. Electrodes shall be of a low-hydrogen type meeting requirement of H-16 as tested in accordance with AWS A4.3 and conforming to AWS specifications as referenced in Table 7 on Sheet 2.
   ii. Filler metals shall be classified for nominal 70 ksi tensile strength.
   iii. The maximum permitted electrode diameter shall be in accordance with Table 5 on Sheet 2.
   iv. Filler metals shall have a minimum Charpy V-Notch (CVN) toughness of 20 ft-lbf at 0°F using AWS A5 classification test methods.
   v. The use of intermixed welds shall not occur unless it can be demonstrated by testing in accordance with AWS Section 4.
   vi. The parameters established by the electrode manufacturer shall be reflected in the approved WPS.
d. Other materials not listed in LABC Chapter 35 are not permitted without specific approval from the Department.

3. Welding Processes

Structural welding shall be limited to the Shielded Metal Arc Welding or Flux Cored Arc Welding processes.

4. Base Metal Repairs or Restorations

Any repair or restoration of base metal shall comply with all of the following:

a. Engineer of Record shall review and approve the WPS for repair procedures prior to welding.
b. Ensure that repair procedures meet the requirements outlined in AWS Section 5.26 and ASTM A6/A6M-02 Section 9.2, 9.3, 9.4 and 9.5.
c. All welding shall be performed using low-hydrogen electrodes or with SMAW using low-hydrogen electrodes.
d. Provide continuous visual inspection by the Deputy Inspector.
e. Provide non-destructive testing upon completion of the repair work.

5. Deviations From the Standard Quality Assurance Plan

Deviations from any part of the Standard QA Plan may be made provided the procedures outlined below are followed:

a. Deviations from the Standard QA Plan must be reviewed and approved by the Engineer of Record.
b. Engineer of Record shall provide alternate procedures, specifications, and/or details to justify the deviations.
c. Submit the proposed deviations from the Standard QA Plan to the Department for review and approval prior to commencement of work.
d. Supplemental testing and additional specifications may be required to justify the deviation.
e. Conformance with all applicable provisions of the LABC, AISC, and AWS is required.

IV. QUALITY ASSURANCE

1. Certification

a. Inspectors shall be LADBS Certified Deputy Inspectors per LABC Section 1704.2 and Information Bulletin P/BC 2011-035 "Regulations Regarding Registration for Deputy and Controlled Activities Inspection." Employment shall be in accordance with Information Bulletin P/BC 2014-034 "Employment and Duties of a Registered Deputy Inspector."
b. Welders shall be LADBS Certified Welders for the Structural Steel classification per LABC Section 2204.1, and Information Bulletin P/BC 2014-045 "Welder Certification Rules and Regulations."
c. Shop welds shall be performed in an LADBS Certified Fabricator's Shop per LAMC Section 96.204(g) and Information Bulletin P/BC 2014-042 "Application for Approval as Fabricator."
d. Technicians performing Non Destructive Testing (NDT) shall be certified for Level II in accordance with ASNT SNT-TC-1A (current edition) by a Testing Agency approved per LAMC Section 98.0503 and Information Bulletin P/GI 2017-028 "Rules and regulations for Recognition of Testing Agencies."

2. Pre-Construction Meeting

a. The Owner (or owner's representative) shall arrange a pre-construction meeting(s) with the Engineer of Record (or Structural Observer designated by the Engineer of Record), the Contractor (or affected Sub-Contractor), and the Deputy Inspector to discuss and review welding procedures, bolting procedures, and inspection requirements for all welding and bolting operations with consideration to minimize welding shrinkage effects including number of welders per deputy inspector
b. The City Building Inspector shall be notified of such meeting(s) and may participate at his/her discretion.
c. Meeting record(s) shall be included in the first report submitted to the City Building Inspector.

3. Structural Observation

Structural observation shall be performed in accordance with Information Bulletin P/BC 2017-024. The Structural Observer shall:

a. Perform structural observation listed in Table 6 on Sheet 2.
b. Perform structural observation prior to placement of decking, covering by fireproofing, encasement in concrete or placement of other finishes.
c. Submit observation report(s) to the City Building Inspector at each stage observed and upon completion of the structural system.
d. State in the report that the steel moment frame system substantially conforms with the approved structural plans and specifications.
e. Use the Department's Structural Observation Report Form to report all observations. Structural Observation Report Form can be obtained at www.ladbs.org, keyword "Information Bulletin P/BC 2017-024".

4. Deputy Inspection

The following are the basic Quality Assurance responsibilities of the Deputy Inspectors:

a. Arrive on the job in sufficient time to verify the permit information, check for prior inspections and/or approvals by the City Building Inspector or previous Deputy Inspectors, check the quality of all materials and become familiar with the approved structural plans and specifications.
b. Verify that structural steel delivered is from a fabricator currently licensed by the Department.
c. Identify material from an offsite fabricator in accordance with LABC Section 2203 and compare to the approved plans and specifications.
d. Verify that each steel piece is labeled with the approved fabricator's shop name and license number.
e. Visual check shop welds and/or non-destructive test, as required, joint preparation, faying surfaces, indentation stamps and color codes of high strength steel, excessive mill scale or lamination, and dimensional conformity with the approved plans which are part of the lateral resisting system.
f. Before any welding begins, inspect joint preparation, fit-up, condition of surfaces to be welded, storage and use of electrodes, current license of all welders, and voltage/amperage of welding machines.
g. Ensure that all welding and inspection activities complies with AWS.
h. Measure voltage/amperages near the arc with a hand held calibrated averaging type meter. The meter shall be calibrated not less than once a year. This equipment shall be used by the Fabricator, Erector, and Deputy Inspector.
i. During welding operation, provide continuous inspection particularly on multiple pass welds to assure that each pass has been prepared correctly, preheat and interpass temperatures are maintained and that finished welds shall be the correct size and without rejectable discontinuities.
j. Mark steel near the weldment to indicate that inspection was made.
k. Verify type and size of bolts and washers, check mill certificates, and verify faying surfaces are free of burrs, scale, rust, grease or anything that may inhibit full contact.
l. Verify connections involving high strength bolts and welds are fabricated per Part III Item 2(b) and 2(c) and erected in a sequence per Part V Item 2, unless specified otherwise by the Engineer of Record.
m. Verify high strength bolts are not welded or damaged by preheating.
n. Verify washers are always installed with all bolts, except A-490 bolts which require washers under both elements.
o. Verify that any deficiency noted in the Structural Observation Report Form has been corrected.
p. Verify that the Engineer of Record has approved the written Welding Procedure Specification (WPS) prepared by the Fabricator or Erector. The WPS shall include the following:
   i. All applicable requirements from the codes, the Standard QA Plan, and any other information necessary to produce the welds.
   ii. List the applicable base metal types and thicknesses.
   iii. List the welding joint detail, including joint type, weld type, joint geometry, and applicable dimensions. Individual weld passes shall be identified in sketches and numbered to identify the sequence of their deposition (see Detail 13 on Sheet 3 for example). The sketches shall identify the maximum layer thicknesses and bead widths. In no case shall layer thicknesses exceed 1/4 inch nor shall the maximum bead widths exceed 5/8 inch.
   iv. List the welding processes.
   v. Specify the required welding positions.
   vi. List the filler metal per AWS for electrode specification and classification (see Table 7 on Sheet 2), as well as information regarding shielding material to be used.
   vii. Indicate the minimum preheat and interpass temperatures (see Table 4 on Sheet 2) and post weld heat treatment per Part V Item 5.
   viii. List all applicable electrical characteristics for the welding process employed. WPS shall clearly indicate the specific values required for each welding pass. These electrical characteristics shall include at minimum the following:
      (1) Electrode diameter (see Table 5 on Sheet 2),
      (2) Type of current, and acceptable ranges of current measured in amperage,
      (3) Voltage,
      (4) Travel speed (range), and
      (5) Amperage, voltage and electrode extension (as applicable) shall be within the filler metal manufacturer's recommendations.
   ix. A copy of the electrode manufacturer's technical information with ID # listed shall be attached to the WPS .
q. Weld joints not conforming to AWS Chapter 3 must be tested by an approved testing agency, accepted by the Engineer of Record, and approved by the Department's Material Control Section before the weld is performed. Material Control Section can be contacted at:
   LADBS Material Control Section
   221 N. Figueroa St., Suite 400
   Los Angeles, CA 90012
   (213) 482-0385 or 1-888-LA-4BUILD
r. Notify the Contractor, Engineer of Record, and City Building Inspector of any deviations or non-compliance with the approved WPS, plans or specifications.
s. "Deputy Inspection Report Form IN.FORM07" shall be submitted on a weekly basis to the City Building Inspector and Engineer of Record, unless determined otherwise by the City Building Inspector.
t. During the execution of the work, the Deputy Inspector shall not undertake or engage in any other task or occupation which will interfere with the proper performance of the duties of such inspection.
w. Visual welding inspections, bolting inspections and other inspections shall be conducted at locations and frequencies as specified in Table 8 on sheet 2 of 3.

5. Electrode Storage and Atmospheric Exposure

a. Electrodes are considered to be exposed to the atmoshpere if:
   i. the manufacturer's sealed electrode containers or packagings are opened or damaged, or
   ii. outside of baking or storage ovens.
b. Modification or lubrication of electrodes are not permitted.
c. Drying of electrodes in baking or storage ovens are permitted as recommended by the manufacturer.
d. Electrodes shall be identified to facilitate monitoring of total atmospheric exposure time.
e. Storage and atmospheric exposure of AWS A5.1-91 and A5.5-96 low-hydrogen SMAW electrodes shall be in accordance with AWS Section 5.3.2.
f. FCAW electrodes not consumed within 24 hrs of accumulated atmospheric exposure time shall not be used. Manufacturer's recommendations that show that drying effectively removes moisture and restores electrodes to their designated diffusible hydrogen levels are permitted.
g. FCAW electrode welding suspended more than 8 hrs shall be removed from the machines and stored in an electrode wire baking or storage oven maintained at a temperature between 250° and 550°F, or as recommended by the electrode manufacturer.

6. Plastic Hinging Zone Protection

a. The plastic hinging zone shall be identified diagrammatically, as illustrated in Detail 15 on Sheet 3, on the structural plans by the Engineer of Record.
b. The Engineer of Record and Contractor shall be responsible for reviewing shop drawings of ALL relevant trades to ensure compliance. This shall be discussed and documented in pre-construction meetings.
c. The Contractor shall be responsible for developing a program to ensure that all workers on the project, including their subcontractors, are aware of and understand this requirement. Failure to comply with these requirements may cause the replacement of steel.
d. Plastic hinging zones shall be defined by permanent markings such as paint or ink.
e. A note, as illustrated in Detail 15 on Sheet 3, shall be prominently placed on the structural plans (general note sheet and adjacent to moment frame detail) and the construction documents of ALL trades.
f. Welded, bolted, screwed, or shot-in (powder driven) attachments for perimeter edge angles, shear studs, exterior facades, partitions, duct work, piping, or other connections shall not be permitted within the plastic hinging zones.
g. Any penetrations or damage from temporary welded attachments within the plastic hinging zones shall be repaired as required by the Engineer of Record and comply with Part III Item 4.
h. Initially, the plastic hinging zone "Warning Sign", as illustrated in Detail15 on Sheet 3, may be temporary. However, the temporary "Warning Sign" shall be replaced by a permanent "Warning Sign" before project completion. This sign and identification of the plastic hinging zone shall be maintained during construction; and may require repair after operations such as fireproofing.
i. Signs shall be affixed to the beam and located within the plastic hinging zone. The City Building Inspector may accept alternate methods of attaching the "Warning Sign" to the plastic hinging zones.

7. Additional Charpy V-Notch Toughness

a. Demand Critical Welds
For steel frame with service temperature at 50°F or higher welds at the locations indicated below shall be made with filler metal having a CVN toughness of 20 ft-lbf at -20°F AND 40 ft-lbf at 70°F as determined by test procedure prescribed in the AISC Seismic Sec.9.1-5 "Weld Metal / Welding Procedure Specification Toughness Verification Test."
For steel with service temperature below 50°F , the qualification temperature for AISC Seismic Provision Appendix X shall be 20°F above the lowest anticipated service temperature or at a lower temperature.
   i. Beam flanges to columns,
   ii. Single plate shear connections to columns,
   iii. Beam webs to columns, and
   iv. Column splices.
   v. Column bases
b. Heavy Section CVN Requirements
For structural steel in the SLRS, in addition to the requirements of AISC Specification Section A.3.1c, hot rolled shapes with flanges 1½ in. thick and thicker shall have a min. CVN toughness of 20 ft-lb at 70°F, tested in the alternate core location as described in ASTM A6 Supplemental Requirement S30. Plates 2 in. thick and thicker shall have min. CVN toughness of 20 ft-lb at 70°F, measured at any location permitted by ASTM A673, where the plate is used in the following:
   i. Member built-up from plate
   ii. Connection plates where inelastic strain under seismic loading is expected.

8. Non-Destructive Testing (NDT) Requirements

The following NDT requirements, which shall be considered as a minimum, are to be included in the Quality Assurance Agency Document(s)(see part 1, IV 9 below)

a. The minimum non-destructive testing at each weld joints or parts shall be conducted at the locations and frequencies as specified in Table 2 and Table 3 on Sheet 2 respectively.
b. A copy of each NDT report shall be provided to the Contractor, Engineer of Record, Deputy Inspector, and City Building Inspector with the following information:
   i. Document the accepted and rejected welds, parts, or joints.
   ii. Identify the tested weld by piece mark and location in the piece.
   iii. Identify the tested weld location in the structure.
c. NDT Technician shall perform the following tasks:
   i. Coordinate the NDT scope and schedule with the Deputy Inspector.
   ii. Perform NDT in a timely manner (so as not to hinder construction work) and to detect welding problems soon after occurrence so that corrective measures can be taken by the Contractor.
   iii. Mark the inspected and accepted welds, parts, and joints with a distingquishing mark or die stamp.
d. Reduction Rate for NDT
   i. The rate of UT testing on CJP groove welds may be reduced if approved by the Engineer of Record and the Department, except no reduction is permitted for demand critical welds. Where the initial rate for UT is 100%, the NDT rate for an individual welder or welding operator is permitted to be reduced to 25%, provided the reject rate, the number of welds containing unacceptable defects divided by the number of welds completed, is demonstrated to be 5% or less of the welds tested for the welder or welding operator. A sampling of at least 40 completed welds for a job shall be made for such reduction evaluation. For evaluating the reject rate of continuous welds over 3 ft in length where the effective throat is 1 in. or less, each 12 in. increment or fraction thereof shall be considered as one weld. For evaluating the reject rate on continuous welds over 3 ft in length where the effective throat is greater than 1 in., each 6 in. of length or fraction thereof shall be considered one weld.
   ii. The rate of MT testing on CJP groove welds may be reduced if approved by the Engineer of Record and the Department. The MT rate for an individual welder or welding operator may be reduced to 10%, provided the reject rate is demonstrated to be 5% or less of the welds tested for the welder or welding operator. A sampling of at least 20 completed welds for a job shall be made for such a reduction evaluation. This reduction is not permitted on welds in the k-area, at repair sites, weld tab and backing removal sites and access holes.
   iii. Reject rate shall mean the number of welds containing rejectable defects divided by the number of welds completed.

9. Quality Assurance Agency Documentations

   i. Submit Fabricator and Erector Document for review by EOR prior to fabrication erection per AISC 341-10 Sec J2.
   ii. Submit Quality Assurance Agency Document to EOR, owner, and City Building Inspector per AISC 341-10 Sec J3.
   iii. The reports listed in Table 1 on Sheet 2 shall be submitted to the City Building Inspector in a timely manner.
   iv. The requirements stated in Section 8 are to be included in the Quality Assurance Agency Document(s)

V. WELDING PROCEDURES

1. Bottom Beam Flange Moment Connection Welding
Where welding of the bottom beam flange to the column flange is in the flat welding position, welding shall be completed with the following sequence:
   a. Start welding from Side A (one side of the beam) with a maximum 1/4 inch thick root pass beyond the center of the joint on Side B (other side of the beam), reaching past the beam web through the weld access hole.
   b. After the arc is initiated, electrode travel shall progress toward the edge of the Side A beam flange, terminating on the Side A weld tab.
   c. The SideA root pass, and root pass deposit on SideB, shall be thoroughly cleaned to allow Deputy Inspector to verify the resulting bead profile is suitable for obtaining good fusion by the subsequent root pass to be initiated from SideB. If the profile is not conducive to good fusion, the start of the first root pass shall be gounded,gouged,chipped,orotherwise prepared to ensure adequate profile to achieve fusion.
   d. Complete the root pass on Side B before any other weld passes are performed.
   e. The arc shall be initiated at the start of the first Side A root pass, and electrode travel shall progress toward the edge of the Side B beam flange, terminating on the Side B weld tab.
   f. The above sequence shall be repeated for subsequent weld layers, and each weld layer shall be completed on both sides of the joint before a new layer is deposited.For each layer, the weld starts and stops shall be on opposite side of beam web,as compare to previous layer. The order of operations (Side A, then Side B, or vice versa) is not restricted and may vary for each weld layer. Weld passes shall be placed in horizontal layers. Each pass shall be thoroughly cleaned of slag and wire brushed. Each pass shall be visually inspected by the Deputy Inspector, as described above in Step (c). An alternate welding sequence may be made provided Contractor submits in writing analternate sequence that is approved by the Engineer of Record and complies with the requirements of Part III Item 5 of the Standard QA Plan.
2. Sequence for Welding at Multiple Locations
When welding occur at multiple locations of welded steel moment frame connections, the following sequence shall be followed:
   a. Weld both top and bottom beam flanges prior to any supplemental welding to the beam web or shear tab.
   b. Engineer of Record shall review and approve all field welding sequences prior to the start of work.
   c. Field welding of web shear plates with bolts shall occur after field welding of beam flanges to column flange.
   d. High strength bolts shall be in the snug tight condition prior to welding.
   e. Notwithstanding AISC Steel Construction Manual Specification Section J1.10 to the contrary, high strength bolts shall be fully tensioned upon completion of all welding activities.
An alternate sequence of welding may be made provided the Contractor submits in writing, the alternate sequence minimizes residual stresses and is approved by the Engineer of Record.

3. Welding Technique

   a. Stringer beads shall be used during all welding operations. Maximum bead width, bead thickness, and layer thickness shall be considered. Weaving is not permitted, except when the WPS approved by the Engineer of Record limits electrode oscillation transverse to the weld axis to a maximum of:
      i. 3d for 1G/1F, 2G/2F, and 4G/4F weld positions, or
      ii. 5d for the 3G/3f position, where d = electrode diameter.
   b. Welding layers should progress from the face of the column flange outward toward the groove face of the beam flange as illustrated in Detail 13 on Sheet 3.

4. Preheat and Interpass Temperature

   a. The minimum preheat and interpass temperature requirements in Table 4 of Sheet 2 shall be observed. Special attention shall be given to AWS Section 3.5.1 and Section 5.6 for the thickness of the base metal to be welded.
   b. Preheat and all subsequent interpass temperatures shall be maintained during the welding operation for a distance at least equal to the thickness of the thicker welded part, but not less than 3", in all directions from the point of welding.
   c. Where base metals are of different thickness, the higher minimum preheat and interpass temperature requirements of the thicker plate shall govern.
   d. Maximum preheat and interpass temperature shall not exceed the lesser of:
      i. 550°F, or
      ii. The maximum temperature recommended by the manufacturer.

5. Post Weld Heat Treatment

Unless specified otherwise in an approved WPS, the minimum post weld heat treatment shall be provided as follows:

   a. Apply temperature in the 400°F to 600°F range immediately after completion of welding to prevent the weld metal from cooling below the minimum preheat and interpass temperature.
   b. Maintain temperature for approximately 1 hour per inch of thickness of weld metal or 2 hours, whichever is less.
   c. Conditions specified in AWS Section 3.14 and Section 5.8 should carefully be considered when applying post weld heat treatment.
Alternatively, the use of insulating blankets after the completion of welding in lieu of post weld heat treatment may be permitted to control the cooling of the welded connection to ambient temperature if recommended by the Engineer of Record and approved by the City Building Inspector; unless required otherwise by an approved WPS.

VI. WELDING AND FABRICATION DETAILS

1. Base Metal Joint Preparation

   a. Base metal preparation shall be in comply with AWS Section 5.15.
   b. All beam flange to column flange welds are to be made with an AWS prequalified CJP groove welded joint detail.
   c. Bevel, fit-up and detail tolerances shall be as required by the selected prequalified welded joint detail.
   d. Whenever possible, use the AWS prequalified CJP groove welded joint detail as illustrated in Detail 14 on Sheet 3 and the following:
      i. Use single bevel CJP groove welds made with a 30° groove angle or double bevel CJP groove welds when flange thickness exceed 1-1/2 inch.
      ii. "As Fit-Up" and "As Detailed" shall be the maximum tolerances.
      iii. Meet all prequalified WPS variables in Table 5 on Sheet 2.

2. Weld Access Hole

   a. Where weld access holes are provided, they shall be detailed as illustrated in Detail 12 on Sheet 3.
   b. Notches and gouges shall be repaired following a WPS approved by ther Engineer of Record.
   c. Weld access holes shall be prepared by grinding to a suitable finish in accordance with AISC Specification Section J1.6 and provided with a minimum radius of 3/8 inch as illustrated in Detail 12 on Sheet 3.

3. Backing Bar

   a. Backing bar used in connection with a CJP groove weld of beam flange to column flange shall be removed except that top flange backing bar attached to the column by a continuous fillet weld on the edge below these CJP groove weld need not be removed.
   b. Following removal of backing bar, the root pass shall be backgouged to sound weld metal, and back welded. A reinforcing fillet weld with a minimum leg size of 5/16 inch or the root opening plus 1/16 inch, whichever is larger, shall be provided. The reinforcing fillet weld need not be grounded.

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REVISION DATES
(DESIGN & PAGE ONLY)

Sheet Version 4.0

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

REGISTERED PROFESSIONAL ENGINEER
FABIO ZANOLI
No. 24491
CIVIL
STATE OF CALIFORNIA

SIGN DATE: 11/10/2021

THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED

STANDARD QUALITY ASSURANCE PLAN
For Steel Moment Frames

BUREAU OF ENGINEERING
VERTICAL CONTROL:
HORIZONTAL CONTROL:
SHEET TITLE: STANDARD QUALITY ASSURANCE PLAN
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

The specifications and all drawings prepared in this Standard Quality Assurance Plan have been prepared in accordance with recognized engineering principles and are for general information only. This Standard Quality Assurance Plan should not be used for construction until reviewed by a registered competent professional examination and verification of its accuracy, suitability, and applicability by the Engineer of Architect of Record. By signing and sealing this Standard Quality Assurance Plan, the Engineer or Architect of Record acknowledge that the City of Los Angeles assumes no responsibility for the application of any of the specifications and illustrative details contained in this Standard Quality Assurance Plans and all liability arising from such use.

DEPARTMENT OF PUBLIC WORKS

NO.	REVISIONS:	DATE:	BY:
	100% DESIGN DEVELOPMENT	02/15/21	
	50% CONSTRUCTION DOCUMENTS	03/30/21	
	100% CONSTRUCTION DOCUMENTS - PERMIT SET	11/19/21	

Engineer of Record

CITY OF LOS ANGELES
DEPARTMENT OF BUILDING AND SAFETY
Date: 12/30/2017
Scale: Not to Scale
Sheet:
Sheet 1 of 3

319 Main Street
El Segundo, CA 90245
t: 213/ 239 9700
f: 213/ 239 9669
LFA #19927

Burnett + Young
Shoring Engineers
Labib Funk + Associates
Structural | Civil Engineers

CITY OF LOS ANGELES
GARY LEE MOORE, P.E., ENV SP
CITY ENGINEER
DESIGN GROUP
DATE:
ENGINEER:
DESIGNED BY:
DRAWN BY:
CHECKED BY:
APPROVED BY:

CIP NO.
INDEX NO.
WORK ORDER NO.
E170121B
SHEET NAME
S1.51
SHEET X OF X SHEETS

CONTINUED FROM SHEET 1

c. When backing bar is other than AWS Table 3.1 and Section 5.2.2 approved base metal is used, the following shall apply:
   i. Ceramic, flux or glass tape may be used provided the manufacture's recommendations are followed.
   ii. When a non-metallic backing bar is used, the WPS and the Welder shall be qualified using the type of backing bar intended for welding.
   iii. Nonferrous metallic (e.g. copper) backing materials are not permitted.

1. Weld Tab
a. Weld tabs shall be aligned parallel to the joint preparation.
b. No weld dams are allowed.
c. Weld tabs shall extend beyond the edge of the joint a minimum distance equal to the part thickness, but not less than one inch nor exceed two inches.
d. Weld tab shall be removed upon completion of the welded joint as follows:
   i. No more than 1/8 inch beyond the edge of the joint shall remain, except at continuity plate where up to 1/4 inch is acceptable.
   ii. Edges of the weld tab shall be finished to a surface roughness value of 500 micro inch or better. Grinding to a flush condition is not required.
e. Gouges and notches are not permitted. The transitional slope of any area where gouges and notches have been removed shall not exceed 1:5.
f. Material removed by grinding that extends more than 1/16 inch below the surface of the base metal shall be filled with weld metal. The contour of the weld at the ends shall provide a smooth transition, free of notches and sharp corners.

5. Continuity Plate
a. Continuity plates shall be detailed as illustrated in Detail 11 on Sheet 3.
b. The weld attaching the continuity plate to the column flange shall be as follows:
   i. Use a CJP groove weld for the full length of the groove preparation.
   ii. When backing bars are omitted, the root shall be backgouged and back welded.
   iii. When backing bars are used and remain in place, backing bars shall be attached to the column flanges with a reinforcing fillet weld.
   iv. Fillet weld shall not be used to connect backing bars to continuity plates.
   v. The fillet weld size need not exceed the minimum size requirements of AWS Table 5.8.
c. Weld terminations near the end of the column flange tips may be completed using weld tabs as follows:
   i. Weld tabs may be steel or nonfusible material.
   ii. Weld terminations near the radius of the column need not be made using weld tabs. The use of small nonfusible weld tabs to assist in weld terminations is permitted.
   iii. Weld tabs shall be removed following completion of welding.
d. Continuity plates may be welded to the column web with groove welds, fillet welds, or a combination of the two. Fillet welds shall terminate a minimum distance of 1/4 inch from each end of the joint.

6. Doubler Plate
Web doubler plates, as illustrated in Detail 2, 3, or 4 on Sheet 3, shall be welded using either Detail 5, 6, or 7 on Sheet 3.

7. Requirements for "k" Area
Welds shall terminate short of the "k" area for continuity plates as illustrated in Detail 11 on Sheet 3.

8. Tack Welds
i. Tack welds attaching backing bars and weld tabs shall be placed where they will be incorporated into the final weld.
ii. Tack welds shall be subject to the same welding procedure requirements as thefinal welds including preheat requirements.
iii. Tack welds are fully inspected prior to install the final welds.

VII. EXEMPTIONS

1. Reduction from certain quality assurance components of this Standard QA Plan, as listed in Part VII Item 2, are permitted for the following buildings or structures:
   a. One or two family dwellings not more than 1 story in height and 2,500 sf of floor area,
   b. Buildings or structures accessory to residential uses (such as carport, storage, garage), and
   c. Miscellaneous structures (such as walkway, canopy, patio cover, gazebo, storage rack).

2. Buildings or structures, as listed in Part VII Item 1, are exempt from providing the following quality assurance components:
   a. Electrode Storage and Atmospheric Exposure, Part IV Item 5(f) and 5(g).
   b. Plastic Hinging Zone Protection, Part IV Item 6.
   c. Additional CVN Notch Toughness Testing, Part IV Item 7.
   d. Non-Destructive Testing, Part IV Item 8.
   e. Preheat and Interpass Temperature, Part V Item 4.
   f. Post Weld Heat Treatment, Part V Item 5.

NOTE : (Refer to AISC 341-10 Section J, "COPY RIGHT © Amerian Institute of Steel Construction. Reprint with permission. All right reserved")

The following entries are used in the tables:
- Observe (O) - The inspector shall observe these functions on a random, daily basis. Welding operations need not be delayed pending observations.
- Perform (P) - These inspections shall be performed prior to the final acceptance of the item. Where a task is noted to be performed by both OC and OA, it shall be permitted to coordinate the inspection function between QC and QA so that the inspection functions need be performed by only one party. Where QA is to rely upon inspection functions performed by QC, the approval of the engineer of record and the authority having jurisdiction is required.
- Document (D) - The inspector shall prepare reports indicating that the work has been performed in accordance with the contract documents. The report need not provide detailed measurements for joint fit-up, WPS settings, completed welds, or other individual items listed in the Tables of 8-a, 8-b, 8-c. For shop fabrication, the report shall indicate the piece mark of the piece inspected. For field work, the report shall indicate the reference gride lines and floor or elevation inspected. Work not in compliance with the contract documents and wether the noncompliance has been satisfactorily repaired shall be noted in the inspection report.

Table 8-a Location and Frequencies of bolting inspections

Inspection Tasks Prior to Bolting	QC Task	QC Doc.	QA Task	QA Doc.
Proper bolt selected for the joint detail	O	-	O	-
Proper bolting procedure selected for joint detail	O	-	O	-
Connecting elements are fabricated properly, including the appropriate faying surface condition and hole preparation, if specified, meets appliable requirements	O	-	O	-
Pre-installation verification testing conducted for fastener assemblies and method used.	P	D	O	D
Proper storage provided for bolts, nuts, washers, and other fastener components.	O	-	O	-
Inspection Tasks During Bolting	**QC Task**	**QC Doc.**	**QA Task**	**QA Doc.**
Fastener assemblies placed in all holes and washers (if required) are properly positioned	O	-	O	-
Joint bought to a snug tight condition prior to pretensioning operation	O	-	O	-
Fastener component not turned by the wrench prevented from rotating	O	-	O	-
Bolts are pretensioned progressing systematically from most rigid point toward free edges	O	-	O	-
Inspection Tasks After Bolting	**QC Task**	**QC Doc.**	**QA Task**	**QA Doc.**
Document accepted and rejected connections	P	D	P	D

Table 8-b Location and Frequencies of welding inspections

Visual Inspection Tasks Before Welding	QC Task	QC Doc.	QA Task	QA Doc.
Material Identification (Type/Grade)	O	-	O	-
Welder identification system	O	-	O	-
Fit-up of Grove Welds (including joint geometry) - Joint preparation - Dimensions (alignment, root opening, root face, bevel) - Cleanliness (condition of steel surface) - Tacking (tack weld quality and location) - Backing type and fit (if applicable)	P/O**	-	O	-
Configuration and finish of access holes	O	-	O	-
Fit-up of fillet welds - Dimensions (alignment, gaps at root) - Cleanliness (condition of steel surfaces) - Tacking (tack weld quality and location)	P/O**		O	

** Following performance of this inspection task for ten welds to be made by a given welder, with the welder demonstrating adequate understanding of the requirements and possession of skills and tools to verify these items, the Perform designation of this task shall be reduced to Oberve, and the welder shall perform this task. Should the inspector determine that the welder has discontinued adequate performance of this task, the task shall be returned Perform until such time as the inspector has reestablished adequate assurance that the welder will perform the inspection tasks listed.

Visual Inspection Tasks During Welding	QC Task	QC Doc.	QA Task	QA Doc.
WPS followed - Settings on welding equipment - Travel Speed - Selected welding materials - Shielding gas type/flow rate - Preheat applied - Interpass temperature manitained (min./max.) - Proper position (F,V,H,OH) - Intermix of filler metals avoided unless approved	O	-	O	-
Use of qualified welders	O	-	O	-
Control and handling of welding consumables - Packaging - Exposure control	O	-	O	-
Envirnoment conditions - Wind speed within limits - Precipitation and temperature	O	-	O	-
Welding techniques - Interpass and final cleaning - Each pass within profile limitations - Each pass meets quality requirements	O		O	
No welding over cracked tacks	O	-	O	-
Visual Inspection Tasks After Welding	**QC Task**	**QC Doc.**	**QA Task**	**QA Doc.**
Welds cleaned	O	-	O	-
Verify size, length, and location of welds	P	-	P	-
Visually inspect welds to acceptance criteria - Crack prohibition - Weld/base-metal fusion - Crater cross-section - Weld profiles - Weld size - Undercut - Porosity	P	D	P	D
Placement of reinforcing or contouring fillet welds (if required)	P	D	P	D
Backing removed, weld tabs removed and finished, and fillet welds added (if required)	P	D	P	D
Repair activities	P	-	P	D

Table 8-c Location and Frequencies of other inspections

Other Inspection Task	QC Task	QC Doc.	QA Task	QA Doc.
Reduced beam section (RBS) requirements, if appliable - contour and finish - dimensional tolerances	P	D	P	D
Protected zone - no holes and unapproved attachments made by fabricator or erector, as applicable	P	D	P	D

Table 5. PREQUALIFIED WPS REQUIREMENTS (1, 2, 3)

VARIABLE	POSITION OF WELD	WELD TYPE	SMAW	FCAW
Maximum Electrode Diameter	Flat (F)	Fillet (4)	5/16 in.	1/8 in.
		Groove (4)	1/4 in.	
		Root Pass	3/16 in.	
	Horizontal (H)	Fillet	1/4 in.	1/8 in.
		Groove	3/16 in.	
	Vertical (V)	All	3/16 in.	3/32 in.
	Overhead (OH)	All	3/16 in.	5/64 in.
Maximum Current	All	Fillet	Within the range of recommended operation by the filler metal manufacturer and a WPS approved by engineer of record.	Within the range of recommended operation by the filler metal manufacturer and a WPS approved by engineer of record.
	All	Groove weld root pass with opening		
		Groove weld root pass without opening		
		Groove weld fill passes		
		Groove weld cap pass		
Maximum Root Pass Thickness (5)	Flat (F)	All	3/8 in.	3/8 in.
	Horizontal (H)		5/16 in.	5/16 in.
	Vertical (V)		1/2 in.	1/2 in.
	Overhead (OH)		5/16 in.	5/16 in.
Maximum Fill Pass Thickness	All	All	3/16 in.	1/4 in.
Maximum Single Pass Fillet Weld Size (7)	Flat (F)	Fillet	3/8 in.	1/2 in.
	Horizontal (H)		5/16 in.	3/8 in.
	Vertical (V)		1/2 in.	1/2 in.
	Overhead (OH)		5/16 in.	5/16 in.
Maximum Single Pass Layer Width	All	Root opening >1/2 in.	Not applicable.	Split layers
		Any layer of width w		(6)

NOTES:
1. Applicable provisions of AWS D1.1/D1.1M:2010 Section 3 "Prequalification of WPSs" must be maintained for prequalified status of SMAW and FCAW WPSs.
2. Refer to Detail 13 on Sheet 3 for diagram of weld pass sequence.
3. Reproduced with permission from the American Welding Soceity (AWS), Miami, FL USA - AWS D1.1/D1.1M: 2010 Table Table 3.7 "Prequalified WPS Requirements".
4. Except root passes.
5. See AWS D1.1/D1.1M:2010, Section 3.7.2, for width-to-depth limitations.
6. In the F, H, or OH positions for nontubulars, split layers when the layer width w> 5/8 inch. In the V position for nontubulars or the F, H, V, OH positions for tubulars, split layers when the width w > 1 inch.
7. See AWS D1.1/D1.1M 2010 Sec. 3.7.3 for requirements for welding unpainted and exposed ASTM A588

Table 6. STRUCTURAL OBSERVATION CHECKLIST

STRUCTURAL OBSERVATION PROGRAM (Steel Moment Frame for Seismic Application)
☐ Orientation and placement of connected components.
☐ Removal of backing bars, as required on the plans.
☐ Removal of runoff tabs, as required on the plans.
☐ Presence of continuity plates, as required on the plans.
☐ Presence of doubler plates, as required on the plans.
☐ Configuration and finish of weld access holes, if applicable.
☐ Contour of RBS profile, if applicable.
☐ Verify that no welded attachments occur in the plastic hinging region.
☐ Review NDT and deputy inspection reports for general compliance.

NOTES:
1. Weld qualities shall be verified by the Deputy Inspector.
2. The structural observations listed in this Table are in addition to the structural observations that may be required on the structural plans.

Table 7. PREQUALIFIED BASE METAL - FILLER METAL COMBINATIONS FOR MATCHING STRENGTH (1, 2, 3, 4)

BASE METAL		FILLER METAL		
Group	Steel Specification	Welding Process	AWS Electrode Specification	Electrode Classification
I	ASTM A36 < 3/4 in. ASTM A53 (Grade B) ASTM A500 (Grade B or C) ASTM A 501	SMAW	A5.1	E70XX
			A5.5 (6)	E70XX-X
		FCAW	A5.20 (5)	E7XT-X, E7XT-XM
			A5.29 (6)	E7XTX-X, E7XTX-XM
II	ASTM A36 ≤ 3/4 in. ASTM A529 ASTM A572, A588 ASTM A913 ASTM A992, A1011HSLAS	SMAW	A5.1	E7015, E7016, E7018, E7028
			A5.5 (6)	E7015-X, E7016-X, E7018-X
		FCAW	A5.20 (5)	E7XT-X, E7XT-XM
			A5.29 (6)	E7XTX-X, E7XTX-XM
RELATIONSHIP	BASE METAL(S)		FILLER METAL STRENGTH RELATIONSHIP REQUIRED	
Matching	Any steel to itself or any steel to another in the same group		Any filler metal listed in the same group	
	Any steel in one group to any steel in another		Any filler metal listed for a lower strength group [SMAW electrodes shall be the low-hydrogen classification]	
Under-Matching	Any steel to any steel to any group			

Table 1. REPORTS TO BE SUBMITTED TO THE CITY BUILDING INSPECTOR

	PREPARED BY	TYPE OF REPORT
1.	Structural Observer(s)	Structural Observation Reports
2.	Deputy Inspector(s)	Deputy Inspection Reports
3.	NDT Technician(s)	Non-Destructive Testing Reports

Table 2. NON-DESTRUCTIVE TEST LOCATIONS

	REQUIRED LOCATIONS	Test Frequency
1.	**CJP Groove Weld** Ultrasonic test shall be performed on all CJP groove welds in materials 5/16 inch (8 mm) thick or greater. In addition, magnetic particle test shall be performed on all beam-to-column CJP groove welds.	A
2.	**"k" Area** When welding of doubler plates, continuity plates, or stiffeners has been performed in the k-area, the web shall be tested for cracks using magnetic particle testing. The magnetic particle test area shall include the k-area base metal within 3 in. (75 mm) of the weld.	B
3.	**Beam Cope and Access Hole** At welded splices and connections, thermally cut surfaces of beam copes and access holes shall be tested using magnetic particle testing, when flange thickness exceeds 1-1/2 in. for rolled and built-up shapes.	B
4.	**Reduced Beam Section Repair** Magnetic particle testing shall be performed on any weld and adjacent area of the RBS plastic hinge region that has been repaired by welding, or on the base metal of the RBS plastic hinge region if a sharp notch has been removed by grinding.	B
5.	**Base Metal Lamellar Tearing and Laminations at CJP Groove Weld** Base metal thicker than 1-1/2 in. (38 mm) shall be ultrasonically tested for discontinuities behind and adjacent to the fusion line when the base metal is loaded in tension in the through thickness direction in tee and corner joints and the connected material is greater than 3/4 in. (19 mm). Any base metal discontinuities found within t/4 of the steel surface shall be accepted or rejected on the basis of criteria of AWS D1.1 Table 6.2, where t is the thickness of the part subjected to the through-thickness strain.	A*
6.	**End of Weld at Weld Tab Removal Site** Magnetic particle testing shall be performed on the end of welds from which the weld tabs have been removed, except for continuity plate weld tabs.	B
7.	**PJP Groove Weld** Ultrasonic testing shall be performed on PJP groove welds used in column splices with an effective throat of 3/4 in. (19.1 mm) thick or greater.	B

NOTE: 1) A, and B are the frequencies of non-destructive tests listed in Table 3.
2) Non-destructive testing of welds shall be performed by quality assurance personnel
3) UT shall be performed according to procedures described in Appendix W Sec. W4.1 of AISC 341-10
4) MT shall be performed according to procedures described in Appendix W Sec. W4.2 of AISC 341-10
* Ultrasonic Test only

Table 3. NON-DESTRUCTIVE TEST FREQUENCY

	Frequency Designation A	Frequency Designation B
Ultrasonic Testing (UT)	100% of joints	0% of joints
Magnetic Particle Testing (MT)	25% of joints	100%of joints

NOTES:
1. Refer to Table 2 for locations of non-destructive testing.
2. Rate of non-destructive testing may be reduced as permitted in Sheet 1, Part IV, Item 8(d).
3. No reduction is permitted for demand critical welds for Ultrasonic Testing.
4. No reduction is permitted for welds in the k-area, at repair sites, backing removal sites, and access holes for Magnetic Particle Testing.

Table 4. PREQUALIFIED MINIMUM PREHEAT AND INTERPASS TEMPERATURE

STEEL SPECIFICATION	WELDING PROCESS	THICKNESS OF THICKEST PART AT POINT OF WELDING (in.)	MINIMUM PREHEAT AND INTERPASS TEMPERATURE (°F)
ASTM A36 ASTM A572 Grade 50 ASTM A913 Grade 50 ASTM A992	SMAW with low-hydrogen electrodes, FCAW	1/8 to 3/4 incl.	32
		Over 3/4 to 1-1/2 incl.	50
		Over 1-1/2 to 2-1/2 incl.	150
		Over 2-1/2	225

NOTES:
1. Surfaces to be welded and surfaces adjacent to welds shall be free of moisture pursuant to AWS D1.1/D1.1M:2010 Section 5.15. Use a higher preheat temperature from this Table to remove moisture.
2. Reproduced with permission from the American Welding Society (AWS), Miami, FL USA - AWS D1.1/D1.1M:2010 Table 3.2 "Prequalified Min. Preheat and Interpass Temperature".
3. The minimum preheat or interpass temperature applied to a joint composed of base metals with different minimum preheats (based on Category and thickness) shall be the highest of these minimum preheat temperatures.

NOTES:
1. The base metal/filler metal strength relationships above shall be used to determine whether matching or under-matching filler metals are required. Refer to AWS D1.1/D1.1M:2010, Section 3.3.
2. Preheating of joints involving base metals of different groups shall be in conformance with the requirements applicable to the higher strength group.
3. When welds are to be stress-relieved, the deposited weld metal shall not exceed 0.05 percent vanadium.
4. Reproduced with permission from the American Welding Welding Society (AWS), Miami, FL USA - AWS D1.1/D1.1M:2010 Table 3.1 "Prequalified Base Metals-Filler Metal Combinations for Matching Strength".
5. FCAW electrodes with the -2, -2M, -3, -10, -13, -14, -GS suffix shall be excluded and electrodes with the -11 suffix shall be excluded for thicknesses greater than 1/2 in.
6. Filler metals of alloy group B3, B3L, B4, B4L, B5, B5L, B6, B6L, B7, B7L, B8, B8L, B9,E9015-C5L, E9015-D1, E9016-D1, E9018-D3 or any BXH grade in AWS A5.5, A5.23, A5.28 or A5.29 are not prequalified for use in the as-weld condition.

STANDARD QUALITY ASSURANCE PLAN
For Steel Moment Frames

The specifications and illustrations contained in this Standard Quality Assurance Plan have been prepared in accordance with recognized engineering principles and are for general information only. This Standard Quality Assurance Plan should not be used without the services of a registered engineer who is competent to evaluate the significance and limitations of its contents and who has competent professional examination and verification of its accuracy, suitability, and applicability by the Engineer or Architect of Record. By using and seeking this Standard Quality Assurance Plan, the Engineer or Architect of Record, By signing and sealing this Quality Assurance Plan, the Engineer or Architect of Record acknowledge responsibility for the application of all of this specification and illustrative details. The Engineer or Architect of Record for this Quality Assurance Plan agrees to hold harmless the City of Los Angeles and its officers, employees, and agents from any and all liability arising from such use.

Engineer of Record

LADBS DEPARTMENT OF BUILDING AND SAFETY

Date: 12/30/2017

Scale: Not to Scale

Sheet:

Sheet 2 of 3

319 Main Street
El Segundo, CA 90245
t.: 213/ 239 9700
f.: 213/ 239 9699
LFA #19927

LFA Burnett + Young Labib Funk + Associates Structural Civil Engineers

CITY OF LOS ANGELES
DEPARTMENT OF PUBLIC WORKS
BUREAU OF ENGINEERING

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED •

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

REGISTERED PROFESSIONAL ENGINEER
FABIO ZANOLI
No. 19491
CIVIL
STATE OF CALIFORNIA
SIGN DATE: 11/10/2021

VERTICAL CONTROL:
HORIZONTAL CONTROL:
SHEET TITLE: STANDARD QUALITY ASSURANCE PLAN
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY., RESEDA CA 91335

NO.	REVISIONS:	DATE:	BY:
1	100% DESIGN DEVELOPMENT	02/15/21	
2	50% CONSTRUCTION DOCUMENTS	03/30/21	
3	100% CONSTRUCTION DOCUMENTS - PERMIT SET	11/10/21	

CIP NO.

INDEX NO.

CITY ENGINEER:
DATE:
DESIGN GROUP
ENGINEER: GARY LEE MOORE, P.E., ENV SP
DESIGNED BY:
DRAWN BY:
CHECKED BY:
APPROVED BY:

WORK ORDER NO.
E170121B

SHEET NAME
S1.52
SHEET X OF X SHEETS

REVISION DATES (DESIGN STAGES ONLY)

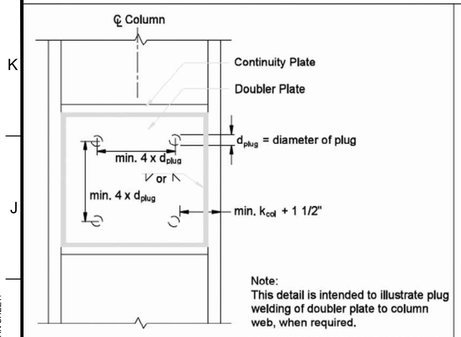
THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

Sheet Version 4.0

\\LFAFS2\DRAFTING19\19927 - RESEDA SKATE FACILITY\JLA S\S D\S151 - S153_19927.DWG 11/24/2021 10:43 AM

Plug Welding of Doubler Plate to Column — Detail 16

Scale: Not to Scale



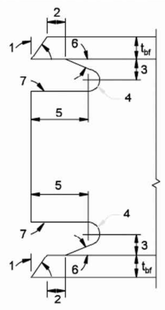
Note:
This detail is intended to illustrate plug welding of doubler plate to column web, when required.

(refer to AWS D1.1/D1.1M:2010 Section 2.3.5, 2.9, and 3.10 for minimum plug weld requirements)

Alternative Weld Access Hole Detail — Detail 12

(Required per AISC 341-10 Sec E1, for OMF application, may use as alternative for RBS application per AISC 358-10 Sec 5.3J C5.3)

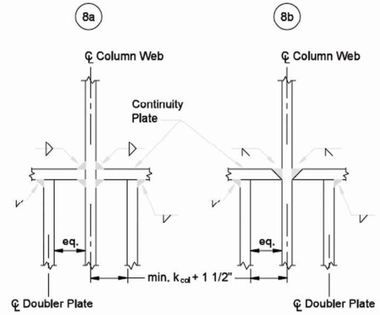
Scale: Not to Scale



Notes:
1. Bevel as required by a selected AWS prequalified CJP groove welded joint detail.
2. Larger of t_{bf} or 1/2" (plus 1/2 t_{bf}, or minus 1/4 t_{bf}).
3. 3/4 t_{bf} to t_{bf}, 3/4" minimum (± 1/4").
4. 3/8" minimum radius (plus not limited, or minus 0).
5. 3 t_{bf}(±1/2").
6. Tolerances shall not accumulate to the extent that the angle of the access hole cut to the flange surface exceed 25°.
7. Weld access hole shall be ground smooth to a surface roughness value not to exceed 500 micro inch; and shall be free of notches and gouges.
8. This detail is required for FR (fully restrained) connection for OMF per AISC 341-10 seismic provisions sec. E1 where weld access holes are provided.

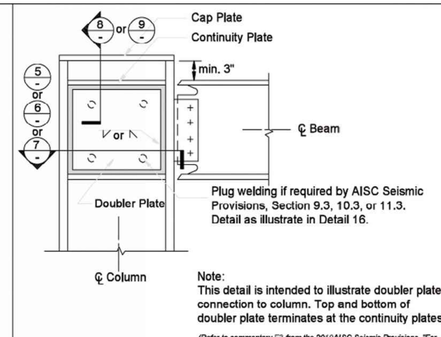
Doubler Plate Welds to Continuity Plate — Detail 8

Scale: Not to Scale



Web Doubler Plate Detail — Detail 4

Scale: Not to Scale



Note:
This detail is intended to illustrate doubler plate connection to column. Top and bottom of doubler plate terminates at the continuity plates.

(Refer to commentary E3 from the 2010AISC Seismic Provisions, "For Structural Steel Buildings")

Typical Sheet 3 General Notes — Detail 1

Scale: Not to Scale

TYPICAL SHEET 3 GENERAL NOTES:

1. The illustrative details provided herein are intended to highlight the minimum fabrication and welding details that should be reflected on the structural plan. It shall not be used as a substitute for or in lieu of structural details that the Engineer or Architect of Record must provide on the structural plan.
2. These illustrative details do not provide information such as, but not limited to, size of columns or beams, continuity or doubler plate thicknesses, size and length of the fillet welds, the type of beam to column moment connections, locations of all seismic demand welds, location od all required lateral braces, steel column frame to foundation connections, or length and location of plastic hinging zones. This information shall be determined by the Engineer or Architect of Record and specified on the structural plan.
3. Where the illustrative details provide information such as weld type to use at a particular weld joint, minimum or maximum dimensions for length, weld size, or gap between base metals, it should be appropriately reflected on the structural plan by the Engineer or Architect of Record.
4. Engineer of Record shall indicate on this plan which Weld Access Hole detail to be used. See Detail 12 and 17 of Sheet 3

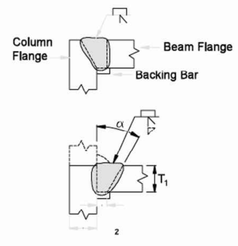
Notes: These are typical details for joints welded from one side against steel backing (tw=thickness of material in which the hole is made)
(1) Width: Greater of 1.5 x tw or 1½ in. Tolerance is +- 1/4 in.
(2) Height : Greater of 1.5 tw or 1 in. but need not exceed 2 in.
(3) R : ⅜ in. min. Grind the thermally cut surface of access holes in heavy shapes as defined in Section A.3.1c and A.3.1d (2010 AISC Seismic provisions). For heavy section as defined in A3.1c and A3.1d, the thermally cut surface of beam copes and weld access holes shall be ground to bright metal and inspected by either magnetic particle or dye penetrant methds prior to deposition of splice welds.
(4) Slope "a" forms a transition from the web to the flange. Slope "b" may be horizontal.
(5) The bottom of the top is to be contoured to permit the light fit of backing bars where they are to be used.
(6) The web-to-flange weld of built-up members is to be held back a distance of at least the weld size from the edge of the access hole.
(Refer to AISC 360-10 Specification for Structural Steel Buildings fig. C–J1.6, Weld Access Hole Geometry)

Weld Access Hole Detail — Detail 17

(Required per AISC 358-10 Sec 5.3J C5.3 for RBS application, may use detail 12 as alternative)

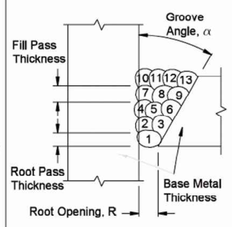
Scale: Not to Scale

TOLERANCES	
As Detailed	As Fit-Up
R = +1/16, -0	+1/4, -1/16
α = +10°, -0°	+10°, -5°



Weld Pass Sequence — Detail 13

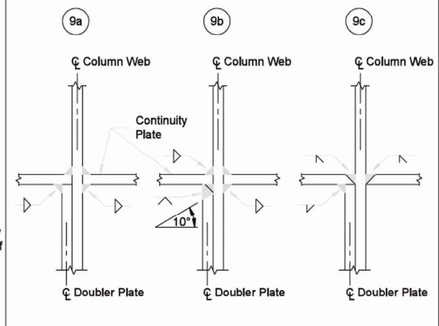
Scale: Not to Scale



Notes:
1. For maximum fill pass thickness, see Table 5 on Sheet 2.
2. For moment connection at bottom beam flange to column flange, the maximum root pass thickness shall not exceed 1/4" per Part V, Item 1. For welded connection at all other locations, see Table 5 on Sheet 2 for maximum root pass thickness.
3. Root Opening, R, and Groove Angle, α, shall be per selected AWS prequalified CJP groove welded joint detail.
4. Welding pass numbers are shown diagrammatically to indicate sequence. Quantity of passes may vary due to depth and/or position of weld. This figure is intended to illustrate recommended welding sequence for FCAW and SMAW welding process only to reduce stresses due to weld skrinkage

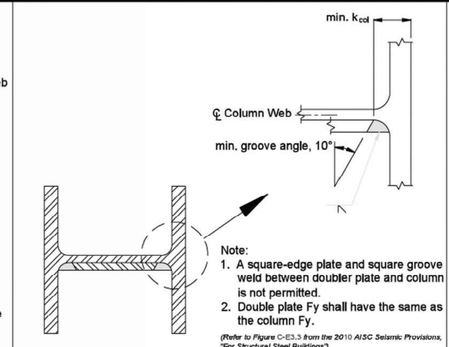
Doubler Plate Welds to Continuity Plate — Detail 9

Scale: Not to Scale



Groove Welded Doubler Plate — Detail 5

Scale: Not to Scale

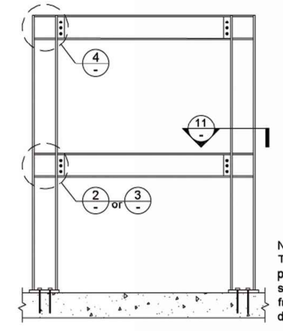


Note:
1. A square-edge plate and square groove weld between doubler plate and column is not permitted.
2. Double plate Fy shall have the same as the column Fy.

(Refer to Figure C-E3.3 from the 2010 AISC Seismic Provisions, "For Structural Steel Buildings")

Sample Steel Moment Frame — Detail 1

Scale: Not to Scale



Note:
This detail is for illustrative purpose only. Refer to the structural plans for actual frame connections and details.

Weld Pass Sequence — Detail 13

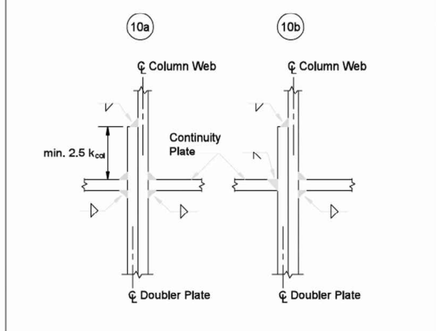
Scale: Not to Scale

Welding Process	Joint Designation	Base Metal Thickness (U = unlimited) T_1	Base Metal Thickness (U = unlimited) T_2	Groove Preparation: Root Opening	Groove Preparation: Groove Angle	Allowed Welding Positions	Gas Shielding for FCAW
SMAW	TC-U4a	U	U	R = 1/4	α = 45°	All	-
				R = 3/8	α = 30°	F, V, OH	-
FCAW	TC-U4a-GF	U	U	R = 3/16	α = 30°	All	Required
				R = 3/8	α = 30°	F	Not required
				R = 1/4	α = 45°	All	Not required

Notes:
1. Groove welds in corner and T-joints of cyclically loaded structures shall be reinforced with fillet welds equal to T_1 /4, but need not exceed 3/8 inch.
2. For corner joints, the outside groove preparation may be in either or both members, provided the basic groove configuration is not changed and adequate edge distance is maintained to support the welding operations without excessive edge melting.
3. Adapted with permission from the AWS D1.1 Committee on Structural Welding, Structural Welding Code - Steel, AWS D1.1/D1.1M: 2010 Miami: American Welding Society, Figure 3.4 pg. 95 (top left).

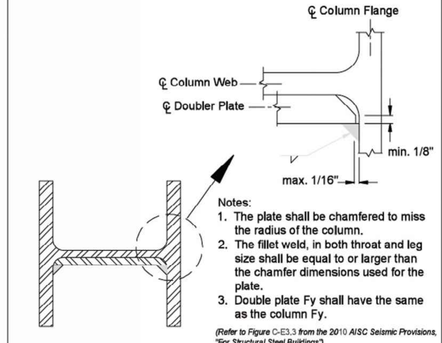
Doubler Plate Welds to Continuity Plate — Detail 10

Scale: Not to Scale



Groove or Fillet Welded Doubler Plate — Detail 7

Scale: Not to Scale

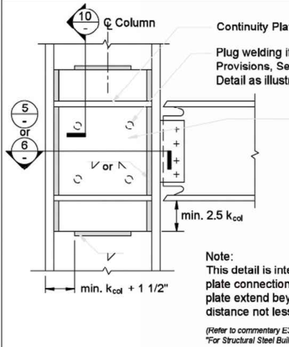


Notes:
1. The plate shall be chamfered to miss the radius of the column.
2. The fillet weld, in both throat and leg size shall be equal to or larger than the chamfer dimensions used for the plate.
3. Double plate Fy shall have the same as the column Fy.

(Refer to Figure C-E3.3 from the 2010 AISC Seismic Provisions, "For Structural Steel Buildings")

Web Doubler Plate Detail — Detail 3

Scale: Not to Scale

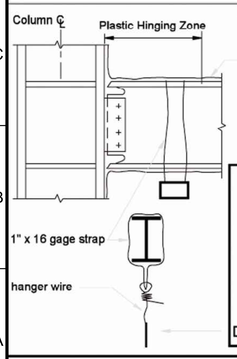


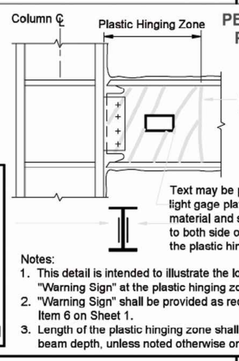
Note:
This detail is intended to illustrate doubler plate connection to column web. Doubler plate extend beyond continuity plate a distance not less than min. 2.5 k_{col} .

(Refer to commentary E3 from the 2010 AISC Seismic Provisions, "For Structural Steel Buildings")

AWS Prequalified CJP Groove Welded Joint Detail — Detail 14

Scale: Not to Scale





WARNING SIGN

"It is PROHIBITED to attach and to cause penetration or damage to the plastic hinging zones of steel moment-frames. These PROHIBITED conditions include bolts, holes, screws, shot pins, welds and tack welds (permanent or temporary). Failure to comply with these requirements may cause the replacement of steel."

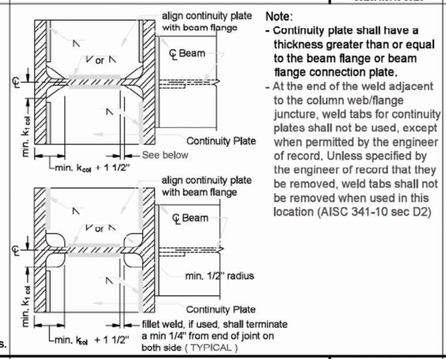
DO NOT MOVE OR REMOVE THIS SIGN

Text may be printed on either light gage plate or adhesive material and shall be affixed to both side of the beam within the plastic hinging zone.

Notes:
1. This detail is intended to illustrate the location of the "Warning Sign" at the plastic hinging zone.
2. "Warning Sign" shall be provided as required by Part IV Item 6 on Sheet 1.
3. Length of the plastic hinging zone shall be a min. of 2 x beam depth, unless noted otherwise on the structural plans.

Doubler Plate Welds to Continuity Plate — Detail 11

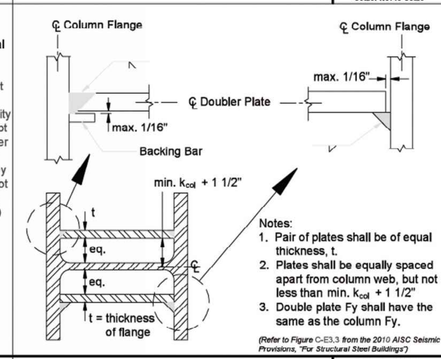
Scale: Not to Scale



Note:
- Continuity plate shall have a thickness greater than or equal to the beam flange or beam flange connection plate.
- At the end of the weld adjacent to the column web/flange juncture, weld tabs for continuity plates shall not be used, except when permitted by the engineer of record. Unless specified by the engineer of record that they be removed, weld tabs shall not be removed when used in this location (AISC 341-10 sec D2)

Fillet Welded Doubler Plate — Detail 6

Scale: Not to Scale

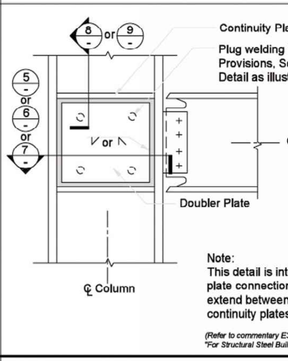


Notes:
1. Pair of plates shall be of equal thickness, t.
2. Plates shall be equally spaced apart from column web, but not less than min. k_{col} + 1 1/2"
3. Double plate Fy shall have the same as the column Fy.

(Refer to Figure C-E3.3 from the 2010 AISC Seismic Provisions, "For Structural Steel Buildings")

Web Doubler Plate Detail — Detail 2

Scale: Not to Scale

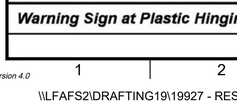


Note:
This detail is intended to illustrate doubler plate connection to column. Doubler plate extend between the top and bottom of the continuity plates.

(Refer to commentary E3 from the 2010 AISC Seismic Provisions, "For Structural Steel Buildings")

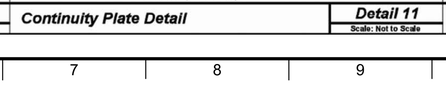
Warning Sign at Plastic Hinging Zone — Detail 15

Scale: Not to Scale



Continuity Plate Detail — Detail 11

Scale: Not to Scale



Note:
- Continuity plate shall have a thickness greater than or equal to the beam flange or beam flange connection plate.
- At the end of the weld adjacent to the column web/flange juncture, weld tabs for continuity plates shall not be used, except when permitted by the engineer of record. Unless specified by the engineer of record that they be removed, weld tabs shall not be removed when used in this location (AISC 341-10 sec D2)

Groove or Fillet Welded Doubler Plate — Detail 7

Scale: Not to Scale

Notes:
1. Pair of plates shall be of equal thickness, t.
2. Plates shall be equally spaced apart from column web, but not less than min. k_{col} + 1 1/2"
3. Double plate Fy shall have the same as the column Fy.

(Refer to Figure C-E3.3 from the 2010 AISC Seismic Provisions, "For Structural Steel Buildings")

Web Doubler Plate Detail — Detail 3

Scale: Not to Scale

Note:
This detail is intended to illustrate doubler plate connection to column. Doubler plate extend between the top and bottom of the continuity plates.

(Refer to commentary E3 from the 2010 AISC Seismic Provisions, "For Structural Steel Buildings")

STANDARD QUALITY ASSURANCE PLAN
For Steel Moment Frames

THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED

SIGN DATE: 11/10/2021

Engineer of Record

CITY OF LA DBS DEPARTMENT OF BUILDING AND SAFETY

Date: 12/30/2017

Scale: Not to Scale

Sheet:

Sheet 3 of 3

319 Main Street
El Segundo, CA 90245
t: 213/ 239 9700
f: 213/ 239 9699
LFA #19927

Burnett + Young Associates
Structural | Civil Engineers

The specifications and illustrations contained in this Standard Quality Assurance Plan are intended to conform to accepted engineering practices and standards of the engineering profession. By signing and sealing this Standard Quality Assurance Plan, the Engineer or Architect of Record is stating that he/she is a competent professional and has exercised reasonable care in the preparation and verification of its accuracy, reliability, and applicability to the project. By signing and sealing this Standard Quality Assurance Plan, the Engineer or Architect of Record assumes full responsibility for the application of all of the specifications and illustrations and illustrative details contained in this Standard Quality Assurance Plan. By signing and sealing this Standard Quality Assurance Plan, the Engineer or Architect of Record acknowledges that the City of Los Angeles assumes no responsibility for the application of any of the specifications and illustrations and illustrative details contained in this Standard Quality Assurance Plans and all liability arising from such use.

BUREAU OF ENGINEERING

VERTICAL CONTROL:
HORIZONTAL CONTROL:

SHEET TITLE: STANDARD QUALITY ASSURANCE PLAN

PROJECT: RESEDA SKATE FACILITY

ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

NO.	REVISIONS:	DATE:	BY:
1	100% DESIGN DEVELOPMENT	02/15/21	
2	50% CONSTRUCTION DOCUMENTS	03/30/21	
3	100% CONSTRUCTION DOCUMENTS - PERMIT SET	11/10/21	

CITY ENGINEER: DATE:

ENGINEER:
DESIGNED BY:
DRAWN BY:
CHECKED BY:
APPROVED BY:
DESIGN GROUP

CIP NO.

INDEX NO.

CITY OF LOS ANGELES
DEPARTMENT OF PUBLIC WORKS
GARY LEE MOORE, P.E., ENV SP

WORK ORDER NO.
E170121B

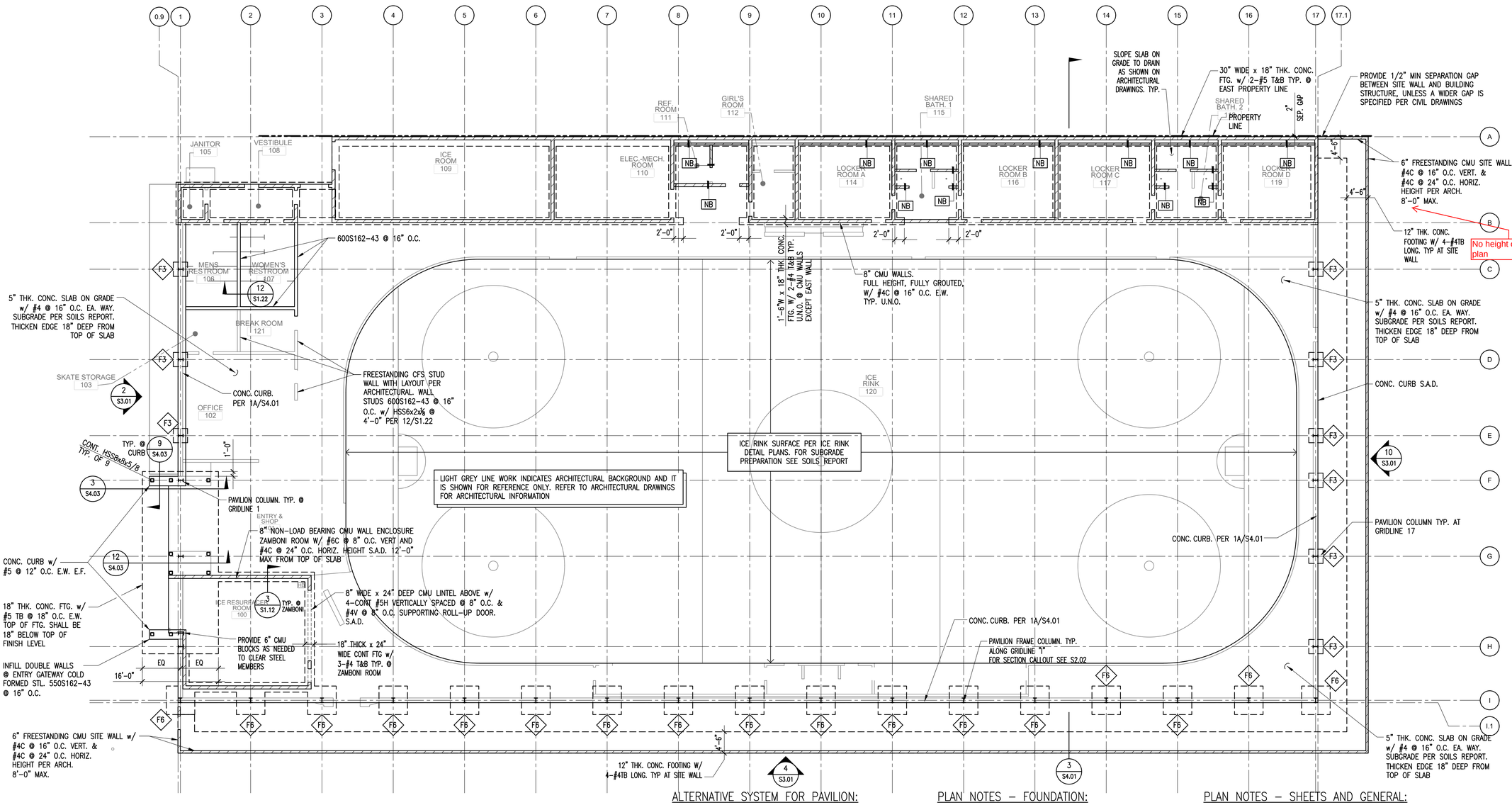
SHEET NAME
S1.53
SHEET X OF X SHEETS

REVISION DATES (DESIGN STAGE ONLY)

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

Sheet Version 4.0

\\LFAFS2\DRAFTING19\19927 - RESEDA SKATE FACILITY\JLA S\S D\S151 - S153_19927.DWG 11/24/2021 10:43 AM



INDICATES CONCRETE FOOTING

NB — INDICATES NON-BEARING CMU WALL w/ #4C @ 24" O.C. E.W. PROVIDE THICKENED SLAB EDGE PER 1/S1.12

S - - - - S — INDICATES STEPPED FOOTING PER TYP. DETAIL

F# — INDICATES CONCRETE FOOTING PER SCHEDULE THIS SHEET

INDICATES STEEL COLUMN

6-#6C4 @ 12" — REBAR CALLOUT
- REBAR SPACING WHERE APPLICABLE
- REBAR LENGTH IN FEET WHERE NOTED. IF NOT NOTED REBAR LENGTH SHALL COMPLY WITH DETAILS. HOOK OR TAILS PER DETAILS
- REBAR LOCATION T (TOP), B (BOTTOM), C (CENTER), H (HORIZONTAL), V (VERTICAL).
- REBAR SIZE
- NUMBER OF REBAR

C. THE ALTERNATIVE SYSTEM WILL DEPLOY MAIN "FRAMES" SPANNING ACROSS THE BUILDING ALONG THE GRIDLINES 1 THRU 17 WITHOUT ALTERING SPACING OF THE GRIDLINES, AND WILL BE BASED ON THE SAME LOAD PATH OF THE PROPOSED FRAMING SYSTEM.

D. THE ALTERNATIVE SYSTEM WILL NOT RESULT IN CHANGES TO THE BASE AS DEFINED ABOVE OR TO THE ARCHITECTURAL LAYOUT.

E. COMPLETE SET OF DRAWINGS AND REACTIONS ARE SUBMITTED TO THE SEOR FOR REVIEW OF STRUCTURAL IMPACT, AND COMPLETE SET OF DRAWINGS AND STAMPED CALCULATIONS ARE SUBMITTED TO THE AUTHORITY OF JURISDICTION FOR PLAN CHECK REVIEW AND A PERMIT IS OBTAINED.

F. COST FOR DESIGN AND PERMITTING OF THE ALTERNATIVE SYSTEM WILL BE LEVIED AGAINST CONSTRUCTION COST.

SYMBOLS – FOUNDATION

INDICATES CHANGE IN FLOOR ELEVATION

INDICATES CONCRETE WALL

INDICATES CONCRETE WALL BELOW

INDICATES CMU WALL

INDICATES CMU WALL BELOW

ALTERNATIVE SYSTEM FOR PAVILION:

901. PER THESE DRAWINGS, A "PAVILION" EXTENDING BETWEEN GRIDLINES 0.9, 17.1, B, AND I.1, AND A CONCRETE AND CMU "BASE" THAT THE PAVILION IS ANCHORED TO, ARE SPECIFIED.

902. THE PAVILION CONSISTS OF AN ARCHITECTURAL MEMBRANE SPANNING BETWEEN A STRUCTURAL STEEL FRAME. FOR THE ARCHITECTURAL MEMBRANE SPECIFICATIONS & ADDITIONAL PROFILES CONNECTING MEMBRANE TO STEEL MEMEBERS SEE ARCHITECTURAL DRAWINGS. FOR THE PAVILION STEEL FRAME, SEE THESE STRUCTURAL DRAWINGS. THE STEEL FRAMING SYSTEM CONSISTS IN MAIN "FRAMES" DEPLOYED ALONG GRIDLINES 1 THRU 17 SPANNING ACROSS THE EAST WEST DIRECTION OF THE PAVILION. STEEL MEMBERS ALONG THE NORTH AND SOUTH ELEVATIONS AT GRIDLINES 1 AND 17 RESPECTIVELY, AND ROOF AND WALL STEEL MEMBERS, RODS, AND BRACES, EXTENDING BETWEEN THE FRAMES. THE PROPOSED STEEL FRAMING SYSTEM IS ANCHORED TO THE CONCRETE AND CMU CONSTRUCTION.

903. AN ALTERNATIVE SYSTEM TO THE STEEL FRAMING SYSTEM FOR THE PAVILION DESCRIBED ABOVE, INCLUDING ALTERNATIVE MATERIAL SUCH AS ALUMINUM, ALTERNATIVE PRE-ENGINEERED FRAMING SYSTEMS, ALTERNATIVE CONNECTIONS, AND ALTERNATIVE ANCHORAGE TO THE FOUNDATION AND CMU CONSTRUCTION, MAY BE PROPOSED PROVIDED THAT:
A. THE SUBSTITUTION IS APPROVED BY THE PROJECT ARCHITECT
B. THE PAVILION DIMENSIONS AND SHAPE AS SPECIFIED ON THE ARCHITECTURAL DRAWINGS ARE MAINTAINED.

PLAN NOTES – FOUNDATION:

201. ALL GRADING & FOUNDATION WORK MUST BE OBSERVED AND APPROVED BY THE PROJECT GEOTECHNICAL ENGINEER PRIOR TO PLACEMENT OF STEEL REINFORCEMENT AND POURING CONCRETE.

202. FOR LIMITS AND EXTENT OF OVER EXCAVATION SEE CIVIL DRAWINGS AND SOILS REPORT.

203. PER SOILS REPORT THE RECOMMENDED BEARING MATERIALS ARE CERTIFIED COMPATED FILL AND NATIVE SOIL. FOR SPECIFIC LOCATION OF EITHER OF THE TWO BEATING MATERIALS SPECIFIED ABOVE SEE SOILS REPORT.

204. FOOTINGS BEARING ON COMPACTED FILL SHALL BE EMBEDDED AT LEAST 24" BELOW THE LOWEST ADJACENT GRADE. FOOTINGS BEARING ON NATIVE SOIL SHALL BE EMBEDDED AT LEAST 6" INTO THE NATIVE SOIL.

205. U.N.O. TOP OF CONCRETE GRADE BEAMS & TOP OF CONC. FOOTING ELEVATION SHALL BE 12" BELOW THE TOP OF THE LOWEST SLAB DIRECTLY ABOVE THE FOOTING. FOR TOP OF SLAB ELEVATION SEE ARCH'L DRAWINGS.

206. FOR SLAB ON GRADE SUB-GRADE PREPARATION SEE SOILS REPORT.

207. FOR VAPOR BARRIER AT INTERIOR SPACES S.A.D. SPECIFICATIONS/DRAWINGS.

PLAN NOTES – SHEETS AND GENERAL:

101. GENERAL NOTES AND TYPICAL DETAILS SHEETS: SEE S0.01 THRU S1.53 SHEETS. GENERAL NOTES & TYPICAL DETAILS APPLY TO ALL PARTS OF THE WORK EXCEPT WHERE SPECIFICALLY DETAILED OR U.N.O. ON THE FLOOR PLANS AND PLAN NOTES

102. VERIFY ALL DIMENSIONS, ELEVATIONS, SLAB EDGES, SLAB DEPRESSIONS, SLAB OPENINGS, CURBS, SLOPES, FOOTING, PENETRATIONS, WALL OPENINGS WITH ARCHITECTURAL, MECHANICAL, PLUMBING, ELECTRICAL & CIVIL DRAWINGS.

103. FOR ALL DIMENSIONS & ROOF SLOPES S.A.D.

104. NON-BEARING WALLS SHOWN FOR ILLUSTRATIVE PURPOSES ONLY. FOR NON-BEARING WALL LOCATIONS S.A.D.

105. FOR FIRE RATING AND FIRE PROTECTION REQUIREMENTS, INCLUDING BUT NOT LIMITED TO STRUCTURAL STEEL FRAMING, SEE ARCH'L DRAWINGS

FOOTING SCHEDULE	
MARK	SIZE AND REINFORCEMENT
F3	3'-0" SQUARE x 24" THICK W/ 3-#5 T&B EACH WAY
F6	6'-0" SQUARE x 24" THICK W/ 5-#5 T&B EACH WAY

FIRST FLOOR FOUNDATION PLAN
Scale: 3/32" = 1'-0"

Burnett + Young Shoring Engineers
Labib Funk + Associates Structural | Civil Engineers
319 Main Street
El Segundo, CA 90245
t: 213/ 239 9700
f: 213/ 239 9699
LFA #19927

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

REGISTERED PROFESSIONAL ENGINEER FABIO ZANOZI No. 34491 CIVIL STRUCTURAL STATE OF CALIFORNIA

SIGN DATE: 11/10/2021

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED •

DEPARTMENT OF PUBLIC WORKS
BUREAU OF ENGINEERING
VERTICAL CONTROL:
HORIZONTAL CONTROL:
SHEET TITLE: FIRST FLOOR FOUNDATION PLAN
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

CITY OF LOS ANGELES
CITY ENGINEER
DATE:
GARY LEE MOORE, P.E., ENV SP
DESIGN GROUP
ENGINEER:
DESIGNED BY:
DRAWN BY:
CHECKED BY:
APPROVED BY:

NO.	REVISIONS:	DATE:	BY:
1	100% DESIGN DEVELOPMENT	02/15/21	
2	50% CONSTRUCTION DOCUMENTS	03/30/21	
3	100% CONSTRUCTION DOCUMENTS - PERMIT SET	11/10/21	

CIP NO.
INDEX NO.

WORK ORDER NO.
E170121B

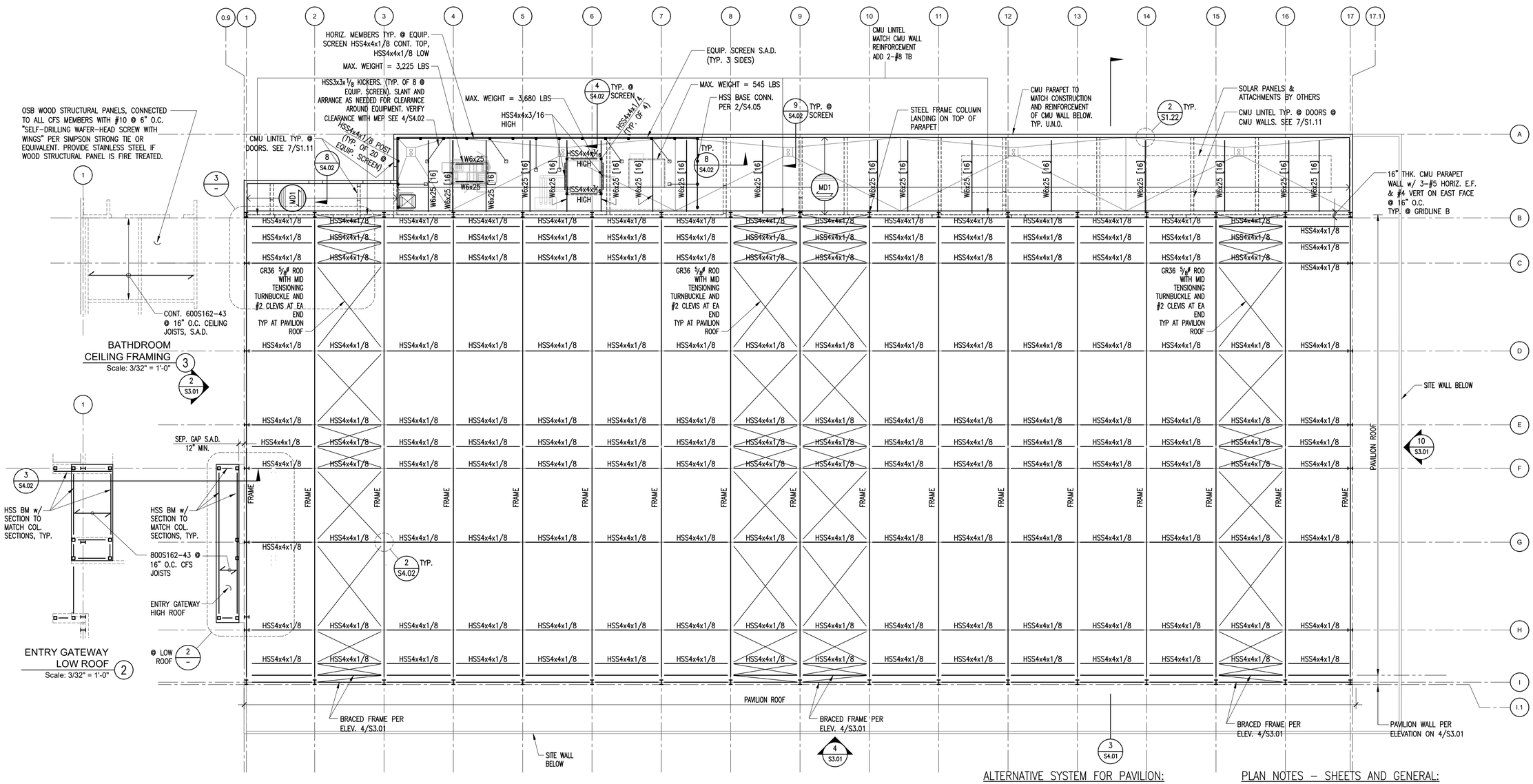
SHEET NAME
S2.01
SHEET X OF X SHEETS

REVISION DATES (DESIGN STAGE ONLY)

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

Sheet Version 4.0

\\LFAFS2\DRAFTING19\19927 - RESEDA SKATE FACILITY\JLA S\S D\S201_19927.DWG 11/24/2021 10:43 AM



ROOF FRAMING PLAN
Scale: 3/32" = 1'-0"

	INDICATES STEEL COLUMN
C.A.	INDICATES STEEL COLUMN ABOVE
[X]	NUMBER OF SHEAR STUDS REQUIRED. SEE S1.31
<c=X>	UPWARD CAMBER IN BEAM (INCHES)
FRAME	INDICATES STEEL FRAME WITH W12x72 SECTION WITH PROFILE PER 3/S4.01. CAMBER & BEND STEEL MEMBERS AS SHOWN ON SECTION. PROVIDE SPLICE DETAIL AS NEEDED FOR ERECTION PER 1/S4.05.

SYMBOLS – STEEL

- CHANGE IN FLOOR ELEVATION
- BEARING CMU WALL
- NON LOAD BEARING CMU WALL
- MD1: 4.5" LIGHT WEIGHT CONCRETE w/ 4X4 – W1.4 X W1.4 WIRE MESH OVER W2 x 20 GAUGE VERCO METAL DECK. PROVIDE 1/2" WNS ON ALL STEEL MEMBERS IN CONTACT WITH THE METAL DECK, w/ MAX SPACING @ 12" O.C. OR LESS WHEN SPEC'D ON FLOOR PLAN.

C. THE ALTERNATIVE SYSTEM WILL DEPLOY MAIN "FRAMES" SPANNING ACROSS THE BUILDING ALONG THE GRIDLINES 1 THRU 17 WITHOUT ALTERING SPACING OF THE GRIDLINES, AND WILL BE BASED ON THE SAME LOAD PATH OF THE PROPOSED FRAMING SYSTEM.
D. THE ALTERNATIVE SYSTEM WILL NOT RESULT IN CHANGES TO THE BASE AS DEFINED ABOVE OR TO THE ARCHITECTURAL LAYOUT.
E. COMPLETE SET OF DRAWINGS AND REACTIONS ARE SUBMITTED TO THE SEOR FOR REVIEW OF STRUCTURAL IMPACT, AND COMPLETE SET OF DRAWINGS AND STAMPED CALCULATIONS ARE SUBMITTED TO THE AUTHORITY OF JURISDICTION FOR PLAN CHECK REVIEW AND A PERMIT IS OBTAINED.
F. COST FOR DESIGN AND PERMITTING OF THE ALTERNATIVE SYSTEM WILL BE LEVIED AGAINST CONSTRUCTION COST.

ALTERNATIVE SYSTEM FOR PAVILION:

901. PER THESE DRAWINGS, A "PAVILION" EXTENDING BETWEEN GRIDLINES 0.9, 17.1, B, AND I.1, AND A CONCRETE AND CMU "BASE" THAT THE PAVILION IS ANCHORED TO, ARE SPECIFIED.

902. THE PAVILION CONSISTS OF AN ARCHITECTURAL MEMBRANE SPANNING BETWEEN A STRUCTURAL STEEL FRAME. FOR THE ARCHITECTURAL MEMBRANE SPECIFICATIONS & ADDITIONAL PROFILES CONNECTING MEMBRANE TO STEEL MEMEBERS SEE ARCHITECTURAL DRAWINGS. FOR THE PAVILION STEEL FRAME, SEE THESE STRUCTURAL DRAWINGS. THE STEEL FRAMING SYSTEM CONSISTS IN MAIN "FRAMES" DEPLOYED ALONG GRIDLINES 1 THRU 17 SPANNING ACROSS THE EAST WEST DIRECTION OF THE PAVILION, STEEL MEMBERS ALONG THE NORTH AND SOUTH ELEVATIONS AT GRIDLINES 1 AND 17 RESPECTIVELY, AND ROOF AND WALL STEEL MEMBERS, RODS, AND BRACES, EXTENDING BETWEEN THE FRAMES. THE PROPOSED STEEL FRAMING SYSTEM IS ANCHORED TO THE CONCRETE AND CMU CONSTRUCTION.

903. AN ALTERNATIVE SYSTEM TO THE STEEL FRAMING SYSTEM FOR THE PAVILION DESCRIBED ABOVE, INCLUDING ALTERNATIVE MATERIAL SUCH AS ALUMINUM, ALTERNATIVE PRE-ENGINEERED FRAMING SYSTEMS, ALTERNATIVE CONNECTIONS, AND ALTERNATIVE ANCHORAGE TO THE FOUNDATION AND CMU CONSTRUCTION, MAY BE PROPOSED PROVIDED THAT:
A. THE SUBSTITUTION IS APPROVED BY THE PROJECT ARCHITECT
B. THE PAVILION DIMENSIONS AND SHAPE AS SPECIFIED ON THE ARCHITECTURAL DRAWINGS ARE MAINTAINED.

PLAN NOTES – SHEETS AND GENERAL:

101. GENERAL NOTES AND TYPICAL DETAILS SHEETS: SEE S0.01 THRU S1.53 SHEETS. GENERAL NOTES & TYPICAL DETAILS APPLY TO ALL PARTS OF THE WORK EXCEPT WHERE SPECIFICALLY DETAILED OR U.N.O. ON THE FLOOR PLANS AND PLAN NOTES

102. VERIFY ALL DIMENSIONS, ELEVATIONS, SLAB EDGES, SLAB DEPRESSIONS, SLAB OPENINGS, CURBS, SLOPES, FOOTING, PENETRATIONS, WALL OPENINGS WITH ARCHITECTURAL, MECHANICAL, PLUMBING, ELECTRICAL & CIVIL DRAWINGS.

103. FOR ALL DIMENSIONS & ROOF SLOPES S.A.D.

104. NON-BEARING WALLS SHOWN FOR ILLUSTRATIVE PURPOSES ONLY. FOR NON-BEARING WALL LOCATIONS S.A.D.

105. FOR FIRE RATING AND FIRE PROTECTION REQUIREMENTS, INCLUDING BUT NOT LIMITED TO STRUCTURAL STEEL FRAMING, SEE ARCH'L DRAWINGS

Burnett + Young Shoring Engineers
Labib Funk + Associates Structural | Civil Engineers
319 Main Street
El Segundo, CA 90245
t: 213/ 239 9700
f: 213/ 239 9699
LFA #19927

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Design Section

REGISTERED PROFESSIONAL ENGINEER FABIO ZANGOLI No. 34491 CIVIL STRUCTURAL STATE OF CALIFORNIA

SIGN DATE: 11/10/2021

THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED

DEPARTMENT OF PUBLIC WORKS
BUREAU OF ENGINEERING

VERTICAL CONTROL:
HORIZONTAL CONTROL:
SHEET TITLE: ROOF FRAMING PLAN
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

NO.	REVISIONS:	DATE:	BY:
1	100% DESIGN DEVELOPMENT	02/15/21	
2	50% CONSTRUCTION DOCUMENTS	03/30/21	
3	100% CONSTRUCTION DOCUMENTS - PERMIT SET	11/10/21	

CIP NO.
INDEX NO.

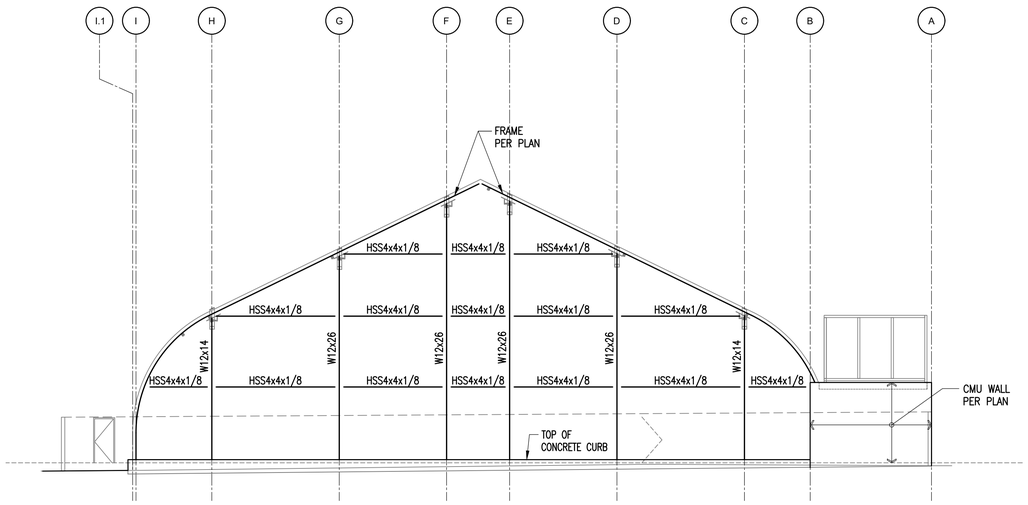
CITY OF LOS ANGELES
GARY LEE MOORE, P.E., ENV SP
CITY ENGINEER
DESIGN GROUP
DATE:
ENGINEER:
DESIGNED BY:
DRAWN BY:
CHECKED BY:
APPROVED BY:

WORK ORDER NO.
E170121B

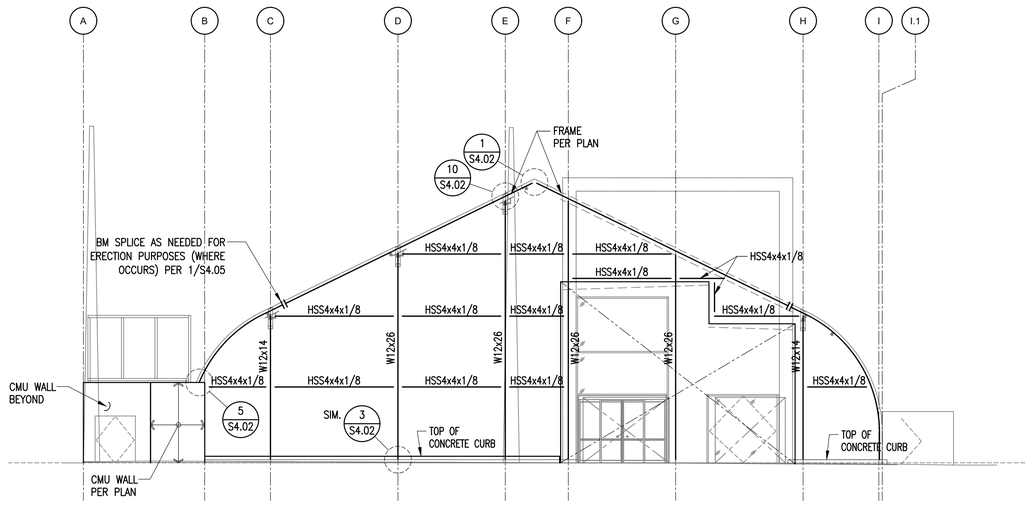
SHEET NAME
S2.02
SHEET X OF X SHEETS

REVISION DATES (DESIGN STAGE ONLY)

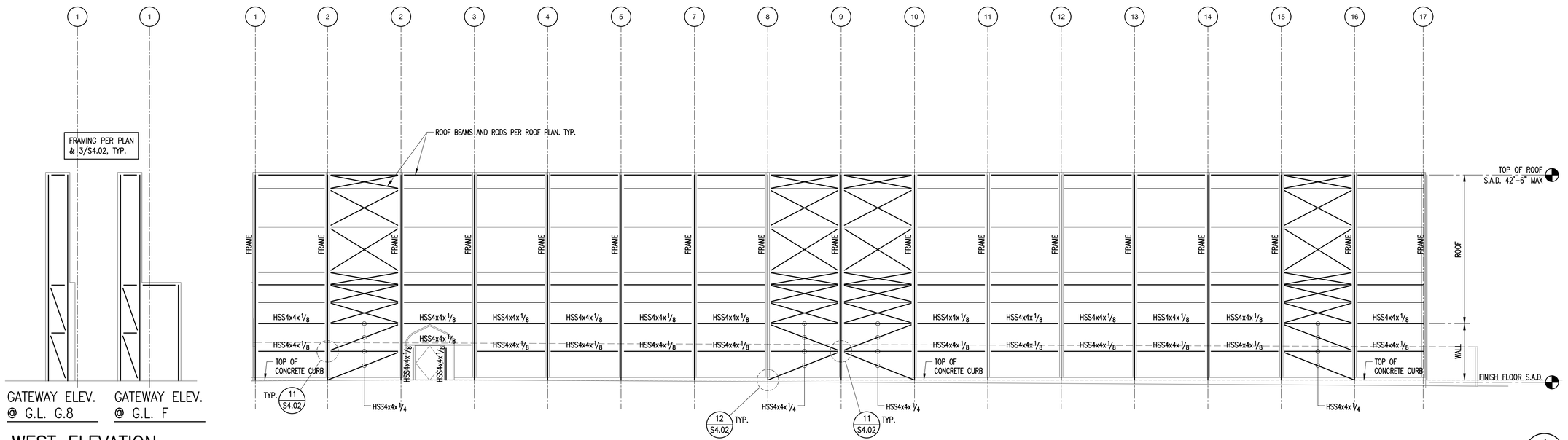
THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.



DETAIL 10 -
SCALE: N.T.S.



DETAIL 2 -
SCALE: N.T.S.



WEST ELEVATION 4 -
SCALE: N.T.S.

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REVISION DATES (DESIGN STAGE ONLY)

Sheet Version 4.0

\\LFAFS2\DRAFTING19\19927 - RESEDA SKATE FACILITY\JLA S\S D\S301_19927.DWG 11/24/2021 10:43 AM

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED

REGISTERED PROFESSIONAL ENGINEER FABIO ZANGOLI No. 6491 STRUCTURAL STATE OF CALIFORNIA
SIGN DATE: 11/10/2021

BUREAU OF ENGINEERING

VERTICAL CONTROL:
HORIZONTAL CONTROL:
SHEET TITLE: ROOF FRAMING PLAN
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

DEPARTMENT OF PUBLIC WORKS

NO.	REVISIONS:	DATE:	BY:
	100% DESIGN DEVELOPMENT	02/15/21	
	50% CONSTRUCTION DOCUMENTS	03/30/21	
	100% CONSTRUCTION DOCUMENTS - PERMIT SET	11/10/21	

CIP NO.

INDEX NO.

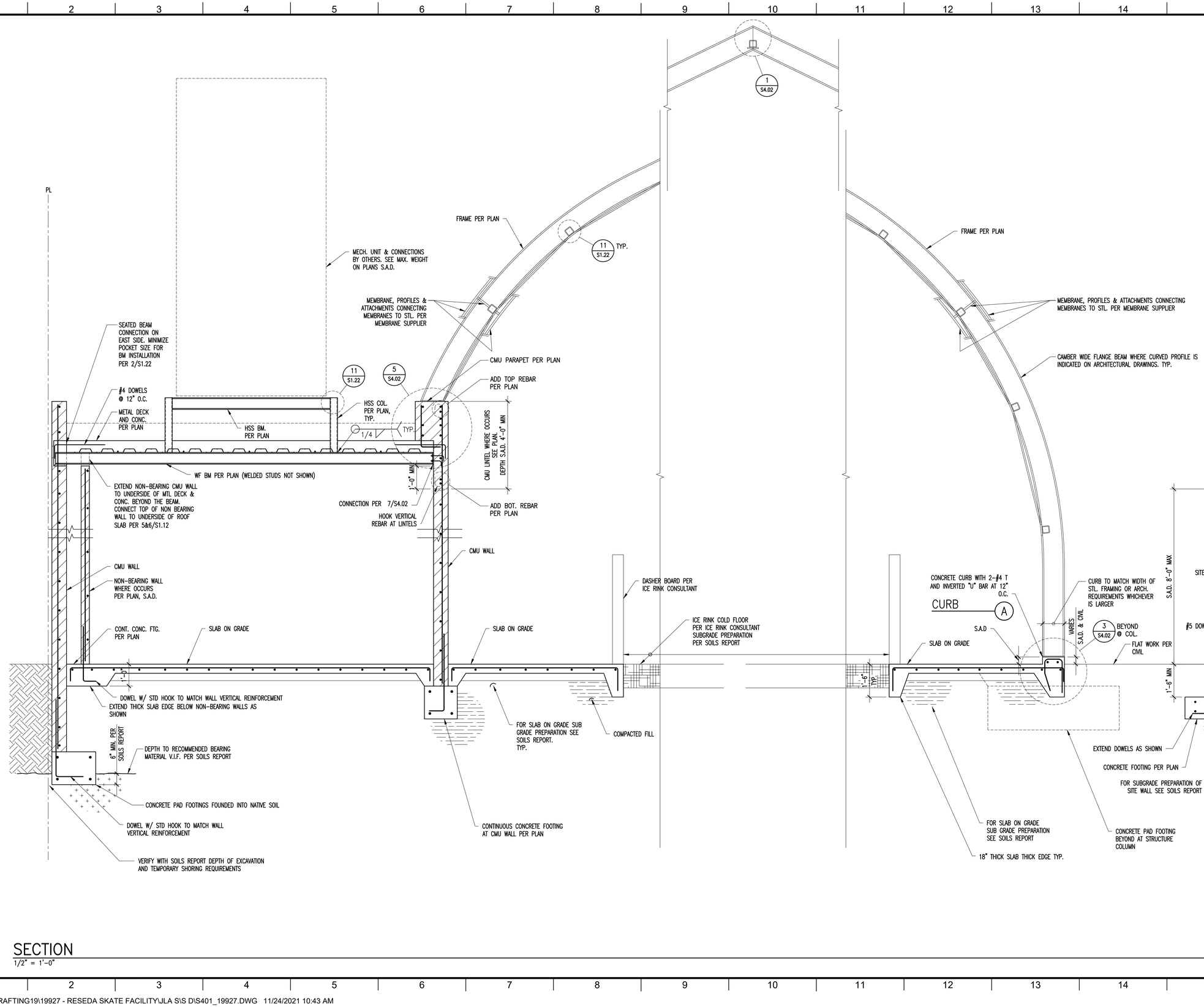
CITY OF LOS ANGELES

GARY LEE MOORE, P.E., ENV SP
CITY ENGINEER
DESIGN GROUP
DATE:
ENGINEER:
DESIGNED BY:
DRAWN BY:
CHECKED BY:
APPROVED BY:

LFA
Labib Funk + Associates
Structural | Civil Engineers
Burnett + Young
Shoring Engineers
319 Main Street
El Segundo, CA 90245
t: 213/ 239 9700
f: 213/ 239 9699
LFA #19927

WORK ORDER NO.
E170121B

SHEET NAME
S3.01
SHEET X OF X SHEETS



SECTION

1/2" = 1'-0"

3
-

319 Main Street
El Segundo, CA 90245
t: 213/ 239 9700
f: 213/ 239 9699
LFA #19927

LFA
Labib Funk + Associates
Structural | Civil Engineers
Burnett + Young
Shoring Engineers

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REVISION DATES
DESIGN & PHASE (ONLY)

Sheet Version 4.0

\\LFAFS2\DRAFTING19\19927 - RESEDA SKATE FACILITY\JLA S\S D\S401_19927.DWG 11/24/2021 10:43 AM

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

REGISTERED PROFESSIONAL ENGINEER
FABIO ZANOZI
No. 24491
CIVIL
STATE OF CALIFORNIA

SIGN DATE: 11/10/2021

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED •

DEPARTMENT OF PUBLIC WORKS
BUREAU OF ENGINEERING

VERTICAL CONTROL:
HORIZONTAL CONTROL:

SHEET TITLE: SECTIONS & DETAILS

PROJECT: RESEDA SKATE FACILITY

ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

NO.	REVISIONS:	DATE:	BY:
1	100% DESIGN DEVELOPMENT	02/15/21	
2	50% CONSTRUCTION DOCUMENTS	03/30/21	
3	100% CONSTRUCTION DOCUMENTS - PERMIT SET	11/19/21	

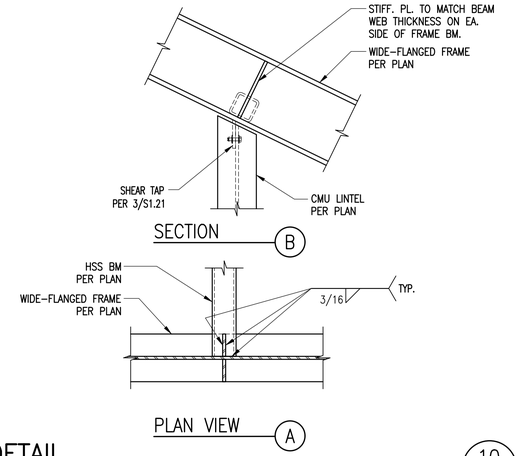
CIP NO.

INDEX NO.

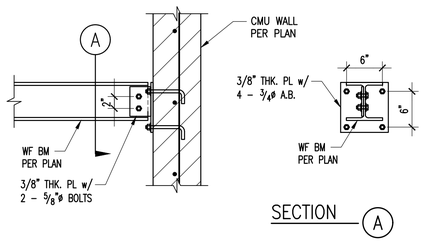
CITY OF LOS ANGELES
GARY LEE MOORE, P.E., ENV SP
CITY ENGINEER
DATE:
DESIGN GROUP
ENGINEER:
DESIGNED BY:
DRAWN BY:
CHECKED BY:
APPROVED BY:

WORK ORDER NO.
E170121B

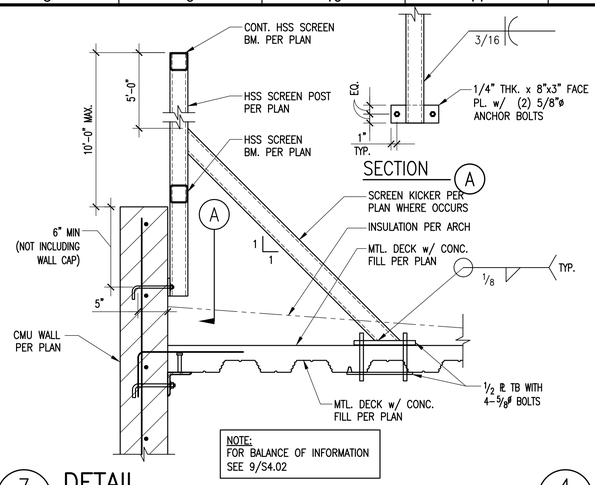
SHEET NAME
S4.01
SHEET X OF X SHEETS



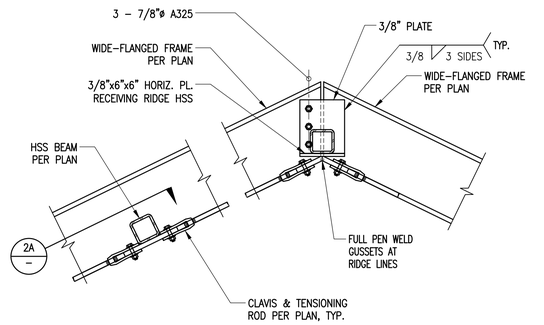
DETAIL — N.T.S. — 10 / –



DETAIL — N.T.S. — 7 / –



DETAIL — N.T.S. — 4 / –

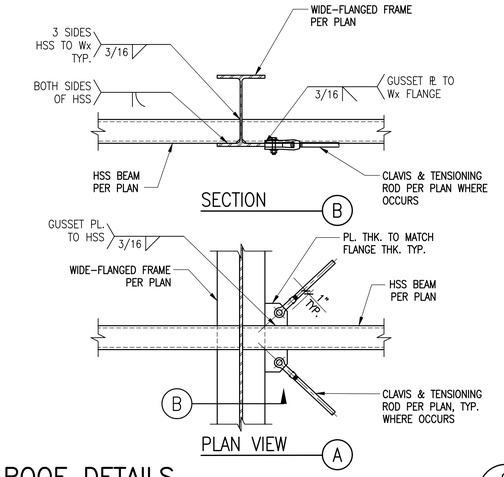


SECTION — N.T.S. — 1 / –

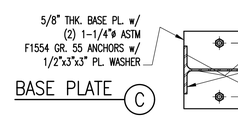
TYPICAL BRACE CONNECTION — N.T.S. — 11 / –

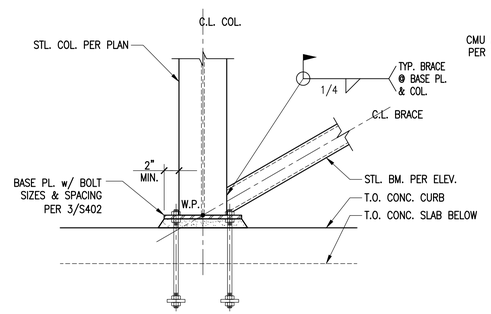
TOP OF BEARING CMU WALL — N.T.S. — 8 / –

DETAIL — N.T.S. — 5 / –

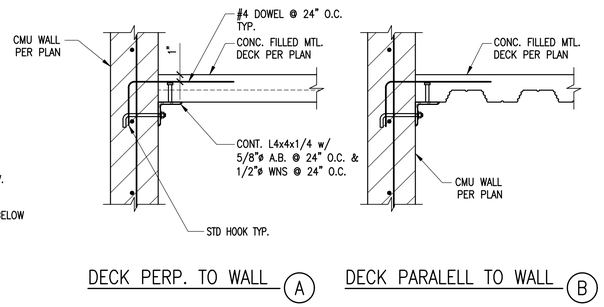


ROOF DETAILS — N.T.S. — 2 / –





DETAIL — N.T.S. — 12 / –



CONC. FILLED METAL DECK TO CMU WALL — N.T.S. — 9 / –

SECTION — N.T.S. — 3 / –

319 Main Street
El Segundo, CA 90245
t: 213/ 239 9700
f: 213/ 239 9669
LFA #19927

LFA — Labib Funk + Associates — Structural | Civil Engineers — Burnett + Young Shoring Engineers

CITY OF LOS ANGELES
GARY LEE MOORE, P.E., ENV SP
CITY ENGINEER
DESIGN GROUP
DATE:
ENGINEER:
DESIGNED BY:
DRAWN BY:
CHECKED BY:
APPROVED BY:

DEPARTMENT OF PUBLIC WORKS
BUREAU OF ENGINEERING

NO.	REVISIONS:	DATE:	BY:
1	100% DESIGN DEVELOPMENT	02/15/21	
2	50% CONSTRUCTION DOCUMENTS	03/30/21	
3	100% CONSTRUCTION DOCUMENTS - PERMIT SET	11/10/21	

VERTICAL CONTROL:
HORIZONTAL CONTROL:
SHEET TITLE: SECTIONS & DETAILS
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

CIP NO.
INDEX NO.

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

REGISTERED PROFESSIONAL ENGINEER — FABIO ZANGOLI — No. 34491 — CIVIL — STATE OF CALIFORNIA
SIGN DATE: 11/10/2021

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED

WORK ORDER NO.
E170121B

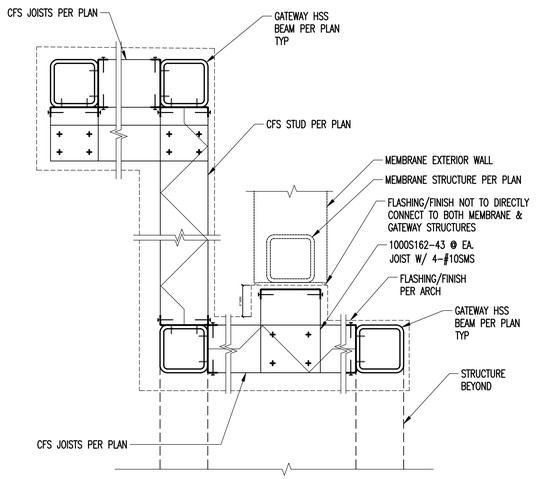
SHEET NAME
S4.02
SHEET X OF X SHEETS

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REVISION DATES
(DESIGN & PAGE ONLY)

Sheet Version 4.0

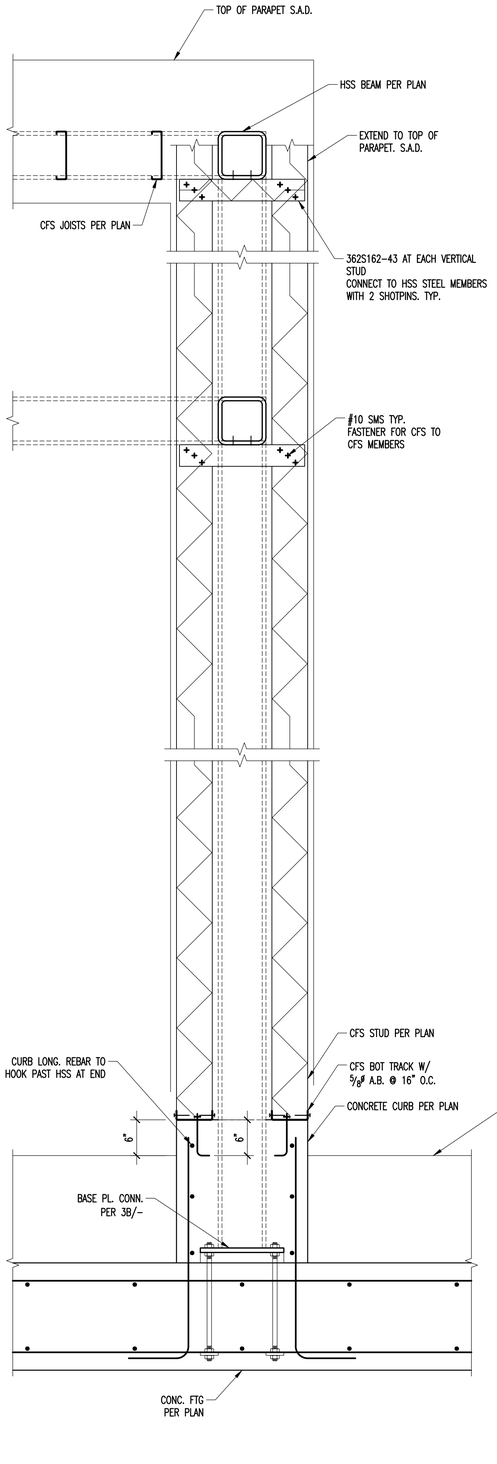
\\LFAFS2\DRAFTING19\19927 - RESEDA SKATE FACILITY\JLA S\S D\S402_19927.DWG 11/24/2021 10:43 AM

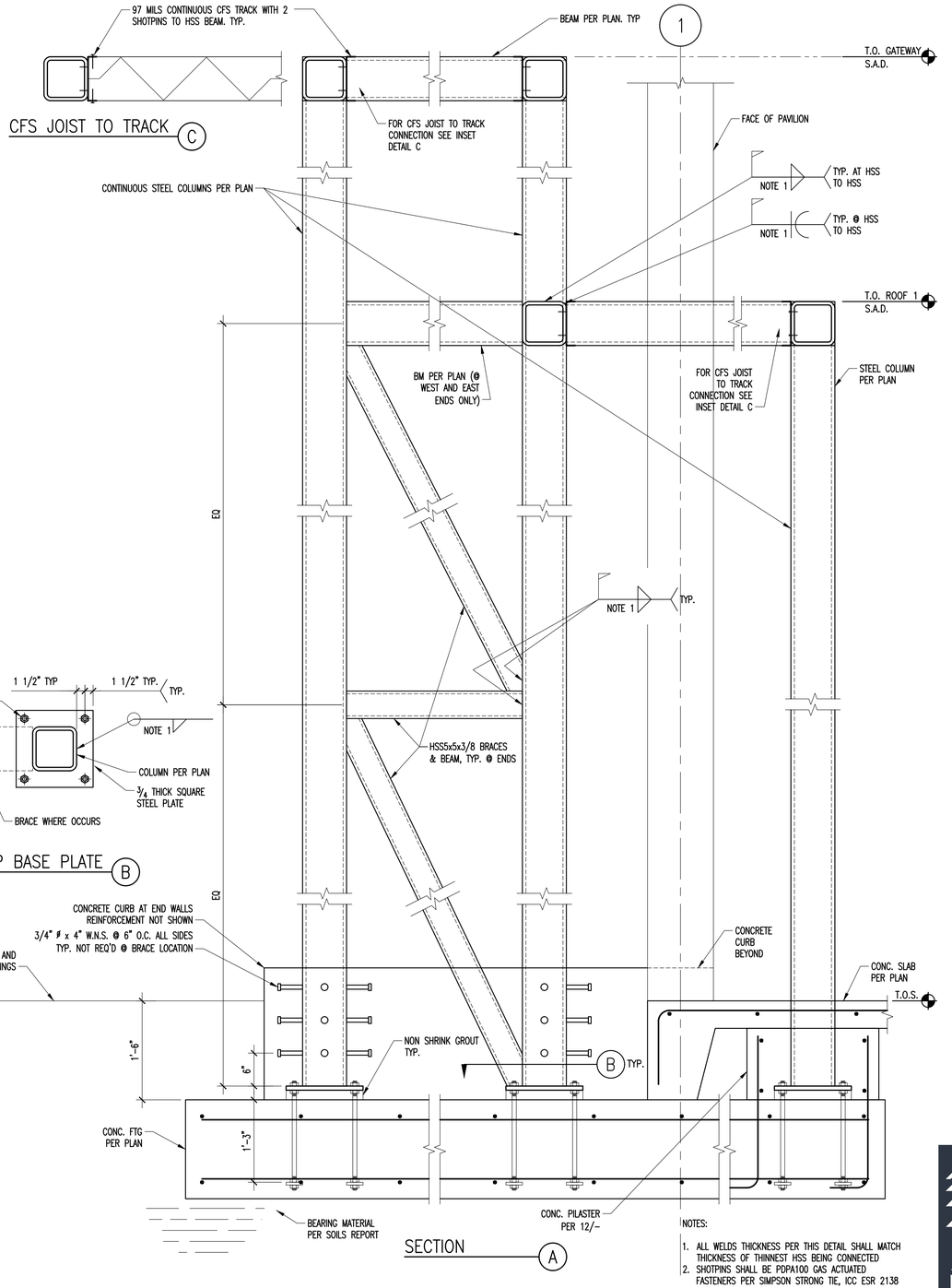


GATEWAY–MEMBRANE INTERSECTION

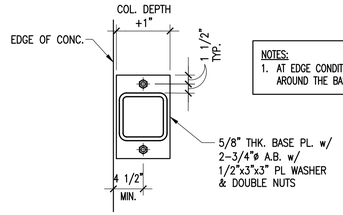
N.T.S.

10 / -



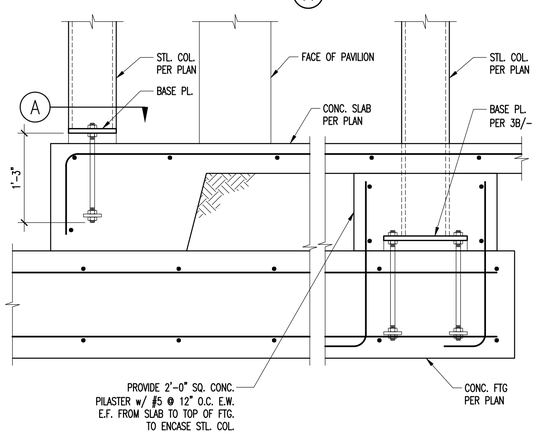


CFS JOIST TO TRACK C



NOTES:
1. AT EDGE CONDITIONS A MIN. 4" CONC. COVER ALL AROUND THE BASE PL. SHALL BE PROVIDED.

BASE PLATE @ EXTERIOR WALL CONDITIONS A



GATEWAY SECTION

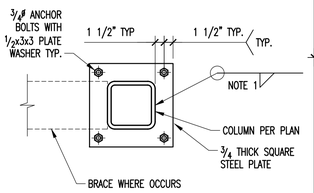
N.T.S.

12 / -

GATEWAY SECTION

N.T.S.

9 / -



TYP BASE PLATE B

SECTION A

NOTES:
1. ALL WELDS THICKNESS PER THIS DETAIL SHALL MATCH THICKNESS OF THINNEST HSS BEING CONNECTED
2. SHOTPINS SHALL BE PDPA100 GAS ACTUATED FASTENERS PER SIMPSON STRONG TIE, ICC ESR 2138 AND LABC SUPPLEMENT

GATEWAY SECTION

N.T.S.

3 / -

319 Main Street
El Segundo, CA 90245
t: 213/ 239 9700
f: 213/ 239 9669
LFA #19927

LFA
Labib Funk + Associates
Structural | Civil Engineers
Burnett + Young
Shoring Engineers

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

REGISTERED PROFESSIONAL ENGINEER
FABIO ZANOLI
No. 34491
CIVIL
STRUCTURAL
STATE OF CALIFORNIA

SIGN DATE: 11/10/2021

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED •

DEPARTMENT OF PUBLIC WORKS
BUREAU OF ENGINEERING

NO.	REVISIONS:	DATE:	BY:
1	100% DESIGN DEVELOPMENT	02/15/21	
2	50% CONSTRUCTION DOCUMENTS	03/30/21	
3	100% CONSTRUCTION DOCUMENTS - PERMIT SET	11/10/21	

VERTICAL CONTROL:
HORIZONTAL CONTROL:
SHEET TITLE: SECTIONS & DETAILS
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

CIP NO.

INDEX NO.

CITY OF LOS ANGELES
GARY LEE MOORE, P.E., ENV SP
CITY ENGINEER
DESIGN GROUP
DATE:
ENGINEER:
DESIGNED BY:
DRAWN BY:
CHECKED BY:
APPROVED BY:

WORK ORDER NO.
E170121B

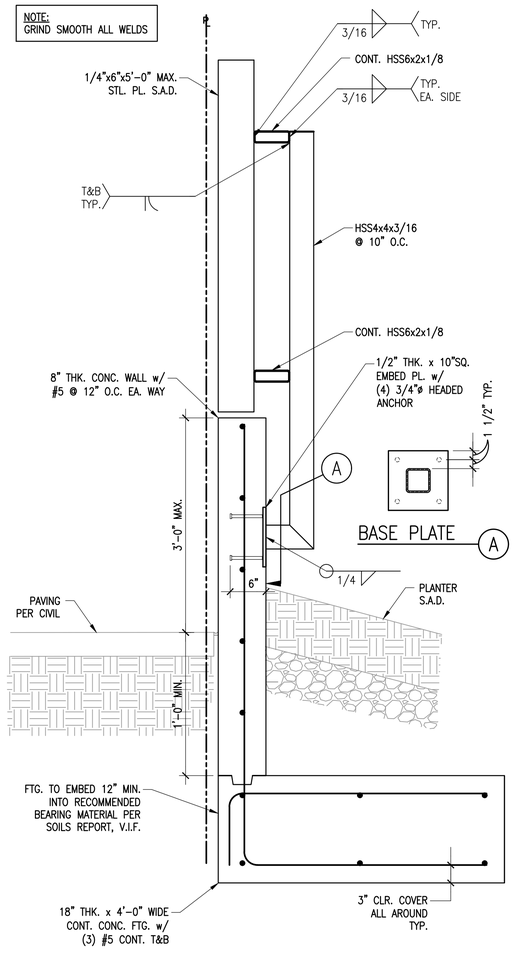
SHEET NAME
S4.03
SHEET X OF X SHEETS

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REVISION DATES
(DESIGN & PLACE ONLY)

Sheet Version 4.0

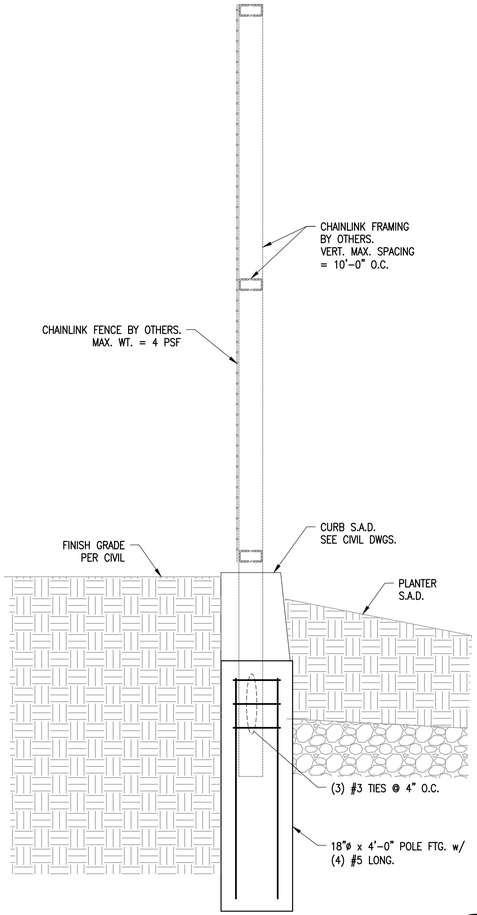
\\LFAFS2\DRAFTING19\19927 - RESEDA SKATE FACILITY\JLA S\S D\S403_19927.DWG 11/24/2021 10:43 AM



FENCE SECTION

SCALE: N.T.S.

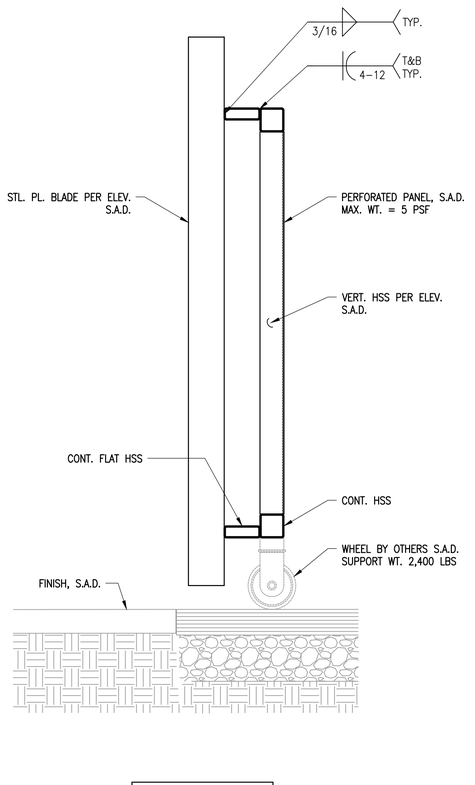
11



CHAINLINK FENCT FTG.

SCALE: N.T.S.

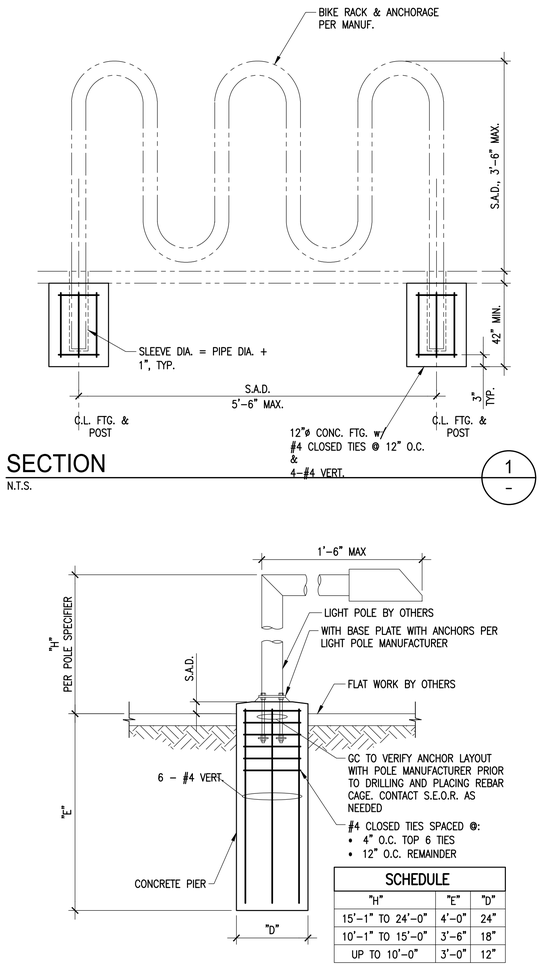
8



SWING GATE SECTION

SCALE: N.T.S.

5



SECTION

N.T.S.

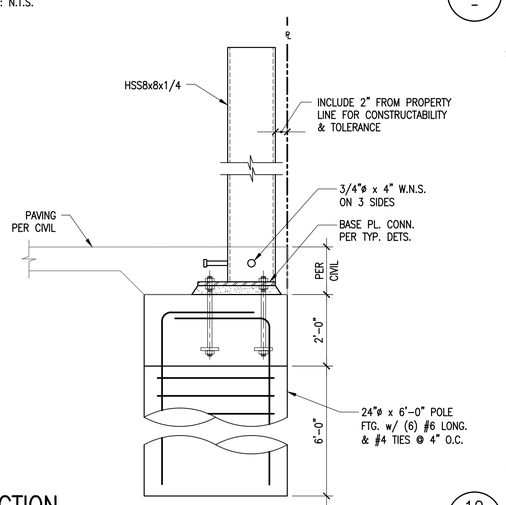
1

SCHEDULE		
"H"	"E"	"D"
15'-1" TO 24'-0"	4'-0"	24"
10'-1" TO 15'-0"	3'-6"	18"
UP TO 10'-0"	3'-0"	12"

LIGHT POLE FOOTING

SCALE: N.T.S.

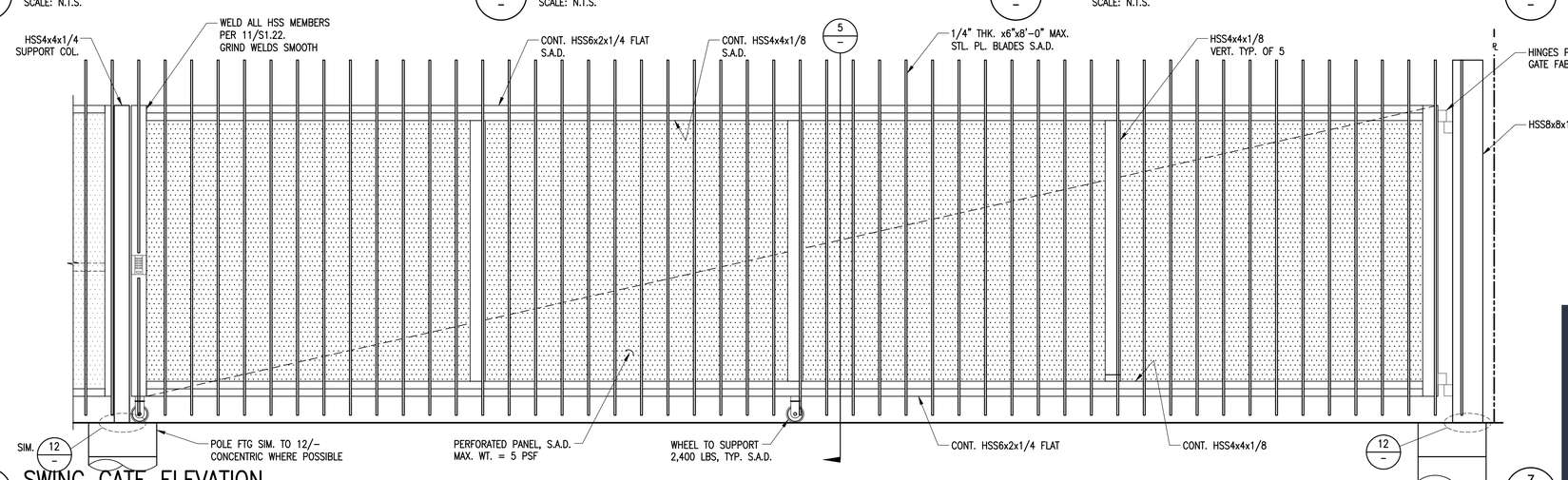
2



SECTION

N.T.S.

12



SWING GATE ELEVATION

SCALE: N.T.S.

3

NOTE:
GRIND SMOOTH ALL WELDS

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REVISION DATES:
DESIGN STAGES (MAJ.):

Sheet Version 4.0

319 Main Street
El Segundo, CA 90245
t: 213/ 239 9700
f: 213/ 239 9699
LFA #19927

LFA
Labib Funk + Associates
Structural | Civil Engineers
Burnett + Young
Shoring Engineers

CITY OF LOS ANGELES
DEPARTMENT OF PUBLIC WORKS
BUREAU OF ENGINEERING

GARY LEE MOORE, P.E., ENV SP
CITY ENGINEER

DESIGN GROUP:
ENGINEER:
DESIGNED BY:
DRAWN BY:
CHECKED BY:
APPROVED BY:
DATE:

NO.	REVISIONS:	DATE:	BY:
1	100% DESIGN DEVELOPMENT	02/15/21	
2	50% CONSTRUCTION DOCUMENTS	03/30/21	
3	100% CONSTRUCTION DOCUMENTS - PERMIT SET	11/10/21	

VERTICAL CONTROL:
HORIZONTAL CONTROL:

SHEET TITLE: SECTIONS & DETAILS

PROJECT: RESEDA SKATE FACILITY

ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

WORK ORDER NO.
E170121B

SHEET NAME
S4.04
SHEET X OF X SHEETS

CIP NO.

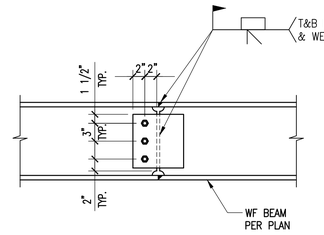
INDEX NO.

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

REGISTERED PROFESSIONAL ENGINEER
FABIO ZANOZI
No. 34491
CIVIL
STATE OF CALIFORNIA

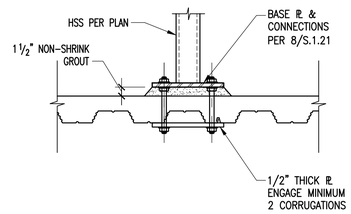
SIGN DATE: 11/10/2021

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED •



SECTION
N.T.S.

1
-



HSS TO METAL DECK
N.T.S.

2
-

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REVISION DATES
(DESIGN STAGES ONLY)

Sheet Version 4.0

\\LFAFS2\DRAFTING19\19927 - RESEDA SKATE FACILITY\JLA S\S D\S405_19927.DWG 11/24/2021 10:43 AM

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

REGISTERED PROFESSIONAL ENGINEER
FABIO ZANOZI
No. 34491
CIVIL
ENVIRONMENTAL
STATE OF CALIFORNIA

SIGN DATE: 11/10/2021

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED •

BUREAU OF ENGINEERING

VERTICAL CONTROL:
HORIZONTAL CONTROL:

SHEET TITLE: SECTIONS & DETAILS

PROJECT: RESEDA SKATE FACILITY

ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

DEPARTMENT OF PUBLIC WORKS

NO.	REVISIONS:	DATE:	BY:
1	100% DESIGN DEVELOPMENT	02/15/21	
2	50% CONSTRUCTION DOCUMENTS	03/30/21	
3	100% CONSTRUCTION DOCUMENTS - PERMIT SET	11/10/21	

CIP NO.

INDEX NO.

CITY OF LOS ANGELES

CITY ENGINEER
GARY LEE MOORE, P.E., ENV SP
DATE:

DESIGN GROUP

ENGINEER:
DESIGNED BY:
DRAWN BY:
CHECKED BY:
APPROVED BY:

Burnett + Young
Shoring Engineers
Labib Funk + Associates
Structural | Civil Engineers
319 Main Street
El Segundo, CA 90245
t: 213/ 239 9700
f: 213/ 239 9699
LFA #19927

WORK ORDER NO.
E170121B

SHEET NAME
S4.05
SHEET X OF X SHEETS

RESEDA SKATING FACILITY

18210 SHERMAN WAY, RESEDA, CA 91335

100% CD-PERMIT SET
10/29/2021

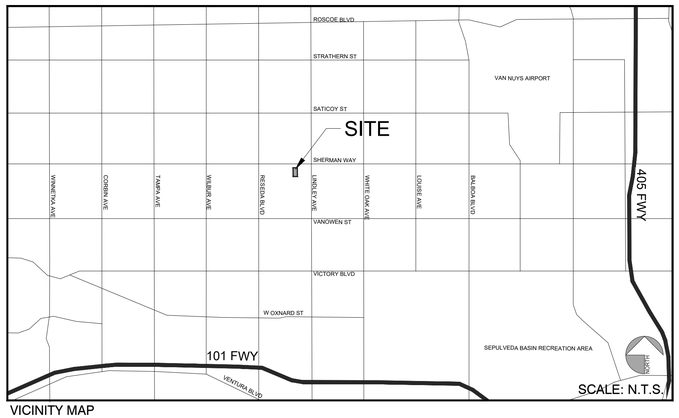
PROJECT CONSULTANTS

ARCHITECT
BROOKS SCARPA
Contact: Eleftheria Stavridi
e:eleftheria@brooksscarpa.com

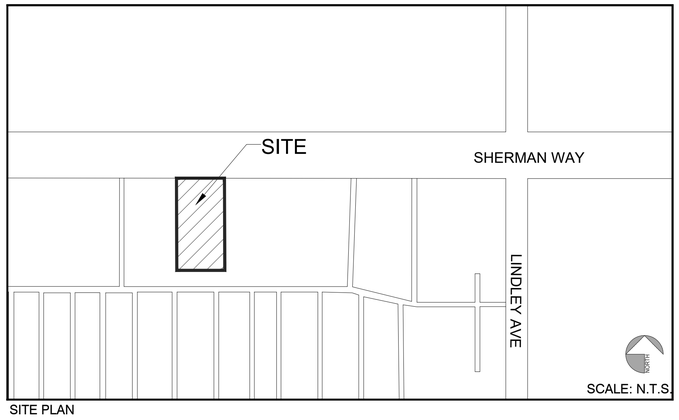
STRUCTURAL
LABIB FUNK + ASSOCIATES
Contact: FABIO ZANGOLI
e: fabio.zangoli@labibfunk.com

CIVIL ENGINEER
VCA ENGINEERS
Contact: Autumn Waggoner
e: autumn.waggoner@vcaeng.com

LANDSCAPE ARCHITECT
HONGJOO KIM LANDSCAPE ARCHITECTS
Contact: Hongjoo Kim
e:hongjoo@hklainc.com



VICINITY MAP



SITE PLAN

GREEN BUILDING CODE HEAT ISLAND REQUIREMENTS

Total project area:	45,400 s.f.
Total square footage of paved areas:	14,898 s.f.
Total square footage of Complying paved area - SRI .30 or greater	14,898 s.f.
Percentage of complying hardscape areas (50% MIN.):	100%

SEE DETAIL 2/L1.21 FOR PRODUCT SPECS & SRI VALUE.

GREEN BUILDING NOTES

1. I AGREE TO COMPLY WITH THE REQUIREMENTS OF THE WATER EFFICIENT LANDSCAPE ORDINANCE AND SUBMIT A COMPLETE LANDSCAPE DOCUMENTATION PACKAGE.
2. A MINIMUM 3-INCH LAYER OF MULCH SHALL BE APPLIED ON ALL EXPOSED SOIL SURFACE OF PLANTING AREAS EXCEPT TURF AREAS, CREEPING OR ROOTING GROUNDCOVER, OR DIRECT SEEDING APPLICATIONS WHERE MULCH IS CONTRAINDICATED.
3. UNLESS CONTRADICTED BY SOIL TEST, COMPOST AT A RATE OF A MINIMUM OF FOUR CUBIC YARDS PER 1,000 SQUARE FEET OF PERMEABLE AREA SHALL BE INCORPORATED TO A DEPTH OF SIX INCHES INTO THE SOIL.
4. AT THE TIME OF FINAL INSPECTION, THE PERMIT APPLICATION MUST PROVIDE THE OWNER OF THE PROPERTY WITH A CERTIFICATE OF COMPLETION, CERTIFICATE OF INSTALLATION, IRRIGATION SCHEDULE OF LANDSCAPE AND IRRIGATION MAINTENANCE.
5. PRESSURE REGULATING DEVICES ARE REQUIRED IF WATER PRESSURE IS BELOW OR EXCEEDS THE RECOMMENDED PRESSURE OF THE SPECIFIED IRRIGATION DEVICES.
6. RECIRCULATING WATER SYSTEMS SHALL BE USED FOR WATER FEATURES
7. CHECK VALVES OR ANTI-DRAIN VALVES ARE REQUIRED ON ALL SPRINKLER HEADS WHERE LOW POINT DRAINAGE COULD OCCUR.
8. I HAVE COMPLIED WITH THE CRITERIA OF THE ORDINANCE AND APPLIED THEM FOR THE EFFICIENT USE OF WATER IN THE LANDSCAPE DESIGN PART.
9. A DIAGRAM OF THE IRRIGATION PLAN SHOWING HYDROZONES SHALL BE KEPT WITH THE IRRIGATION CONTROLLER FOR SUBSEQUENT MANAGEMENT PURPOSE.
10. A CERTIFICATE OF COMPLETION SHALL BE FILLED OUT AND CERTIFIED BY EITHER THE DESIGNER OF THE LANDSCAPE PLANS, IRRIGATION PLANS, OR THE LICENSED LANDSCAPE CONTRACTOR FOR THE PROJECT.
11. AN IRRIGATION AUDIT REPORT SHALL BE COMPLETED AT THE TIME OF FINAL INSPECTION BY GENERAL CONTRACTOR.
12. AUTOMATIC LANDSCAPE IRRIGATORS SHALL BE INSTALLED IN SUCH A WAY THAT IT DOESN'T SPRAY THE BUILDING.
13. FOR PROJECTS THAT INCLUDE LANDSCAPE WORK, THE LANDSCAPE CERTIFICATION, FORM GRN12, SHALL BE COMPLETED PRIOR TO FINAL INSPECTION APPROVAL BY GENERAL CONTRACTOR.
14. AT THE TIME OF FINAL INSPECTION, THE PERMIT APPLICATION MUST PROVIDE THE OWNER OF THE PROPERTY WITH A CERTIFICATE OF COMPLETION, CERTIFICATE OF INSTALLATION, IRRIGATION SCHEDULE OF LANDSCAPE AND IRRIGATION MAINTENANCE.

GENERAL NOTES

1. STREET TREES WITHIN THE PUBLIC RIGHT OF WAY ARE TO BE PLANTED PER APPROVED STREET IMPROVEMENT PLANS.
2. ALL HARDSCAPE, RETAINING WALLS, AND/OR BLOCK WALLS MUST BE REVIEWED AND APPROVED UNDER A SEPARATE PERMIT.
3. THIS APPROVAL IS FOR LANDSCAPE/IRRIGATION PLANS AND ALL COMMON AREAS MAINTAINED BY BUILDING MANAGEMENT TO COMPLY WITH WATER-EFFICIENT LANDSCAPING (CHAPTER 71) ONLY.

SHEET INDEX

L0.00	LANDSCAPE COVER SHEET
L0.01	CONSTRUCTION SCHEDULE AND NOTES
L1.00	LANDSCAPE OVERALL PLAN
L1.01	CONSTRUCTION ENLARGEMENT PLAN
L1.02	LANDSCAPE DIMENSION PLAN
L1.10	LANDSCAPE SECTIONS AND ELEVATIONS
L1.20	LANDSCAPE CONSTRUCTION DETAILS
L1.21	LANDSCAPE CONSTRUCTION DETAILS & AC COLOR COATING SPECS
L2.01	LANDSCAPE HYDROZONE PLAN
L3.00	MASTER IRRIGATION LEGEND, NOTES, & CALCS
L3.01	LANDSCAPE IRRIGATION PLAN
L3.10	LANDSCAPE IRRIGATION DETAILS
L3.11	LANDSCAPE IRRIGATION DETAILS
L4.00	PLANTING SCHEDULE AND NOTES
L4.01	LANDSCAPE PLANTING PLAN
L4.20	LANDSCAPE PLANTING DETAILS

MAINTENANCE SCHEDULE

A REGULAR MAINTENANCE SCHEDULE SATISFYING THE FOLLOWING CONDITIONS SHALL BE SUBMITTED AS PART OF THE LANDSCAPE DOCUMENTATION PACKAGE

1. LANDSCAPE SHALL BE MAINTAINED TO ENSURE WATER EFFICIENCY. A REGULAR MAINTENANCE SCHEDULE SHALL INCLUDE BUT NOT BE LIMITED TO CHECKING, ADJUSTING AND REPAIRING IRRIGATION EQUIPMENT; RESETTING THE AUTOMATIC CONTROLLER; AERATING AND DETHATCHING TURF AREAS; REPLENISHING MULCH; FERTILIZING; PRUNING AND WEEDING IN ALL LANDSCAPED AREAS.
2. WHENEVER POSSIBLE, REPAIR OF IRRIGATION EQUIPMENT SHALL BE DONE WITH THE ORIGINALLY SPECIFIED MATERIALS OR THEIR EQUIVALENTS.
3. A LANDSCAPE IRRIGATION AUDIT SCHEDULE AS REQUIRED BY THIS SHEET MAY BE RECOMMENDED. THE MAXIMUM PERIOD BETWEEN AUDITS SHALL BE FIVE YEARS.

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

LICENSED LANDSCAPE ARCHITECT
HONGJOO KIM NO. 5887
Signature 12/31/21 Renewal Date
10/29/21 Date
STATE OF CALIFORNIA

THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED

BUREAU OF ENGINEERING
VERTICAL CONTROL:
HORIZONTAL CONTROL:
SHEET TITLE: COVER SHEET
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

CITY OF LOS ANGELES
DEPARTMENT OF PUBLIC WORKS
NO. REVISIONS: DATE: BY:
CIP NO.
INDEX NO.

CITY OF LOS ANGELES
CITY ENGINEER
DATE:
GARY LEE MOORE, P.E., ENV SP
DESIGN GROUP
ENGINEER:
DESIGNED BY: HONGJOO KIM LANDSCAPE ARCHITECTURE
DRAWN BY: MX
CHECKED BY: CA
APPROVED BY: HK

WORK ORDER NO.
E170121B

HONGJOO KIM LANDSCAPE ARCHITECTS

811 Know what's below. Call before you dig.

NOT FOR CONSTRUCTION

SHEET NAME
L0.00
SHEET 1 OF 16 SHEETS

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REVISION DATES (DESIGN STAGE ONLY)

Sheet Version 4.0

C:\USERS\MINGLEI XIONG\HKLA SERVER DROPBOX\2019117 HKLA_RESEDA SKATE FACILITIES\09 PHASE\03 CD\01 CAD\2019117_RESEDA SKATE FACILITIES_L100.DWG 10/28/2021 2:13 PM

GENERAL CONSTRUCTION NOTES

1. ALL PROPERTY LINES AND LOT LINES SHALL BE VERIFIED PRIOR TO COMMENCING WORK.
2. CONTRACTOR SHALL BE RESPONSIBLE FOR MAKING HIMSELF FAMILIAR WITH ALL EXISTING UNDERGROUND UTILITIES, PIPES, AND STRUCTURES. CONTRACTOR SHALL TAKE FULL RESPONSIBILITY FOR COST INCURRED DUE TO DAMAGES AND REPLACEMENT OF SAID UTILITIES.
3. CONTRACTOR SHALL NOT WILLFULLY PROCEED WITH CONSTRUCTION AND / OR GRADE DIFFERENCE WHEN IT IS OBVIOUS THAT UNKNOWN OBSTRUCTIONS EXIST THAT MAY NOT HAVE BEEN KNOWN DURING DESIGN. SUCH CONDITIONS SHALL BE IMMEDIATELY BROUGHT TO THE ATTENTION OF THE OWNER'S AUTHORIZED REPRESENTATIVE. THE CONTRACTOR SHALL ASSUME FULL RESPONSIBILITY FOR ALL NECESSARY REVISIONS DUE TO FAILURE TO GIVE SUCH NOTIFICATION.
4. THE LOCATION OF FEATURES TO BE CONSTRUCTED NOT SPECIFICALLY DIMENSIONED MAY BE DETERMINED BY SCALE. VERIFY SUCH CONDITIONS WITH OWNER'S AUTHORIZED REPRESENTATIVE.
5. ALL CONSTRUCTION AND INSTALLATION OF LANDSCAPE ITEMS SHALL BE PER CITY OF LOS ANGELES CODES AND ORDINANCES.
6. ALL WOOD CONSTRUCTION, UNLESS OTHERWISE NOTED, SHALL BE DOUGLAS FIR, COMMON EXPOSED GRADE OR BETTER.
7. EXPLANATION OF DRAWINGS: DUE TO THE SCALE OF DRAWINGS, IT IS NOT POSSIBLE TO INDICATE ALL OFFSETS, FITTINGS, SLEEVES, ETC., WHICH MAY BE REQUIRED. THE LANDSCAPE CONTRACTOR SHALL BE RESPONSIBLE TO CAREFULLY INVESTIGATE THE STRUCTURAL AND FINISHED CONDITIONS AFFECTING ALL OF THIS WORK AND PLAN THIS WORK ACCORDINGLY, FURNISHING SUCH FITTINGS, ETC., AS MAY BE REQUIRED TO MEET SUCH CONDITIONS. DRAWINGS ARE GENERALLY DIAGRAMMATIC AND INDICATIVE OF THE WORK TO BE INSTALLED. THE WORK SHALL BE INSTALLED IN SUCH A MANNER AS TO AVOID CONFLICTS BETWEEN IRRIGATION SYSTEMS, WATER FEATURE MECHANICAL SYSTEMS, PLANTING AND ARCHITECTURAL FEATURES.
8. ALL CONCRETE PAVING SHALL BE PER CIVIL AND ARCHITECTURAL PLANS.
9. CONCRETE EXPANSION AND SAW CUT CONTROL JOINTS PER PLANS AND SPECS. CONTRACTOR TO SUBMIT EXPANSION/CONTROL JOINTS SHOP DWGS, PRIOR TO CONSTRUCTION FOR APPROVAL.
10. ALL CURVE TO CURVE TANGENT LINES SHALL BE NEAT, TRIM, SMOOTH AND UNIFORM.
11. EACH CONTRACTOR (TRADE) SHALL BE RESPONSIBLE TO PAY FOR AND OBTAIN ALL NECESSARY BUILDING PERMITS AS MAY BE REQUIRED BY LOCAL AGENCIES. AS WELL, EACH CONTRACTOR SHALL PROVIDE ALL DRAWINGS, SCHEDULES, AND SPECIFICATIONS AS MAY BE REQUIRED FOR BUILDING PERMITS.
12. THE SUBDIVIDER SHALL RECORD A COVENANT AND AGREEMENT SATISFACTORY TO THE ADVISORY AGENCY GUARANTEEING THAT:
    - A. THE PLANTING AND IRRIGATION SYSTEM SHALL BE COMPLETED BY THE DEVELOPMENT /BUILDER PRIOR TO THE CLOSE OF ESCROW OF 50% PERCENT OF THE UNITS OF THE PROJECT OR PHASE.
    - B. SIXTY DAYS AFTER LANDSCAPE AND IRRIGATION INSTALLATION, THE LANDSCAPE CONTRACTOR SHALL SUBMIT TO THE HOMEOWNERS/PROPERTY OWNERS ASSOCIATION A CERTIFICATION OF SUBSTANTIAL COMPLETION (§ 12.40 G LAMC)
    - C. THE DEVELOPER/BUILDER SHALL MAINTAIN THE LANDSCAPE AND IRRIGATION FOR 12 MONTHS AFTER COMPLETION OF THE LANDSCAPE AND IRRIGATION INSTALLATION.
    - D. EXCEEDING THE CONDITIONS OF APPROVAL, ALL TREES AND SHRUBS SHALL BE GUARANTEED TO HAVE A MINIMUM LIFE GUARANTEE OF TWO YEARS OF NORMAL VIGOROUS GROWTH.

TREE PROTECTION NOTES:

1. TREE REMOVAL, SEE CIVIL DEMOLITION PLAN
2. MAXIMUM EFFORT MUST BE MADE TO RETAIN EXISTING TREES ON SITE. SEE TREE PROTECTION SPECIFICATIONS.
3. ALL EXISTING TREES NOT INDICATED FOR REMOVAL MUST BE PROTECTED ON SITE DURING CONSTRUCTION.
4. INSTALL TEMPORARY MINIMUM 5' HEIGHT CHAIN-LINK FENCING AT DRIP LINE OF TREES TO PROTECT PRIOR TO DEMOLITION. ADD 3" MULCH PROTECTION LAYER TO RETAIN MOISTURE. TREES MUST CONTINUE TO RECEIVE ADEQUATE WATER. IF THEY ARE NOT SERVED BY THE EXISTING IRRIGATION SYSTEM DURING CONSTRUCTION, THEY MUST BE HAND WATERED.
5. CUTTING THROUGH WOODY ROOTS SHALL NOT BE ALLOWED.
6. TRENCHING, DIGGING AND GRADING (BOTH EXCAVATION AND FILL) IS TO TAKE PLACE OUTSIDE THE DRIP ZONE OF TREES TO REMAIN.
7. IF PLAN REQUIRES WORK WITHIN DRIP ZONE, ALL GRADING IN PROTECTED ZONE OF EXISTING TREES SHALL BE DONE BY HAND.
8. LIMIT OF GRADING TO BE FIELD VERIFIED BY LANDSCAPE ARCHITECT OR ARCHITECT FOR APPROVAL TO ENSURE EXTENT OF PROTECTION OF EXISTING TREE ROOT SYSTEM. THE LOCATION OF TREE PROTECTION FENCE, TO BE FIELD APPROVED BY LANDSCAPE ARCHITECT. NOTIFY LANDSCAPE ARCHITECT OR ARCHITECT AT LEAST ONE WEEK PRIOR TO BEGIN THE WORK.
9. THE PROTECTION ZONE SHOULD BE IRRIGATED SUFFICIENTLY WITH CLEAN POTABLE WATER TO KEEP THE TREE IN GOOD HEALTH AND VIGOR BEFORE, DURING, AND AFTER CONSTRUCTION. THIS MAY MEAN DEEPLY SOAKING THE GROUND PERIODICALLY.
10. NO CONSTRUCTION STAGING OR DISPOSAL OF CONSTRUCTION MATERIALS OF BYPRODUCTS INCLUDING BUT NOT LIMITED TO PAINT, PLASTER, OR CHEMICAL SOLUTIONS IS ALLOWED IN THE ROOT PROTECTION ZONE.
11. THE ROOT PROTECTION ZONE SHOULD NOT BE SUBJECTED TO FLOODING INCIDENTAL TO THE CONSTRUCTION WORK.
12. ALL WORK CONDUCTED IN THE GROUND WITHIN THE ROOT PROTECTION ZONE OF ANY PROTECTED TREE SHOULD BE ACCOMPLISHED WITH HAND TOOLS UNLESS AN AIR SPADE IS UTILIZED. TRENCHES IN THE ROOT PROTECTION ZONE SHOULD BE TUNNELED, OR COMPLETED WITH AN AIR SPADE TO AVOID DAMAGE TO SMALL FEEDER ROOTS WITHIN THE ROOT PROTECTION ZONE.
13. WHERE MORE THAN 50% OF THE ROOT ZONE IS IMPACTED OR ROOTS GREATER THAN 3 INCHES IN DIAMETER ARE TO BE REMOVED WITHIN FOUR FEET OF THE TRUNK, THE ENGINEER OF RECORD SHOULD SUBMIT ACCEPTABLE DESIGN ALTERNATIVES TO LANDSCAPE ARCHITECT FOR REVIEW.
14. ANY REQUIRED TRENCHING SHOULD BE ROUTED IN SUCH A MANNER AS TO MINIMIZE ROOT DAMAGE. RADIAL TRENCHING (RADIAL TO THE TREE TRUCK) IS PREFERRED AS IT IS LESS HARMFUL THAN TANGENTIAL TRENCHING. CONSTRUCTION ACTIVITY SHOULD BE DIVERTED FROM THE ROOT PROTECTION ZONE. CUTTING OF ROOTS SHOULD BE AVOIDED (I.E. PLACE PIPES AND CABLES BELOW UNCUT ROOTS). WHEREVER POSSIBLE AND IN ACCORDANCE WITH APPLICABLE CODE REQUIREMENTS, THE SAME TRENCH SHOULD BE USED FOR MULTIPLE UTILITIES.
15. "NATURAL" OR PRE-CONSTRUCTION GRADE SHOULD BE MAINTAINED IN THE ROOT PROTECTION ZONE. AT NO TIME DURING OR AFTER CONSTRUCTION SHOULD SOIL BE IN CONTACT WITH THE TRUNK OF THE TREE ABOVE THE BASAL FLAIR.
16. IN AREAS WHERE THE GRADE AROUND THE PROTECTED TREE WILL BE LOWERED, SOME CUTTING MAY BE UNAVOIDABLE. CUTS SHOULD BE CLEAN AND MADE AT RIGHT ANGLES TO THE ROOTS. WHEN PRACTICAL, CUT ROOTS BACK TO A BRANCHING LATERAL ROOT.
17. WHEN REMOVING EXISTING PAVEMENT IN THE ROOT PROTECTION ZONE, AVOID THE USE OF HEAVY EQUIPMENT, WHICH WILL COMPACT AND DAMAGE THE ROOT SYSTEM.
18. SUBMIT CONSTRUCTION STAGING PLANS TO INDICATE WHERE MATERIALS WILL BE STORED AND HOW THE EQUIPMENT WILL MOVE IN AND AROUND THE PROPERTY TO MINIMIZE DAMAGE TO THE ROOT PROTECTION ZONE AND TREE CANOPIES.
19. COORDINATE INSPECTION OF PROTECTIVE FENCING TO VERIFY PLACEMENT AND APPROVAL OF MATERIALS PRIOR TO THE COMMENCEMENT OF CONSTRUCTION
20. GC TO COORDINATE PRE-CONSTRUCTION MEETING WITH THE CONTRACTOR, THE SITE SUPERVISOR, GRADING EQUIPMENT CONTRACTORS, AND DEMOLITION CREW TO DISCUSS TREE PROTECTION.
21. EVALUATE / PROVIDE HAZARD ANALYSIS OF IMMEDIATE ADJACENT TREES & PROTECTED TREES OF THE SITE RIGHT AFTER CONSTRUCTION

SOIL PREPARATION AND FINE GRADING NOTES:

1. SITE DRAINAGE AND SITE DEVICES INCLUDING FOR ALL ON GRADE SLABS, WALKWAYS, ALL PLANTING AREAS, ON GRADE PAVED SURFACES ARE BY CIVIL ENGINEER, REFERENCE ARCHITECTURAL AND CIVIL DRAWINGS FOR ALL SITE DRAINAGE & NEW AND EXISTING FINISHES.
2. ALL DRAINAGE PIPING UNDER PAVEMENT SHALL BE SCHEDULED PER CIVIL SPECIFICATIONS.
3. CONTRACTOR SHALL MAINTAIN A MINIMUM OF 2% DRAINAGE AWAY FROM ALL BUILDINGS, STRUCTURES, AND WALLS. FINISHED GRADES SHALL BE SMOOTHED TO ELIMINATE PONDING OR STANDING WATER.
4. FINISH GRADES OF ALL SHRUB AREAS SHALL BE 1 1/2" BELOW ADJACENT CURBS, PAVEMENT, TOP PLANTER WALL, OR HEADERS. FINISH GRADES OF ALL TURF AREAS SHALL BE 1" BELOW ADJACENT CURBS, PAVEMENT, TOP OF PLANTER WALL, OR HEADERS.
5. REFER TO CIVIL ENGINEER'S DRAWINGS FOR GRADING AND DRAINAGE INFORMATION AND OTHER RELATED NON-LANDSCAPE WORK. VERIFY ON-SITE AND REPORT DISCREPANCIES TO LANDSCAPE ARCHITECT BEFORE START OF ANY WORK ON THIS CONTRACT.
6. CONTINUOUS SOIL PREPARATION IS REQUIRED IN ALL PLANTING AREAS.
7. UNLESS OTHERWISE NOTED IN CIVIL PLAN, FOR PLANTING AREA'S DRAINAGE, COMPACTION, AND PERCOLATION, GENERAL CONTRACTOR TO REVIEW STRUCTURAL SOILS BASED ON GEOTECHNICAL ENGINEER'S REPORT PRIOR TO SITE GRADING. GENERAL CONTRACTOR SHOULD REPORT IF COMPACTION AFTER ROUGH GRADE BECOMES MORE THAN 80% IN PLANTING AREA.
8. PRIOR TO PLANTING, IRRIGATION SYSTEM SHALL BE APPROVED BY THE LANDSCAPE ARCHITECT AND BE FULLY OPERATIONAL. ALL PLANTING AREAS SHALL BE FULLY SOAKED.
8. FINAL GRADING SHALL BE APPROVED BY THE LANDSCAPE ARCHITECT AND CIVIL ENGINEER IN THE FIELD AFTER SOIL PREPARATION AND PRIOR TO PLANTING. ALL PLANTING AREAS SHALL BE GRADED TO THE ELEVATIONS INDICATED ON THE CIVIL ENGINEER'S PLANS.
9. EXCESS SOIL FROM LANDSCAPE GRADING TO BE REMOVED AND DISPOSED OF OFF-SITE BY CONTRACTOR.
10. CONTRACTOR SHALL APPLY A CONTACT HERBICIDE, WHERE WEEDS ARE PRESENT, PER MANUFACTURER'S SPECIFICATIONS A MINIMUM OF TEN (10) DAYS PRIOR TO COMMENCEMENT OF ANY PLANTING OR IRRIGATION WORK. WEEDS SHALL BE ALLOWED TO COMPLETELY DIE BACK, INCLUDING THE ROOTS BEFORE PROCEEDING WITH WORK.
11. IF DIRECTED BY AGRONOMIST'S TEST RECOMMENDATIONS AND/OR BY LANDSCAPE ARCHITECT, COMPACTED SOIL IN ALL PLANTING AREAS SHALL BE RIPPED TO A DEPTH OF EIGHTEEN (18) INCHES PRIOR TO SOIL AMENDMENT WORK.
12. LANDSCAPE CONTRACTOR IS RESPONSIBLE FOR PERFORMING PERCOLATION TESTS IN TREE PITS PRIOR TO BRINGING TREES TO THE SITE. ONCE HOLES HAVE BEEN DUG AS SPECIFIED, CONTRACTOR SHALL FILL SAND PIT WITH WATER TO A DEPTH OF 12 INCHES AND REPORT TIME REQUIRED FOR ALL WATER TO DRAIN FROM HOLE. IF DRAINAGE REQUIRES MORE THAN 24 HOURS, CONTRACTOR SHALL INSTALL, AT HIS COST, A 6" DIAMETER, PERFORATED PVC "CHIMNEY DRAIN", MINIMUM 48" DEEP, GRAVEL FILLED,COVERED WITH GEOTEXTILE, SET VERTICALLY AT THE LOWEST POINT OF THE BOTTOM OF THE TREE PIT WITH MINIMUM 2% SLOPE, OUTSIDE OF THE TREE.
13. SEE SPECIFICATIONS FOR THE FOLLOWING:
    - A. SOIL FILL AND BACKFILL MIX
    - B. SOIL AMENDMENTS
    - C. SHRUB AND TREE BACKFILL MIX
    - D. PLANT TABLETS FOR PLANT PITS

PLANTING IRRIGATION

1. SEE IRRIGATION PLANS FOR INFORMATION ON NEW IRRIGATION SYSTEMS & NOTES.

LAYOUT & MATERIAL NOTES

1. THE CONTRACTOR SHALL LAYOUT AND VERIFY ALL DIMENSIONS PRIOR TO CONSTRUCTION. A PRELIMINARY PAVING AND WALL LAYOUT WALK THROUGH SHALL BE CONDUCTED PRIOR TO ANY FOOTING EXCAVATION OR FORMWORK CONSTRUCTION. ANY DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE LANDSCAPE ARCHITECT. APPROVAL OF LAYOUT SHALL BE OBTAINED FROM THE LANDSCAPE ARCHITECT.
2. VERIFY LOCATIONS OF ALL SITE IMPROVEMENTS INSTALLED UNDER OTHER SECTIONS. IF ANY PART OF THIS PLAN CANNOT BE FOLLOWED DUE TO SITE CONDITIONS, CONTACT THE LANDSCAPE ARCHITECT FOR INSTRUCTION PRIOR TO COMMENCING WORK.
3. WRITTEN DIMENSIONS TAKE PRECEDENCE OVER SCALED DIMENSIONS.
4. ALL HANDICAPPED ACCESS TO COMPLY WITH "STATE OF CALIFORNIA STANDARDS FOR HANDICAPPED PERSONS," A.D.A. (AMERICANS WITH DISABILITIES ACT).
5. WHERE DIMENSIONS ARE CALLED AS "EQUAL"OR "EQ", ALL REFERENCED ITEMS SHALL BE SPACED EQUALLY, MEASURED TO THEIR CENTER LINES.
6. ALL MEASUREMENTS ARE TO FACE OF BUILDING, WALL OR OTHER FIXED SITE IMPROVEMENT. DIMENSIONS TO CENTER LINES ARE INDICATED.
7. INSTALL ALL INTERSECTING ELEMENTS AT 90 DEGREES TO EACH OTHER UNLESS OTHERWISE NOTED.
8. INSTALL EXPANSION JOINTS FOR ALL CONCRETE FLATWORK THAT INTERFACE WITH VERTICAL SURFACES INCLUDING BUILDING AND FREE STANDING WALLS, CURBS AND UTILITIES.
9. UPON REQUEST, AUTOCAD FILE TO BE PROVIDED FOR ALL LAYOUT OF HARDSCAPE, DECORATIVE STRIPING, CURBS, PLANTER WALLS, TREE PLANTING, AND OTHER LANDSCAPE ITEMS.

PAVING SCHEDULE

SYMBOL	ITEM / DESCRIPTION	HATCH	COLOR	FINISH	MANUFACTURER /SUPPLIER	MODEL / REMARKS
P-101	EXISTING PAVING		-	-	-	SEE ARCH PLAN FOR WATER PROOFING AND CONSTRUCTION DETAILS
P-102	STREETBOND® AC COLOR COATING		SR SANDSTONE	SEE MANUFACTURE SPECS	GAF. STREETBOND® OR EQUAL 951-360-4200	SEE CIVIL PLAN FOR DRAINAGE PROVIDE SHOP DRAWINGS FOR SCORING PATTERN FOR APPROVAL
P-103	STREETBOND® AC COLOR COATING		SR WHITE	SEE MANUFACTURE SPECS	GAF. STREETBOND® OR EQUAL 951-360-4200	CONTRACTOR TO SUBMIT 6'x6' MOCK UPS FOR APPROVAL PRIOR TO INSTALLATION.
P-104	3" DEEP, 1"-2" MEXICAN BEACH PEBBLE		BLACK	-	SOUTHWEST BOULDER & STONE OR EQUAL 714-882-1010	CONTRACTOR TO SUBMIT CERTIFIED INSTALLER'S INFORMATION FOR ASPHALT COLOR COATING

SITE FURNITURE SCHEDULE

SYMBOL	ITEM/DESCRIPTION	HATCH	COLOR	FINISH	MANUFACTURER /SUPPLIER	DETAIL	MODEL/REMARKS
S-101	20"(W) X 18"(H) C.I.P. CONCRETE BENCH W/ SKATE DETERRENT		DARK GRAY	SMOOTH	DAVIS COLORS 323-265-8323	1/L1.20	-
S-102	ORIGINAL CYCLOOPS BIKE RACK		COFFEE TAN	-	COLUMBIA CASCADE ORIGINAL CYCLOOPS® 800-547-1940	1/L1.21	# 2170-7

WALL/CURB SCHEDULE

SYMBOL	ITEM/DESCRIPTION	HATCH	COLOR	FINISH	MANUFACTURER /SUPPLIER	DETAIL	MODEL/REMARKS
W-101	BIO-FILTRATION C.I.P. CONCRETE PLANTER WALL		DARK GRAY	SMOOTH	DAVIS COLORS 323-265-8323	5/L1.20	-
C-101	6" WIDE PLANTER CURB		DARK GRAY	SMOOTH	DAVIS COLORS 323-265-8323	4/L1.20	-
C-102	3/8" THICKNESS METAL EDGER		-	-	-	SEE ARCH DWGS	-
C-103	10" WIDE CONCRETE CURB		NATURAL GRAY	SMOOTH	-	SEE CIVIL DWGS	-
C-104	10" WIDE CONCRETE MOW CURB		NATURAL GRAY	SMOOTH	-	SEE CIVIL DWGS	-

CONSTRUCTION SYMBOLS

KEYNOTE (X)
LANDSCAPE MATERIAL SCHEDULE (X-xxx)
DETAIL (X → LX.XX) — SHEET # / MATCH LINE / DETAIL # / SHEET #
ELEVATION (X → LX.XX) — ELEVATION # / SHEET #
SECTION (X → LX.XX) — ELEVATION # / SHEET #
CONTROL JOINT
EXPANSION JOINT (EJ)
FACE OF BUILDING (FOB.)
LANDSCAPE EDGER
LIMIT OF WORK LINE (L.O.W.)
LINE OF BUILDING ABOVE
LINE OF BUILDING BELOW
POINT OF BEGINNING/ ORIGIN POINT OF LAYOUT
PROPERTY LINE (P.L.)

ABBREVIATIONS

AC.	ASPHALTIC CONCRETE	F.F.	FINISH FLOOR	P.A.	PLANTING AREA	DET.	DETAIL
⌒	ALIGN	F.G.	FINISH GRADE	P.L.	PROPERTY LINE	DIA.	DIAMETER
ARCH.	ARCHITECT(URAL)	FIN.	FINISH (ED)	P.O.B.	POINT OF BEGINNING	DIAG.	DIAGONAL
AUTO.	AUTOMATIC	F.J.	FOUNTAIN JET	P.O.C.	POINT OF CURVATURE	→	DIRECTION OF FLOW (HARDSCAPE)
BLDG.	BUILDING	F.L.	FLOW LINE	P.O.T.	POINT OF TANGENCY	~→	DIRECTION OF FLOW (SOFTSCAPE)
B.O.C.	BACK OF CURB	F.O.B.	FACE OF BUILDING	PREFAB.	PREFABRICATED	DIM.	DIMENSION
B.S.	BOTTOM OF STEP	F.O.C.	FACE OF CURB	R./RAD.	RADIUS	D.L.	DRAIN LINE
B.R.	BOTTOM OF RAMP	F.O.W.	FACE OF WALL	REF.	REFERENCE	DN	DOWN
B.W.	BOTTOM OF WALL	F.S.	FINISH SURFACE	REV.	REVISION	D.S.	DOWN SPOUT
C.B.	CATCH BASIN	FT.	FOOT OR FEET	RWD.	REDWOOD	DWG.	DRAWING
C.I.	CAST IRON	FTG.	FOOTING	SHT.	SHEET	EA.	EACH
C.J.	COLD JOINT	GA.	GAUGE	SIM.	SIMILAR	E.J.	EXPANSION JOINT
℄	CENTERLINE	GAL.	GALLON	SPEC.	SPECIFICATION	ELEV.	ELEVATION
CLR.	CLEAR	GALV.	GALVANIZED	S.L.	SCORE LINE	EQ.	EQUAL
COL.	COLUMN	G.C.	GROUNDCOVER	SQ.	SQUARE	EXT.	EXTERIOR
CONC.	CONCRETE	GR.	GRADE	STD.	STANDARD	(E)	EXISTING
CONT.	CONTINUOUS	HORIZ.	HORIZONTAL	T.	TURF	TYP.	TYPICAL
H.P.	HIGH POINT	T.C.	TOP OF CURB	MED.	MEDIUM	W/	WITH
HT.	HEIGHT	T.COP.	TOP OF COPING	MFR.	MANUFACTURER	W/O	WITHOUT
I.D.	INSIDE DIAMETER	T.F.	TOP OF FENCE	MISC.	MISCELLANEOUS	WD.	WOOD
INV.	INVERT	T.O.F.	TOP OF FOOTING	NAT.	NATURAL	W.I.	WROUGHT IRON
INT.	INTERIOR	T.G.	TOP OF GRATE	N.I.C.	NOT IN CONTRACT	W.W.M.	WELDED WIRE MESH
L.A.	LANDSCAPE ARCHITECT	THK.	THICK(NESS)	N.T.S.	NOT TO SCALE	W.S.	WATER SURFACE
L.O.W	LIMIT OF WORK	T.P.	TOP OF PILASTER	O.C.	ON CENTER	WUCOLS	WATER USE CLASSIFICATION OF LANDSCAPE SPECIES
M	MULTI-TRUNKED	T.S.	TOP OF STEP	O.D.	OUTSIDE DIAMETER		
MAX.	MAXIMUM	T.R.	TOP OF RAMP	DBL.	DOUBLE		
MIN.	MINIMUM	T.W.	TOP OF WALL	D.D.	DECK DRAIN		
VL	VERY LOW WATER USE	L	LOW WATER USE	M	MEDIUM WATER USE	H	HIGH WATER USE

HONGJOO KIM LANDSCAPE ARCHITECTS

811 Know what's below. Call before you dig.

NOT FOR CONSTRUCTION

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Design Division

LICENSED LANDSCAPE ARCHITECT HONGJOO KIM NO. 5987 — Signature — Renewal Date: 12/31/21 — Date: 10/29/21 — STATE OF CALIFORNIA

THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED

DEPARTMENT OF PUBLIC WORKS
BUREAU OF ENGINEERING
VERTICAL CONTROL:
HORIZONTAL CONTROL:
SHEET TITLE: CONSTRUCTION SCHEDULE & NOTES
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

NO.	REVISIONS:	DATE:	BY:

CIP NO.
INDEX NO.

CITY OF LOS ANGELES
GARY LEE MOORE, P.E., ENV SP — CITY ENGINEER — DATE:
DESIGN GROUP:
ENGINEER: HONGJOO KIM LANDSCAPE ARCHITECTURE
DESIGNED BY: MX
DRAWN BY: CA
CHECKED BY: HK
APPROVED BY:

WORK ORDER NO. E170121B

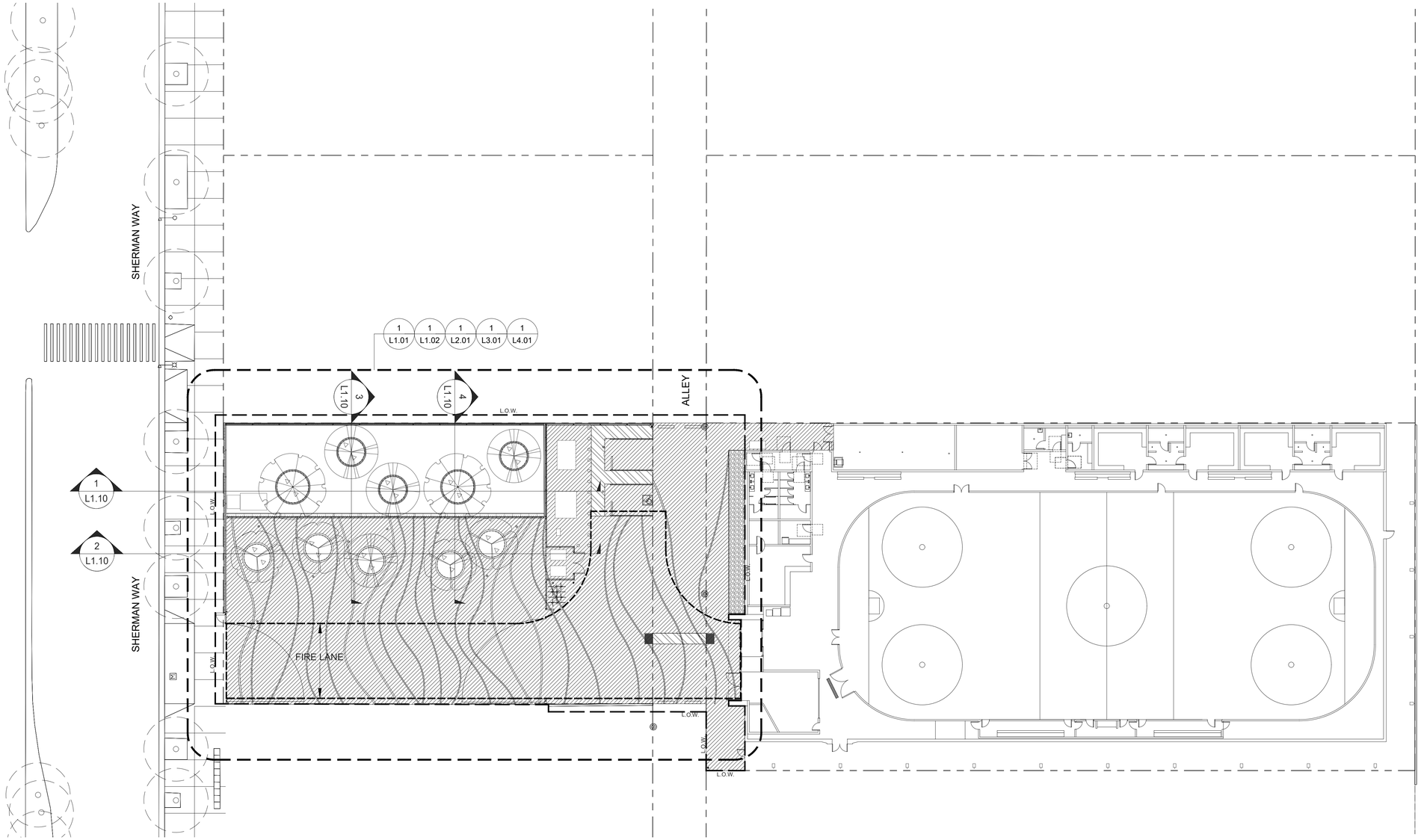
SHEET NAME: CONSTRUCTION SCHEDULE & NOTES
L0.01
SHEET 2 OF 16 SHEETS

REVISION DATES (DESIGN STAGE ONLY)

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

Sheet Version 4.0

C:\USERS\MINGLEI XIONG\HKLA SERVER DROPBOX\2019117 HKLA_RESEDA SKATE FACILITIES\09 PHASE\03 CD\01 CAD\2019117_RESEDA SKATE FACILITIES_L100.DWG 10/28/2021 2:14 PM



1 LANDSCAPE OVERALL PLAN

SCALE: 1"=20'-0"

N

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REVISION DATES (DESIGN STAGE ONLY)

Sheet Version 4.0

ENGINEERING

CITY OF LOS ANGELES

Environmental Engineering Design Division

THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED

LICENSED LANDSCAPE ARCHITECT
HONGJOO KIM NO. 5087
Signature
12/31/21
Renewal Date
10/29/21
Date
STATE OF CALIFORNIA

BUREAU OF ENGINEERING

VERTICAL CONTROL:
HORIZONTAL CONTROL:

SHEET TITLE: LANDSCAPE OVERALL PLAN

PROJECT: RESEDA SKATE FACILITY

ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

DEPARTMENT OF PUBLIC WORKS

NO.	REVISIONS:	DATE:	BY:

CIP NO.

INDEX NO.

CITY OF LOS ANGELES

CITY ENGINEER

GARY LEE MOORE, P.E. ENV SP

DATE:

DESIGN GROUP:

ENGINEER:

DESIGNED BY: HONGJOO KIM LANDSCAPE ARCHITECTURE

DRAWN BY: MX

CHECKED BY: CA

APPROVED BY: HK

WORK ORDER NO.
E170121B

SHEET NAME
LANDSCAPE
OVERALL PLAN

L1.00

SHEET 3 OF 16 SHEETS

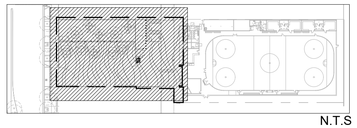
HONGJOO KIM LANDSCAPE ARCHITECTS

811 Know what's below. Call before you dig.

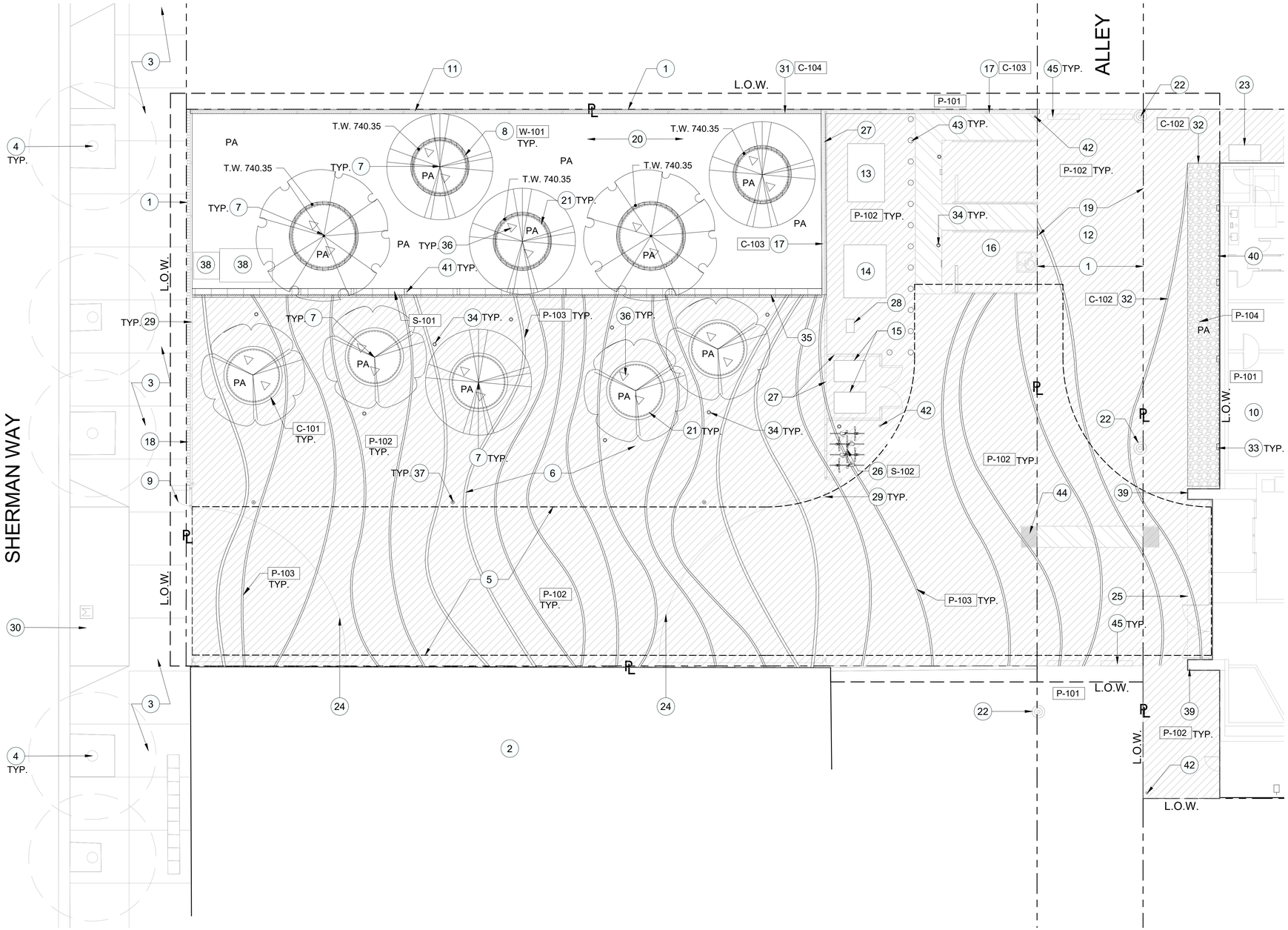
NOT FOR CONSTRUCTION

C:\USERS\MINGLEI XIONG\HKLA SERVER DROPBOX\2019117 HKLA_RESEDA SKATE FACILITIES\09 PHASE\03 CD\01 CAD\2019117_RESEDA SKATE FACILITIES_L100.DWG 10/28/2021 2:14 PM

KEY PLAN



N.T.S



PAVING SCHEDULE

SYMBOL	ITEM / DESCRIPTION	HATCH
P-101	EXISTING PAVING	
P-102	STREETBOND® AC COLOR COATING	
P-103	STREETBOND® AC COLOR COATING	
P-104	3" DEEP, 1"-2" MEXICAN BEACH PEBBLE	

SITE FURNITURE SCHEDULE

SYMBOL	ITEM/DESCRIPTION	HATCH
S-101	20"(W) X 18"(H) C.I.P. CONCRETE BENCH W/ SKATE DETERRENT	
S-102	ORIGINAL CYCLOOPS BIKE RACK	

WALL/CURB SCHEDULE

SYMBOL	ITEM/DESCRIPTION	HATCH
W-101	BIO-FILTRATION C.I.P. CONCRETE PLANTER WALL	
C-101	6" WIDE PLANTER CURB	
C-102	3/8" THICKNESS METAL EDGER	
C-103	10" WIDE CONCRETE CURB	
C-104	10" WIDE CONCRETE MOW CURB	

CONSTRUCTION LEGEND

1. PROPERTY LINE
2. EXISTING BUILDING
3. EXISTING SIDEWALK, SEE CIVIL DWGS
4. EXISTING TREE, PROTECT IN PLACE
5. FIRE LANE, SEE CIVIL DWGS
6. ROLLER RINK AREA
7. PROPOSED TREE, SEE PLANTING PLAN
8. BIO-FILTRATION C.I.P. CONCRETE PLANTER WALL, SEE DETAIL 5/L120
9. EXIT GATE, SEE ARCH DWGS
10. PROPOSED BUILDING, SEE ARCH DWGS
11. CHAIN LINK SECURITY FENCE, SEE DETAIL 3/L120
12. PROPOSED DWP ACCESS
13. ELECTRICAL SWITCHGEAR PAD, SEE ELECTRICAL DWGS
14. TRANSFORMER PAD, SEE ELECTRICAL DWGS
15. TRASH DUMPSTER, SEE ARCH DWGS
16. HC PARKING, SEE CIVIL DWGS
17. 10" WIDE CONCRETE CURB, SEE CIVIL DWGS
18. SECURITY FENCE ON LOW WALL, SEE ARCH DWGS
19. EXISTING ALLEY, SEE CIVIL DWGS
20. BIO-FILTRATION PLANTER, SEE CIVIL DWGS
21. ROOT BARRIER, SEE DETAIL 6/L120
22. POWER POLE, SEE ELECTRICAL DWGS
23. SWITCHBOARD PAD, SEE ELECTRICAL DWGS
24. VEHICULAR GATE, SEE ARCH DWGS
25. BUILDING OVERHAND, SEE ARCH DWGS
26. BIKE RACK, SEE DETAIL 1/L1.21
27. CORRUGATED METAL SECURITY FENCE, SEE ARCH DWGS
28. ELECTRICAL PEDESTAL, SEE ELECTRICAL DWGS
29. FENCE POST, SEE ARCH DWGS
30. EXISTING DRIVEWAY, SEE CIVIL DWGS
31. 10" WIDE CONCRETE MOW CURB, SEE CIVIL DWGS
32. METAL EDGER, SEE ARCH DWGS
33. LED LIGHTING FIXTURE, SEE ELECTRICAL DWGS
34. OUTDOOR PATHWAY COLUMN LIGHTING, SEE ELECTRICAL DWGS
35. LED TAPE UNDER BENCH, SEE ELECTRICAL DWGS
36. OUTDOOR UPLIGHT, SEE ELECTRICAL DWGS
37. POLE LIGHT, SEE ELECTRICAL DWGS
38. SUMP PIT, SEE CIVIL DWGS
39. BUILDING WALL, SEE ARCH DWGS
40. WATER PROOFING, SEE ARCH DWGS
41. WEEPHOLE, 1" x 6", 10'-0" O.C., OPENINGS AT THE BOTTOM OF SEATWALL, SEE DETAIL L1/120
42. PEDESTRIAN WARNING SIGN , SEE ARCH DWGS
43. BOLLARDS, SEE ARCH DWGS
44. DETECTABLE WARNING SURFACE
45. SPEED BUMP, SEE ARCH DWGS

1 LANDSCAPE ENLARGEMENT PLAN

SCALE: 1"=10'-0"

N

NOTE:
UPON REQUEST, A CAD FILE TO BE PROVIDED FOR LAYOUT OF COATING ON AC PAVING & LOCATION OF PLANTER/SEATING WALL.

811 Know what's below. Call before you dig.

HONGJOO KIM LANDSCAPE ARCHITECTS

NOT FOR CONSTRUCTION

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Design Division

LICENSED LANDSCAPE ARCHITECT
HONGJOO KIM NO. 5987
Signature
Renewal Date: 12/31/21
Date: 10/29/21
STATE OF CALIFORNIA

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED •

DEPARTMENT OF PUBLIC WORKS
BUREAU OF ENGINEERING

VERTICAL CONTROL:
HORIZONTAL CONTROL:
SHEET TITLE: LANDSCAPE CONSTRUCTION PLAN
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

CITY OF LOS ANGELES
GARY LEE MOORE, P.E., ENV SP — CITY ENGINEER
DESIGN GROUP — DATE:
ENGINEER:
DESIGNED BY: HONGJOO KIM LANDSCAPE ARCHITECTURE
DRAWN BY: MX
CHECKED BY: CA
APPROVED BY: HK

NO. | REVISIONS: | BY: | DATE:

CIP NO.

INDEX NO.

WORK ORDER NO.
E170121B

SHEET NAME
LANDSCAPE CONSTRUCTION PLAN
L1.01
SHEET 4 OF 16 SHEETS

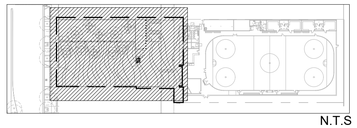
REVISION DATES (DESIGN STAGE ONLY)

Sheet Version 4.0

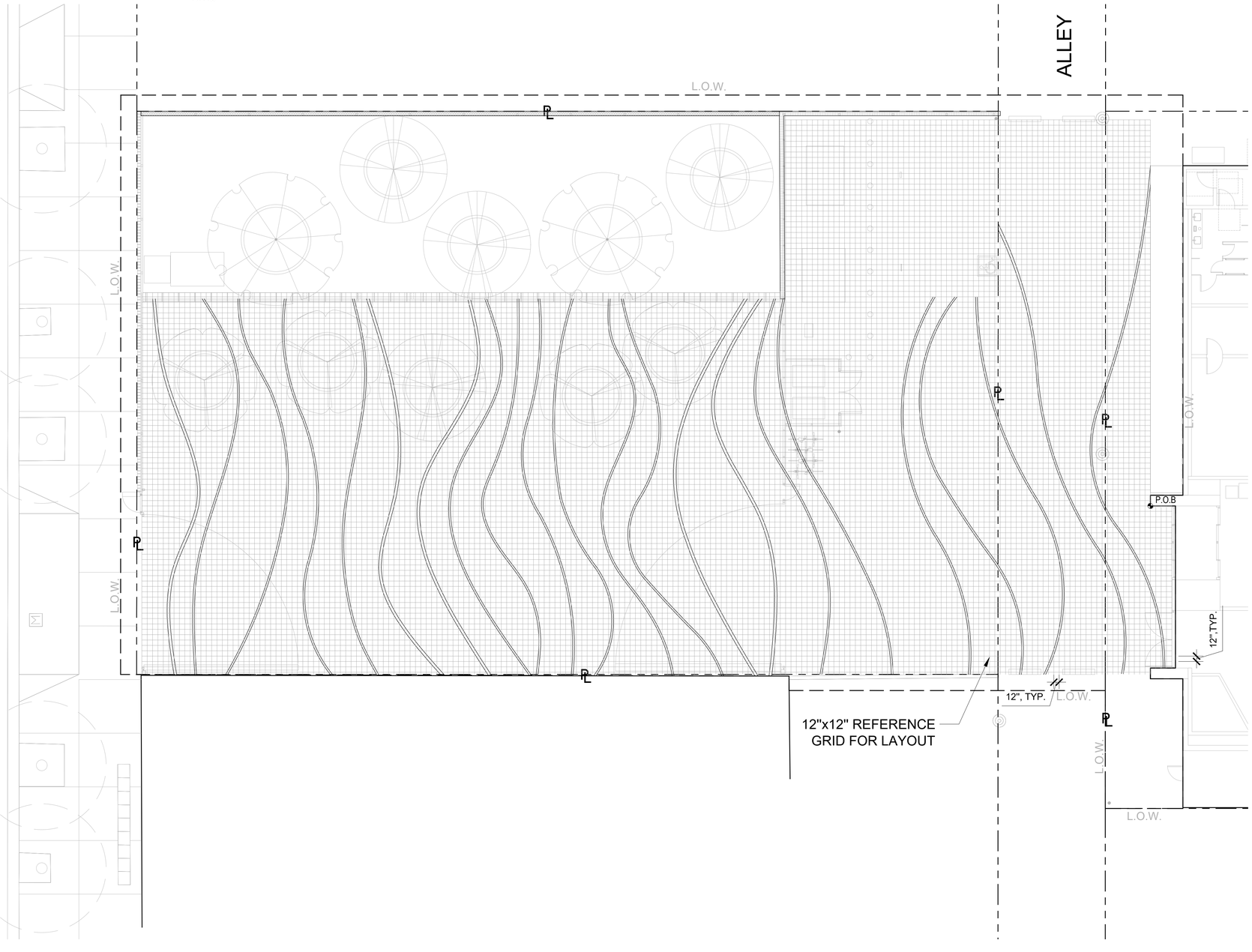
THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

C:\USERS\MINGLEI XIONG\HKLA SERVER DROPBOX\2019117 HKLA_RESEDA SKATE FACILITIES\09 PHASE\03 CD\01 CAD\2019117_RESEDA SKATE FACILITIES_L100.DWG 10/28/2021 2:17 PM

KEY PLAN



N.T.S



NOTE:

UPON REQUEST LANDSCAPE ARCHITECT TO PROVIDE A CAD FILE FOR HARDSCAPE AND GRAPHIC LINES LAYOUT. PRIOR TO CONSTRUCTION, GC TO SET UP TEMPORARY MARKUPS AT THE FIELD FOR VERIFICATION OF DESIGN INTENT AND APROVAL.

1 LANDSCAPE DIMENSION PLAN

SCALE: 1"=10'-0"

NOTE:
UPON REQUEST, A CAD FILE TO BE PROVIDED FOR LAYOUT OF COATING ON AC PAVING & LOCATION OF PLANTER/SEATING WALL.

811 Know what's below. Call before you dig.

HONGJOO KIM LANDSCAPE ARCHITECTS

NOT FOR CONSTRUCTION

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Design Division

LICENSED LANDSCAPE ARCHITECT
HONGJOO KIM NO. 5987
Signature
12/31/21
Renewal Date
10/29/21
Date
STATE OF CALIFORNIA

THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED

BUREAU OF ENGINEERING
VERTICAL CONTROL:
HORIZONTAL CONTROL:
SHEET TITLE LANDSCAPE CONSTRUCTION PLAN
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

DEPARTMENT OF PUBLIC WORKS
BY:
DATE:
NO. REVISIONS:
CIP NO.
INDEX NO.

CITY OF LOS ANGELES
CITY ENGINEER
DATE:
GARY LEE MOORE, P.E., ENV SP
DESIGN GROUP
ENGINEER:
DESIGNED BY: HONGJOO KIM LANDSCAPE ARCHITECTURE
DRAWN BY: MX
CHECKED BY: CA
APPROVED BY: HK

WORK ORDER NO.
E170121B

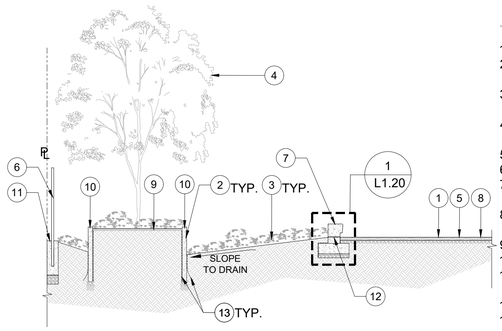
SHEET NAME
LANDSCAPE DIMENSION PLAN
L1.02
SHEET 5 OF 16 SHEETS

REVISION DATES (DESIGN STAGE ONLY)

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

Sheet Version 4.0

C:\USERS\MINGLEI XIONG\HKLA SERVER DROPBOX\2019117 HKLA_RESEDA SKATE FACILITIES\09 PHASE\03 CD\01 CAD\2019117_RESEDA SKATE FACILITIES_L100.DWG 10/28/2021 2:20 PM



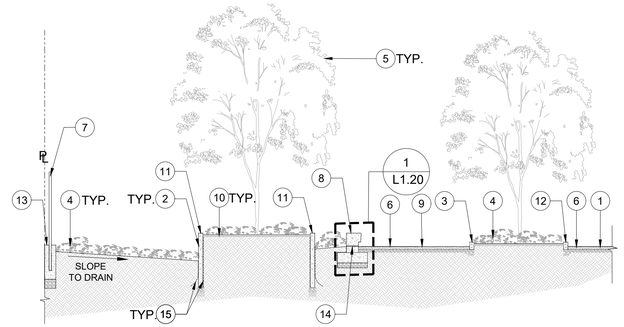
LEGEND

1. ROLLER RINK AREA, SEE L1.01
2. BIO-FILTRATION C.I.P. CONCRETE PLANTER WALL, SEE DETAIL 5/L1.20
3. LANDSCAPE PLANTING, SEE PLANTING PLAN
4. PROPOSED TREE, SEE PLANTING PLAN
5. GRADING, SEE CIVIL DWGS
6. CHAIN LINK FENCE, SEE DETAIL 3/L1.20
7. C.I.P. CONCRETE BENCH W/ SKATE DETERRENT,SEE DETAIL 1/L1.20
8. AC PAVING, SEE CIVIL DWGS STRIPING/COATING, SEE L1.01
9. PINE BARK MULCH, SEE SPECS
10. TOP OF WALL, SEE L1.01
11. POST FOOTING, SEE STRUCTURAL DWGS/ 10" WIDE MOW CURB, SEE CIVIL DWGS
12. WEEPHOLE, SEE DETAIL L1/120
13. BIO-FILTRATION LINER PER CIVIL

3 LANDSCAPE SECTION 3 - E/W ROLLER RINK AREA & PLANTERS

SCALE: 1/8" = 1'-0"

0' 8' 16' 32'



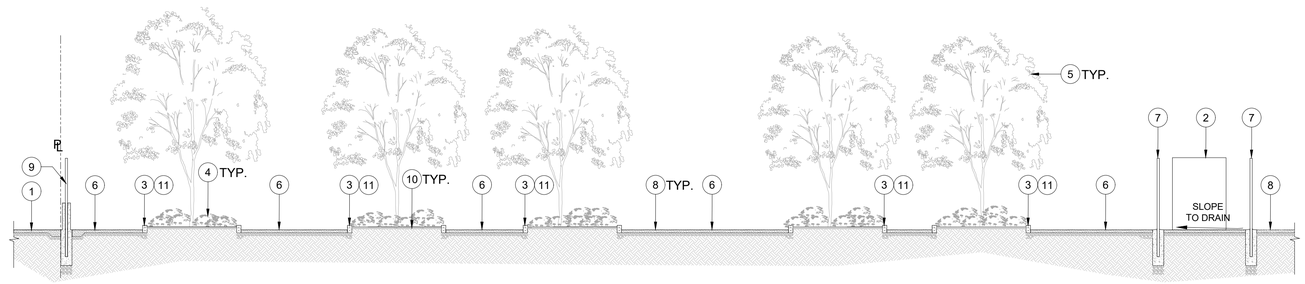
LEGEND

1. ROLLER RINK AREA, SEE L1.01
2. BIO-FILTRATION C.I.P. CONCRETE PLANTER WALL, SEE DETAIL 5/L1.20
3. 6" PLANTER CURB, SEE DETAIL 4/L1.20
4. LANDSCAPE PLANTING, SEE PLANTING PLAN
5. PROPOSED TREE, SEE PLANTING PLAN
6. GRADING, SEE CIVIL DWGS
7. CHAIN LINK FENCE, SEE DETAIL 3/L1.20
8. C.I.P. CONCRETE BENCH W/ SKATE DETERRENT, SEE DETAIL 1/L1.20
9. AC PAVING, SEE ARCH/CIVIL DWGS STRIPING/COATING, SEE L1.01
10. PINE BARK MULCH, SEE SPECS
11. TOP OF WALL, SEE L1.01
12. TOP OF THE CURB, SEE CIVIL DWGS
13. POST FOOTING, SEE STRUCTURAL DWGS/ 10" WIDE MOW CURB, SEE CIVIL DWGS
14. WEEPHOLE, SEE DETAIL L1/120
15. BIO-FILTRATION LINER PER CIVIL

4 LANDSCAPE SECTION 4 - E/W BIORETENTION PLANTERS

SCALE: 1/8" = 1'-0"

0' 8' 16' 32'



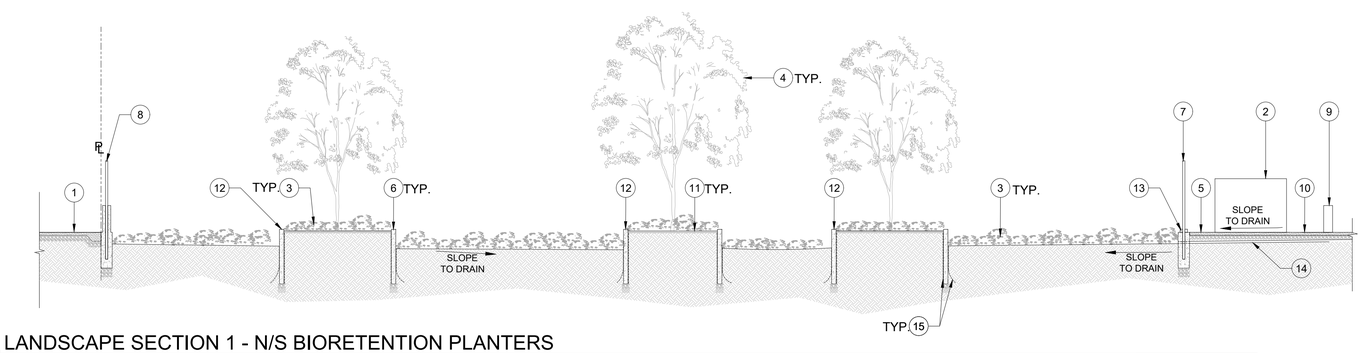
LEGEND

1. EXISTING SIDEWALK, SEE CIVIL DWGS
2. TRASH DUMPSTER, SEE ARCH DWGS
3. 6" CONCRETE PLANTER CURB, SEE DETAIL 4/L1.20
4. LANDSCAPE PLANTING, SEE PLANTING PLAN
5. PROPOSED TREE, SEE PLANTING PLAN
6. GRADING, SEE CIVIL DWG.
7. CORRUGATED METAL SECURITY FENCE, SEE ARCH DWGS
8. AC PAVING, SEE CIVIL DWGS/ COATING/STRIPING, SEE L1.01
9. SECURITY FENCE ON LOW WALL, SEE ARCH DWGS
10. PINE BARK MULCH, SEE SPECS
11. TOP OF CURB, SEE CIVIL DWGS

2 LANDSCAPE SECTION 2 - N/S ROLLER RINK PLANTERS

SCALE: 1/8" = 1'-0"

0' 8' 16' 32'



LEGEND

1. EXISTING SIDEWALK, SEE CIVIL DWGS
2. ELECTRICAL SWITCH GEAR, SEE ARCH/ELECTRICAL DWGS
3. LANDSCAPE PLANTING, SEE PLANTING PLAN
4. PROPOSED TREE, SEE PLANTING PLAN
5. GRADING, SEE CIVIL DWGS
6. BIO-FILTRATION C.I.P. CONCRETE PLANTER WALL, SEE 5/L1.20
7. CORRUGATED METAL SECURITY FENCE, SEE ARCH DWGS
8. SECURITY FENCE ON LOW WALL, SEE ARCH DWGS
9. BOLLARD, SEE ARCH DWGS
10. AC PAVING, SEE CIVIL DWGS/ STRIPING/COATING, SEE L1.01
11. PINE BARK MULCH, SEE SPECS
12. TOP OF WALL, SEE L1.01
13. POST FOOTING, SEE STRUCTURAL DWGS/ 10" WIDE CONCRETE CURB, SEE CIVIL DWGS
14. STORM DRAIN PIPE, SEE CIVIL DWGS
15. BIO-FILTRATION LINER PER CIVIL

1 LANDSCAPE SECTION 1 - N/S BIORETENTION PLANTERS

SCALE: 1/8" = 1'-0"

0' 8' 16' 32'

HONGJOO KIM LANDSCAPE ARCHITECTS

811 Know what's below. Call before you dig.

NOT FOR CONSTRUCTION

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Design

LICENSED LANDSCAPE ARCHITECT
HONGJOO KIM NO. 5987
Signature
12/31/21
Renewal Date
10/29/21
STATE OF CALIFORNIA

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED •

BUREAU OF ENGINEERING
VERTICAL CONTROL:
HORIZONTAL CONTROL:
SHEET TITLE LANDSCAPE SECTIONS
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

DEPARTMENT OF PUBLIC WORKS
NO. REVISIONS: DATE: BY:
CIP NO.
INDEX NO.

CITY OF LOS ANGELES
GARY LEE MOORE, P.E. ENV SP — CITY ENGINEER
DESIGN GROUP — DATE:
ENGINEER:
DESIGNED BY: HONGJOO KIM LANDSCAPE ARCHITECTURE
DRAWN BY: MX
CHECKED BY: CA
APPROVED BY: HK

WORK ORDER NO.
E170121B

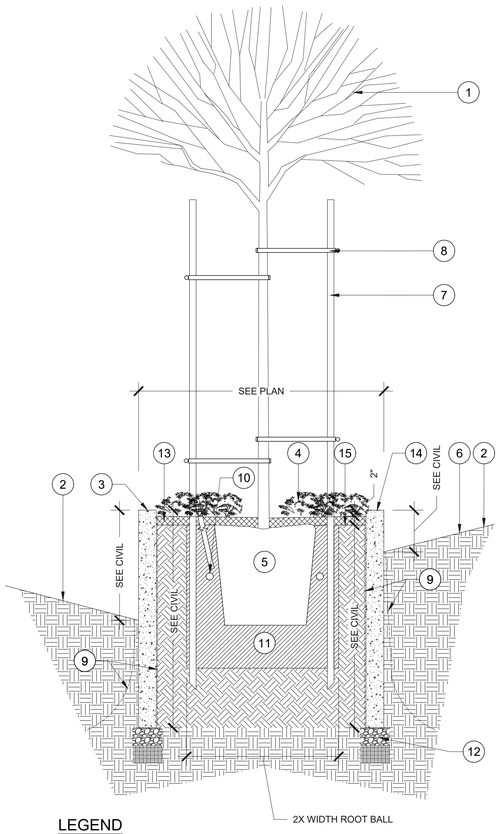
SHEET NAME
LANDSCAPE SECTIONS
L1.10
SHEET 6 OF 16 SHEETS

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REVISION DATES (DESIGN STAGE ONLY)

Sheet Version 4.0

C:\USERS\MINGLEI XIONG\HKLA SERVER DROPBOX\2019117 HKLA_RESEDA SKATE FACILITIES\09 PHASE\03 CD\01 CAD\2019117_RESEDA SKATE FACILITIES_L110.DWG 10/28/2021 2:23 PM

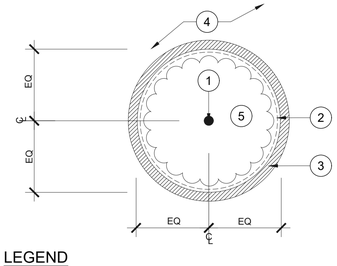


LEGEND

1. PROPOSED TREE, SEE PLANTING PLAN
2. BIO-FILTRATION PLANTER, SEE CIVIL DWGS
3. C.I.P CONCRETE PLANTER WALL, SEE CIVIL DWGS
4. PLANTING, SEE PLANTING PLAN
5. ROOTBALL
6. SLOPE, SEE CIVIL DWGS
7. LODGEPOLE PINE STAKE
   24" BOX TREES: 2" X 10'.
   36" BOX TREES: 3" X 12'.
   DO NOT DRIVE STAKE THROUGH ROOTBALL. CUT OFF TOP SECTION DAMAGED BY HAMMERING. TOP OF STAKE IS 6" CLEAR OF LOWEST TREE BRANCHES.
8. FLEXIBLE VINYL TREE TIE, 4/TREE
9. BIO-FILTRATION LINER PER CIVIL
10. PLANT FERTILIZER TABLET, SEE SPECS
11. AMENDED BACKFILL, SEE SPECS
12. COMPACTED AGGREGATE, SEE GEOTECH REPORT
13. 3" THICK PINE BARK MULCH, SEE SPECS
14. TOP OF PLANTER WALL, SEE PLAN
15. FINISH GRADE

5 BIO-FILTRATION C.I.P. CONCRETE PLANTER WALL

SCALE: 1/2"=1'-0"

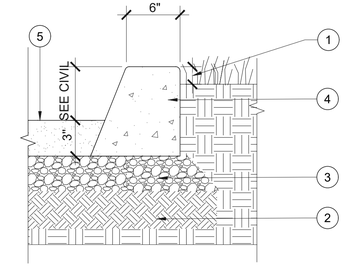


LEGEND

1. TREE TRUNK
2. 18"-DEEP ROOT CONTROL BARRIER: DEEPROOT UB-18 OR EQUIVALENT. CENTER BARRIER ON TRUNK OF TREE. INSTALL PER MANUFACTURER'S SPECS
3. CIRCULAR CONCRETE PLANTER WALL/CURB, SEE L1.01
4. ADJACENT PLANTING/ PAVING AREA , SEE L1.01
5. PLANTING AREA, SEE PLANTING PLAN

6 ROOT BARRIER

SCALE: 1/4"=1'-0"

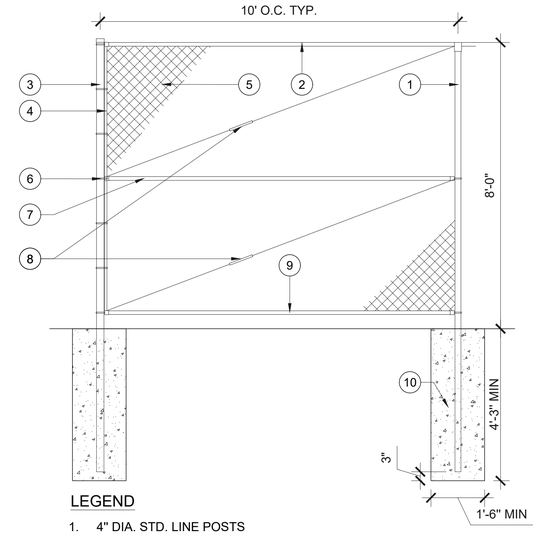


LEGEND

1. FINISH GRADE OF PLANTING AREA 2" IN GROUND COVER/SHRUB AREA & 1" IN LAWN AREA
2. COMPACTED SUBGRADE, PER GEOTECHNICAL ENGINEER
3. 4" MIN. THICK 95% COMPACTED STONE CRUSHED AGGREGATE SUBGRADE PER GEOTECHNICAL ENGINEER
4. 6" CONCRETE PLANTER CURB, SEE CIVIL DWGS
5. ADJACENT PAVING

4 6" CONCRETE PLANTER CURB

SCALE: 1 1/2"=1'-0"



LEGEND

1. 4" DIA. STD. LINE POSTS
2. 1-1/4" DIA. STD. PIPE W/6 GAGE WIRE TIES @14" O.C.
3. 4" DIA. STD. PIPE END POSTS
4. STRETCHER BAR 3/16" X 3/4"
5. CHAIN LINK FABRIC 9 GAGE 2" MESH GALVANIZED KNUCKLED TOP & BOTTOM
6. BRACE BANDS 3/16" X 1/4" @ 14" O.C.
7. 1-1/4" DIA. ST. PIPE BRACE W/ 11 GAGE WIRE TIES @14" O.C.
8. TRUSS ROD 3/8" DIA. W/ 3/8" X 7-1/8" TURNBUCKLE
9. 1-1/4" DA. ST. PIPE BOTTOM BRACE
10. CONCRETE FOOTING, SEE STRUCTURAL DWGS

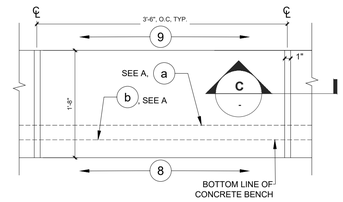
NOTE:

AFTER FIELD VERIFICATION OF FENCE LAYOUT, GC TO PROVIDE SHOP DRAWINGS FOR REVIEW PRIOR TO CONSTRUCTION.

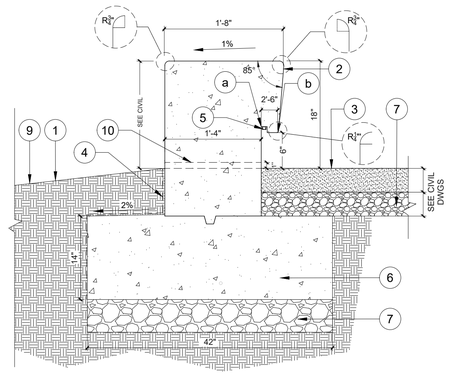
3 CHAIN LINK FENCE

SCALE: 1/2"=1'-0"

C. SKATE DETERRENT SECTION



B. SKATE DETERRENT PLAN



A. TYPICAL SECTION

LEGEND

1. FINISH GRADE OF SLOPE, SEE CIVIL DWGS
2. C.I.P CONCRETE BENCH , SMOOTH ARCHITECTURAL FINISH,NATURAL GRAY COLOR, SEE ARCH SPECS 03 30 00
3. FINISH SURFACE, SEE CIVIL DWGS
4. BIO-FILTRATION LINER PER CIVIL
5. LED TAPE LIGHT CHANNEL NICHE, 1"X1", SEE ELECTRICAL DWGS
6. CONCRETE FOOTING, SEE CIVIL DWGS
7. COMPACTED AGGREGATE BASE PER GEOTECHNICAL ENGINEER'S REPORT
8. PAVEMENT, SEE PLAN
9. PLANTING AREA, SEE PLANTING PLAN
10. 1" x 6" WEEPHOLE, TO BE FLUSH W/ AC FINISH SURFACE, 10'-0" O.C., TYP.

1 C.I.P CONCRETE BENCH W/ SKATE DETERRENT

SCALE: 1"=1'-0"

HONGJOO KIM LANDSCAPE ARCHITECTS

811 Know what's below. Call before you dig.

NOT FOR CONSTRUCTION

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Design Division

THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED

LICENSED LANDSCAPE ARCHITECT
HONGJOO KIM NO. 5987
Signature
12/31/21
Renewal Date
10/29/21
Date
STATE OF CALIFORNIA

BUREAU OF ENGINEERING
VERTICAL CONTROL:
HORIZONTAL CONTROL:
SHEET TITLE: LANDSCAPE DETAILS
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

DEPARTMENT OF PUBLIC WORKS
CITY OF LOS ANGELES
GARY LEE MOORE, P.E., ENV SP
CITY ENGINEER
DATE:
DESIGN GROUP
ENGINEER:
DESIGNED BY: HONGJOO KIM LANDSCAPE ARCHITECTURE
DRAWN BY: MX
CHECKED BY: CA
APPROVED BY: HK

NO. REVISIONS: BY: DATE:
CIP NO.
INDEX NO.

WORK ORDER NO. E170121B

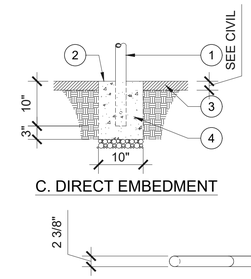
SHEET NAME LANDSCAPE DETAILS
L1.20
SHEET 7 OF 16 SHEETS

REVISION DATES (DESIGN STAGE ONLY)

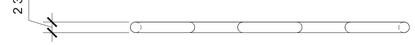
THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

2 STREETBOND® AC COLOR COATING SPECS

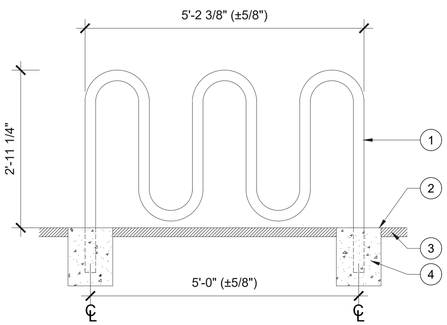
SCALE: N.T.S.



C. DIRECT EMBEDMENT



B. PLAN VIEW



A. ELEVATION VIEW

LEGEND

1. CYCLOOPS
2. FINISHED GRADE, SEE CIVIL DWGS
3. AC PAVING, SEE CIVIL DWGS
4. FOOTING, SEE STRUCTURAL DWGS

1 CYCLOOPS BIKE RACK

SCALE: 3/4"=1'-0"

HONGJOO KIM LANDSCAPE ARCHITECTS

811 Know what's below. Call before you dig.

NOT FOR CONSTRUCTION

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Design Division

LICENSED LANDSCAPE ARCHITECT
HONGJOO KIM NO. 5087
Signature
12/31/21
Renewal Date
10/29/21
Date
STATE OF CALIFORNIA

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED •

BUREAU OF ENGINEERING
VERTICAL CONTROL:
HORIZONTAL CONTROL:
SHEET TITLE LANDSCAPE DETAILS
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

DEPARTMENT OF PUBLIC WORKS
CITY OF LOS ANGELES
GARY LEE MOORE, P.E., ENV SP CITY ENGINEER
DESIGN GROUP DATE:
ENGINEER:
DESIGNED BY: HONGJOO KIM LANDSCAPE ARCHITECTURE
DRAWN BY: MX
CHECKED BY: CA
APPROVED BY: HK

NO. REVISIONS: BY: DATE:

CIP NO.

INDEX NO.

WORK ORDER NO.
E170121B

SHEET NAME
LANDSCAPE DETAILS & COLOR COATING SPECS
L1.21
SHEET 8 OF 16 SHEETS

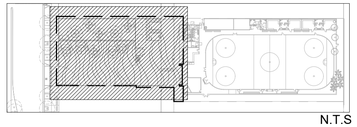
THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REVISION DATES (DESIGN STAGE ONLY)

Sheet Version 4.0

C:\USERS\MINGLEI XIONG\HKLA SERVER DROPBOX\2019117 HKLA_RESEDA SKATE FACILITIES\09 PHASE\03 CD\01 CAD\2019117_RESEDA SKATE FACILITIES_L120.DWG 10/28/2021 2:25 PM

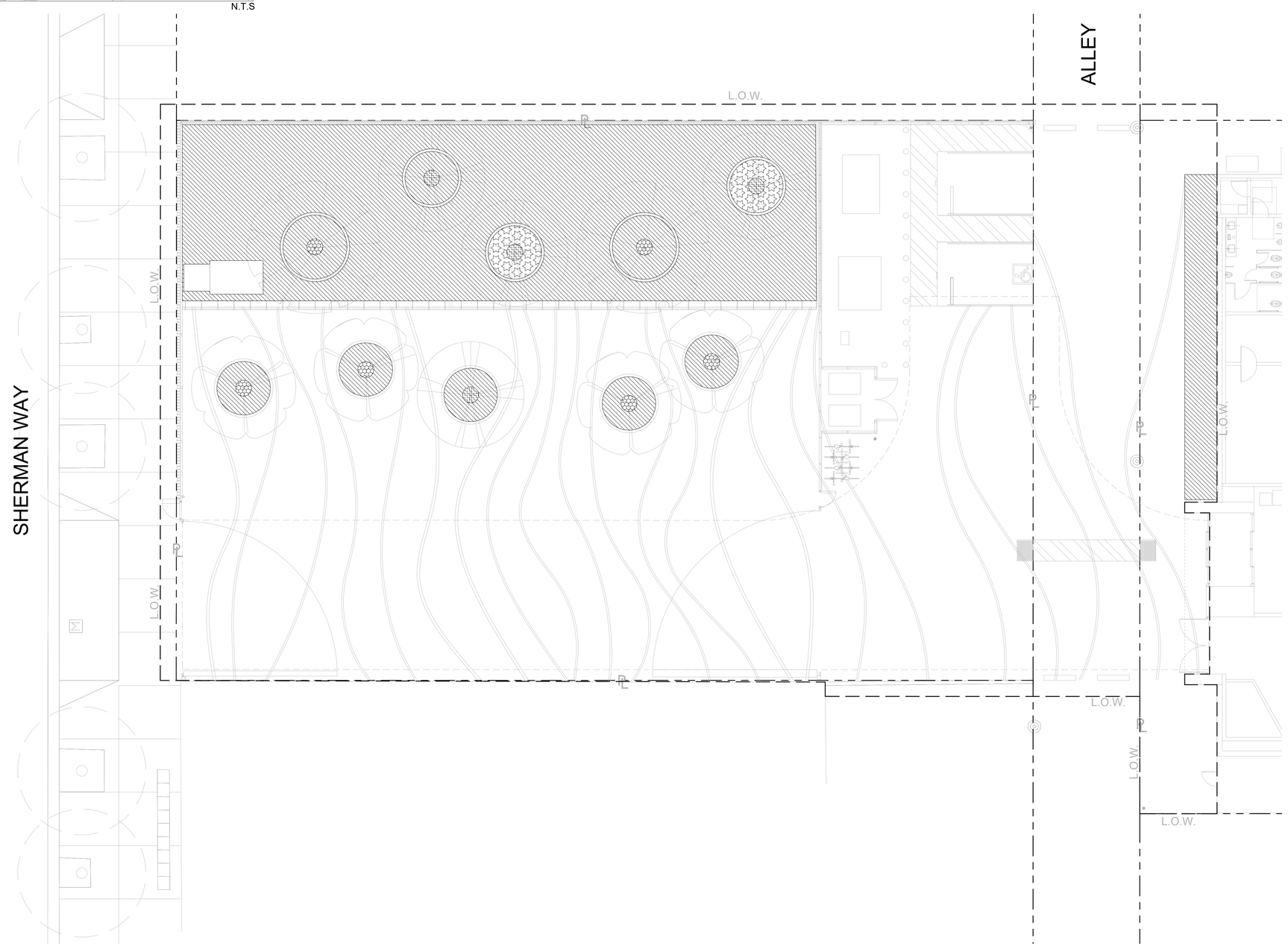
KEY PLAN



N.T.S

HYDROZONE LEGEND

SYMBOL	WATER USE ZONE
	TREE - LOW WATER
	TREE - MEDIUM WATER
	SHRUB - MEDIUM WATER
	SHRUB - LOW WATER



1 LANDSCAPE HYDROZONE PLAN

SCALE: 1"=10'-0"

0 10' 20' 30'

N

HONGJOO KIM LANDSCAPE ARCHITECTS

811 Know what's below. Call before you dig.

NOT FOR CONSTRUCTION

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

LICENSED LANDSCAPE ARCHITECT
HONGJOO KIM NO. 5087
Signature
12/31/21
Renewal Date
10/29/21
STATE OF CALIFORNIA

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED

BUREAU OF ENGINEERING
VERTICAL CONTROL:
HORIZONTAL CONTROL:
SHEET TITLE: LANDSCAPE HYDROZONE PLAN
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

DEPARTMENT OF PUBLIC WORKS
NO. REVISIONS: DATE: BY:
CIP NO.
INDEX NO.

CITY OF LOS ANGELES
CITY ENGINEER
GARY LEE MOORE, P.E. ENV SP
DATE:
DESIGN GROUP:
ENGINEER:
DESIGNED BY: HONGJOO KIM LANDSCAPE ARCHITECTURE
DRAWN BY: MX
CHECKED BY: CA
APPROVED BY: HK

WORK ORDER NO.
E170121B

SHEET NAME
LANDSCAPE HYDROZONE PLAN
L2.01
SHEET 9 OF 16 SHEETS

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REVISION DATES (DESIGN STAGE ONLY)

Sheet Version 4.0

C:\USERS\MINGLEI XIONG\HKLA SERVER DROPBOX\2019117 HKLA_RESEDA SKATE FACILITIES\09 PHASE\03 CD\01 CAD\2019117_RESEDA SKATE FACILITIES_L200.DWG 10/28/2021 2:26 PM

HYDROZONE TABLE

VALVE #	EMISSION TYPE	FLOW RATE	APPLICATION RATE	OPERATING PRESSURE	HYDROZONE	AREA	RUN TIMES
1	DRIP	18 GPM	.96 in/hr	30	LOW	1784 SQFT	15 min
2	BUBBLER	4 GPM	-	30	MED	36 SQFT	5 min
3	DRIP	2 GPM	.96 in/hr	30	MED	146 SQFT	20 min
4	DRIP	17 GPM	.96 in/hr	30	LOW	1643 SQFT	15 min
5	DRIP	6 GPM	.96 in/hr	30	LOW	366 SQFT	15 min
6	BUBBLER	6 GPM	-	30	LOW	54 SQFT	3 min
7	BUBBLER	7 GPM	-	30	VERY LOW	228 SQFT	3 min

RUN TIMES ARE SET FOR THE HOTTEST DAY OF THE YEAR. ENABLE SOLAR SYNC WEATHER SENSOR DELAY FUNCTION FOR FIRST 60 DAYS OF ESTABLISHMENT PERIOD. SMART CONTROLLER WILL MAKE RUN TIME ADJUSTMENTS PER LIVE WEATHER DATA VIA SOLAR SYNC WEATHER SENSOR AFTER ESTABLISHMENT PERIOD.

PROGRAM START TIMES:
RUN ALL STATIONS EVERY DAY FOR THE FIRST 30 DAYS.
ADJUST PROGRAM START TIMES FOR EVERY OTHER DAY FOR FOLLOWING 60 DAYS. AFTER 90 DAY MAINTENANCE PERIOD, ADJUST PROGRAM START TIMES TO THE FOLLOWING

SHRUB ZONES : MONDAY, WEDNESDAY, FRIDAY.

PRESSURE CALCULATIONS FOR DOMESTIC IRRIGATION

Project Name and/or Tract#: Reseda Skate Park
Date and Source of Information: 03.26.21
Name of Contact Person and Phone Number: LA DWP
P.O.C. Water Meter #: -
Water Meter Size and Type: 1.5" Potable
Hydraulic Grade Level: - FT
Water Meter Elevation: 0 FT
Highest Head Elevation on the System: 0 FT
Basis for Calculations: Zone with Largest Demand

Remote Control Valve#: A4

Size of Remote Control Valve: 1"
Demand at Remote Control Valve: 17gpm

QUANTITY	SIZE	DESCRIPTION	FLOW (GPM)	LOSS (PSI)
1	1.5"	Water Meter	17	1
1	1.5"	Backflow RP	17	12
1	1.5"	Pressure Regulator	17	1
1	1.5"	Gate Valve(s)	17	1
-	-	Gate Valve(s)	-	-
1	1.5"	Master Valve	17	1
1	1.5"	Flow Sensor	17	1
240'	1.5"	Mainline	17	1
-	-	Mainline	-	-
-	-	Mainline	-	-
-	-	Mainline	-	-
1	1"	Remote Control Valve	17	3
		Lateral Line Losses (10%)		2
		Other Losses (10%)		2
		Elevation Loss or Gain	-	0
		Total		25

PRESSURE (PSI)

Pressure Required to Operate Irrigation Head	30
Sub-Total Pressure Required for Irrigation System	55
Total Pressure Required for Irrigation System (Sub-Total Pressure + 10%)	61
Static Pressure Available	87
Residual Pressure (Subtract Total Pressure from Static Pressure)	26

GENERAL IRRIGATION NOTES

1. THE IRRIGATION CONTRACTOR SHALL BE RESPONSIBLE FOR FAMILIARIZING THEMSELVES WITH ALL DIFFERENCES IN GRADE, LOCATION OF SEATWALLS, LOCATION OF RETAINING WALLS, ETC. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING ALL IRRIGATION WORK WITH THE GENERAL CONTRACTOR, ELECTRICAL CONTRACTOR, AND ALL OTHER SUBCONTRACTORS FOR THE LOCATION AND THE INSTALLATION OF IRRIGATION RELATED SLEEVES THROUGH WALLS, STRUCTURES, UNDER ROADWAYS, PAVING, ETC.
2. THE IRRIGATION DESIGN PRESENTED IN THESE DOCUMENTS IS INTENDED TO BE DIAGRAMMATIC. ALL IRRIGATION EQUIPMENT, PIPING AND VALVE LOCATIONS, ETC. SHOWN WITHIN PAVED AREAS ARE FOR DESIGN CLARIFICATION AND SHALL ONLY BE INSTALLED IN PLANTING AREAS. IRRIGATION CONTRACTOR SHALL INSTALL ALL REMOTE CONTROL VALVES, QUICK COUPLERS, AND GATE VALVES, IN SHRUB PLANTING AREAS OR AS APPROVED BY OWNER'S REPRESENTATIVE & THE LANDSCAPE IRRIGATION DESIGNER. AVOID ANY CONFLICTS BETWEEN THE SPRINKLER SYSTEM, PLANTING AND ARCHITECTURAL FEATURES.
3. THE IRRIGATION SYSTEM DESIGN IS BASED UPON THE MINIMUM OPERATING PRESSURE AND THE MAXIMUM FLOW DEMAND SHOWN ON THE IRRIGATION DRAWINGS AT EACH POINT OF CONNECTION. THE IRRIGATION CONTRACTOR SHALL VERIFY WATER PRESSURE PRIOR TO CONSTRUCTION. ANY DIFFERENCE BETWEEN THE WATER PRESSURE INDICATED ON THE DRAWINGS AND THE ACTUAL PRESSURE READING AT THE IRRIGATION POINT OF CONNECTION SHALL BE IMMEDIATELY REPORTED IN WRITING TO THE OWNER'S AUTHORIZED REPRESENTATIVE. IF THE PRESSURE DIFFERENCES ARE NOT IMMEDIATELY REPORTED PRIOR TO BEGINNING CONSTRUCTION, THE IRRIGATION CONTRACTOR SHALL ASSUME FULL RESPONSIBILITY FOR ALL REVISIONS TO THE IRRIGATION SYSTEM DEEMED NECESSARY BY THE OWNER'S REPRESENTATIVE AND ALL COSTS ASSOCIATED WITH THOSE REVISIONS.
4. WHEN IT IS APPARENT TO THE LANDSCAPE CONTRACTOR IN THE FIELD THAT OBSTRUCTIONS, GRADE DIFFERENCES, OR DIFFERENCES IN THE CALCULATED AREA DIMENSIONS EXIST THAT MAY HAVE NOT BEEN CONSIDERED IN THE DESIGN OF THE SYSTEM, THE IRRIGATION CONTRACTOR SHALL NOT WILLFULLY INSTALL THE IRRIGATION SYSTEM AS INDICATED ON THE CONSTRUCTION DRAWINGS. THE OWNER'S AUTHORIZED REPRESENTATIVE SHALL BE NOTIFIED IN WRITING OF ANY SUCH OBSTRUCTIONS OR DIFFERENCES PRIOR TO BEGINNING ANY IRRIGATION INSTALLATION. IF NOTIFICATION IS NOT RECEIVED PRIOR TO BEGINNING INSTALLATION, THE IRRIGATION CONTRACTOR SHALL ASSUME FULL RESPONSIBILITY FOR ALL REVISIONS TO THE IRRIGATION SYSTEM AS DEEMED NECESSARY BY OWNER'S REPRESENTATIVE AND ALL COSTS ASSOCIATED WITH THOSE REVISIONS.
5. THE IRRIGATION CONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLING ALL CONTROL WIRE SLEEVING OF SUFFICIENT SIZE, UNDER ALL PAVED AREAS IN ADDITION TO THE CONTROL WIRE SLEEVING SHOWN ON THE DRAWINGS.
6. ALL PIPING AND EQUIPMENT SHALL BE INSTALLED PER THE IRRIGATION DETAILS. TEFLON TAPE OR TEFLON PIPE DOPE SHALL BE APPLIED TO ALL MALE PVC PIPE THREADS ON ALL IRRIGATION VALVE ASSEMBLIES.
7. THE IRRIGATION CONTRACTOR SHALL BE RESPONSIBLE FOR FLUSHING AND ADJUSTING ALL IRRIGATION HEADS FOR OPTIMUM PERFORMANCE AND TO PREVENT OVER SPRAY ONTO AREAS NOT INTENDED FOR IRRIGATION. THIS SHALL INCLUDE THROTTLING THE FLOW CONTROL AT EACH VALVE TO OBTAIN THE OPTIMUM OPERATING PRESSURE FOR EACH SYSTEM.
8. THE IRRIGATION CONTRACTOR SHALL BE RESPONSIBLE FOR ADJUSTING THE PRESSURE REGULATOR ON EACH ELECTRIC CONTROL VALVE SO THE IRRIGATION HEAD FARTHEST AND HIGHEST IN ELEVATION FROM ITS ASSOCIATED CONTROL VALVE FUNCTIONS WITHIN THE OPERATING PRESSURE SHOWN ON THE IRRIGATION LEGEND (NOT TO EXCEED 5 PSI ABOVE THE INDICATED OPERATING PRESSURE).
9. THE IRRIGATION CONTRACTOR SHALL BE RESPONSIBLE FOR MAKING FIELD ADJUSTMENTS TO THE IRRIGATION SYSTEM BY INSTALLING A QUARTER CIRCLE OR HALF CIRCLE SPRINKLER HEAD ON EACH SIDE OF ANY VERTICAL ELEMENT (PROPS, STREET LIGHTS, TREES, ETC.) WHICH PREVENTS PROPER COVERAGE BY INTERFERING WITH THE SPRAY PATTERN OF THE IRRIGATION HEAD. ALL ADJUSTMENTS SHALL BE MADE AT NO ADDITIONAL COSTS TO THE OWNER.
10. DRAINAGE OF IRRIGATION WATER THROUGH THE EMITTER WILL NOT BE ALLOWED. HUNTER CHECK VALVE FEATURE SHALL BE USED TO PREVENT SPRAY HEAD DRAINAGE. DURING CONSTRUCTION, THE CONTRACTOR SHALL CHANGE SPRAY BODIES WITH HUNTER CHECK VALVE FEATURES FOR SPRAY HEADS SHOWING SIGNS OF DRAINING AFTER THE IRRIGATION SYSTEM HAS OPERATED FROM AN ON TO OFF POSITION. INSTALLATION OF HUNTER CHECK VALVE FEATURE SHALL BE INCLUDED IN THE BID PRICE OF THE IRRIGATION SYSTEM.
11. THE IRRIGATION CONTRACTOR SHALL BE RESPONSIBLE FOR MAKING THE FINAL CONNECTION BETWEEN THE POWER SOURCE AND THE AUTOMATIC CONTROLLER. 120 VOLT ELECTRICAL POWER SOURCE SHALL BE PROVIDED BY OTHERS AT THE AUTOMATIC CONTROLLER LOCATION.
12. ADHESIVES, SEALANTS AND CAULKS SHALL MEET LOCAL OR REGIONAL AIRPOLLUTION CONTROL OR SOUTH COAST AQMD RULE 1168 VOC AND STATEWIDE VOC STANDARDS.
13. BEFORE COMMENCING ANY WORK, OBTAIN AN UNDERGROUND SERVICE ALERT I.D. NUMBER BY CALLING 1-800-422-4133. ALLOW TWO (2) WORKING DAYS AFTER THE I.D. NUMBER IS OBTAINED AND BEFORE THE EXCAVATION WORK IS STARTED SO THAT UTILITY OWNERS CAN BE NOTIFIED.
14. GUARANTEE: THE INSTALLED SPRINKLER SYSTEM SHALL BE GUARANTEED FOR A PERIOD OF ONE (1) YEAR FROM THE DATE OF ACCEPTANCE OF THE WORK. SHOULD ANY TROUBLE DEVELOP WITHIN THE TIME SPECIFIED DUE TO INFERIOR OR FAULTY MATERIAL OR WORKMANSHIP, THE TROUBLE SHALL BE CORRECTED BY THE CONTRACTOR WITHOUT EXPENSE TO THE OWNER.
15. ALL LOCAL, MUNICIPAL AND STATE LAWS, RULES AND REGULATIONS GOVERNING OR RELATING TO ANY PORTION OF THIS WORK ARE HEREBY INCORPORATED INTO AND MADE A PART OF THESE SPECIFICATIONS AND THEIR PROVISIONS SHALL BE CARRIED OUT BY THE CONTRACTOR.
16. THE INTENT OF THE DESIGN IS TO PROVIDE 100% COVERAGE TO ALL PLANTING AREAS. AS PART OF THE SCOPE OF WORK, THE CONTRACTOR WILL PROVIDE ANY ADDITIONAL HEADS, SPECIAL NOZZLES, OR PATTERNS TO ACHIEVE PROPER COVERAGE WITH A MINIMUM OF OVER SPRAY AT NO ADDITIONAL COST TO THE OWNER.
17. FOR PROJECTS THAT INCLUDE LANDSCAPE WORK, THE LANDSCAPE CERTIFICATION, FORM GRN 12, SHALL BE COMPLETED PRIOR TO FINAL INSPECTION APPROVAL.

OFF SITE IRRIGATION NOTES

1. ALL IRRIGATION MAINLINE SHALL BE SCHEDULE 80 PVC, AND ALL LATERALS/SLEEVES SHALL BE SCHEDULE 40 PVC. SLEEVES SHALL BE 2X THE SIZE OF THE PIPE BEING SLEEVED. ALL IRRIGATION MAINLINE AND LATERALS SHALL BE A MINIMUM OF 3/4" SIZE.
2. CONTRACTOR TO OBTAIN AND PAY FOR ALL PERMITS FOR WORK DONE IN ALLEY BEYOND PROPERTY LINE OF PROJECT. CONTRACTOR RESPONSIBLE TO CONTACT LOCAL JURISDICTION FOR REVIEW OF WORK DONE OFF SITE. ALL PERMITS AND APPLICATIONS MUST BE FILED AT THE START OF CONSTRUCTION.

OBSERVATION SCHEDULING

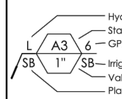
The landscape contractor shall be schedule an irrigation site observation by the irrigation designer, and/or the owner's representative, which shall not occur without at least 48 hours prior notification. The following items shall be reviewed:

1. Pre-job/kick-off meeting with contractor, general contractor, and irrigation designer.
2. Mainline, basket strainers, master valves, flow sensors, booster pump installation and operation, installation review prior to backfilling trenches, irrigation mainline pressure test, etc.
3. Finalizing the location for the controller assemblies - landscape contractor shall coordinate with the irrigation designer to verify connection of flow sensors and associated equipment to each controller assembly and for certification/warranty of equipment.
4. Irrigation coverage test - a dynamic pressure test shall be performed by the landscape contractor and shall be observed by the owner (or the owner's representative) and the irrigation designer for each valve during the irrigation coverage test.

IRRIGATION LEGEND

SYMBOL	RAD.	MANF.	MODEL NO. WITH NOZZLE SIZE & TYPE
F H Q A			
●	-	Hunter	RZWS-18-CV
■	-	Hunter	PROS-04-PRS30 w/PCN-50
		Hunter	Irrigation Dripline - HDL-06-12-CV
		Hunter	AVR-075 - Air Relief Valve
		Hunter	ECO-ID - Drip Operation Indicator
		Hunter	PLD-BV - Manual Flush Valve
		Hunter	PLD-LOC- 050 - Drip Connector
M	-		Existing 1.5" Water Meter
		Febco	825YA - Size Per Main Line
		Nibco	T-111 Gate Valve Line Size 2 1/2" and smaller.
SM		Hunter	HC-150-Flow - Submeter
MV		Superior	3300 Series - Normally Open
FS		Flomec	QS-200 - Size Per Mainline
		Hunter	HQ33D-RC Quick Coupler Valve
		Hunter	ICV-FS w/AS-ADJ Size Per Callout on Plan
		Hunter	ICZ-101-LF for .5-20 GPM ICZ-151-XL for 20-60 GPM
WS		Hunter	WSS-SEN - Wireless Solar Sync Sensor w/WS-Guard +WR-Guard
A2		Hunter	A2C-1200-M w/ACC-PED
			Existing Mainline
			Mainline
			Lateral Line
			PVC Sleeves

IRRIGATION VALVE CALLOUT:



LATERAL LINE SIZING CHART

3/4"	NOTE: THE LATERAL SIZE BETWEEN TWO IDENTICAL TICK MARKS SHALL BE SIZED THE SAME. MINIMUM PIPE SIZE IS 3/4".
1"	
1 1/4"	
1 1/2"	
2"	
2 1/2"	
3"	

DESCRIPTION	PSI	FLOW RATE IN GPM F	H	Q	A	DETAIL
Bubbler in Sleeve with Grate	30	.50	-	-	-	C/L3.11
Flood Bubbler on 4" Pop Up	30	.50	-	-	-	D/L3.11
Space lateral rows at 12'. Dripper spacing at 12". Install 3" Below Grade and Staked at 3' O.C. Use Hunter PLD-LOC fittings. Application rate: 0.96 in/hr. Time to apply 1/4": 15 minutes.	30	0.6 GPH Flow Rate				I.J/L3.10
Install in a Hunter - Multi Purpose Box MB-0811						G/L3.11
Install in a visible area.						B/L3.11
Install in a Hunter - Multi Purpose Box MB-0811						A/L3.11
-						-
Potable Water Source. 87 available psi. Install Pressure Regulator and set to 80 psi.						-
Verify location in field prior to installation. Install within Strong Box Stainless Steel Enclosure per detail. See detail for size.						E.I/L3.11
For mainline sizes 3" and larger, use Nibco F-619-SON, epoxy coated. Assemble with stainless steel hardware. Install in a 10" round valve box.						G/L3.10
Submeter to be installed in rectangle valve box adjacent to backflow preventer.						E/L3.10
Master Valve to be installed in rectangle valve box adjacent to flow sensor.						D/L3.10
Size per plan. Install per detail. See irrigation construction notes for additional information and model numbers.						F/L3.11
Install with stabilizing stake.						H/L3.10
Self cleaning remote control valve with adjustable pressure dial. Install in rectangle valve box per detail.						D/L3.10
Remote control valve kit with pressure regulating filter. Install in rectangle valve box per detail.						F/L3.10
Weather/Rain Sensor. Locate in location with most sun. Open to air and free from any obstructions. Verify location in field.						-
Smart irrigation controller with automatic time adjustments through on site ET Data provided by solar sync sensor. Controller also wifi and central control capable. WR-Guard to be mounted to side of pedestal.						A/L3.10
Protect in place.						-
Irrigation Mainline - PVC SCH. 40 IPS white pipe. PVC SCH. 40 IPS for mainline sizes 1" to 2" PVC Class 315 IPS for mainline sizes 2 1/2" to 3" Sleeve mainline per notes and details.						B/L3.10
Lateral Pipe - PVC SCH. 40 IPS white pipe. Minimum pipe size shall be 3/4" - size laterals per plan. PVC SCH. 40 IPS for sizes 3/4" to 2 1/2" PVC Class 315 IPS for sizes 3" and larger						B/L3.10
PVC SCH. 40 IPS white pipe - sleeves shall be installed for any mainline, lateral, or wires crossing under hardscape per irrigation construction notes. Size to be two times the pipe diameter or wire bundle.						C/L3.10

PLANT MATERIAL ABBREVIATIONS:

Plant Type:		Hydrozone:	
TF	Turf	H	High
SB	Shrub/Ground cover	M	Medium
TR	Trees	L	Low
PT	Pots	VL	Very Low
DP	Drip		

POINT OF CONNECTION NOTES

1. CONTRACTOR TO CONNECT TO EXISTING 1.5" POTABLE WATER METER OFF OF SHERMAN WAY FOR NEW IRRIGATION SYSTEM.

- STATIC WATER PRESSURE 87 PSI (PROVIDED BY LADWP)
- DESIGN WATER PRESSURE 61 PSI
- MAXIMUM SYSTEM DEMAND 17 GPM @ VALVE A4
- RESIDUAL WATER PRESSURE 26 PSI
- CONTRACTOR TO INSTALL PRESSURE REGULATOR AT BACKFLOW PREVENTER AND SET TO 80 PSI

CONTROLLER INFORMATION

1. PEDESTAL MOUNT CONTROLLER TO BE ON INSTALLED ON CONCRETE PAD. REFER TO LEGEND FOR MODEL AND STATION COUNT.
2. WIRELESS WEATHER/RAIN SENSOR FOR CONTROLLER SHALL BE MOUNTED IN AN OPEN AREA OPEN TO THE SKY AND FREE FROM ANY OBSTRUCTIONS.
3. CONTRACTOR TO PROVIDE 120 VOLT POWER TO CONTROLLER.
4. INSTALLATION OF CONTROL WIRES SHALL FOLLOW MAINLINE ROUTING.
5. THE SYSTEM IS DESIGNED FOR THE OPERATION OF ONE VALVE AT A TIME PER CONTROLLER. THE SYSTEM HAS BEEN DESIGNED FOR ONE VALVE OPENING AND ONE VALVE CLOSING.

WATER EFFICIENT LANDSCAPE WORKSHEET

DATE:	10/25/2021	WUCOLS ZONE:	South Coastal	LA Sq. Ft. :	4,257
PROJECT:	Reseda Skate Facilities				
CITY:	Reseda	CIMIS ETo REF. CITY:	San Fernando	SLA Sq. Ft. :	0
CLIENT:	Los Angeles City				
PREPARED BY:	Hongjoo Kim Landscape Architecture	Annual Eto:	52.0		

Point of Connection - 1

MAXIMUM APPLIED WATER ALLOWANCE

	ETo		Total Area		SLA Area		MAWA
Landscape Irrigation MAWA	52.0 x 0.62 x (		4,257 x 0.45	+	0 x 0.6	) =	61,761

ESTIMATED APPLIED WATER USE

	ETo		Area	PF	IE		ETWU
Special Landscaped Area	43.5 x 0.62 x (		0 x	0.3 /	0.81	) =	0
A1 - Low Shrubs - Drip	52.0 x 0.62 x (		1,784 x	0.3 /	0.81	) =	21,302
A2 - Medium Trees - Bubblers	52.0 x 0.62 x (		36 x	0.4 /	0.81	) =	573
A3 - Medium Shrubs - Drip	52.0 x 0.62 x (		146 x	0.4 /	0.81	) =	2,324
A4 - Low Shrubs - Drip	52.0 x 0.62 x (		1,643 x	0.3 /	0.81	) =	19,619
A5 - Low Shrubs - Drip	52.0 x 0.62 x (		366 x	0.3 /	0.81	) =	4,370
A6 - Low Shrubs - Bubblers	52.0 x 0.62 x (		54 x	0.3 /	0.81	) =	645
A7 - Very Low Shrubs - Bubblers	52.0 x 0.62 x (		228 x	0.1 /	0.81	) =	907
	52.0 x 0.62 x (		0 x	0.3 /	0.81	) =	0
	52.0 x 0.62 x (		0 x	0.3 /	0.81	) =	0
	52.0 x 0.62 x (		0 x	0.3 /	0.81	) =	0
	52.0 x 0.62 x (		0 x	0.3 /	0.81	) =	0
	52.0 x 0.62 x (		0 x	0.3 /	0.75	) =	0
	52.0 x 0.62 x (		0 x	0.3 /	0.75	) =	0
	52.0 x 0.62 x (		x	1.0 /	0.75	) =	0
	52.0 x 0.62 x (		x	1.0 /	0.75	) =	0
			4,257		**TOTAL ETWU**	=	**49,741**

ETWU is less than MAWA

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REVISION DATES (DESIGN STAGE ONLY)

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Design

THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED

LICENSED LANDSCAPE ARCHITECT
HONGJOO KIM NO. 5387
Signature
12/31/21
Renewal Date
10/29/21
Date
STATE OF CALIFORNIA

BUREAU OF ENGINEERING
VERTICAL CONTROL:
HORIZONTAL CONTROL:
SHEET TITLE: MASTER IRRIGATION LEGEND, NOTES, & CALCS
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

DEPARTMENT OF PUBLIC WORKS
NO. | REVISIONS: | DATE: | BY:
CIP NO.
INDEX NO.

CITY OF LOS ANGELES
CITY ENGINEER
GARY LEE MOORE, P.E., ENV SP
DATE:
DESIGN GROUP
ENGINEER:
DESIGNED BY: HONGJOO KIM LANDSCAPE ARCHITECTURE
DRAWN BY: MX
CHECKED BY: CA
APPROVED BY: HK

WORK ORDER NO.
E170121B

HONGJOO KIM LANDSCAPE ARCHITECTS

811 Know what's below. Call before you dig.

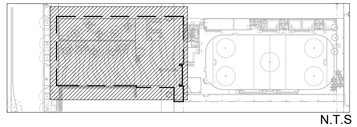
NOT FOR CONSTRUCTION

SHEET NAME
MASTER IRRIGATION LEGEND, NOTES, CALCS
L3.00
SHEET 10 OF 16 SHEETS

Sheet Version 4.0

C:\USERS\MINGLEI XIONG\HKLA SERVER DROPBOX\2019117 HKLA_RESEDA SKATE FACILITIES\09 PHASE\03 CD\01 CAD\2019117_RESEDA SKATE FACILITIES_L300.DWG 10/28/2021 2:32 PM

KEY PLAN



N.T.S

CONTROLLER NOTE:
CONTRACTOR TO INSTALL PEDESTAL MOUNT CONTROLLER ON A CONCRETE PAD. TOP OF PAD TO HAVE SLOPED EDGES. CONTRACTOR RESPONSIBLE FOR MAKING FINAL POWER CONNECTIONS TO CONTROLLER. COORDINATE WITH ELECTRICAL TO PROVIDE POWER SOURCE CONNECTION. NOT SHOWN ON ELECTRICAL DRAWINGS.

WALL MOUNT WEATHER/RAIN SENSOR ON ADJACENT WALL IN VANDAL RESISTANT ENCLOSURE. MODEL: HUNTER WS-GUARD. LOCATE OPEN TO AIR, FREE FROM ANY OBSTRUCTIONS AND IN AREA WITH THE MOST SUN RECEIVED DURING THE DAY

IRRIGATION MAINLINE SHOWN IN PAVING FOR DESIGN CLARITY ONLY. INSTALL IN PLANTING AREA

CONTRACTOR TO OBTAIN AND PAY FOR ANY PERMITS ON WORK EXTENDING IRRIGATION MAINLINE THROUGH ALLEY WAY

POINT OF CONNECTION:
CONTRACTOR TO CONNECT WATER SUPPLY MAINLINE TO EXISTING 1.5" POTABLE WATER METER. INSTALL BACKFLOW PREVENTER, SUBMETER, MASTER VALVE AND FLOW SENSOR TO SIDE OF PROPERTY WHERE LEAST VISIBLE. FLOW SENSOR TO HAVE 15" OF STRAIGHT PIPE FROM MASTER VALVE AND 7.5" OF STRAIGHT PIPE AFTER. FLOW SENSOR WIRE TO BE SHIELDED WIRE CABLE. RUN MASTER VALVE AND FLOW SENSOR WIRES IN CONDUIT FROM THIS LOCATION TO IRRIGATION CONTROLLER.

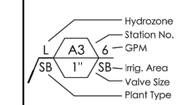
L.O.W.
ALLEY
SHERMAN WAY
P/L
1.25"
1.5"

L A1 18 1" SB
M A2 4 1" TR
M A3 2 1" SB
L A4 17 1" SB
L A5 4 1" SB
L A6 6 1" TR
VL A6 6 1" SB

IRRIGATION LEGEND

SYMBOL (F H Q A)	RAD.	MANF.	MODEL NO. WITH NOZZLE SIZE & TYPE
●	-	Hunter	RZWS-18-CV
■	-	Hunter	PROS-04-PRS30 w/PCN-50
		Hunter	Irrigation Dripline - HDL-06-12-CV
		Hunter	AVR-075 - Air Relief Valve
		Hunter	ECO-ID - Drip Operation Indicator
		Hunter	PLD-BV - Manual Flush Valve
		Hunter	PLD-LOC- 050 - Drip Connector
M	-		Existing 1.5" Water Meter
		Febco	825YA - Size Per Main Line
		Nibco	T-111 Gate Valve Line Size 2 1/2" and smaller.
SM		Hunter	HC-150-Flow - Submeter
MV		Superior	3300 Series - Normally Open
FS		Flomec	QS-200 - Size Per Mainline
		Hunter	HQ33D-RC Quick Coupler Valve
		Hunter	ICV-FS w/AS-ADJ Size Per Callout on Plan
●		Hunter	ICZ-101-LF for .5-20 GPM ICZ-151-XL for 20-60 GPM
WS		Hunter	WSS-SEN - Wireless Solar Sync Sensor w/WS-Guard +WR-Guard
A		Hunter	A2C-1200-M w/ACC-PED
			Existing Mainline
			Mainline
			Lateral Line
			PVC Sleeves

IRRIGATION VALVE CALLOUT:



LATERAL LINE SIZING CHART

	3/4"
	1"
	1 1/4"
	1 1/2"
	2"
	2 1/2"
	3"

NOTE: THE LATERAL SIZE BETWEEN TWO IDENTICAL TICK MARKS SHALL BE SIZED THE SAME. MINIMUM PIPE SIZE IS 3/4".

CONTROL WIRE CONDUIT SIZING CHART

SLEEVE SIZE	2" MIN.	2-1/2"	3"	4"
WIRES IN SLEEVE	0-16	17-24	25-40	41-48

IRRIGATION SLEEVE SIZING CHART

PIPE SIZE	3/4"	1"	1-1/4	1-1/2"	2"	2-1/2"	3"
SLEEVE SIZE	3"	3"	3"	4"	4"	4"	6"

IRRIGATION SLEEVE AND CONDUIT NOTES

1. Sleeves are required for all irrigation pipe and control wire conduit under paving (typical). Refer to Irrigation Sleeve Sizes and Control Wire Conduit Charts for appropriate sleeve and conduit sizing.
2. For drawing clarity, not all irrigation sleeves are sized but shall be installed and included as part of the contractor's bid. Also, for drawing clarity, not all conduits and irrigation sleeves are shown. Contractor is responsible for installation for sleeves and conduits of appropriate size under all paved areas as well as all sleeve pipes and conduits that are shown on the drawings.
3. The irrigation contractor shall be responsible for familiarizing themselves with all differences in grade, location of seatwalls, location of retaining walls, etc. The contractor shall be responsible for coordinating all irrigation work with the general contractor, electrical contractor, and all other subcontractors for the location and the installation of irrigation related sleeves through walls, structures, under roadways, paving, etc.

NOTES

1. The irrigation design presented in these documents is intended to be diagrammatic. All irrigation equipment, piping and valve locations, etc. shown within paved areas are for design clarification and shall only be installed in planting areas. Irrigation Contractor shall install all remote control valves, quick couplers, and gate valves, in shrub planting areas or as approved by owner's representative & the landscape irrigation designer. Avoid any conflicts between the sprinkler system, planting and architectural features.
2. SEE SHEET L3.00 FOR MASTER IRRIGATION LEGEND, CALCULATIONS AND NOTES

1 LANDSCAPE IRRIGATION PLAN
SCALE: 1"=10'-0"
0 10' 20' 30'

N

811 Know what's below. Call before you dig.

HONGJOO KIM LANDSCAPE ARCHITECTS

NOT FOR CONSTRUCTION

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Design

LICENSED LANDSCAPE ARCHITECT
HONGJOO KIM NO. 5987
Signature 12/31/21
Renewal Date 10/29/21
STATE OF CALIFORNIA

THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED

BUREAU OF ENGINEERING
VERTICAL CONTROL:
HORIZONTAL CONTROL:
SHEET TITLE: LANDSCAPE IRRIGATION PLAN
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

DEPARTMENT OF PUBLIC WORKS
NO. REVISIONS: DATE: BY:
CIP NO.
INDEX NO.

CITY OF LOS ANGELES
CITY ENGINEER
DATE:
GARY LEE MOORE, P.E., ENV SP
DESIGN GROUP
ENGINEER:
DESIGNED BY: HONGJOO KIM LANDSCAPE ARCHITECTURE
DRAWN BY: MX
CHECKED BY: CA
APPROVED BY: HK

WORK ORDER NO.
E170121B

SHEET NAME
LANDSCAPE IRRIGATION PLAN
L3.01
SHEET 11 OF 16 SHEETS

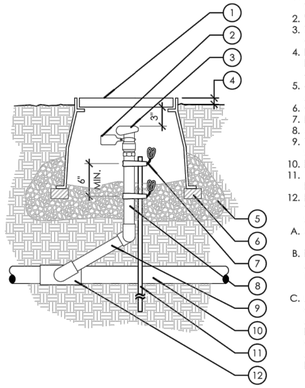
REVISION DATES (DESIGN STAGE ONLY)

Sheet Version 4.0

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

C:\USERS\MINGLEI XIONG\HKLA SERVER DROPBOX\2019117 HKLA_RESEDA SKATE FACILITIES\09 PHASE\03 CD\01 CAD\2019117_RESEDA SKATE FACILITIES_L300.DWG 10/28/2021 2:34 PM

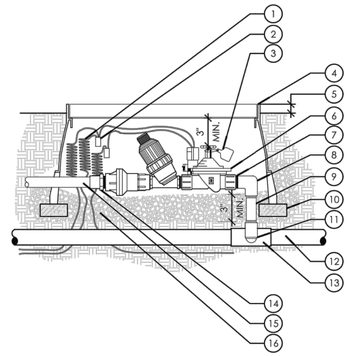
THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.



1. GREEN PLASTIC, 10" ROUND VALVE BOX WITH BOLT DOWN COVER, HEAT BRANDED "QCV"
2. WATER ID TAG
   QUICK COUPLER VALVE - REFER TO
3. IRRIGATION LEGEND
   FINISH GRADE:
   - 1/2" BELOW BOX LID IN TURF AREAS
   - 1 1/2" BELOW BOX LID IN SHRUB/GC AREAS
4. ONE (1) CU. FT. (MIN.) OF 3/4" CRUSHED
5. ROCK AT BASE OF VALVE BOX
6. SUPPORT - COMMON RED BRICK
7. V.I.T. STAINLESS STEEL TIES - TYPICAL
8. SCH. 80 PVC NIPPLE - LENGTH AS
9. REQUIRED
10. 1" DIA. SCH. 80 PVC SWING JOINT - PREASSEMBLED BY SPEARS
11. PVC MAINLINE
    1/2" DIA. x 24" LENGTH GALVANIZED PIPE STAKE
12. SCH. 80 PVC TEE FITTING

A. NOTES:
   ALL THREADS SHALL BE WRAPPED WITH TEFLON TAPE
B. 12" MIN. CLEAR SPACE SHALL BE
C. MAINTAINED BETWEEN THE QUICK COUPLER VALVE BOX AND ANY ADJACENT HARDSCAPE - WHERE OCCURS INSTALLATION SHALL COMPLY WITH THE CITY OF IRVINE STANDARD PLAN NO 508 AND IRWD RECYCLED WATER USE REQUIREMENTS.

H Quick Coupler Valve
Scale: 3/4"=1'-0"

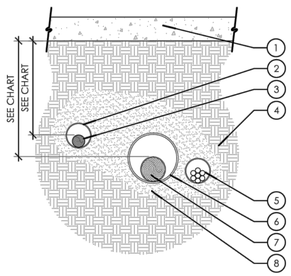


1. 30" LENGTH OF COILED WIRE
2. WATER PROOF CONNECTOR - REFER TO IRRIGATION SPECIFICATIONS
3. ID TAG - REFER TO IRRIGATION SPECIFICATIONS
4. RECTANGULAR, GREEN PLASTIC VALVE BOX WITH LOCKING COVER - LID SHALL BE HEAT BRANDED WITH LETTERS "RCV" & STATION NUMBER - REFER TO IRRIGATION SPECIFICATIONS
5. FINISH GRADE:
   - 1/2" FROM TOP OF BOX LID IN TURF
   - 1 1/2" FROM TOP OF BOX LID IN SHRUB/GC
6. REMOTE CONTROL VALVE WITH FILTER AND PRV - REFER TO IRRIGATION LEGEND
7. SCH. 80 PVC NIPPLE (CLOSE)
8. SCH. 40 PVC ELL
9. SCH. 80 PVC NIPPLE (LENGTH AS REQUIRED)
10. BRICK (1 OF 4)
11. SCH. 80 PVC NIPPLE (2" LENGTH, HIDDEN) AND SCH. 40 PVC ELL
12. PVC MAINLINE PIPE
13. SCH. 40 PVC TEE OR ELL
14. SCH. 40 PVC MALE ADAPTER
15. PVC LATERAL PIPE
16. (3) CUBIC FEET, MIN. OF 3/4" MINUS, WASHED GRAVEL

NOTE:
A. ALL THREADS SHALL BE WRAPPED WITH TEFLON TAPE

F Remote Control Drip Valve and Filter
Scale: 1 1/2"-1'-0"

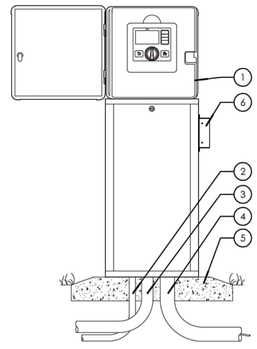
LINE TYPE	LOCATION	DEPTH
PRESSURIZED MAINLINE	IN LANDSCAPE	24"
	UNDER VEH. PAVING	36"
LATERAL LINES	IN LANDSCAPE	18"
	UNDER VEH. PAVING	30"



1. VEHICULAR or PEDESTRIAN PAVING - REFER TO CONSTRUCTION LAYOUT PLANS FOR SPECIFIC CONDITION
2. LATERAL LINE SLEEVING SHALL BE SCH. 40 PVC - SLEEVE DIA. SHALL BE 2 x LATERAL DIA.
3. LATERAL LINE - REFER TO SPECIFICATIONS
4. BACKFILL - 90% RELATIVE COMPACTION, MINIMUM - REFER TO GEOTECHNICAL REPORT
5. CONTROL WIRE BUNDLE SLEEVING SHALL BE SCH. 40 PVC PIPE
6. MAINLINE SLEEVING SHALL BE SCH. 40 PVC PIPE - SLEEVE DIA. SHALL BE 2 x MAINLINE DIA.
7. MAINLINE - REFER TO SPECIFICATIONS
8. SAND BACKFILL - 2" BASE & 6" OF COVER, MIN.

NOTES:
A. ALL IRRIGATION WIRES, LATERALS AND MAINLINE SHALL BE PLACED IN SLEEVES
B. IRRIGATION CONTRACTOR SHALL COORDINATE ALL SLEEVING LOCATIONS & SIZES WITH HARDSCAPE CONTRACTOR PRIOR TO BEGINNING CONSTRUCTION
C. ALL SLEEVES SHALL EXTEND A MINIMUM OF 12" BEYOND THE EDGE OF THE HARDSCAPE SURFACE

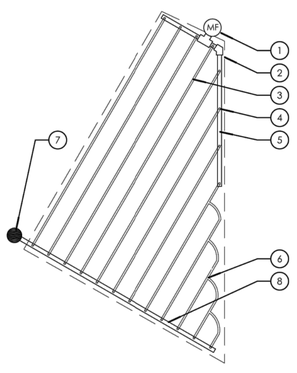
C Irrigation Sleeving
Scale: 1"=1'-0"



1. IRRIGATION CONTROLLER PER MASTER IRRIGATION LEGEND
2. ELECTRICAL SUPPLY CONDUIT. CONNECT TO POWER SOURCE, J-BOX INSIDE CONTROLLER
3. GROUND WIRE CONDUIT GROUND PER ASIC GUIDELINES
4. IRRIGATION CONTROL WIRE IN CONDUIT SIZE AND TYPE PER LOCAL CODES
5. PEDESTAL BASE PER PLAN INSURE POSITIVE DRAINAGE AWAY FROM PEDESTAL
6. WEATHER/RAIN SENSOR RECEIVER IN VANDAL RESISTANT ENCLOSURE. MODEL: HUNTER WR-GUARD

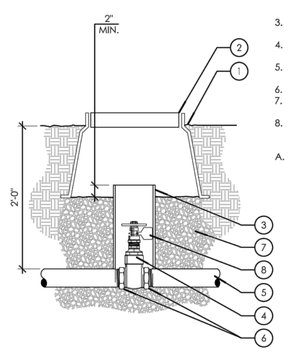
NOTES:
A. CONTROLLER SHALL BE HARD-WIRED TO GROUNDED 110 VAC POWER SOURCE

A Pedestal Mounted Controller
NTS



1. MANUAL FLUSH VALVE PLUMBED TO PVC OR POLY
2. AREA PERIMETER
3. DRIP TUBING, SEE LEGEND FOR EMITTER AND LATERAL LINE SPACING
4. DRIP TUBING START CONNECTION MALE ADAPTER
5. PVC OR POLY EXHAUST HEADER
6. DRIP TUBING TEE
7. DRIP CONTROL ZONE KIT
8. PVC OR POLY SUPPLY HEADER

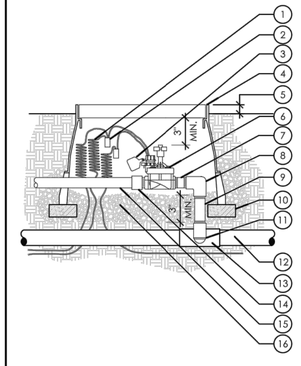
I Dripline Layout - Irregular Areas
Scale: NTS



1. FINISH GRADE
   - 1" IN TURF
   - 2" IN GROUND COVER
2. ROUND, PLASTIC VALVE BOX WITH LOCKING COVER SHALL BE BRANDED "GV" - REFER TO IRRIGATION LEGEND
3. 6" Ø PVC PIPE EXTENSION - LENGTH AS REQUIRED
4. GATE VALVE - REFER TO IRRIGATION LEGEND FOR SPECS.
5. PVC MAINLINE - REFER TO IRRIGATION LEGEND
6. PVC MALE ADAPTER - TWO (2) REQUIRED
7. PEA GRAVEL - TWO (2) CUBIC FEET AT BASE OF VALVE
8. RECLAIMED WATER TAG

NOTE:
A. ALL THREADS SHALL BE WRAPPED WITH TEFLON TAPE

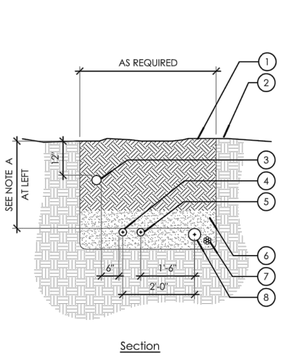
G Gate Valve
Scale: 1"=1'-0"



1. 30" LENGTH OF COILED WIRE
2. WATER PROOF CONNECTOR - REFER TO IRRIGATION SPECIFICATIONS
3. ID TAG - REFER TO IRRIGATION SPECIFICATIONS
4. RECTANGULAR, PLASTIC VALVE BOX WITH LOCKING COVER - LID SHALL BE HEAT BRANDED WITH LETTERS "RCV" & STATION NUMBER - REFER TO IRRIGATION SPECIFICATIONS
5. FINISH GRADE:
   - 1/2" FROM TOP OF BOX LID IN TURF
   - 1 1/2" FROM TOP OF BOX LID IN SHRUB/GC
6. REMOTE CONTROL VALVE - REFER TO IRRIGATION LEGEND
7. SCH. 80 PVC NIPPLE (CLOSE)
8. SCH. 40 PVC ELL
9. SCH. 80 PVC NIPPLE (LENGTH AS REQUIRED)
10. BRICK (1 OF 4)
11. SCH. 80 PVC NIPPLE (2" LENGTH, HIDDEN) AND SCH. 40 PVC ELL
12. PVC MAINLINE PIPE
13. SCH. 40 PVC TEE OR ELL
14. SCH. 40 PVC MALE ADAPTER
15. PVC LATERAL PIPE
16. (3) CUBIC FEET, MIN. OF 3/4" MINUS, WASHED GRAVEL

NOTE:
A. ALL THREADS SHALL BE WRAPPED WITH TEFLON TAPE

D Remote Control Valve/Master Valve Box
Scale: 1 1/2"-1'-0"

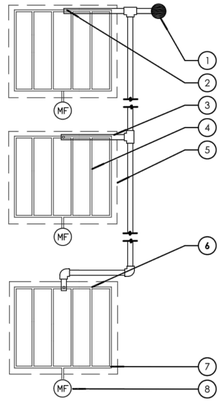


1. REFER TO IRRIGATION SPECS FOR BACKFILL AND COMPACTION REQUIREMENTS
2. FINISH GRADE
3. NON-PRESSURIZED LATERAL LINE PIPING
4. COMMUNICATION CABLE CONDUIT (WHERE REQUIRED)
5. FLOW SENSOR CABLE AND CONDUIT
6. APPROVED TOP SOIL OR SAND BACKFILL - PROVIDE 3" UNDER PIPE AND 6" ABOVE PIPE
7. CONTROL WIRES BUNDLED AND TAPED AT 10'-0" INTERVALS - INSTALL ADJACENT TO MAINLINE
8. PRESSURIZED MAINLINE PIPING

NOTES:
A. MINIMUM BACKFILL DEPTHS FROM FINISH GRADE TO TOP OF MAINLINE SHALL BE AS FOLLOWS:
   - 24" IN PLANTING AREAS
   - 36" UNDER PAVED AREAS
B. ALL PLASTIC PIPING SHALL BE SNAKED IN TRENCHES
C. TIE A LOOSE 20" LOOP IN WIRING AT ANY CHANGE IN DIRECTION GREATER THAN 30° - UNTIE ANY LOOPS AFTER ALL CONNECTIONS HAVE BEEN MADE

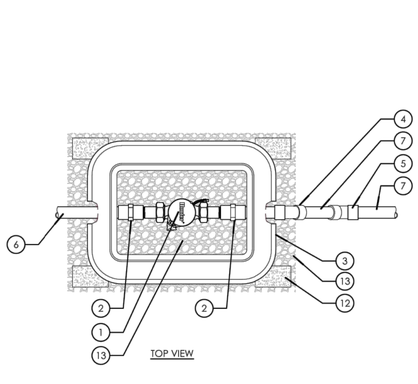
Section

B Trenching Detail
Scale: 1/2"=1'-0"



1. DRIP CONTROL ZONE KIT
2. DRIP TUBING START CONNECTION MALE ADAPTER
3. PVC OR POLY SUPPLY HEADER
4. DRIP TUBING. SEE LEGEND FOR EMITTER AND LATERAL LINE SPACING
5. ISLAND PERIMETER
6. DRIP TUBING TEE
7. DRIP TUBING ELL
8. MANUAL FLUSH VALVE PLUMBED TO DRIP TUBING

J Dripline Island Layout
Scale: NTS



1. HUNTER HC FLOW METER WITH UNION CONNECTIONS
2. SCH 80 PVC FEMALE ADAPTER S X T
3. RECTANGULAR VALVE BOX
4. SCH 80 PVC 45 DEGREE ELBOW S X S TO LOWER MAIN LINE TO PROPER DEPTH (SIZE FOR LARGER MAIN LINE AS NEEDED)
5. SCH 80 PVC 45 DEGREE ELBOW (S X S) TO LOWER MAIN LINE TO PROPER DEPTH
6. 1" DIA MAIN LINE AT INLET AND OUTLET
7. MAIN LINE TO SYSTEM
8. TWO FLOW SENSOR WIRES TO **BE CAPPED AND NOT USED** FOR FLOW SENSING FUNCTION
9. WEATHERPROOF WIRE CONNECTOR
10. FINISH GRADE
11. SPECIFIED SOIL COVER
12. COMMON BRICK SUPPORT
13. GRAVEL BASE

NOTES:
A. INLET PIPE ENTERING METER LENGTH MUST BE A MINIMUM OF 10 X THE PIPE DIAMETER
B. OUTLET PIPE MUST BE STRAIGHT PIPE WITH NO FITTINGS OR TURNS UNTIL AFTER SPECIFIED LENGTHS. PIPE FITTINGS MAY BE SHC 80 PVC SOLVENT WELD, THREADED OR BRASS AS REQUIRED FOR PROJECT

E HC Flow Meter
NTS

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

LICENSED LANDSCAPE ARCHITECT
HONGJOO KIM NO. 5987
Signature
12/31/21
Renewal Date
10/29/21
Date
STATE OF CALIFORNIA

THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED

DEPARTMENT OF PUBLIC WORKS
BUREAU OF ENGINEERING

VERTICAL CONTROL:
HORIZONTAL CONTROL:

SHEET TITLE: IRRIGATION DETAILS

PROJECT: RESEDA SKATE FACILITY

ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

NO.	REVISIONS:	DATE:	BY:

CIP NO.

INDEX NO.

CITY OF LOS ANGELES

CITY ENGINEER

GARY LEE MOORE, P.E., ENV SP

DATE:

DESIGN GROUP

ENGINEER:

DESIGNED BY: HONGJOO KIM LANDSCAPE ARCHITECTURE

DRAWN BY: MX

CHECKED BY: CA

APPROVED BY: HK

WORK ORDER NO.
E170121B

HONGJOO KIM LANDSCAPE ARCHITECTS

811 Know what's below. Call before you dig.

NOT FOR CONSTRUCTION

SHEET NAME
IRRIGATION DETAILS

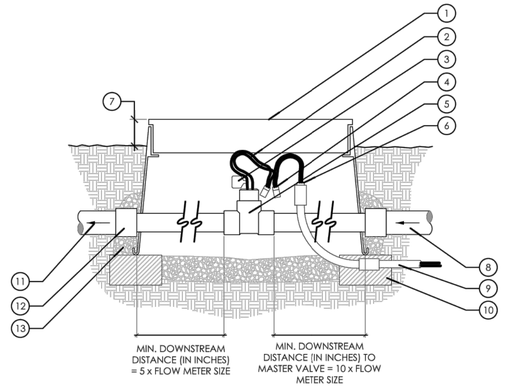
L3.10

SHEET 12 OF 16 SHEETS

REVISION DATES (DESIGN STAGE ONLY)

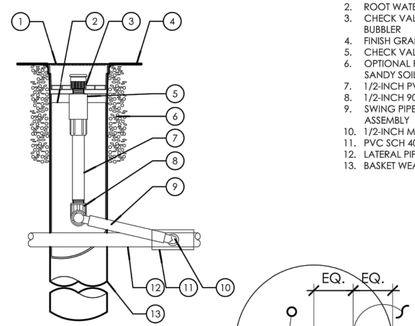
Sheet Version 4.0

C:\USERS\MINGLEI XIONG\HKLA SERVER DROPBOX\2019117 HKLA_RESEDA SKATE FACILITIES\09 PHASE\03 CD\01 CAD\2019117_RESEDA SKATE FACILITIES_L300.DWG 10/28/2021 2:35 PM



1. GREEN PLASTIC, RECTANGULAR VALVE BOX WITH BOLT DOWN COVER
2. FLOW SENSOR CABLE
3. WATER ID TAG
4. WATERPROOF CONNECTOR - REFER TO IRRIGATION SPECIFICATIONS
5. FLOW SENSOR
6. CONDUIT BUSHING
7. FINISH GRADE:
   1/2" BELOW BOX LID IN TURF
   1 1/2" SHRUB/GROUNDCOVER
8. IRRIGATION MAINLINE FROM MASTER VALVE
9. ELECTRICAL CONDUIT AND SWEEP ELBOW BACK TO CONTROLLER
10. SUPPORT - COMMON RED BRICK
11. MAINLINE TO REMOTE CONTROL VALVES
12. 40 PVC COUPLER
13. 3/4" CRUSHED ROCK, (2) CUBIC FEET MINIMUM

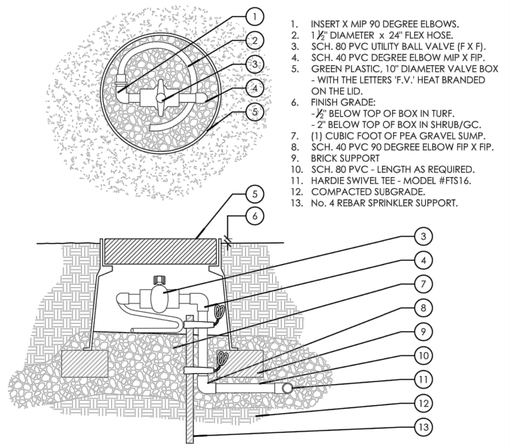
F **Flow Sensor**
NTS



1. 4-INCH GRATE
2. ROOT WATERING SYSTEM
3. CHECK VALVE AND GRATE) BUBBLER
4. FINISH GRADE
5. CHECK VALVE
6. OPTIONAL PEA GRAVEL FOR SANDY SOILS
7. 1/2-INCH PVC SCH 80 NIPPLE
8. 1/2-INCH 90-DEGREE ELBOW
9. SWING PIPE 12-INCH SWING ASSEMBLY
10. 1/2-INCH MALE NPT INLET
11. PVC SCH 40 TEE OR EL
12. LATERAL PIPE
13. BASKET WEAVE CANISTER

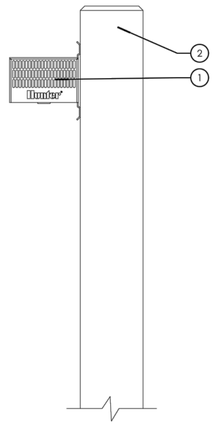
NOTE:
1. EQ. SPACE TYP. BETWEEN TRUNK AND CANOPY EDGE

C **Root Watering System**
NTS



1. INSERT X MIP 90 DEGREE ELBOWS.
2. 1½" DIAMETER x 24" FLEX HOSE.
3. SCH. 80 PVC UTILITY BALL VALVE (F X F).
4. SCH. 40 PVC DEGREE ELBOW MIP X FIP.
5. GREEN PLASTIC, 10" DIAMETER VALVE BOX - WITH THE LETTERS 'F.V.' HEAT BRANDED ON THE LID.
6. FINISH GRADE:
   - ½" BELOW TOP OF BOX IN TURF.
   - 2" BELOW TOP OF BOX IN SHRUB/GC.
7. (1) CUBIC FOOT OF PEA GRAVEL SUMP.
8. SCH. 40 PVC 90 DEGREE ELBOW FIP X FIP.
9. BRICK SUPPORT
10. SCH. 80 PVC - LENGTH AS REQUIRED.
11. HARDIE SWIVEL TEE - MODEL #FTS16.
12. COMPACTED SUBGRADE.
13. No. 4 REBAR SPRINKLER SUPPORT.

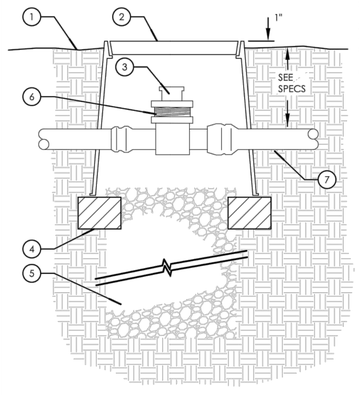
A **Flush Valve Assembly**
Scale: 2"=1'-0"



1. WEATHER/RAIN SENSOR IN VANDAL RESISTANT ENCLOSURE. HUNTER - WS-GUARD
2. ADJACENT MOUNTING SURFACE

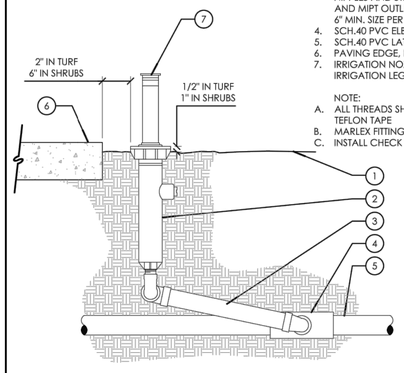
NOTES:
A. WEATHER SENSOR TO BE FIELD VERIFIED BY OWNERS REPRESENTATIVE PRIOR MOUNTING
B. WEATHER SENSOR TO BE LOCATED IN AREA OPEN TO AIR, FREE FROM ANY OBSTRUCTIONS AND AREA RECEIVING THE MOST SUN DURING THE DAY

H **Weather/Rain Sensor**
Scale: NTS



1. FINISH GRADE
2. 6" SUBTERRANEAN EMITTER BOX
3. AIR/VACUUM RELIEF VALVE
4. BRICK SUPPORTS (2 REQ.)
5. ¾" GRAVEL SUMP (1 CUBIC FT.)
6. ¾" M X 1½" F REDUCTION BUSHING
7. SUBSURFACE DRIP LINE

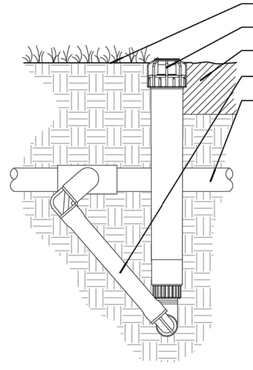
G **Air / Vaccum Valve**
Scale: NTS



1. FINISH GRADE
2. IRRIGATION BODY PER MASTER IRRIGATION LEGEND
3. TRIPLE SWING JOINT WITH SCH. 40 PVC NIPPLES AND STREET ELLS. MIPT INLET AND MIPT OUTLET - LAY LENGTH TO BE 6" MIN. SIZE PER SPRINKLER INLET
4. SCH.40 PVC ELBOW OR TEE
5. SCH.40 PVC LATERAL LINE
6. PAVING EDGE, HEADER OR WALL
7. IRRIGATION NOZZLE PER MASTER IRRIGATION LEGEND

NOTE:
A. ALL THREADS SHALL BE WRAPPED WITH TEFLON TAPE
B. MARLEX FITTINGS NOT ALLOWED
C. INSTALL CHECK VALVES AS REQUIRED

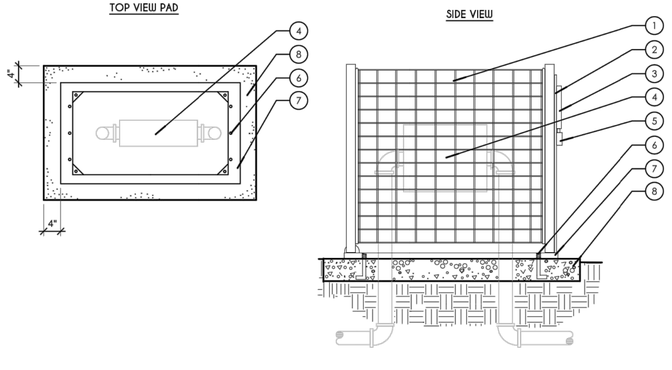
D **Pop-Up Irrigation Head**
Scale: 3"=1'-0"



1. ECO INDICATOR
2. FINISH GRADE
3. ADJACENT PLANTING AREA
4. PVC EXHAUST OR SUPPLY HEADER
5. SWING JOINT

NOTE:
A. ALL THREADS SHALL BE WRAPPED WITH TEFLON TAPE
B. MARLEX FITTINGS NOT ALLOWED
C. INSTALL CHECK VALVES AS REQUIRED

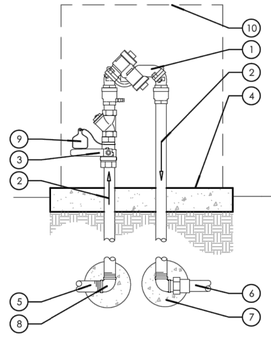
B **Drip Operation Indicator**
Scale: NTS



1. SMOOTH TOUCH BACKFLOW CAGE PER MASTER IRRIGATION LEGEND
2. ENCLOSURE LOCKING SWING DOOR
3. PADLOCK PROTECTIVE COVER
4. BACKFLOW PREVENTER SEE MASTER IRRIGATION LEGEND FOR MODEL
5. PAD LOCK
6. ENCLOSURE SWIVEL POINT ATTACHED TO MOUNTING BASE. SECURED IN 6 LOCATIONS
7. ANCHOR BASE MOUNT
8. POURED IN PLACE CONCRETE BASE 6" MINIMUM THICKNESS. EXTEND BEYOND 4" OUTSIDE DIMENSIONS OF ENCLOSURE

NOTES:
A. ANCHOR BOLTS TO BE SMOOTH TOUCH
B. MOUNTING BASE SECURED TO ENCLOSURE WITH ⅜" J BOLTS IN 4 LOCATIONS
C. USE STRONG BOX SBBC-40SS FOR 1 ½" AND 2" SIZED BACKFLOW PREVENTERS SBBC-22SS FOR ¾" AND 1" SIZED BACKFLOW PREVENTERS

I **Backflow Enclosure**
Scale: 1 1/2"= 1'-0"



1. REDUCED PRESSURE TYPE BACKFLOW PER LEGEND
2. BRASS RISER
3. BALL VALVE, INLET SIDE
4. CONCRETE BASE
5. FROM POINT OF CONNECTION - ADAPT AS REQUIRED
6. TO IRRIGATION SYSTEM - ADAPT AS REQUIRED
7. CONCRETE THRUST BLOCK, TYP.
8. BRASS 90 DEG ELL, TYP.
9. CHRISTY'S I.D.TAG
   - ID.AAA.Y2.PW017 FOR POTABLE WATER SYSTEM
10. ENCLOSURE PER LEGEND

NOTES:
A. INSTALL BACKFLOW PREVENTER AS REQUIRED BY LOCAL CODES ANDHEALTH DEPARTMENT. VERIFY LOCAL REQUIREMENTS PRIOR TO INSTALLATION.

E **Backflow Preventer**
Scale: NTS

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REVISION DATES (DESIGN STAGE ONLY)

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Design

LICENSED LANDSCAPE ARCHITECT
HONGJOO KIM NO. 5987
Signature
Renewal Date 12/31/21
Date 10/29/21
STATE OF CALIFORNIA

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED

DEPARTMENT OF PUBLIC WORKS
BUREAU OF ENGINEERING

VERTICAL CONTROL:
HORIZONTAL CONTROL:
SHEET TITLE: IRRIGATION DETAILS
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

NO.	REVISIONS:	DATE:	BY:

CIP NO.
INDEX NO.

CITY OF LOS ANGELES
CITY ENGINEER
GARY LEE MOORE, P.E., ENV SP
DATE:
DESIGN GROUP
ENGINEER:
DESIGNED BY: HONGJOO KIM LANDSCAPE ARCHITECTURE
DRAWN BY: MX
CHECKED BY: CA
APPROVED BY: HK

WORK ORDER NO.
E170121B

HONGJOO KIM LANDSCAPE ARCHITECTS

811 Know what's below. Call before you dig.

NOT FOR CONSTRUCTION

SHEET NAME
IRRIGATION DETAILS
L3.11
SHEET 13 OF 16 SHEETS

Sheet Version 4.0

C:\USERS\MINGLEI XIONG\HKLA SERVER DROPBOX\2019117 HKLA_RESEDA SKATE FACILITIES\09 PHASE\03 CD\01 CAD\2019117_RESEDA SKATE FACILITIES_L300.DWG 10/28/2021 2:35 PM

GENERAL PLANTING NOTES:

1. TREE LOCATIONS MAY BE ADJUSTED TO AVOID CONFLICTS WITH UNDERGROUND UTILITIES. CONSULT WITH LANDSCAPE ARCHITECT OR OWNER'S REPRESENTATIVE PRIOR TO ADJUSTMENT OF TREE LOCATIONS, ESPECIALLY THOSE ARRANGED ON A SPECIFIED MODULE OR IN A GRID PATTERN.
2. ALL TREES LOCATED WITHIN 3' OF PAVEMENT OR STRUCTURES ARE TO HAVE ROOT CONTROL BARRIERS INSTALLED AT TIME OF PLANTING. UNLESS OTHERWISE SPECIFIED, A 12' LONG X 18" DEEP LINEAR BARRIER SHALL BE INSTALLED AT EDGE OF PAVEMENT/STRUCTURE, WITH LENGTH CENTERED AT THE TREE TRUNK.
3. NURSERY STAKES ARE TO BE REMOVED AFTER PLANTING TREES AND STAKING OR GUYING AS SHOWN ON PLANS.
4. CONTRACTOR IS RESPONSIBLE FOR PRUNING TREES AS DIRECTED BY LANDSCAPE ARCHITECT. NO PRUNING IS TO BE DONE UNLESS DIRECTED.
5. MULCH ALL AREAS (EXCEPT TURF, SLOPES 2:1 AND GREATER, AND AS NOTED ON PLANS) WITH 2" LAYER OF SPECIFIED MATERIAL
6. WHERE GROUNDCOVER IS SHOWN ON PLANS: GROUNDCOVER PLANTING CONTINUES UNDER SHRUBS & TREES AT SPECIFIED SPACING. DO NOT PLANT GROUNDCOVER IN SHRUB/TREE WATERING BASINS.
7. THE PLANTING PLAN IS DIAGRAMMATIC. ALL PLANT LOCATIONS ARE APPROXIMATE. PLANT SYMBOLS TAKE PRECEDENCE OVER PLANT QUANTITIES SPECIFIED. QUANTITIES SHOWN ON THE PLANTING PLAN ARE APPROXIMATE AND ARE FOR OWNER INFORMATION. CONTRACTOR SHALL NOTIFY THE LANDSCAPE ARCHITECT OF DISCREPANCIES BETWEEN QUANTITIES AND THE SYMBOLS SHOWN. CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING ALL PLANT COUNTS AND SQUARE FOOTAGES.
8. CONTRACTOR SHALL ACCOMPANY THE PROJECT AGRONOMIST TO THE SITE FOR THE PURPOSE OF TAKING SOIL SAMPLES, CONDUCTING PERCOLATION TESTS, AND REVIEWING EXISTING SITE CONDITIONS. THE APPROPRIATE QUANTITY OF SAMPLES SHALL BE VERIFIED WITH THE LANDSCAPE ARCHITECT AND AGRONOMIST. SAMPLES SHALL THEN BE TESTED AND ANALYZED FOR PERCOLATION AND AGRICULTURAL SUITABILITY AND FERTILITY BY AN ACCREDITED SOIL TESTING LABORATORY. ANALYSIS SHALL INCLUDE REVIEW AND COORDINATION WITH SPECIFICATIONS AND RECOMMENDATIONS FOR SOIL PREPARATION AND BACKFILL MIX AND SHALL BE PAID FOR BY THE CONTRACTOR AT NO COST TO THE OWNER. SUBMIT SOILS ANALYSES TO LANDSCAPE ARCHITECT FOR APPROVAL PRIOR TO SOIL PREPARATION. THIS REQUIREMENT APPLIES TO ALL SOILS AND CONDITIONS WITHIN THIS PROJECT. REFER TO SPECIFICATIONS FOR FURTHER REQUIREMENTS.
9. NOTIFICATION PRIOR TO PLANTING : SEE SPECIFICATION
   - SHRUBS SHALL BE PLACED IN THEIR "FINAL" LOCATIONS.
   - CENTERPOINTS OF TREES SHOULD BE STAKED/FLAGGED
10. LANDSCAPE ARCHITECT HAS THE RIGHT TO ADJUST PLANT LOCATIONS AND SPACING UPON REVIEWING IN THE FIELD.
11. PLANT MATERIAL SHALL NOT BE ROOT BOUND. FIVE (5) GALLON PLANTS AND LARGER SHALL HAVE BEEN GROWN IN CONTAINERS FOR A MINIMUM OF SIX (6) MONTHS AND A MAXIMUM OF TWO (2) YEARS. PLANTS SHALL BE FURNISHED ON SITE FREE OF PESTS OR DISEASE AND EXHIBIT HEALTHY GROWTH.
12. ALL TREES SHALL HAVE A MINIMUM LIFE GUARANTEE OF ONE (1) YEAR OF VIGOROUS GROWTH. ALL SHRUBS SHALL HAVE A MINIMUM LIFE GUARANTEE OF SIX (6) MONTHS OF VIGOROUS GROWTH.
13. ALL GROUND COVERS SHALL BE GUARANTEED BY THE CONTRACTOR AS TO GROWTH AND HEALTH FOR A PERIOD OF SIXTY (60) DAYS AFTER COMPLETION OF MAINTENANCE PERIOD AND FINAL ACCEPTANCE. ALL SHRUBS SHALL BE GUARANTEED BY THE CONTRACTOR AS TO GROWTH AND HEALTH FOR A PERIOD OF NINETY (90) DAYS AFTER COMPLETION OF MAINTENANCE PERIOD AND FINAL ACCEPTANCE. ALL TREES SHALL BE GUARANTEED BY THE CONTRACTOR TO LIVE AND GROW IN AN ACCEPTABLE UPRIGHT POSITION FOR A PERIOD OF ONE (1) YEAR AFTER COMPLETION OF THE SPECIFIED MAINTENANCE PERIOF AND FINAL ACCEPTANCE.
14. THE CONTRACTOR, WITHIN FIFTEEN (15) DAYS OF WRITTEN NOTIFICATION BY THE LANDSCAPE ARCHITECT, SHALL REMOVE AND REPLACE ALL GUARANTEED PLANT MATERIALS, WHICH FOR ANY REASON FAIL TO MEET THE REQUIREMENTS OF THE GUARANTEE. REPLACMENT SHALL BE MADE WITH PLANT MATERIALS AS INDICATED OR SPECIFIED ON THE ORIGINAL PLANS, AND ALL SUCH REPLACEMENT MATERIALS SHALL BE GUARANTEED FROM THE TIME OF REPLACEMENT AS SPECIFIED FOR THE ORIGINAL MATERIAL GUARANTEE.
15. IF CONFLICTS ARISE BETWEEN ACTUAL SIZE OF PLANTING AREAS ON-SITE AND THOSE AREAS INDICATED ON DRAWINGS, CONTACT OWNER'S AUTHORIZED REPRESENTATIVE OR LANDSCAPE ARCHITECT FOR RESOLUTION. FAILURE TO MAKE SUCH CONFLICTS KNOWN TO OWNER'S AUTHORIZED REPRESENTATIVE IN A TIMELY FASHION MAY RESULT IN CONTRACTOR'S OWN LIABILITY TO RELOCATE PLANT MATERIALS.
16. CONTRACTOR SHALL MAINTAIN ALL PLANTINGS FOR A PERIOD OF NINETY (90) DAYS AFTER COMPLETION AND ACCEPTANCE BY LANDSCAPE ARCHITECT. ALL AREAS SHOULD BE KEPT CLEAN, WATERED, AND WEED-FREE.
17. PRIOR TO END OF MAINTENANCE PERIOD, LANDSCAPE CONTRACTOR SHALL CONTACT OWNER AND ARRANGE A FINAL WALK THROUGH INSPECTION BY LANDSCAPE ARCHITECT. OWNER MUST ACCEPT ALL MAINTAINED AREAS IN WRITING PRIOR TO END OF MAINTENANCE PERIOD. OWNER SHALL BE RESPONSIBLE FOR FUTURE MAINTENANCE AFTER MAINTENANCE PERIOD AND FINAL WALK THROUGH.
18. ALIGN AND EQUALLY SPACE IN ALL DIRECTIONS ALL TREES, SHRUBS, AND VINES AS NOTED IN THE DRAWINGS.
19. ALL PLANTS TO BE LOCATED 6 INCHES AWAY FROM NON-MASONRY SIDING.
20. PRUNE NEWLY PLANTED TREES ONLY DIRECTED BY THE LANDSCAPE ARCHITECT.
21. FOR PROJECTS THAT INCLUDE LANDSCAPE WORK, THE LANDSCAPE CERTIFICATION, FORM GRN 12, SHALL BE COMPLETED PRIOR TO FINAL INSPECTION APPROVAL.
22. AUTOMATIC LANDSCAPE IRRIGATORS SHALL BE INSTALLED IN SUCH A WAY THAT IT DOESN'T SPRAY ON THE BUILDING OR ADJACENT PAVING.
23. ALL PLANTS TO BE PROPAGATED FROM DIVISION ONLY

SOIL PREPARATION AND FINE GRADING NOTES:

1. SITE DRAINAGE AND SITE DEVICES INCLUDING FOR ALL ON GRADE SLABS, WALKWAYS, ALL PLANTING AREAS, ON GRADE PAVED SURFACES ARE BY CIVIL ENGINEER, REFERENCE ARCHITECTURAL AND CIVIL DRAWINGS FOR ALL SITE DRAINAGE & NEW AND EXISTING FINISHES.
2. ALL DRAINAGE PIPING UNDER PAVEMENT SHALL BE SCHEDULED PER CIVIL SPECIFICATIONS.
3. CONTRACTOR SHALL MAINTAIN A MINIMUM OF 2% DRAINAGE AWAY FROM ALL BUILDINGS, STRUCTURES, AND WALLS. FINISHED GRADES SHALL BE SMOOTHED TO ELIMINATE PONDING OR STANDING WATER.
4. FINISH GRADES OF ALL SHRUB AREAS SHALL BE 1 1/2" BELOW ADJACENT CURBS, PAVEMENT, TOP PLANTER WALL, OR HEADERS. FINISH GRADES OF ALL TURF AREAS SHALL BE 1" BELOW ADJACENT CURBS, PAVEMENT, TOP OF PLANTER WALL, OR HEADERS.
5. REFER TO CIVIL ENGINEER'S DRAWINGS FOR GRADING AND DRAINAGE INFORMATION AND OTHER RELATED NON-LANDSCAPE WORK. VERIFY ON-SITE AND REPORT DISCREPANCIES TO LANDSCAPE ARCHITECT BEFORE START OF ANY WORK ON THIS CONTRACT.
6. CONTINUOUS SOIL PREPARATION IS REQUIRED IN ALL PLANTING AREAS.
7. UNLESS OTHERWISE NOTED IN CIVIL PLAN, FOR PLANTING AREA'S DRAINAGE, COMPACTION, AND PERCOLATION, GENERAL CONTRACTOR TO REVIEW STRUCTURAL SOILS BASED ON GEOTECHNICAL ENGINEER'S REPORT PRIOR TO SITE GRADING. GENERAL CONTRACTOR SHOULD REPORT IF COMPACTION AFTER ROUGH GRADE BECOMES MORE THAN 80% IN PLANTING AREA.
8. PRIOR TO PLANTING, IRRIGATION SYSTEM SHALL BE APPROVED BY THE LANDSCAPE ARCHITECT AND BE FULLY OPERATIONAL. ALL PLANTING AREAS SHALL BE FULLY SOAKED.
8. FINAL GRADING SHALL BE APPROVED BY THE LANDSCAPE ARCHITECT AND CIVIL ENGINEER IN THE FIELD AFTER SOIL PREPARATION AND PRIOR TO PLANTING. ALL PLANTING AREAS SHALL BE GRADED TO THE ELEVATIONS INDICATED ON THE CIVIL ENGINEER'S PLANS.
9. EXCESS SOIL FROM LANDSCAPE GRADING TO BE REMOVED AND DISPOSED OF OFF-SITE BY CONTRACTOR.
10. CONTRACTOR SHALL APPLY A CONTACT HERBICIDE, WHERE WEEDS ARE PRESENT, PER MANUFACTURER'S SPECIFICATIONS A MINIMUM OF TEN (10) DAYS PRIOR TO COMMENCEMENT OF ANY PLANTING OR IRRIGATION WORK. WEEDS SHALL BE ALLOWED TO COMPLETELY DIE BACK, INCLUDING THE ROOTS BEFORE PROCEEDING WITH WORK.
11. IF DIRECTED BY AGRONOMIST'S TEST RECOMMENDATIONS AND/OR BY LANDSCAPE ARCHITECT, COMPACTED SOIL IN ALL PLANTING AREAS SHALL BE RIPPED TO A DEPTH OF EIGHTEEN (18) INCHES PRIOR TO SOIL AMENDMENT WORK.
12. LANDSCAPE CONTRACTOR IS RESPONSIBLE FOR PERFORMING PERCOLATION TESTS IN TREE PITS PRIOR TO BRINGING TREES TO THE SITE. ONCE HOLES HAVE BEEN DUG AS SPECIFIED, CONTRACTOR SHALL FILL SAND PIT WITH WATER TO A DEPTH OF 12 INCHES AND REPORT TIME REQUIRED FOR ALL WATER TO DRAIN FROM HOLE. IF DRAINAGE REQUIRES MORE THAN 24 HOURS, CONTRACTOR SHALL INSTALL, AT HIS COST, A 6" DIAMETER, PERFORATED PVC "CHIMNEY DRAIN", MINIMUM 48" DEEP, GRAVEL FILLED,COVERED WITH GEOTEXTILE, SET VERTICALLY AT THE LOWEST POINT OF THE BOTTOM OF THE TREE PIT WITH MINIMUM 2% SLOPE, OUTSIDE OF THE TREE.
13. SEE SPECIFICATIONS FOR THE FOLLOWING:
    A. SOIL FILL AND BACKFILL MIX
    B. SOIL AMENDMENTS
    C. SHRUB AND TREE BACKFILL MIX
    D. PLANT TABLETS FOR PLANT PITS

TREE LEGEND:

SYMBOL	BOTANICAL NAME "COMMON NAME"	SIZE	WUCOLS	COUNT
	Quercus agrifolia Coast Live Oak	36" BOX	VL	2
	Pistacia chinensis Chinese Pistache	36" BOX	M	4
	Prosopis velutina Maverick Mesquite	36" BOX	L	4
	Existing Tree, Protect In Place	-	-	-

SHRUB, VINE, AND GROUNDCOVER LEGEND:

SYMBOL	BOTANICAL NAME "COMMON NAME"	SIZE	WUCOLS	SPACING
	Agave attenuata Fox Tail Agave	5 GAL	VL	SEE PLAN
	Carex tumulicola Foothill Sedge	1 GAL	L	24" O.C.
	Dietes Vegeta Fortnight Lily	5 GAL	L	30" O.C.
	Juncus patens Common Rush	1 GAL	L	24" O.C.
	Leymus condensatus 'Canyon Prince' Canyon Prince Giant Rye Grass	5 GAL	L	24" O.C.
	Miscanthus sinensis 'Graziella' Graziella Maiden Grass	5 GAL	M	30" O.C.
	Muhlenbergia rigens Deer Grass	1 GAL	L	30" O.C.
	Pennisetum advena 'Eaton Canyon' Dwarf Red Fountain Grass	5 GAL	L	24" O.C.

HONGJOO KIM LANDSCAPE ARCHITECTS

811 Know what's below. Call before you dig.

NOT FOR CONSTRUCTION

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED

LICENSED LANDSCAPE ARCHITECT
HONGJOO KIM NO. 5987
Signature
12/31/21
Renewal Date
10/29/21
Date
STATE OF CALIFORNIA

BUREAU OF ENGINEERING
VERTICAL CONTROL:
HORIZONTAL CONTROL:
SHEET TITLE: PLANTING SCHEDULE & NOTES
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

DEPARTMENT OF PUBLIC WORKS
CITY OF LOS ANGELES
CITY ENGINEER
GARY LEE MOORE, P.E., ENV SP
DESIGN GROUP
DATE:
ENGINEER:
DESIGNED BY: HONGJOO KIM LANDSCAPE ARCHITECTURE
DRAWN BY: MX
CHECKED BY: CA
APPROVED BY: HK

NO. | REVISIONS: | BY: | DATE:

CIP NO.

INDEX NO.

WORK ORDER NO.
E170121B

SHEET NAME
PLANTING SCHEDULE & NOTES
L4.00
SHEET 14 OF 16 SHEETS

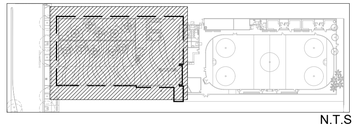
THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REVISION DATES
DESIGN STAGE ONLY

Sheet Version 4.0

C:\USERS\MINGLEI XIONG\HKLA SERVER DROPBOX\2019117 HKLA_RESEDA SKATE FACILITIES\09 PHASE\03 CD\01 CAD\2019117_RESEDA SKATE FACILITIES_L400.DWG 10/28/2021 2:36 PM

KEY PLAN



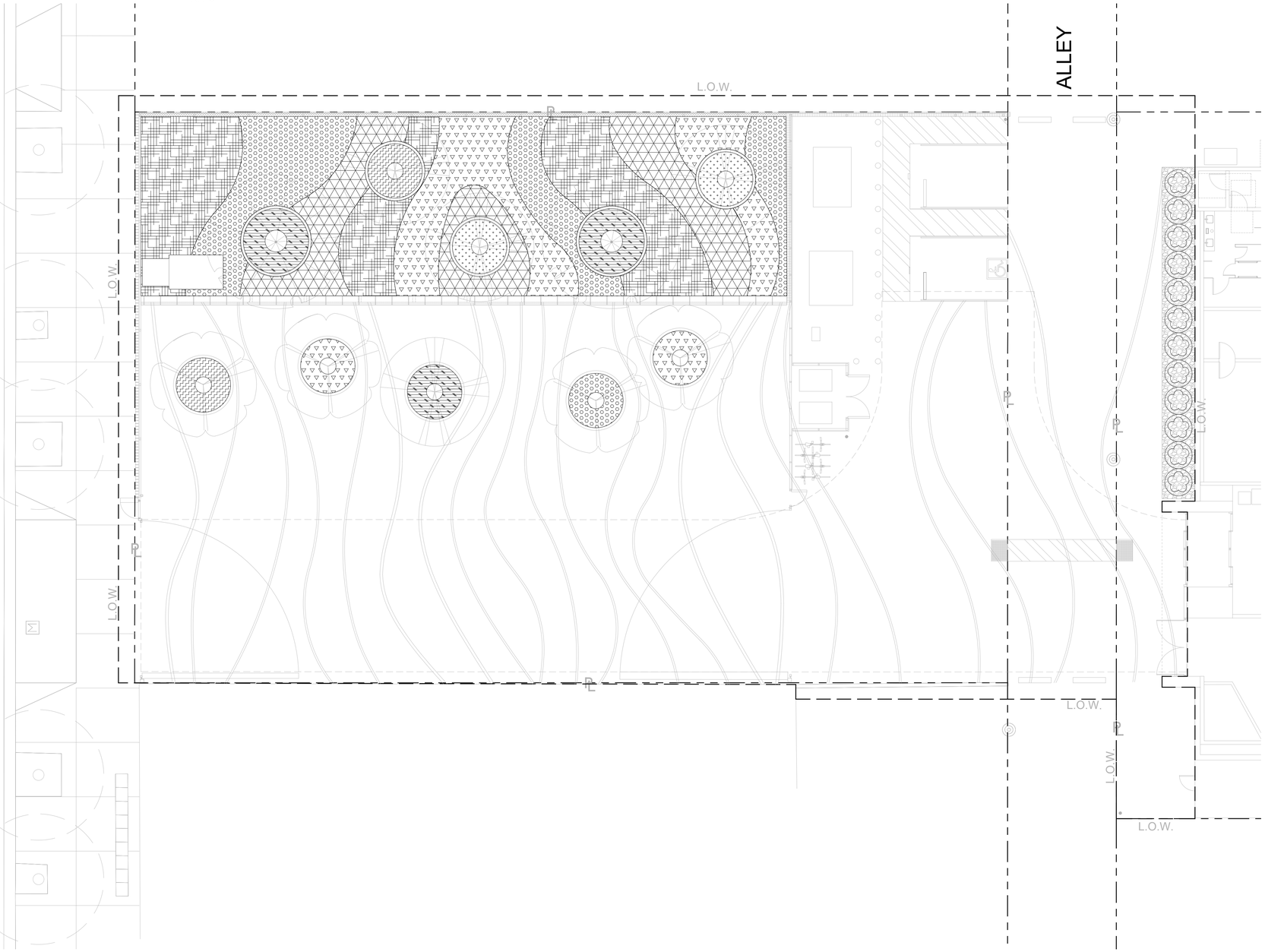
N.T.S

TREE LEGEND:

SYMBOL	BOTANICAL NAME "COMMON NAME"	SIZE	WUCOLS
	Quercus agrifolia Coast Live Oak	36" BOX	VL
	Pistacia chinensis Chinese Pistache	36" BOX	M
	Prosopis velutina Maverick Mesquite	36" BOX	L
	Existing Tree, Protect In Place	-	-

SHRUB, VINE, AND GROUNDCOVER LEGEND:

SYMBOL	BOTANICAL NAME "COMMON NAME"	SIZE	WUCOLS
	Agave attenuata Fox Tail Agave	5 GAL	VL
	Carex tumulicola Foothill Sedge	1 GAL	L
	Dietes Vegeta Fortnight Lily	5 GAL	L
	Juncus patens Common Rush	1 GAL	L
	Leymus condensatus 'Canyon Prince' Canyon Prince Giant Rye Grass	5 GAL	L
	Miscanthus sinensis 'Graziella' Graziella Maiden Grass	5 GAL	M
	Muhlenbergia rigens Deer Grass	1 GAL	L
	Pennisetum advena 'Eaton Canyon' Dwarf Red Fountain Grass	5 GAL	L



1 LANDSCAPE PLANTING PLAN

SCALE: 1"=10'-0"

0 10' 20' 30'

HONGJOO KIM LANDSCAPE ARCHITECTS

811 Know what's below. Call before you dig.

NOT FOR CONSTRUCTION

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

LICENSED LANDSCAPE ARCHITECT
HONGJOO KIM NO. 5087
Signature
12/31/21
Renewal Date
10/29/21
STATE OF CALIFORNIA

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED

BUREAU OF ENGINEERING
VERTICAL CONTROL:
HORIZONTAL CONTROL:
SHEET TITLE: LANDSCAPE PLANTING PLAN
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

DEPARTMENT OF PUBLIC WORKS
NO. REVISIONS: DATE: BY:
CIP NO.
INDEX NO.

CITY OF LOS ANGELES
CITY ENGINEER
GARY LEE MOORE, P.E. ENV SP
DATE:
DESIGN GROUP
ENGINEER:
DESIGNED BY: HONGJOO KIM LANDSCAPE ARCHITECTURE
DRAWN BY: MX
CHECKED BY: CA
APPROVED BY: HK

WORK ORDER NO.
E170121B

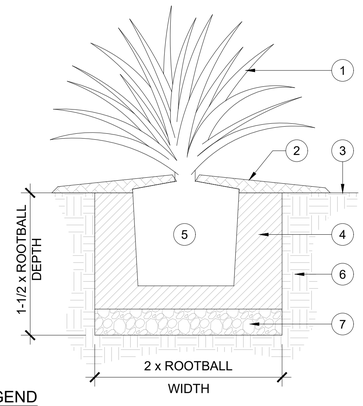
SHEET NAME
LANDSCAPE PLANTING PLAN
L4.01
SHEET 15 OF 16 SHEETS

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REVISION DATES (DESIGN STAGE ONLY)

Sheet Version 4.0

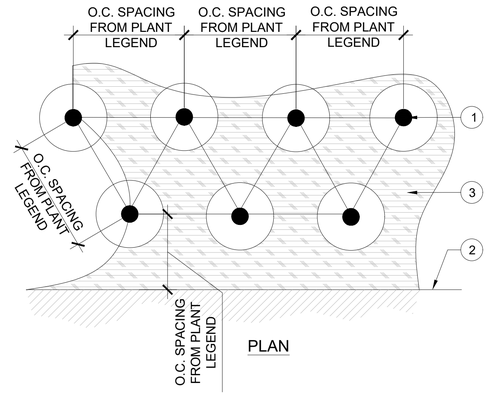
C:\USERS\MINGLEI XIONG\HKLA SERVER DROPBOX\2019117 HKLA_RESEDA SKATE FACILITIES\09 PHASE\03 CD\01 CAD\2019117_RESEDA SKATE FACILITIES_L400.DWG 10/28/2021 2:36 PM



LEGEND

1. SUCCULENT SHRUB.
2. 3" THICK LAYER OF WOOD CHIP MULCH. PROVIDE SAMPLE FOR REVIEW
3. FINISH GRADE
4. AMENDED BACKFILL:SEE SPECIFICATIONS
5. ROOTBALL. SET TOP OF ROOTBALL 2" ABOVE FINISH GRADE.
6. SITE SOIL.
7. 3" LAYER 1/2" TO 3/4" WASHED, CRUSHED ROCK.

6 SUCCULENT PLANTING
SCALE: NTS



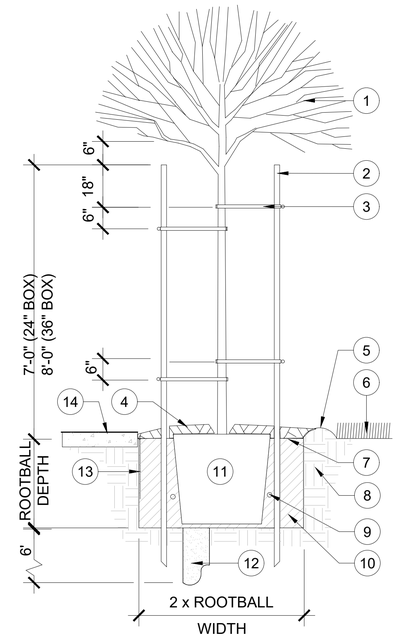
LEGEND

1. SHRUB/GROUNDCOVER - TRIANGULATED ROWS.
2. HARDSCAPE ELEMENT: CURB, WALK, WALL, ETC.
3. PINE BARK MULCH PER SPECIFICATIONS.

NOTE

SPACING DIAGRAM REFERS TO ALL SHRUBS AND GROUND COVER PLANTING UNLESS NOTED OTHERWISE.

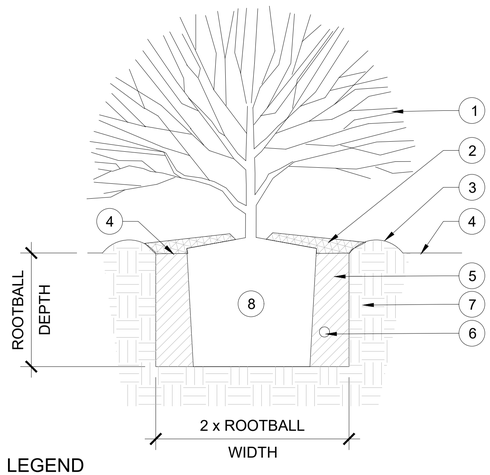
4 GROUNDCOVER SPACING
SCALE: NTS



LEGEND

1. TREE-STREET TREES TO HAVE 7' CLEAR TRUNK.
2. LODGEPOLE PINE STAKE.
   24" BOX TREES: 2" X 10'.
   36" BOX TREES: 3" X 12'.
   DO NOT DRIVE STAKE THROUGH ROOTBALL. CUT OFF TOP SECTION DAMAGED BY HAMMERING. TOP OF STAKE IS 6" CLEAR OF LOWEST TREE BRANCHES.
3. FLEXIBLE VINYL TREE TIE, 4/TREE.
4. MULCH. SEE SPECIFICATONS.
5. 4" HT. WATERING BASIN. REMOVE AT END OF MAINT. PERIOD.
6. ADJACENT PLANTING.
7. FINISH GRADE.
8. SITE SOIL.
9. PLANT FERTILIZER TABLET. SEE SPECIFICATIONS.
10. AMENDED BACKFILL. SEE SPECIFICATIONS.
11. ROOTBALL. PLANT SO TOP OF ROOTBALL IS 2" ABOVE FINISH GRADE.
12. DRAINAGE SUMP: 12" DIA. X 72" DEEP. FILL W/ COARSE SAND. SEE SPECIFICATIONS.
13. ROOT CONTROL BARRIER PER PLAN AND NOTES. INSTALL PER MANUF.
14. ADJACENT PAVEMENT.

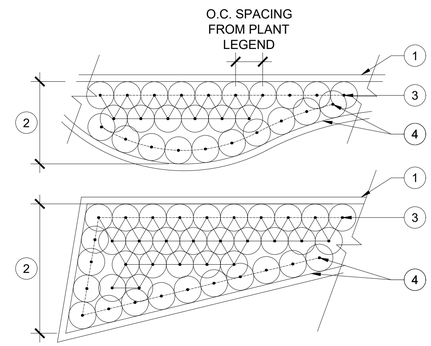
1 TREE PLANTING W/ DOUBLE STAKES
SCALE: N.TS



LEGEND

1. SHRUB.
2. 3" WOOD CHIP MULCH. PROVIDE SAMPLE FOR REVIEW
3. 3" HT WATERING BASIN.
4. FINISH GRADE.
5. AMENDED BACKFILL. SEE SPECIFICATIONS.
6. FERTILIZER TABLET. SEE SPECIFICATIONS.
7. SITE SOIL.
8. ROOTBALL. SET TOP OF ROOTBALL 2" ABOVE FINISH.

5 SHRUB PLANTING
SCALE: NTS



LEGEND

1. PAVING EDGE OR HEADER.
2. PLANTING AREA.
3. PLANT.
4. OUTER ROW OF PLANTS FOLLOWS EDGE OF PAVING OR HEADER.

3 PLANT LAYOUT AT IRREGULAR PLANTERS
SCALE: NTS

HONGJOO KIM LANDSCAPE ARCHITECTS

811 Know what's below. Call before you dig.ig.

NOT FOR CONSTRUCTION

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Design Division

LICENSED LANDSCAPE ARCHITECT
HONGJOO KIM NO. 5987
Signature
12/31/21
Renewal Date
10/29/21
Date
STATE OF CALIFORNIA

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED

BUREAU OF ENGINEERING
VERTICAL CONTROL:
HORIZONTAL CONTROL:
SHEET TITLE: LANDSCAPE PLANTING DETAILS
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

DEPARTMENT OF PUBLIC WORKS
NO. | REVISIONS: | DATE: | BY:
CIP NO.
INDEX NO.

CITY OF LOS ANGELES
GARY LEE MOORE, P.E. ENV SP — CITY ENGINEER — DATE:
DESIGN GROUP:
ENGINEER:
DESIGNED BY: HONGJOO KIM LANDSCAPE ARCHITECTURE
DRAWN BY: MX
CHECKED BY: CA
APPROVED BY: HK

WORK ORDER NO.
E170121B

SHEET NAME
LANDSCAPE PLANTING DETAILS
L4.20
SHEET 16 OF 16 SHEETS

REVISION DATES (DESIGN STAGE ONLY)

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

Sheet Version 4.0

C:\USERS\MINGLEI XIONG\HKLA SERVER DROPBOX\2019117 HKLA_RESEDA SKATE FACILITIES\09 PHASE\03 CD\01 CAD\2019117_RESEDA SKATE FACILITIES_L420.DWG 10/28/2021 2:37 PM

ABBREVIATIONS

A	AMPERE, AUTO, AMMETER	MCC	MOTOR CONTROL CENTER
AB	ANCHOR BOLT	MCP	MOTOR CIRCUIT PROTECTOR
AC	ALTERNATING CURRENT	MECH	MECHANICAL
ACU	AIR CONDITIONING UNIT	MR	MULTIPLE RATIO
AF	AMPERE FRAME SIZE OF CIRCUIT BREAKERS	MFR	MANUFACTURER
		MH+	MOUNTING HEIGHT
AFF	ABOVE FINISHED FLOOR	MH	MAINTENANCE HOLE
AMP	AMPERES, AMPERAGE	MIN	MINUTES, MINIMUM
APPROX	APPROXIMATE	MISC	MISCELLANEOUS
ASYM	ASYMMETRIC,ASYMMETRICAL	MLO	MAIN LUGS ONLY
AT	AMPERE TRIP	MOV	MOTOR OPERATED VALVE
ATS	AUTOMATIC TRANSFER SWITCH	MS	MANUAL MOTOR STARTER
AUTO	AUTOMATIC	MSA	MAIN SERVICE ENTRANCE EQUIPMENT "A"
AUX	AUXILIARY		
AWG	AMERICAN WIRE GAUGE	MSDA	MAIN DISTRIBUTION SWITCHBOARD "A"
		MTG	MOUNTING
BC	BARE COPPER	MTR	MOTOR
BKR	BREAKER	(N)	NEW
BLDG	BUILDING	N	NEUTRAL
		NA	NON-AUTOMATIC
C	CONDUIT, CLOSED CLOSING RELAY OR CONTACTOR	NC	NORMALLY CLOSED
		NF	UNFUSED, NON-FUSED
CAB	CABINET	NO, NOS	NUMBER, NUMBERS
CAP	CAPACITOR, CAPACITY	NIC	NOT IN CONTRACT
CAT	CATALOG	NTS	NOT TO SCALE
CB	CIRCUIT BREAKER		
CKT	CIRCUIT	OC	ON CENTER
CM	CIRCULAR MIL	OD	OUTSIDE DIAMETER
CO	CONDUIT ONLY	OL	OVERLOAD RELAY
COAX	COAXIAL (CABLE)		
COMM	COMMUNICATION	P	POLE, POWER OR PRESSURE
CONN	CONNECTION, CONNECTOR	PB	PULL BOX, PUSHBUTTON
COT'N	CONTINUATION	PB STA	PUSHBUTTON STATION
CP	CONTROL PANEL	PCM	PROCESS CONTROL MODULE
CPT	CONTROL POWER TRANSFORMER	PH,Ø	PHASE
CR	CONTROL RELAY	P & ID	PROCESS & INSTRUMENTATION DIAGRAM
CS	CONTROL SWITCH OR CORE AND SHELL		
CSI	CONTROL SYSTEM INTERFACE	PNL	PANEL
CT	CONTROL TRANSFORMER	POS	POSITIVE
CU	COPPER	PM	POWER MONITOR
		PMM	PROCESS MONITORING MODULE
DBS	DEPARTMENT OF BUILDING AND SAFETY	PS	PRESSURE SWITCH
DC	DIRECT CURRENT	PSPDP	PARKING STRUCTURE POWER DISTRIBUTION PANEL
DHU	DEHUMIDIFICATION UNIT		
DIA	DIAMETER	PT	POTENTIAL TRANSFORMER
DIAG	DIAGRAM	PV	PHOTOVOLTAIC
DIM	DIMENSION	PVC	POLYVINYL CHLORIDE
DISC	DISCONNECT	PWR	POWER
DISTR	DISTRIBUTION		
DN	DOWN	R	REACTOR OR RECTIFIER
DS	DISCONNECT SWITCH	REC	RECEPTACLE
DWG	DRAWING	RECPTS	RECEPTACLES
		REF	REFERENCE
EA	EACH	REQ'D	REQUIRED
EL	ELEVATION (HEIGHT)	REV	REVERSE CONTACTOR COIL
ELEV	ELEVATION (VIEW)	RGS	RIGID GALVANIZED STEEL
EMLA	EMERGENCY LIGHTING PANEL "A"	RM	ROOM
EMT	ELECTRICAL METALLIC TUBING		
ENCL	ENCLOSURE	SBDB	STANDBY DISTRIBUTION BOARD
EP	EXPLOSION PROOF	SEC	SECOND OR SECONDARY
EQPT	EQUIPMENT	SC	SHORT CIRCUIT
ER	CONDUCTANCE LEVEL RELAY	SCH	SCHEDULE
EXIST		SEC	SECONDS, SECONDARY
OR (E)	EXISTING	SECT	SECTION
		SEL SW	SELECTOR SWITCH
FA	FIRE ALARM	SEQ	SEQUENCE
FACP	FIRE ALARM CONTROL PANEL	SHLD	SHIELDED
FC	FOOT CANDLE	SHT	SHEET
FDR	FEEDER	SN	SOLID NEUTRAL
FFE	FACILITY FURNISHINGS AND EQUIPMENT	SOL	SOLENOID
FIG	FIGURE	SP	SPARE
FIN	FINISHED	SPECS	SPECIFICATIONS
FIXT	FIXTURE	SSS	SHARED SYSTEM SUPPLIER
FLEX	FLEXIBLE	SST	STAINLESS STEEL - (TYPE 316)
FLA	FULL LOAD AMPS	STA	STATION
FT	FOOT	STD	STANDARD
FTG	FOOTING	STL	STEEL
FUT	FUTURE	SV	SOLENOID VALVE
		SW	SWITCH
GALV	GALVANIZED	SWBD	SWITCHBOARD
GFCI	GROUND FAULT CIRCUIT INTERRUPT	SWGR	SWITCHGEAR
GRD, GND	GROUND	SYMM	SYMMETRICAL
		SYS	SYSTEM
HOA	HAND - OFF - AUTOMATIC		
HP	HORSEPOWER	TB	TERMINAL BOX
HZ	HERTZ	TEMP	TEMPERATURE
HGT	HEIGHT	TERM	TERMINAL
HV	HIGH VOLTAGE	TR	TRANSFORMER
HS	HANDSWITCH	TYP	TYPICAL
IC	INTERRUPTING CAPACITY	UG	UNDERGROUND
ID	INSIDE DIAMETER	UPS	UNINTERRUPTABLE POWER SUPPLY
I/O	INPUT/OUTPUT		
INSTR	INSTRUMENT	UNO	UNLESS NOTED OTHERWISE
		UST	UNIT SUBSTATION TRANSFORMER
JB	JUNCTION BOX		
		VA	VOLT-AMPS
KCMIL	KILO-CIRCULAR MILS	V	VOLTAGE, VOLTS
KHZ	KILOHERTZ	VFD	VARIABLE FREQUENCY DRIVE
KV	KILOVOLT	VSD	VARIABLE SPEED DRIVE (OTHER THAN VFD)
KVA	KILO VOLT AMPERE		
KVAR	KILOVAR	W	WATTS, WIRE
KW	KILOW ATT	WP	WEATHERPROOF
		XFMR	TRANSFORMER
LCP	LOCAL CONTROL PANEL		MISCELLANEOUS
LOC	LOCAL		
LOS	LOCKOUT STOP	1/C	SINGLE CONDUCTOR
LS	LEVEL SWITCH	2/C	TWO CONDUCTOR
LTG	LIGHTING	3P	THREE-POLE
LACEC	LOS ANGELES CITY ELECTRICAL CODE	3PH	THREE PHASE
		3W	THREE WIRE
M	MOTOR CONTACTOR COIL	4/C	FOUR CONDUCTOR
MA	MILLIAMPERE	4P	FOUR-POLE
MAX	MAXIMUM	% IMP	PERCENT IMPEDANCE

GENERAL NOTES

RACEWAYS

1. CONTRACTOR SHALL PREPARE AND SUBMIT ELECTRICAL SHOP DRAWINGS AND INSTALLATION DETAILS FOR CITY REVIEW AND ACCEPTANCE. ELECTRICAL SUBMITTALS SHALL INCLUDE ALL ASPECTS FOR FULLY FUNCTIONAL, CODE COMPLIANT FACILITY, INCLUDING BUT NOT LIMITED TO:
   a. COMPLIANCE WITH NEC.
   b. COMPLIANCE WITH CITY OF LA PLAN CHECK REQUIREMENTS.
   c. ELECTRICAL SHORT-CIRCUIT STUDIES AND ARC-FLASH COMPLIANCE.
   d. GROUNDING PER NEC.
2. CONTRACTOR SHALL PROVIDE AND INSTALL ALL NECESSARY CONDUITS, FITTINGS, JUNCTION BOXES AND ALL NECESSARY COMPONENTS WHETHER SHOWN OR NOT ON THE DRAWINGS. TO MAKE ELECTRICAL INSTALLATION COMPLETE AND OPERATIONAL.
3. ELECTRICAL CONDUITS ARE SHOWN DIAGRAMMATICALLY AND PANEL AND EQUIPMENT LOCATIONS SHALL BE PLACED TO SUIT FIELD CONDITIONS.
4. ELECTRICAL CONTRACTOR TO LIMIT THE NUMBER OF 90° BENDS BETWEEN PULL POINTS TO COMPLY WITH THE REQUIREMENTS OF THE CALIFORNIA ELECTRICAL SAFETY ORDERS, THE NATIONAL ELECTRICAL CODE AND THE LOS ANGELES CITY ELECTRICAL CODE.
5. PROVIDE 30" (MAXIMUM) LENGTH OF FLEXIBLE CONDUIT WHERE RIGID CONDUIT TERMINATES AT EQUIPMENT SUBJECT TO MOVEMENT FROM VIBRATION, EXPANSION AND CONTRACTION.
6. ELECTRICAL CONTRACTOR SHALL PROVIDE GALVANIZED STEEL SUPPORTS FOR ALL ELECTRICAL WORK (CONDUIT, PANELS, BOXES ETC.)
7. CONDUITS TERMINATED AT MOTOR CONTROL CENTER, SWITCHGEAR CONTROL CABINETS, ETC, SHALL BE EQUIPPED WITH GROUNDING BUSHINGS AND SHALL BE EFFECTIVELY BONDED TO GROUNDING BUSES.
8. ALL OUTDOOR ELECTRICAL DEVICES AND ENCLOSURES SHALL BE WEATHERPROOF AND CORROSION RESISTANT (NEMA 4X OR 3R) ALL INDOOR DEVICES AND ENCLOSURES SHALL BE NEMA 12.
9. SWITCHGEAR, MOTOR CONTROL CENTERS, AND ALL OUTDOOR FREE STANDING CABINETS/PANELS SHALL BE SET ON A 4" HIGH MINIMUM CONCRETE PAD.
10. ALL SWITCHES, PULLBOXES, ETC. SHALL BE MOUNTED 48" ABOVE FLOOR SURFACES UNLESS NOTED OTHERWISE.
11. ALL BENDS IN CABLES SHALL BE MADE SO THAT THE PROTECTIVE COVERING OF THE CABLE WILL NOT BE INJURED. NO BEND SHALL HAVE A RADIUS LESS THAN THE MINIMUM RECOMMENDED BY THE CABLE MANUFACTURER.
12. THE MINIMUM SIZE OF CONDUIT INSTALLED ABOVE GRADE SHALL BE 3/4" UNLESS OTHERWISE NOTED.
13. INSTALLATIONS SHALL BE IN ACCORDANCE WITH ALL CODES AND STANDARDS. ALL LIGHTING AND RECEPTACLE CIRCUITS SHALL INCLUDE 1#12 GROUND WIRE.
14. ALL ABOVE GRADE CONDUITS AND FITTINGS SHALL BE RIGID GALVANIZED STEEL. USE RIGID STEEL CONDUIT, INCLUDING BUSHINGS, COUPLINGS, ELBOWS, NIPPLES, AND OTHER FITTINGS, GALVANIZED BY HOT-DIPPING, AND MEETING THE REQUIREMENTS OF ANSI C80.1, ANSI C80.4, UL, AND THE LAEC. DO NOT USE SETSCREW TYPE COUPLINGS, BUSHINGS, BENDS, NIPPLES, AND OTHER FITTINGS, UNLESS APPROVED BY THE ENGINEER OR THE INSPECTOR. FACTORY BENDS ARE NOT PERMITTED UNLESS APPROVED BY THE ENGINEER OR THE INSPECTOR.

CONDUCTORS

1. PROVIDE CONDUCTORS WITH TYPE THW OR TYPE THHN/THWN INSULATION, EXCEPT FOR SIZES NO. 6 AND LARGER SHALL HAVE WITH XHHW INSULATION.
2. ALL POWER AND CONTROL CABLES SHALL BE COPPER. NETWORK CABLES SHOULD BE FIBER OPTIC CABLE WHERE SPECIFIED.
3. PROVIDE CABLE THAT IS UL LISTED TYPE TC AND CONFORMS TO THE REQUIREMENTS OF UL 1277 AND NEC ARTICLE 340, OR UL LISTED POWER LIMITED CIRCUIT CABLE THAT CONFORMS TO THE REQUIREMENTS OF ARTICLE 725 OF THE LAEC. PROVIDE CABLES PERMANENTLY AND LEGIBLY MARKED WITH THE MANUFACTURER'S NAME, THE MAXIMUM WORKING VOLTAGE FOR WHICH THE CABLE WAS TESTED, THE TYPE OF CABLE, AND LABELED UL (OR SUBMIT EVIDENCE OF UL LISTING).
4. ACCEPTABLE MANUFACTURERS: SOUTHWIRE, HOUSTON WIRE AND CABLE COMPANY, BELDEN ALPHA WIRE COMPANY, GENERAL CABLE OR EQUAL.

TYPE 1 (600-VOLT MULTI-CONDUCTOR CONTROL CABLE, TYPE TC)

1. MULTI-CONDUCTOR CONTROL CIRCUIT INTERCONNECTION CABLE WITH GROUND. SUITABLE FOR INSTALLATION IN OPEN AIR, IN CABLE TRAYS, CONDUIT, OR OTHER APPROVED RACEWAYS. MAXIMUM CABLE TEMPERATURE RATING 90 DEGREES C DRY LOCATIONS, 75 DEGREES C WET LOCATIONS. PASSES VERTICAL TRAY FLAME TEST.

TYPE 2 (600-VOLT NO. 16 AWG TWISTED, SHIELDED PAIR INSTRUMENTATION CABLE, TYPE TC)

1. SINGLE PAIR INSTRUMENTATION CABLE DESIGNED FOR NOISE REJECTION FOR PROCESS CONTROL, COMPUTER, OR DATA LOG APPLICATIONS. SUITABLE FOR INSTALLATION IN CABLE TRAYS, CONDUIT, OR OTHER APPROVED RACEWAYS. MAXIMUM CABLE TEMPERATURE RATING SHALL BE 90 DEGREES C DRY LOCATIONS, 75 DEGREES C WET LOCATIONS.
2. INDIVIDUAL CONDUCTORS: BARE SOFT ANNEALED COPPER, CLASS B, 7-STRAND CONCENTRIC PER ASTM B 8; 20 AWG, 7-STRAND TINNED COPPER DRAIN WIRE.

TYPE 3 (600-VOLT MULTI-CONDUCTOR POWER CABLE, TYPE TC):

1. 3 OR 4 -CONDUCTOR, WITH GROUND AND OVERALL JACKET. SUITABLE FOR INSTALLATION IN OPEN AIR, IN CABLE TRAYS, CONDUIT, OR OTHER APPROVED RACEWAYS. MAXIMUM CABLE TEMPERATURE RATING 90 DEGREES C DRY LOCATIONS, 75 DEGREES C WET LOCATIONS.
2. INDIVIDUAL CONDUCTORS: CLASS B STRANDED, COATED, OR UNCOATED COPPER.

TYPE 4 (600-VOLT NO. 16 TWISTED, SHIELDED TRIAD INSTRUMENTATION CABLE, TYPE TC):

1. SINGLE TRIAD INSTRUMENTATION CABLE DESIGNED FOR NOISE REJECTION FOR PROCESS CONTROL, COMPUTER, OR DATA LOG APPLICATIONS. SUITABLE FOR INSTALLATION IN CABLE TRAY, CONDUIT, OR OTHER APPROVED RACEWAYS. MAXIMUM CABLE TEMPERATURE RATING SHALL BE 90 DEGREES C DRY LOCATIONS, 75 DEGREES C WET LOCATIONS.
2. CONDUCTORS: BARE SOFT ANNEALED COPPER, CLASS B, 7-STRAND CONCENTRIC PER ASTM B 8; 20 AWG, 7-STRAND, TINNED COPPER DRAIN WIRE.

TYPE 5 (600-VOLT NO. 18 AWG, MULTI-TWISTED SHIELDED PAIRS WITH A COMMON OVERALL SHIELD INSTRUMENTATION CABLE, TYPE TC):

1. TWISTED, SHIELDED PAIRS OF INSTRUMENT CABLES, GROUPED IN A SINGLE CABLE, DESIGNED FOR USE AS INSTRUMENTATION, PROCESS CONTROL, AND COMPUTER CABLE. SUITABLE FOR INSTALLATION IN CABLE TRAY, CONDUIT, OR OTHER APPROVED RACEWAYS. MAXIMUM CABLE TEMPERATURE RATING SHALL BE 90 DEGREES C DRY LOCATIONS, 75 DEGREES C WET LOCATIONS.
2. BARE SOFT ANNEALED COPPER, CLASS B, 7-STRAND, CONCENTRIC PER ASTM B 8. TINNED COPPER DRAIN WIRES. PAIR DRAIN WIRE SIZE AWG 20, GROUP DRAIN WIRE SIZE AWG 18.

GROUNDING

1. ALL METALLIC STRUCTURES AND EQUIPMENT SUCH AS STRUCTURAL STEEL, GENERATOR AND MOTOR FRAMES, ENCLOSURES, CABINETS FOR SWITCHGEAR AND OTHER ELECTRIC EQUIPMENT, METALLIC CONDUITS, CABLE TRAYS, STAIRS, FENCES AND HANDRAILS SHALL BE PERMANENTLY AND EFFECTIVELY GROUNDED. THE GROUND CONNECTION SHALL BE MADE TO THE PLANT GROUND GRID. REFER TO STANDARD DETAILS.
2. ALL GROUNDING CONDUCTORS SHALL BE BARE STRANDED SOFT DRAWN COPPER, CLASS B, UNLESS OTHERWISE NOTED.
3. THE GROUND CABLE SHALL BE INSTALLED, WHERE POSSIBLE, BENEATH SLABS, ATTACHED TO BUILDING STEEL OR RUN IN RACEWAYS AS SHOWN.
4. BURIED GROUND CABLES SHALL BE A MINIMUM OF 18" BELOW GRADE EXCEPT UNDER BUILDINGS WHERE THEY SHALL BE A MINIMUM OF 6" BELOW BOTTOM OF SLAB.
5. CONDUIT RUNS SHALL BE BONDED TOGETHER TO FORM A CONTINUOUS ELECTRICAL CONDUCTOR.
6. WHERE SEAL-TIGHT FLEXIBLE CONDUIT FOR MOTOR CONNECTION IS USED, PROVIDE GROUNDING JUMPER BETWEEN THE RIGID STEEL CONDUIT (MOTOR FEEDER) AND THE MOTOR BOX OR FRAME.
7. GENERATOR CASINGS, EXCITERS, SWITCHGEARS, MOTOR CONTROL CENTERS, LARGE METAL TANKS, TRANSFORMER CORES, AND MOTOR FRAMES LARGER THAN 150HP SHALL BE GROUNDED AT TWO POINTS.
8. THE FRAMES OF MOTORS SMALLER THAN 150HP SHALL BE GROUNDED DIRECTLY TO THE GROUND GRID OR TO THE STEEL COLUMN CONNECTED TO THE GROUND LOOP WITH COPPER WIRE OF SIZE AS REQUIRED BY THE LOS ANGELES CITY ELECTRICAL CODE.
9. ALL EQUIPMENT GROUND TERMINAL LUGS SHALL BE OF THE MECHANICAL TYPE.
10. BENDS IN GROUND CABLE SHALL BE GREATER THAN 12 TIMES THE CABLE OUTSIDE DIAMETER.
11. GROUNDING CONDUCTOR PIGTAIL AND INSERT LOCATIONS ARE APPROXIMATE ONLY. CONTRACTOR SHALL VERIFY IN THE FIELD AND LOCATE THEM CLOSE TO MOTOR, EQUIPMENT, GENERATOR, OR METAL STRUCTURE SERVED.
12. GROUNDING PIGTAIL SHALL BE THE SAME SIZE AS THE PHASE WIRE BUT NO LESS THAN NUMBER 8 AWG.
13. WHERE BARE GROUND CONDUCTORS ARE EXPOSED, CONTRACTOR SHALL PROVIDE PVC SCHEDULE 80 CONDUITS WITH ULTRA-VIOLET LIGHT PROTECTION.
14. ALL FLEXIBLE MOTOR CONDUITS SHALL HAVE OUTER GROUND CONDUCTOR.

EQUIPMENT AND DEVICES

1. ALL EQUIPMENT DIMENSIONS SHOWN ON PLANS AND ELEVATIONS ARE APPROXIMATE ONLY. THE CONTRACTOR SHALL USE THE SHOP DRAWINGS FOR PROPER FOUNDATION AND PAD LAYOUT, ETC. FOR FINAL INSTALLATION WITHOUT ANY ADDITIONAL COST TO THE CITY.
2. IT IS INCUMBENT UPON THE CONTRACTOR TO COORDINATE WITH HIS SUBCONTRACTORS TO MAKE SURE THAT EQUIPMENT SUPPLIERS PROVIDE ALL NECESSARY ELECTRICAL INFORMATION TO THE ELECTRICAL SUBCONTRACTOR FOR INCLUSION OF COSTS IN BID PACKAGE. ALL NECESSARY MATERIALS AND LABOR TO COMPLETE ELECTRICAL INSTALLATION SHALL BE PROVIDED WHETHER SHOWN OR NOT SHOWN ON THE DRAWINGS. ALL ELECTRICAL WORK SHALL BE IN ACCORDANCE WITH ALL CODES AND STANDARDS PER SPECIFICATION.
3. SWITCHGEARS, SWITCHBOARDS, MOTOR CONTROL CENTERS AND ALL FREE STANDING PANELS SHALL BE SET WITH LEVELING CHANNELS UNLESS OTHERWISE NOTED.
4. CONTRACTOR TO PROVIDE DESIGNS AND DETAILS FOR ALL MOUNTING AND ANCHORAGE OF EQUIPMENT IN ACCORDANCE WITH CHAPTER 23 OF THE LATEST EDITION OF THE UNIFORM BUILDING CODE AND LOS ANGELES BUILDING CODE.

MISCELLANEOUS

1. IN CASE OF INTERFERENCE BETWEEN ELECTRICAL EQUIPMENT AND OTHER EQUIPMENT THE CONTRACTOR SHALL NOTIFY THE ENGINEER IN WRITING AND THE ENGINEER SHALL REVIEW PROPOSED CHANGES BEFORE THEY ARE MADE.
2. ALL RECEPTACLES SHALL BE MOUNTED 18" ABOVE FLOOR SURFACE, UNLESS OTHERWISE NOTED ON THE DRAWINGS.
3. ALL RECEPTACLES IN OUTDOOR AND ANTICIPATED WET AREAS SHALL BE GROUND FAULT INTERRUPTER TYPE RECEPTACLES WITH WEATHER PROOF COVER PLATES.
4. CIRCUITS OF DIFFERENT SERVICE VOLTAGE RANGES SHALL BE INSTALLED IN SEPARATE RACEWAYS, PULLBOXES AND JUNCTION BOXES. THE VOLTAGE AND SERVICE LEVELS ARE:
   (1) 120V-480VOLT
   (2) INSTRUMENTATION AND CONTROL LESS THAN 50VDC
      a) ANALOG
      b) SIGNAL
   (3) TELEPHONE AND COMMUNICATIONS.
   (4) FIBER OPTICS
5. RECEPTACLES, LIGHTING AND CONTROL CIRCUITS SHALL BE TYPE THHN/THWN WIRE.
6. ALL ELECTRICAL EQUIPMENT AND DEVICES SHALL BE UL APPROVED OR OTHER INDEPENDENT AGENCIES APPROVED BY THE CITY OF LOS ANGELES.
7. NO PIPING, DUCTS OR FOREIGN EQUIPMENT SHALL BE PERMITTED TO BE LOCATED WITHIN THE DEDICATED SPACE ABOVE THE ELECTRICAL EQUIPMENT.
8. FUSES SHALL BE PROVIDED WITH REJECTION TYPE FUSE HOLDERS.

MINIMUM SUBMITTAL REQUIREMENTS FOR SCHEMATIC DIAGRAMS:

1. ALL CONTROLS SHOWN DE-ENERGIZED.
2. CONTRACTOR SHALL INCORPORATE NECESSARY FUNCTIONS FOR PROPER OPERATIONS AND PROTECTION OF SYSTEMS.
3. SLAVE OR INTERPOSING RELAYS SHALL BE ADDED WHERE REQUIRED TO PROVIDE ALL NECESSARY CONTACTS REQUIRED FOR THE SCHEMATIC DIAGRAM SHOWN.
4. ALL DEVICES SHOWN ON MOTOR STARTER SCHEMATIC DIAGRAMS SHALL BE MOUNTED IN MOTOR STARTER CUBICLES, UNLESS OTHERWISE NOTED.

ELECTRICAL STUDIES

1. CONTRACTOR IS RESPONSIBLE FOR PREPARING A POWER SYSTEM ANALYSIS REPORT INCLUDING SHORT CIRCUIT CALCULATIONS, A PROTECTIVE DEVICE COORDINATION STUDY, ARC-FLASH STUDY, AND A HARMONIC ANALYSIS. THE STUDY SHALL BEGIN WITH THE UTILITY COMPANY'S FEEDER PROTECTIVE DEVICE AND INCLUDE ALL OF THE ELECTRICAL DISTRIBUTION EQUIPMENT DOWN TO AND INCLUDING LOW VOLTAGE MOTOR CONTROL CENTERS, POWER DISTRIBUTION PANEL BOARDS AND LIGHTING PANELS AND TRANSFORMERS.
2. ALL INFORMATION REQUIRED TO PERFORM THE STUDY SHALL BE OBTAINED BY THE ENTITY PERFORMING THE STUDY. ALL COSTS FOR THIS WORK INCLUDING FIELD SETTINGS OF DEVICES, ADJUSTMENTS, AND MODIFICATIONS TO EQUIPMENT THAT ARE REQUIRED FOR CONFORMANCE WITH THE APPROVED STUDY SHALL BE INCLUDED IN THE CONTRACTOR BID PROPOSAL AND IS NOT REIMBURSABLE BY THE CITY.

ELECTRIC MOTORS

1. UNLESS OTHERWISE SPECIFIED, ALL 3-PHASE MOTORS SHALL BE TEFC, SQUIRREL-CAGE INDUCTION, CONSTANT SPEED, HAVE ANTI-FRICTION BEARINGS AND CLASS F INSULATION, AND BE IN ACCORDANCE WITH ALL NEMA STANDARDS. MOTORS SHALL HAVE A MINIMUM SERVICE FACTOR OF 1.15 AT 40°C AMBIENT, AND STAINLESS STEEL AUTOMATIC BREATHER-DRAINS AT THE LOWEST POINT OF THE MOTOR ENCLOSURE.
2. ALL SINGLE-PHASE MOTORS, UNLESS OTHERWISE SPECIFIED, SHALL MEET ALL NEMA STANDARDS, BE TEFC, WITH ANTI-FRICTION BEARINGS, CLASS F INSULATION, AND HAVE A 1.15 SERVICE FACTOR AT 40°C AMBIENT.
3. ALL MOTORS LARGER THAN 3 HORSEPOWER SHALL BE PREMIUM EFFICIENCY, CAST IRON, CORROSIVE RESISTANT, HOSTILE ENVIRONMENT DESIGN, BALDOR "ECP", RELIANCE "XE", U. S. MOTORS "CORRO-DUTY" OR EQUAL. MOTORS LESS THAN 3 HORSEPOWER SHALL BE OF CAST IRON, STEEL OR ALUMINUM CONSTRUCTION, PREMIUM EFFICIENCY, AND CORROSIVE RESISTANT, HOSTILE ENVIRONMENT DESIGN.
4. MOTORS AND CONTROLS SHALL BE ADEQUATELY SIZED SO THE NAMEPLATE RATING WILL NOT BE EXCEEDED UNDER THE MAXIMUM DESIGN CAPACITY OF THE EQUIPMENT SUPPLIED.
5. ALL MOTOR NAMEPLATES SHALL BE STAINLESS STEEL, PERMANENTLY SECURED TO THE MOTOR, AND PROVIDE THE FOLLOWING INFORMATION: (1) NEMA DESIGN LETTER, (2) VOLTAGE, (3) PHASES, (4) FREQUENCY, (5) HORSEPOWER, (6) FULL LOAD CURRENT, (7) CLASS OF INSULATION, (8) FULL LOAD RPM, (9) AMBIENT TEMPERATURE/SERVICE FACTOR, (10) TIME RATING, (11) KVA CODE, (12) FRAME SIZE, (13) MFG. TYPE OR MODEL, (14) MFG. CATALOG NUMBER WITH DATE CODE, AND (15) SERIAL NUMBER.

VFDS

1. VFDS SHALL BE COMPLETE ALTERNATING CURRENT ELECTRIC DRIVE SYSTEMS INCLUDING HARDWARE AND SOFTWARE NECESSARY FOR VARIABLE SPEED OPERATION OF INDUCTION MOTOR AND LOAD COMBINATION.
2. VFD SUPPLIERS SHALL COORDINATE WITH EQUIPMENT MANUFACTURERS TO INSURE COMPATIBILITY AND PERFORMANCE.
3. VFD SUPPLIERS SHALL BE RESPONSIBLE FOR THE SUCCESSFUL APPLICATION AND OPERATION OF THE DRIVE COMBINED WITH THE MOTOR AND DRIVEN EQUIPMENT. THIS INCLUDES THE RESPONSIBILITY FOR DETERMINING DRIVEN EQUIPMENT LOAD, TORQUE, SPEED, AND PERFORMANCE REQUIREMENTS.
4. VFD SYSTEMS SHALL BE SUITABLE FOR OPERATION AS PART OF A 480 VOLT ALTERNATING CURRENT, 3 PHASE, 60 HERTZ POWER DISTRIBUTION SYSTEM. VFD SYSTEMS SHALL BE DESIGNED TO WITHSTAND MECHANICAL FORCES EXERTED DURING SHORT CIRCUIT CONDITIONS. IN THE EVENT THAT THE RESULTS OF THE SHORT CIRCUIT FAULT ANALYSIS SUBMITTED DURING THE SHOP DRAWINGS PERIOD, AS ACCEPTED BY THE ENGINEER, INDICATE THAT A HIGHER SHORT CIRCUIT DUTY RATING OF THE VFD SYSTEM IS REQUIRED, THE CONTRACTOR SHALL FURNISH THE VFD SYSTEM WITH THAT HIGHER RATING.
5. ALL NECESSARY MOTOR AND DRIVE PARAMETERS TOGETHER WITH SPECIFIC CONTROL AND PROTECTION FUNCTIONS SHALL BE PROGRAMMABLE VIA A KEYPAD. CONTROL AND SEQUENCE LOGIC SHALL BE DESIGNED SUCH THAT THE MOTOR-LOAD COMBINATION CAN BE OPERATED IN THE MANUAL MODE UPON CONTROL AND SEQUENCE LOGIC FAILURE, AND THAT ALL NECESSARY PERSONNEL AND EQUIPMENT SAFETY INTERLOCKS WILL REMAIN EFFECTIVE.

CONDUIT ROUGH IN COORDINATION

1. PROVIDE AND INSTALL CONDUITS FOR POWER LIGHTING/FIRE ALARM AND OTHER TRADES ON A UNISTRUT APACE AT 5 FEET INTERNAL. CONDUITS MUST NOT BE ATTACHED TO THE BUILDING STRUCTURE/BEAMS.
2. COORDINATE ALL CONDUIT LAYOUT WITH OTHER TRADES.

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Contract Division

REGISTERED PROFESSIONAL ENGINEER
GILBERT D. GETTER
No. E 21884
Exp. 06-30-23
ELECTRICAL
11/17/2021
• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED •

BUREAU OF ENGINEERING
VERTICAL CONTROL:
HORIZONTAL CONTROL:
SHEET TITLE: ELETRICAL ABBREVIATIONS & GENERAL NOTES
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

DEPARTMENT OF PUBLIC WORKS
NO. | REVISIONS: | BY: | DATE:
CIP NO.
INDEX NO.

CITY OF LOS ANGELES
GARY LEE MOORE, P.E., ENV SP
CITY ENGINEER
DESIGN GROUP
ENGINEER: RGETTER
DESIGNED BY: ACARRIE
DRAWN BY: JCHIN
CHECKED BY: RHUBATCH
APPROVED BY: XX
DATE:
WORK ORDER NO. E170121B
SHEET NAME E-01
SHEET X OF X SHEETS

REVISION DATES (DESIGN STAGE ONLY)
A
B
C
D
E
F
G
H
I
J
K

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

Sheet Version 4.0

Q:\PROJECTS\CITY OF LA_BROOKSSCARPA\PROJECTLINE DRAWINGS\CAD\E-01_RECOVER.DWG 11/30/2021 12:07 PM

E L E C T R I C A L S Y M B O L S

P L A N

- CONDUIT RUN EXPOSED
- CONDUIT RUN, UNDERGROUND
- CONDUIT RUN, CONCEALED IN CEILING OR WALL.
- CONDUIT RUN, CHANGE IN ELEVATION
- CONDUIT BENDS UP OR TOWARD OBSERVER
- CONDUIT BENDS DOWN OR AWAY FROM OBSERVER
- CONDUIT CONTAINING: T=TELEPHONE, FA=FIRE ALARM, S=SIGNAL, ET=EMERGENCY TELEPHONE, PA=PUBLIC ADDRESS
- FLEXIBLE CONDUIT
- CONDUIT FITTING
- CONDUIT CAPPED
- CONDUIT SEAL
- ¾"C WITH 8 NO.12 WIRES MAX. AS SHOWN. NO CIRCUIT # NOTED. CONDUIT RUNS NOT MARKED ARE ¾"C WITH 2#12 WIRES ONLY. WIRE SIZES OTHER THAN #12 ARE MARKED. PROVIDE 1#12 WIRE FOR GROUNDING
- LPA-1/3/5, 2/4,7 — CROSS MARKS ON CONDUIT WITH CKT.# NOTED INDICATE NUMBER OF NO. 12 WIRES IN ¾"C HOMERUN ONLY.3/4" CONDUIT WITH 9 NO.12 WIRES SHOWN, CIRCUITS 1,3 & 5 WITH COMMON NEUTRAL CIRCUITS 2 & 4 WITH COMMON NEUTRAL & CIRCUIT 7 WITH SEPARATE NEUTRAL HOMERUN TO PANEL `LPA'.
- P15 — CONDUIT NUMBER, SEE CONDUIT SCHEDULE P = POWER, C = CONTROL, S = SIGNAL; 15 =ARBITRARY SEQUENTIAL NUMBER
- 3/4"C- 2#10 — CONDUIT RUNS NOT LISTED IN CONDUIT SCHEDULE ARE NOTED AS SHOWN.
- J — JUNCTION BOX
- GROUND INSERT
- GROUND WIRE, MAIN LOOP (UNDERGROUND)
- GROUND WIRE, TAP EXPOSED
- UNDERGROUND TAP
- GROUND ROD
- GROUND WELL AND ROD FOR PAVED AREAS
- GROUND WELL AND ROD FOR UNPAVED AREAS
- 2A — CEILING OR PENDANT MTD. LTG. FIXTURE "2" INDICATES CIRCUIT NUMBER. "a" INDICATES FIXTURE CONTROLLED BY SW "a".
- 2 — CEILING OR PENDANT MTD. LED LTG. FIXTURE "2" INDICATES CIRCUIT NO.
- WALL MOUNTED LED LTG. FIXTURE
- EMERGENCY LED LIGHTING FIXTURE
- 1 — LIGHTING FIXTURE CONNECTED TO EMERGENCY CIRCUIT "1" INDICATES CIRCUIT NO.
- LED STRIP LIGHTING FIXTURE
- LED STRIP EMERGENCY LIGHTING FIXTURE
- LED STRIP LIGHTING FIXTURE TANDEM WIRED
- WALL MOUNTED LIGHTING FIXTURE
- STREETLIGHT
- E — EMERGENCY LIGHTING UNIT, SELF CHARGING BATTERY TYPE WITH LOW VOLTAGE SEALED LAMPS
- EXIT LIGHT
- RE — RECESSED EXIT LIGHT
- ±8'-6" — A / 2/40 / 3 — LTG. FIXTURE TYPE `A', 2-40 WATT LAMPS, 3=NUMBER OF FIXTURES; 8'-6"=ACTUAL MOUNTING HEIGHT
- T — THERMOSTAT
- 120V, 1Ø ELECTRIC MOTOR

- H — HEATER
- SS — PUSHBUTTON STATION; "SS"=START-STOP, LOS=LOCK-OUT-STOP, "SLOS"=START-LOCK-OUT-STOP
- H-O-A — SELECTOR SWITCH H-O-A=HAND, OFF, AUTOMATIC, L-O-R=LOCAL OFF REMOTE
- TELEPHONE OUTLET, PUBLIC
- TELEPHONE OUTLET, PRIVATE
- BELL
- BUZZER
- P — H=HORN, S=SPEAKER, SN=SIREN, P=PUBLIC ADDRESS
- S — SPEAKER, CEILING MOUNTED - SURFACE MOUNTED
- LIGHTING PANEL/POWER PANEL
- CONTROL PANEL
- MOTOR CONTROL CENTER
- TC — TERMINAL CABINET
- MH — MAINTENANCE HOLE
- HH — HANDHOLE
- PB — PULLBOX
- FA — FIRE ALARM MANUAL STATION
- T — TRANSFORMER
- MAGNETIC MOTOR STARTER
- MAGNETIC CONTACTOR
- F — DISCONNECT SWITCH, N=NON FUSIBLE, F=FUSIBLE
- EMERGENCY TELEPHONE STATION
- TC — TELEPHONE TERMINAL CABINET
- 2 — TELEPHONE/DATA OUTLET, WALL MOUNTED AT 18" AFF NUMBER INDICATES NUMBER OF PORTS
- $a — SINGLE POLE SWITCH. "a" INDICATES CIRCUIT CONTROLLED
- $3 — THREE-WAY SWITCH
- $P — SWITCH AND PILOT LIGHT
- $MC — MANUAL MOTOR STARTER
- $WP — WEATHERPROOF SWITCH

WALL FLOOR

- 120V SINGLE RECEPTACLE, NEMA CONFIGURATION 5-20.
- 120V DUPLEX RECEPTACLE, NEMA CONFIGURATION 5-20
- SPECIAL PURPOSE RECEPTACLE (INDICATE RATING)

- B — "B" DENOTES SECTION LETTER 0-E-3 DENOTES REFERENCE TO DRAWING ON WHICH DETAIL IS SHOWN.

O N E L I N E D I A G R A M

- COMBINATION MAGNETIC STARTER AND FUSED DISCONNECT SWITCH-LOW VOLTAGE.
- CONTACT & RELAY W/STARTER ON/OFF/AUTO
- COMBINATION MAGNETIC STARTER & DISCONNECT SWITCH
- 30AS 10AF 3P — F — FUSED DISCONNECT SWITCH. "AS" INDICATES AMPERE SWITCH FRAME, "AF" INDICATES AMPERE FUSE RATING AND "3/P" INDICATES NUMBER OF POLES
- MOTOR CONTROLER
- MS-1 — FEEDER TAG
- Sm — HP RATED MOTOR SWITCH

FACILITY FURNISHINGS AND EQUIPMENT (FFE) CONTRACTOR SCOPE:

1. FFE SCOPE WILL INCLUDE COMPLETE ICE SYSTEM AS SHOWN ON R-DRAWINGS, DHU, AND LOW-VOLTAGE SYSTEMS (SPECIALTY LIGHT AND SOUND SYSTEMS, SCOREBOARD, SECURITY CAMERAS, CARD ACCESS FOR DOORS, OUTDOOR GATEWAY LIGHTING, ETC.). FF&E ELECTRICAL WILL INCLUDE:
   a. ICE ROOM EQUIPMENT SUPPLIED AS AN EQUIPMENT PACKAGE, INCLUDING CHILLERS, PUMPS, COOLING TOWER, AND RELATED CONTROL PANELS AND ELECTRICAL.
   b. DHU AND RELATED CONTROLS.
   c. BUILDING SECURITY CAMERAS.
   d. DOOR ACCESS SECURITY SYSTEMS.
   e. SPECIALTY LIGHTING AND SOUND SYSTEMS.
   f. PA SYSTEMS.
   g. GATEWAY LIGHTING SYSTEMS.
   h. SCOREBOARD.
   i. LANDSCAPE LIGHTING AT BACKLIT SIGN AT STREET, AND LF FIXTURES AT FRONT OF BUILDING.
2. FFE AND FFE SUBS SHALL COORDINATE WITH CS CONTRACTOR ON SIZES AND LOCATIONS OF RACEWAYS TO FFE EQUIPMENT. FFE COORDINATION BUDGET SHALL INCLUDE AT LEAST WEEKLY 2-HOUR LONG MEETINGS WITH FFE SUBS AND CS CONTRACTOR TO SCHEDULE TIMING AND DURATION OF FFE SUB WORK, AND TO COORDINATE SIZES AND LOCATIONS FOR RACEWAY INSTALLATIONS TO SERVE FFE EQUIPMENT.
3. FFE AND FFE SUBS SHALL PREPARE, SUBMIT AND UPDATE AS NEEDED PLANS FOR INSTALLATION OF FFE EQUIPMENT USING RACEWAYS INSTALLED BY CS CONTRACTOR.

CORE AND SHELL (CS) CONTRACTOR SCOPE:

1. CS SCOPE INCLUDES BUILDING INFRASTRUCTURE, ELECTRICAL SERVICE AND DISTRIBUTION PANELS, UPS, BUILDING LIGHTING, GROUNDING, FIRE DETECTION AND ALARM SYSTEMS, PLUMBING AND MECHANICAL SYSTEMS. CS ALSO PROVIDES ALL CONDUITS AND RACEWAYS FOR FFE SCOPE ITEMS, SO FFE AND FFE SUB CAN PULL WIRES AND INSTALL THEIR DEVICES. CS ELECTRICAL WILL INCLUDE:
   a. ELECTRICAL FOR BUILDING INFRASTRUCTURE SYSTEMS, INCLUDING DWP SERVICE TRANSFORMER AND RELATED EQUIPMENT, SWITCHBOARD, MCC, UPS, BUILDING LIGHTING SYSTEMS, BUILDING GROUNDING SYSTEMS, AND WIRING OF HVAC AND PLUMBING SCOPE ITEMS AS SHOWN ON CONTRACT ELECTRICAL DRAWINGS.
   b. ELECTRICAL INSTALLATIONS FOR BUILDING FIRE DETECTION AND ALARM SYSTEMS THROUGHOUT THE FACILITY, WHICH WILL BE PROVIDED AS DEFERRED SUBMITTALS TO CITY DBS.
   c. OUTDOOR ELECTRICAL WIRING AS SHOWN ON CONTRACT ELECTRICAL DRAWINGS FOR OUTDOOR LIGHTING, STORMWATER PUMPS, ETC.
2. ELECTRICAL DRAWINGS SHOW PRELIMINARY LAYOUT FOR CONDUITS TO BE INSTALLED BY CS CONTRACTOR TO SERVE FFE EQUIPMENT. THESE RACEWAYS ARE SHOWN WITH DASHED LINES TO DISTINGUISH THEM FROM CONDUITS SERVICE CS SCOPE EQUIPMENT (E.G. HVAC EQUIPMENT). CS CONTRACTOR NEEDS TO COORDINATE WITH FFE AND CONFIRM LOCATIONS AND SIZES FOR THESE CONDUITS WITH FFE SUBS PRIOR TO PURCHASE AND INSTALLATION OF RACEWAYS.
3. CS SHALL BUDGET TIME AS REQUIRED FOR COORDINATION WITH FFE SPECIALTY SUBCONTRACTORS (E.G. EXPECT ICE SYSTEM SUB, SECURITY SUB, SPECIALTY SOUND AND LIGHTING SUB) IN BID AMOUNT. CS COORDINATION BUDGET SHALL INCLUDE WEEKLY 2-HOUR LONG MEETINGS WITH FFE SUBS TO SCHEDULE TIMING AND DURATION OF FFE SUB WORK, AND TO COORDINATE SIZES AND LOCATIONS FOR RACEWAY INSTALLATIONS.
4. CS NEEDS TO COORDINATE SCHEDULES WITH FFE AND FFE SUBS AND PROVIDE SPACE AND ACCESS FOR FFE INSTALLATION.
5. CS SHALL SUBMIT PRELIMINARY PLAN FOR COORDINATION WITH FFE SUBS WITHIN 2 WEEKS OF NTP. THE COORDINATION PLAN SHALL PRESENT PLANS FOR RACEWAYS TO SERVE FFE EQUIPMENT THAT ARE COORDINATED WITH RACEWAYS THAT WILL SERVE CS EQUIPMENT. THE COORDINATION PLAN SHALL ALSO ESTIMATE TIMING AND DURATION OF WORK BY FFE SUBS. CS SHALL UPDATE THIS COORDINATION PLAN AS NEEDED TO SUPPORT THE CONSTRUCTION SCHEDULE BASED ON INPUT FROM FFE AND FFE SUBS.
6. CS CONTRACTOR AND ELECTRICAL SUBCONTRACTOR SHALL COORDINATE WIRING REQUIREMENTS WITH FF&E SUBCONTRACTORS AND PROVIDE A COORDINATED SYSTEM OF RACEWAYS FOR BOTH CS AND FFE SCOPES OF WORK. ELECTRICAL SUBCONTRACTOR SHALL SUBMIT PROPOSED ELECTRICAL RACEWAY LAYOUTS FOR ARCHITECT APPROVAL PRIOR TO ELECTRICAL INSTALLATIONS, AND PRIOR TO SUBMITTAL OF RELATED ELECTRICAL SHOP DRAWINGS. IN GENERAL:
   a. POWER AND CONTROL WIRING BETWEEN DWP SERVICE AND ELECTRICAL ROOM IS EXPECTED TO BE ROUTED UNDER FLOOR SLABS.
   b. POWER AND CONTROL WIRING TO ICE ROOM EQUIPMENT IS EXPECTED TO BE ROUTED WITHIN OR UNDER FLOOR SLABS.
   c. EXPECT CABLE TRAY AROUND PERIMETER OF SPRUNG STRUCTURE, AND COORDINATED RACEWAYS INSIDE DOME OF SPRUNG STRUCTURE, TO INCLUDE VARIOUS WIRING AS APPROPRIATE. SELECTION OF CABLE TRAY AND RACEWAYS WITHIN DOME WILL CONSIDER AESTHETICS AND INTERIOR APPEARANCE.
   d. WIRING WITHIN RESTROOMS AND LOCKER ROOMS IS EXPECTED TO BE INSTALLED EITHER OVERHEAD, INSIDE WALLS, OR IN FLOOR SLABS, DEPENDING ON LOCATION OF ITEMS TO BE WIRED.

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REVISION DATES (DESIGN STAGE ONLY)

Sheet Version 4.0

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Design Construction

REGISTERED PROFESSIONAL ENGINEER
ROBERT D. GETTER
No. E 21884
Exp. 06-30-23
ELECTRICAL
11/17/2021

THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED

BUREAU OF ENGINEERING
VERTICAL CONTROL:
HORIZONTAL CONTROL:
SHEET TITLE: ELECTRICAL LEGEND
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

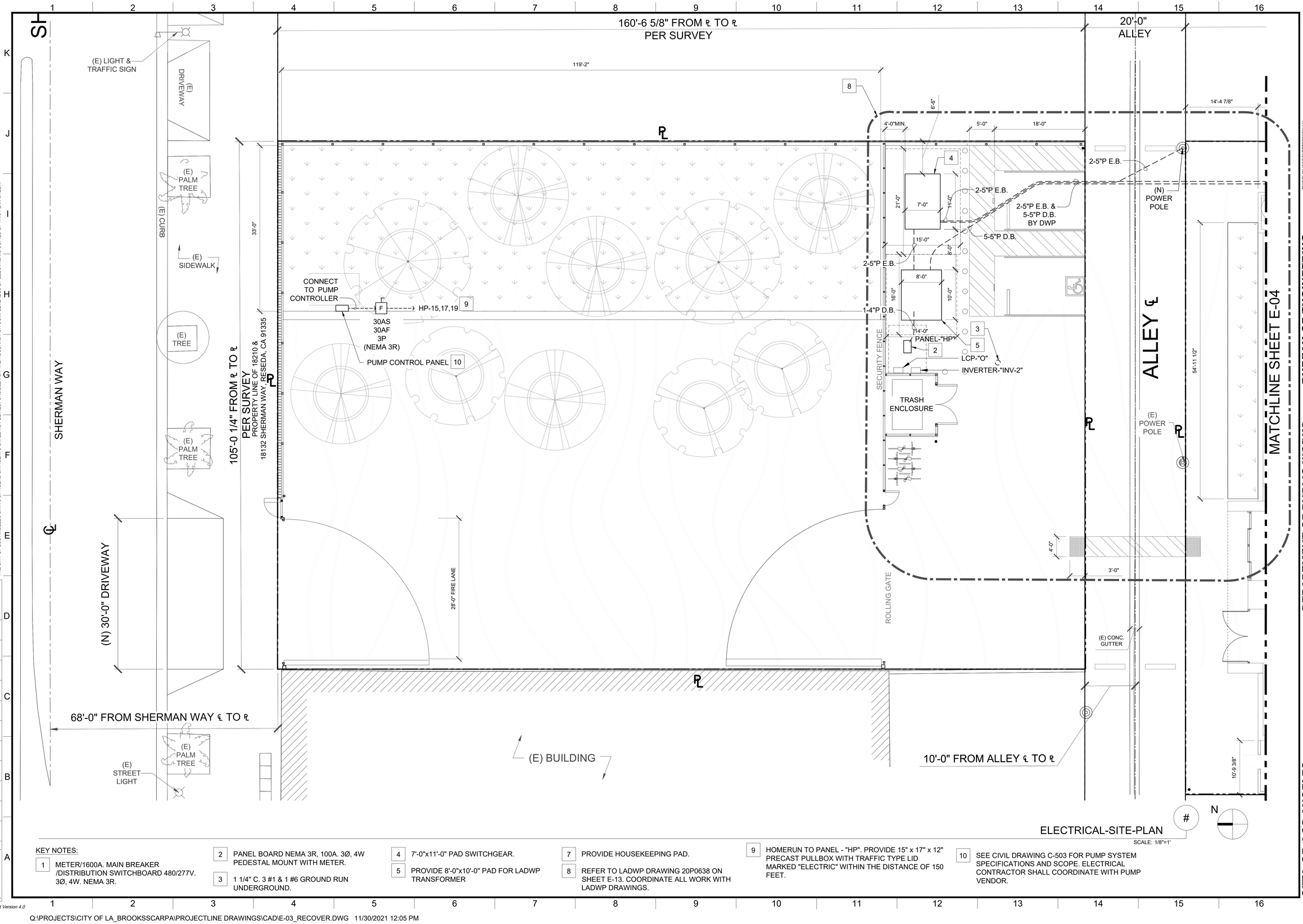
DEPARTMENT OF PUBLIC WORKS
CITY OF LOS ANGELES
GARY LEE MOORE, P.E., ENV SP
CITY ENGINEER
DATE:
DESIGN GROUP
ENGINEER: RGETTER
DESIGNED BY: ACARRIE
DRAWN BY: JCHIN
CHECKED BY: RHUBATCH
APPROVED BY: XX

BY:
DATE:
NO. REVISIONS:

CIP NO.
INDEX NO.
WORK ORDER NO. E170121B

SHEET NAME E-02
SHEET X OF X SHEETS

Q:\PROJECTS\CITY OF LA_BROOKSSCARPA\PROJECTLINE DRAWINGS\CAD\E-02.DWG 11/30/2021 12:06 PM



ELECTRICAL-SITE-PLAN

SCALE: 1/8"=1'

KEY NOTES:

1. METER/1600A. MAIN BREAKER /DISTRIBUTION SWITCHBOARD 480/277V. 3Ø, 4W. NEMA 3R.
2. PANEL BOARD NEMA 3R, 100A. 3Ø, 4W PEDESTAL MOUNT WITH METER.
3. 1 1/4" C. 3 #1 & 1 #6 GROUND RUN UNDERGROUND.
4. 7'-0"x11'-0" PAD SWITCHGEAR.
5. PROVIDE 8'-0"x10'-0" PAD FOR LADWP TRANSFORMER
7. PROVIDE HOUSEKEEPING PAD.
8. REFER TO LADWP DRAWING 20P0638 ON SHEET E-13. COORDINATE ALL WORK WITH LADWP DRAWINGS.
9. HOMERUN TO PANEL - "HP". PROVIDE 15" x 17" x 12" PRECAST PULLBOX WITH TRAFFIC TYPE LID MARKED "ELECTRIC" WITHIN THE DISTANCE OF 150 FEET.
10. SEE CIVIL DRAWING C-503 FOR PUMP SYSTEM SPECIFICATIONS AND SCOPE. ELECTRICAL CONTRACTOR SHALL COORDINATE WITH PUMP VENDOR.

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REVISION DATES (RESCAN STAGES ONLY)

Sheet Version 4.0

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Design Standards

REGISTERED PROFESSIONAL ENGINEER
ROBERT D. GOETTER
No. E 21884
Exp. 06-30-23
ELECTRICAL
11/17/2021

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED

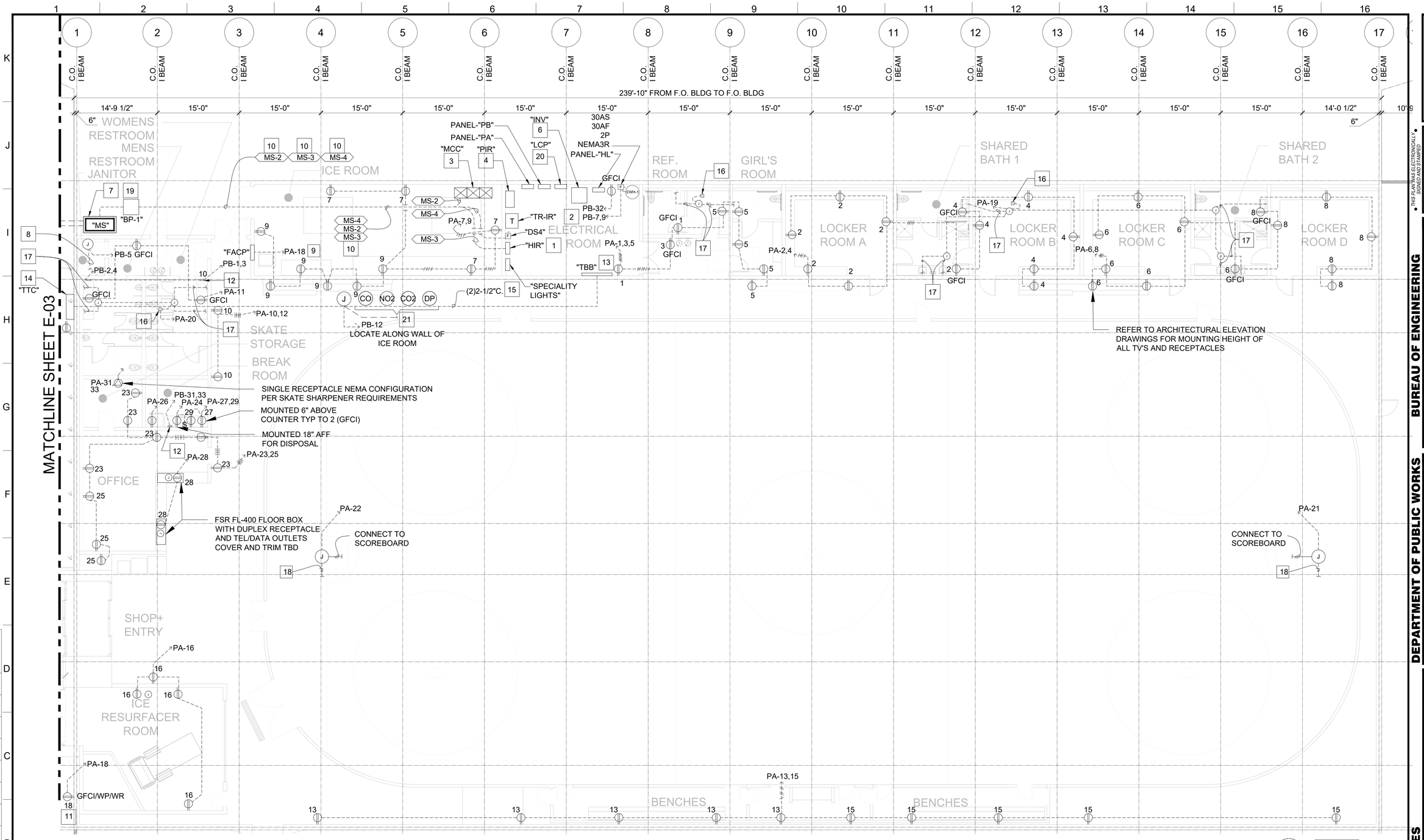
BUREAU OF ENGINEERING
VERTICAL CONTROL:
HORIZONTAL CONTROL:
SHEET TITLE: ELECTRICAL SITE PLAN
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

DEPARTMENT OF PUBLIC WORKS
NO. | REVISIONS: | DATE: | BY:
CIP NO.
INDEX NO.

CITY OF LOS ANGELES
GARY LEE MOORE, P.E., ENV SP
CITY ENGINEER
DESIGN GROUP
DATE:
ENGINEER: RGOETTER
DESIGNED BY: ACARRIE
DRAWN BY: JCHIN
CHECKED BY: RHUBATCH
APPROVED BY: XX

WORK ORDER NO.
E170121B

SHEET NAME
E-03
SHEET X OF X SHEETS



POWER PLAN

SCALE: 1/8"=1'-0"

01

N

KEY NOTES:

1. 480/277V. 3Ø, 4W DIST. PANEL
2. TRANSFORMER 480V-208/120V. 3Ø, 4W.
3. 480/277V. MOTOR CONTROL CENTER.
4. 208/120V. 3Ø, 4W. DIST. PANEL
5. PANEL BOARDS.
6. INVERTER.
7. MAIN SWITCH BOARD - MS.
8. CONNECT TO FLOW SWITCH & TAMPER SWITCH.
9. PROVIDE LOCK ON DEVICE ON THE BREAKER.
10. REFER TO SINGLE LINE DIAGRAM & LOAD SUMMARY/FEEDER SCHEDULE FOR SIZE OF CONDUIT & CONDUCTORS ON SHEET E-08.
11. RECEPTACLE FOR PROJECTOR LIGHTS.
12. TANKLESS WATER HEATER
13. TELEPHONE BACKBOARD 4' X 8' X 3/4" THK. TREATED
14. TELEPHONE TERMINAL CABINET 2' X 2' X 6" DEPTH, NEMA 3R
15. FOR TELEPHONE/DATA RUN UNDERGROUND.
16. TRANSFORMER FOR SINK SENSOR 120VAC-24VDC MOUNTED ABOVE CEILING SPACE. SUPPLIED BY PLUMBING INSTALLED BY ELECTRICAL.
17. CONNECT TO LAVATORY SENSOR. COORDINATED WORK WITH PLUMBING
18. PROVIDE (2) 3/4" C. AND CONNECT TO SCORER'S TABLE. RUN CONDUIT IN THE CEILING THRU WALL NEAR THE SCORER'S TABLE AND RUN UNDERGROUND TO THE SCORER'S TABLE
19. UNDERGROUND PRECAST PULLBOX 4' X 4' X 3'
20. LIGHTING CONTROL PANEL HOSTING ALL WIRELESS CONTROLS
21. CONNECT POWER TO CARBON MONOXIDE AND OTHER FFE AIR QUALITY INSTRUMENTS

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Contractor

REGISTERED PROFESSIONAL ENGINEER
ROBERT D. GETTER
No. E 21884
Exp. 06-30-23
ELECTRICAL
11/17/2021

THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED

DEPARTMENT OF PUBLIC WORKS
BUREAU OF ENGINEERING

VERTICAL CONTROL:
HORIZONTAL CONTROL:

SHEET TITLE: POWER PLAN
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

NO.	REVISIONS:	BY:	DATE:

CIP NO.

INDEX NO.

CITY OF LOS ANGELES
GARY LEE MOORE, P.E., ENV SP
CITY ENGINEER

DESIGN GROUP

		DATE:
ENGINEER:	RGETTER	
DESIGNED BY:	ACARRIE	
DRAWN BY:	JCHIN	
CHECKED BY:	RHUBATCH	
APPROVED BY:	XX	

WORK ORDER NO.
E170121B

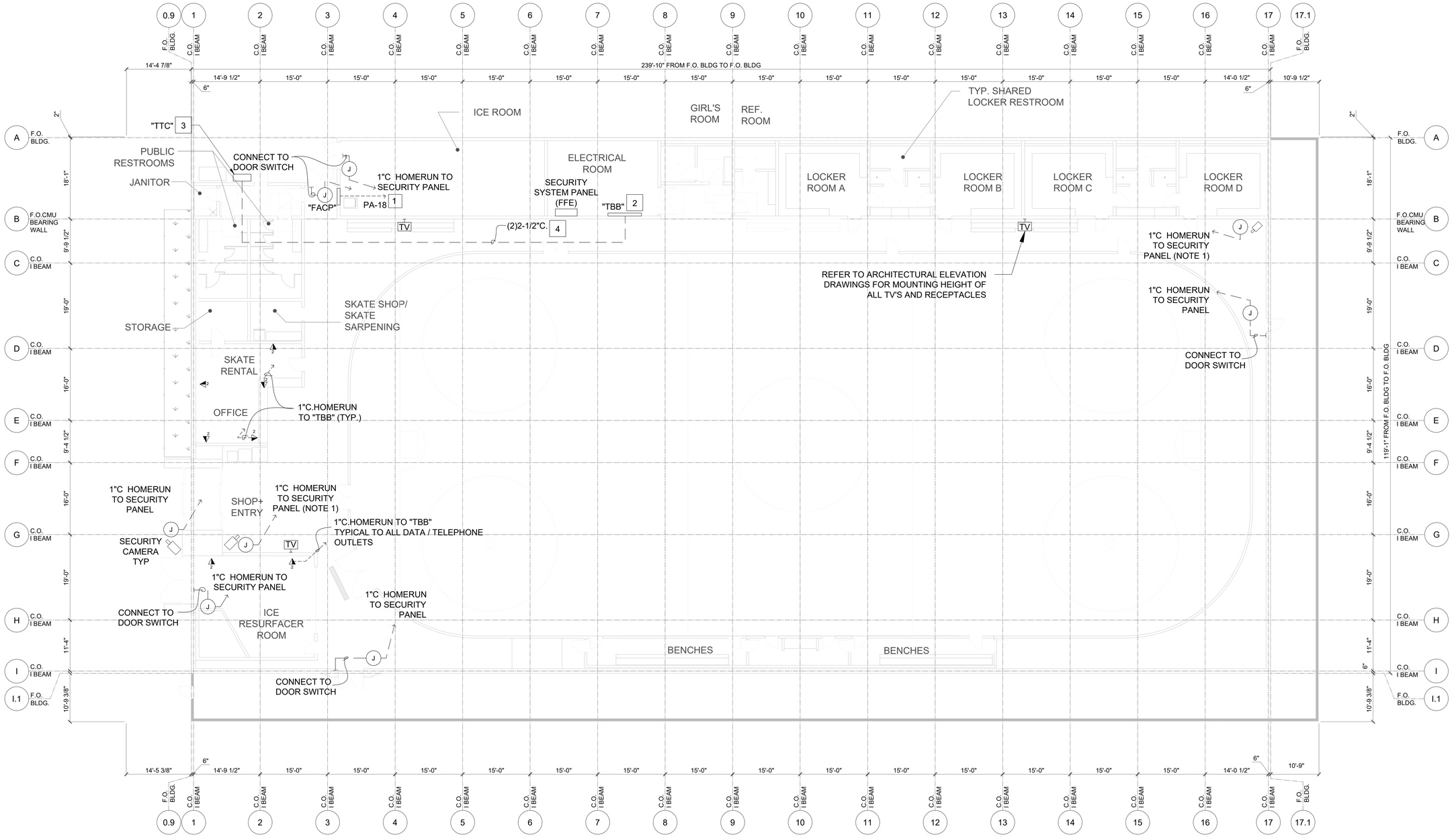
SHEET NAME
E-04
SHEET X OF X SHEETS

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REVISION DATES (DESIGN STAGE ONLY)

Sheet Version 4.0

Q:\PROJECTS\CITY OF LA_BROOKSSCARPA\PROJECTLINE DRAWINGS\CAD\E-04.DWG 11/30/2021 12:29 PM



LOW VOLTAGE PLAN

01

SCALE: 3/32"=1'-0"

N

KEY NOTES:

1. PROVIDE LOCK ON DEVICE ON THE BREAKER
2. TELEPHONE BACKBOARD 4' X 8' X 3/4" THK. TREATED
3. TELEPHONE TERMINAL CABINET 2' X 2' X 6" DEPTH, NEMA 3R
4. FOR TELEPHONE/DATA RUN UNDERGROUND.

NOTES:

1. PROVIDE SECURITY CAMERAS WHERE INDICATED, WITH WIRING TO SECURITY SYSTEM PANEL LOCATED IN ELECTRICAL ROOM. SECURITY CAMERAS SHALL BE TBD, OR EQUAL.
2. SEE FP DRAWINGS FOR FIRE DETECTION, ALARM AND SPRINKLER REQUIREMENTS.
3. SEE E-02 FOR DESCRIPTION OF FFE CONTRACT VS. CORE AND SHELL CONTRACT SCOPES OF WORK AND COORDINATION REQUIREMENTS.
4. CONTRACTOR SHALL PROVIDE CONDUITS AND JBs FOR FFE EQUIPMENT AS SHOWN. PROVIDE PULL WIRES IN CONDUITS FOR FFE INSTALLATION OF WIRING AND DEVICES. CONTRACTOR SHALL COORDINATE WITH FFE FOR ARRANGEMENT OF CONDUITS AND JBs.

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REVISION DATES (DESIGN STAGE ONLY)

Sheet Version 4.0

Q:\PROJECTS\CITY OF LA_BROOKSSCARPA\PROJECTLINE DRAWINGS\CAD\E-05.DWG 11/30/2021 11:58 AM

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Design Group

REGISTERED PROFESSIONAL ENGINEER
ROBERT D. GETTER
No. E 21884
Exp. 06-30-23
ELECTRICAL
11/17/2021

THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED

BUREAU OF ENGINEERING

VERTICAL CONTROL:
HORIZONTAL CONTROL:

SHEET TITLE: FIRE ALARM AND LOW VOLTAGE

PROJECT: RESEDA SKATE FACILITY

ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

DEPARTMENT OF PUBLIC WORKS

NO.	REVISIONS:	DATE:	BY:

CIP NO.

INDEX NO.

CITY OF LOS ANGELES

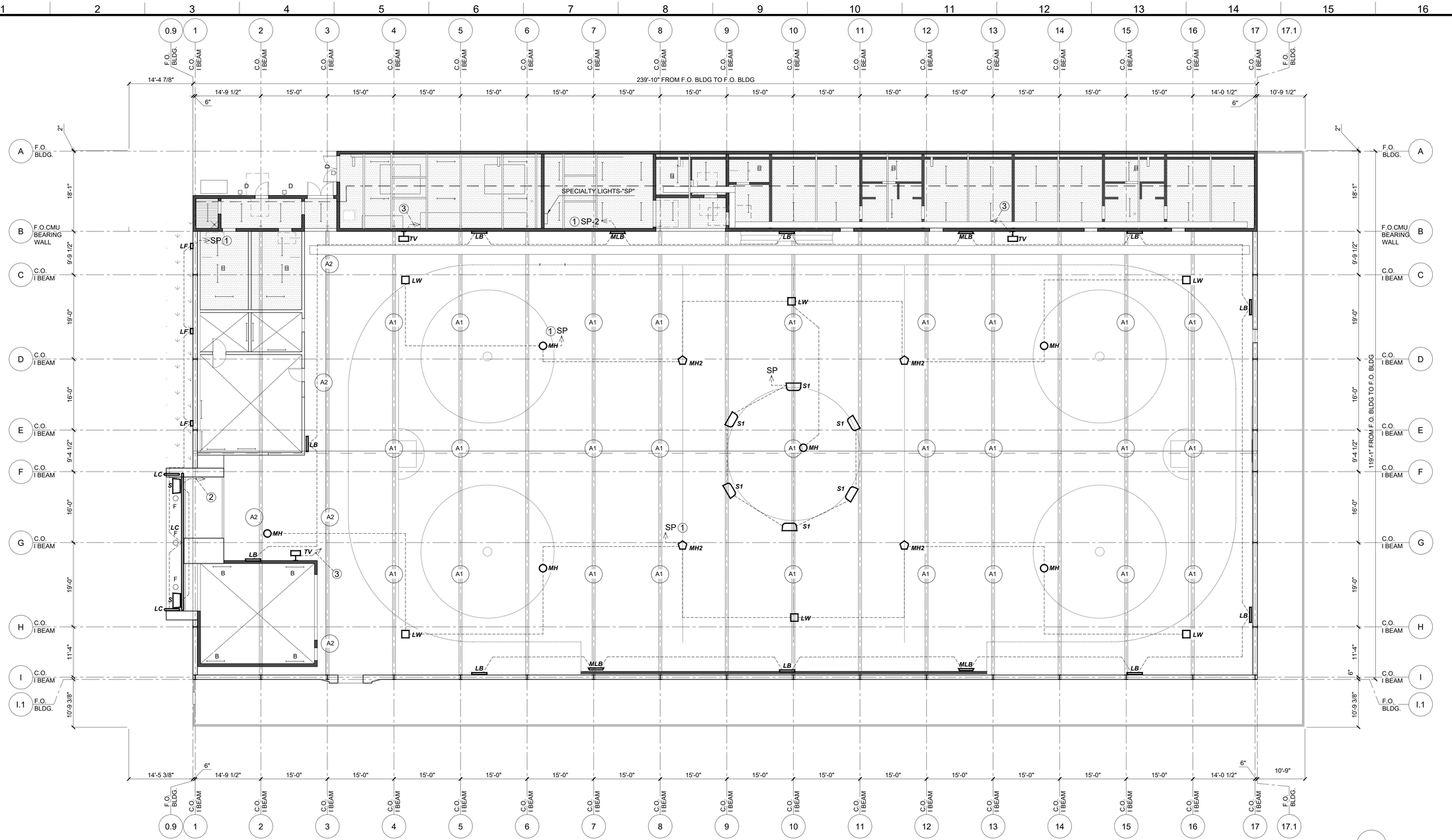
GARY LEE MOORE, P.E., ENV SP
DESIGN GROUP

CITY ENGINEER
DATE:

ENGINEER: RGETTER
DESIGNED BY: ACARRIE
DRAWN BY: JCHIN
CHECKED BY: RHUBATCH
APPROVED BY: XX

WORK ORDER NO.
E170121B

SHEET NAME
E-05
SHEET X OF X SHEETS



AUDIOVISUAL/ SPECIALTY LIGHTING RCP

SCALE: 3/32"=1'-0"

01

NOTES:

1. SEE A7.00A FOR AUDIOVISUAL/SPECIALTY LEGEND.
2. ALL ITEMS SHOWN IN REFLECTED CEILING PLAN ARE WALL MOUNTED OR SUSPENDED UNLESS NOTED OTHERWISE. CONTRACTOR TO VERIFY QUANTITY, FINAL LOCATION & HEIGHT WITH OWNER & ARCHITECT.
3. SEE E-02 FOR DESCRIPTION OF FFE CONTRACT VS. CORE AND SHELL CONTRACT SCOPES OF WORK AND COORDINATION REQUIREMENTS.
4. SEE E-02 FOR DESCRIPTION OF FFE CONTRACT VS. CORE AND SHELL CONTRACT SCOPES OF WORK AND COORDINATION REQUIREMENTS.
5. CONTRACTOR SHALL PROVIDE CONDUITS AND JBs FOR FFE EQUIPMENT AS SHOWN. PROVIDE PULL WIRES IN CONDUITS FOR FFE INSTALLATION OF WIRING AND DEVICES. CONTRACTOR SHALL COORDINATE WITH FFE FOR ARRANGEMENT OF CONDUITS AND JBs.

LEGEND:

LC	LED BAR 1 METER IP65 (OUTDOOR RATED)
LB	LED BAR 1 METER 6W
LF	WHITE LED FLOOD
LW	UV WASH CANNON RGBA
LW	UV WASH CANNON
MH	MOVING HEAD 200W
MH2	LED WARM MOVING HEAD
MLB	LED BAR (MOTORIZED)
S	OUTDOOR SURFACE SPEAKER
S1	HIGH POWERED 2WAY SURFACE SPEAKER

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

REGISTERED PROFESSIONAL ENGINEER
ROBERT D. GETTER
No. E 21884
Exp. 06-30-23
ELECTRICAL
11/17/2021

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED •

DEPARTMENT OF PUBLIC WORKS
BUREAU OF ENGINEERING

VERTICAL CONTROL:
HORIZONTAL CONTROL:

SHEET TITLE: SPECIALTY LIGHTING & EQUIPMENT RCP (FF&E)
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

NO.	REVISIONS:	DATE:	BY:

CIP NO.

INDEX NO.

CITY OF LOS ANGELES
GARY LEE MOORE, P.E., ENV SP
CITY ENGINEER

DESIGN GROUP | DATE:

ENGINEER: RGETTER
DESIGNED BY: ACARRIE
DRAWN BY: JCHIN
CHECKED BY: RHUBATCH
APPROVED BY: XX

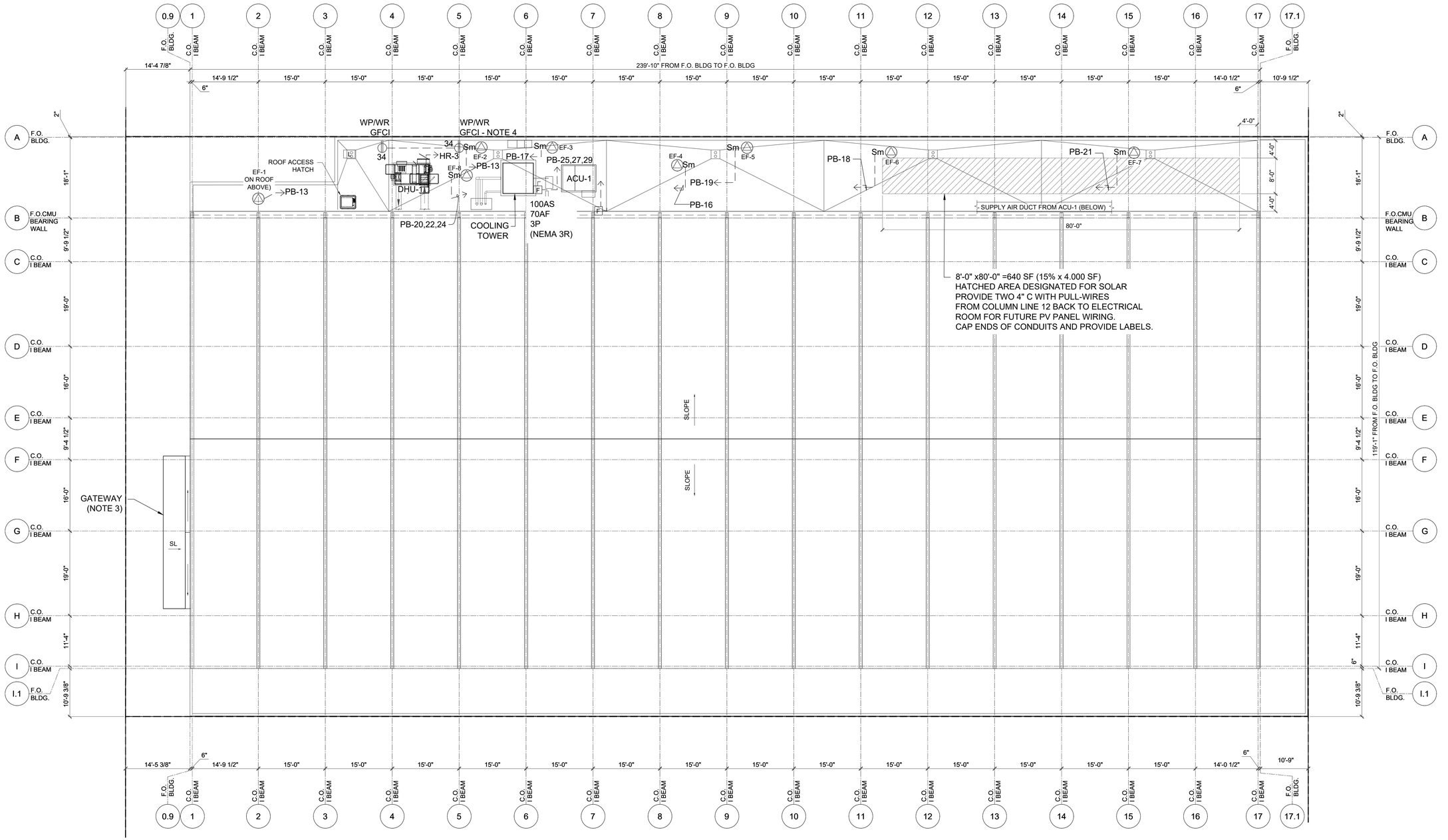
WORK ORDER NO.
E170121B

SHEET NAME
E-05.1
SHEET X OF X SHEETS

REVISION DATES
(DESIGN STAGE ONLY)

Sheet Version 4.0

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.



ROOF PLAN 01

SCALE: 3/32" = 1'-0"

NOTES:

1. ROOF FROM COLUMN LINES A.1 TO B.17 IS LOW, FLAT ROOF FOR CMU STRUCTURE.
2. ROOF FROM COLUMN LINES B.1 TO I.17 IS MEMBRANE ROOF WITH 42 FT H DOME. SEE ARCHITECTURAL DRAWINGS FOR SECTIONS AND DETAILS SHOWING MEMBRANE ROOF AND DOME.
3. ROOF BETWEEN COLUMN LINES F AND H, AND NORTH OF COLUMN LINE 1, IS GATEWAY ENTRANCE ROOF. SEE ARCHITECTURAL DRAWINGS FOR SECTIONS AND DETAILS SHOWING GATEWAY ENTRANCE.
4. PROVIDE WP/WR GFCI WITHIN 25 FT. OF ACU-1

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED

REGISTERED PROFESSIONAL ENGINEER ROBERT D. GETTER No. E 21884 Exp. 06-30-23 ELECTRICAL STATE OF CALIFORNIA 11/17/2021

BUREAU OF ENGINEERING

VERTICAL CONTROL:
HORIZONTAL CONTROL:

SHEET TITLE: ELECTRICAL ROOF LAYOUT PLAN
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

DEPARTMENT OF PUBLIC WORKS

NO.	REVISIONS:	DATE:	BY:

CIP NO.

INDEX NO.

CITY OF LOS ANGELES

GARY LEE MOORE, P.E., ENV SP
CITY ENGINEER
DESIGN GROUP
DATE:

ENGINEER: RGETTER
DESIGNED BY: ACARRIE
DRAWN BY: JCHIN
CHECKED BY: RHUBATCH
APPROVED BY: XX

WORK ORDER NO. E170121B

SHEET NAME E-06

SHEET X OF X SHEETS

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REVISION DATES (DESIGN STAGE ONLY)

Sheet Version 4.0

Q:\PROJECTS\CITY OF LA_BROOKSSCARPA\PROJECTLINE DRAWINGS\CAD\E-06.DWG 11/30/2021 11:56 AM

Track Electrical Service Installation Status

Address: 18210 SHERMAN WY, LOS ANGELES

Overall Job Progress:

11% Complete

Electric Meter Installation:

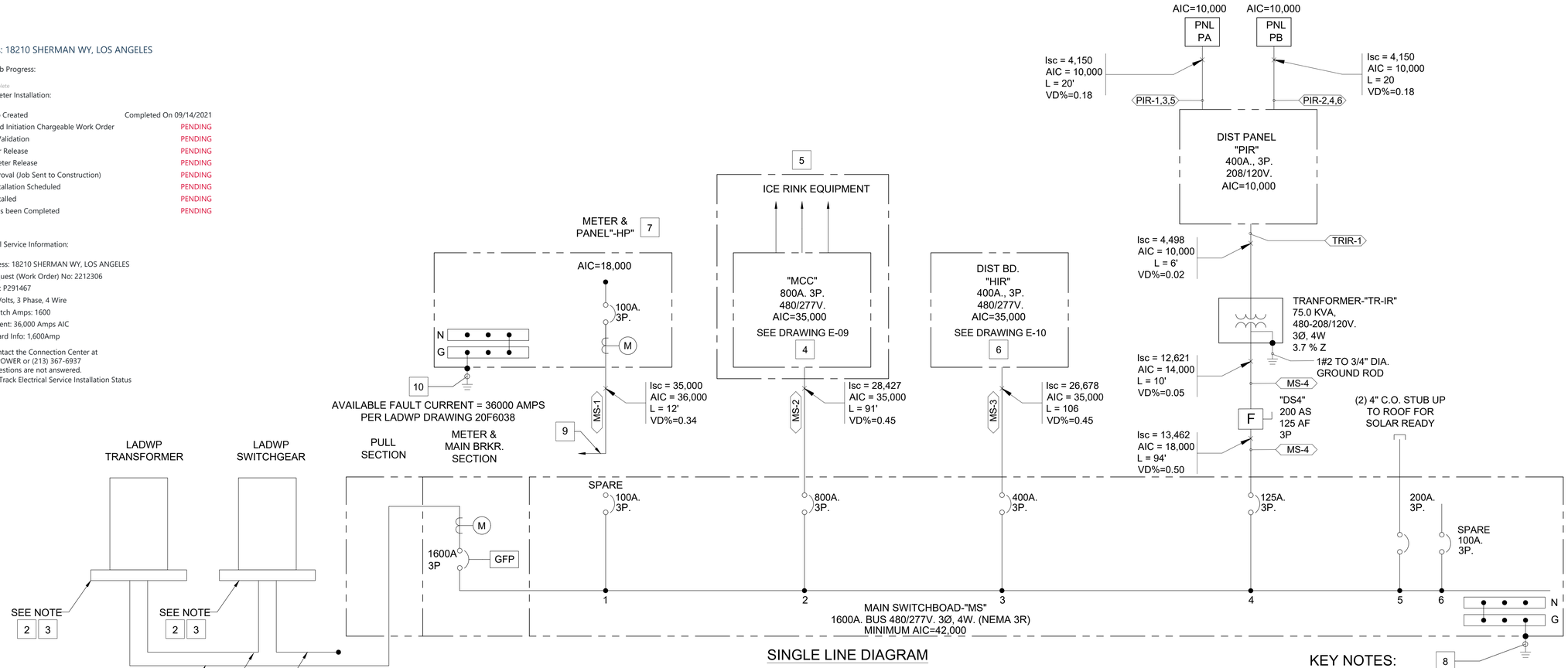
Meter Job Created	Completed On 09/14/2021
Completed Initiation Chargeable Work Order	PENDING
Address Validation	PENDING
ESR Meter Release	PENDING
LADBS Meter Release	PENDING
Final Approval (Job Sent to Construction)	PENDING
Meter Installation Scheduled	PENDING
Meter Installed	PENDING
Project has been Completed	PENDING

Additional Service Information:

Job Address: 18210 SHERMAN WY, LOS ANGELES
Work Request (Work Order) No: 2212306
Project ID: P291467
277/480 Volts, 3 Phase, 4 Wire
Meter Switch Amps: 1600
Fault Current: 36,000 Amps AIC
Switchboard Info: 1,600Amp

Please contact the Connection Center at
(213) EMPOWER or (213) 367-6937
if your questions are not answered.
© 2021 - Track Electrical Service Installation Status

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.



SINGLE LINE DIAGRAM

MS - LOAD SUMMARY & FEEDER SCHEDULE — LOCATION: OUTDOOR

ENCLOSURE: NEMA-3R — DOUBLE ENDED BUS — 1,600 AMP BUS

VOLTAGE: 277/480V,3P,4W — 42,000 AIC SYM, MINIMUM — 1,600 AMP MAIN CB

FEEDER			NO. OF SETS	CONDUIT (INCHES)	CONDUCTORS (AWG)	GROUND (AWG)	CONNECTED LOAD		FEEDER LENGTH*	VOLTAGE DROP	REMARKS
NUMBER	FROM	TO					AMPS	KVA			
MS-1											SPARE
MS-2	MS	MCC	2	4"	4 # 600KCMIL	2/0	599.34	498.05			
MS-3	MS	HIR	1	4"	4 # 600KCMIL	3	261.2	217.07			
MS-4	MS	DS4	1	2"	4 # 1/0	6					
DS4-1	DS4	TR-IR	1	2"	4 # 1	6					
TR-IR1	TI-IR	PIR	1	3"	4 # 250KCMIL	4	92.77	77.1			
								780.92	SUBTOTAL		
									25% OF LARGEST MOTOR		
							953.3	792.22	TOTAL LOAD		

* FEEDER LENGTH IN FEET ARE INDICATED FOR VOLTAGE DROP CALCULATION ONLY AND SHALL NOT BE USED FOR QUANTITY TAKEOFFS.

KEY NOTES:

1. SEE ELECTRICAL SITE PLAN, DRAWING E-03 FOR ROUTING OF CONDUIT.
2. SEE ELECTRICAL SITE PLAN, DRAWING E-03 FOR LOCATION AND SIZES OF PADS.
3. CONTRACTOR SHALL COORDINATE WORK WITH LADWP DRAWING & INSTALLATION REQUIREMENTS..
4. REFER TO SINGLE LINE DIAGRAM-"MCC" FOR LOAD SERVED.
5. EQUIPMENT SUPPLIED AND INSTALLED BY FF&E CONTRACTOR
6. REFER TO SINGLE LINE DIAGRAM "HIR" FOR LOAD SERVED.
7. METER/PANEL WITH 30 CIRCUITS, 100 A, 3 PHASE, 480/277 V., NEMA 3R. REFER TO SITE PLAN FOR LOCATION.
8. #2/0 GROUND TO 3/4" DIA. x 10' COPPER GROUND ROD, BUILDING STEEL AND NEAREST COLD WATER PIPE.
9. TO LADWP TRANSFORMATION REFER TO SITE PLAN ON SHEET E-03 FOR ROUTING OF CONDUIT AND REFER TO LADWP DESIGN DRAWING #20P0638. PROVIDE 4"C., 4 #1 &1 #8 GROUND.
10. #6 GROUND TO 3/4" DIA x 10' GROUND ROD AND USER UFER GROUND

REVISION DATES (DESIGN STAGE ONLY)

Sheet Version 4.0

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Design Consultant

THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED
REGISTERED PROFESSIONAL ENGINEER ROBERT D. GETTER No. E 21884 Exp. 06-30-23 ELECTRICAL
11/17/2021

BUREAU OF ENGINEERING
VERTICAL CONTROL:
HORIZONTAL CONTROL:
SHEET TITLE: SINGLE LINE DIAGRAM & SCHEDULE "MS"
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

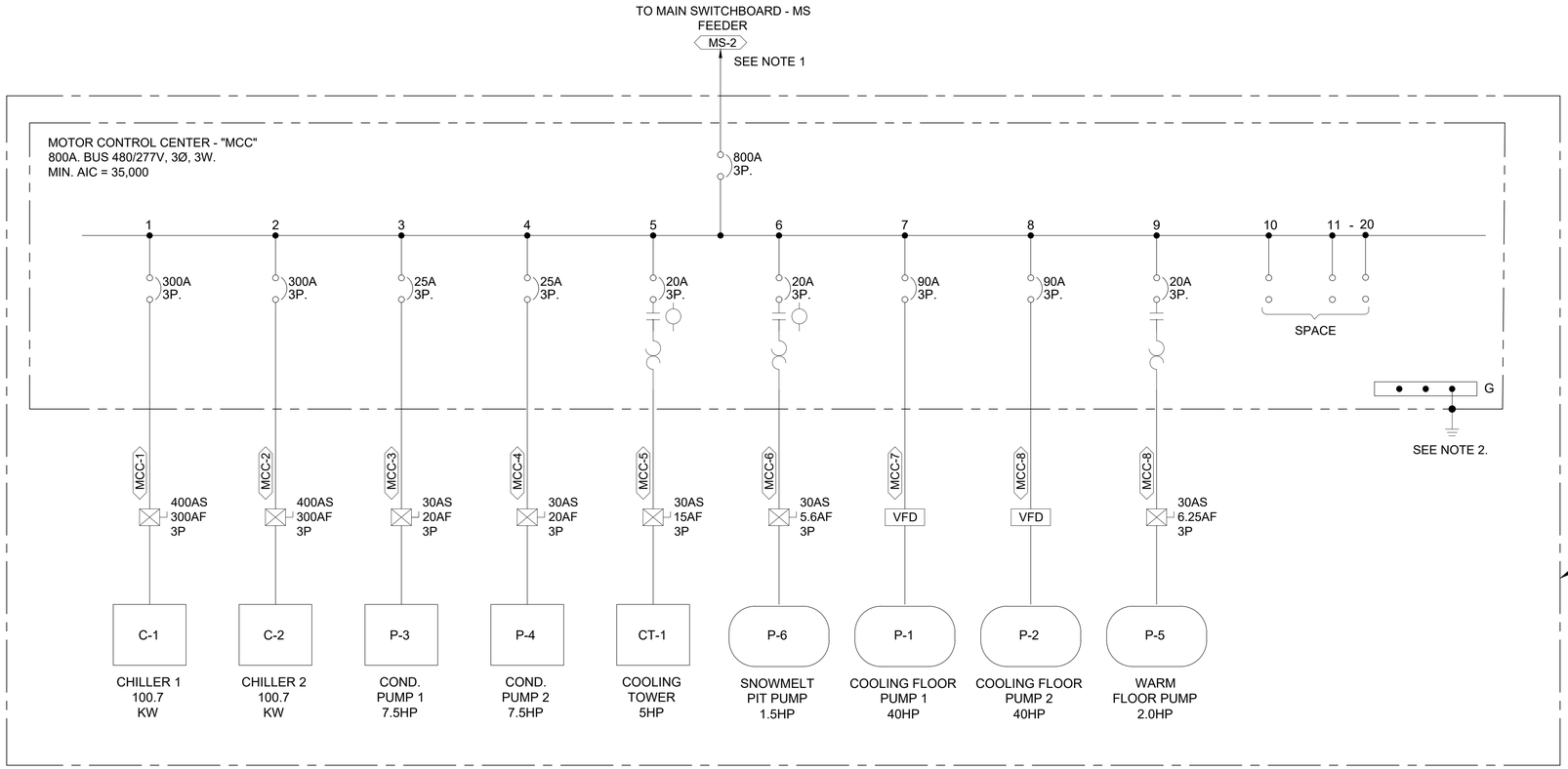
DEPARTMENT OF PUBLIC WORKS
BY:
DATE:
NO. REVISIONS:
CIP NO.
INDEX NO.

CITY OF LOS ANGELES
GARY LEE MOORE, P.E., ENV SP
CITY ENGINEER
DATE:
DESIGN GROUP
ENGINEER: RGETTER
DESIGNED BY: ACARRIE
DRAWN BY: JCHIN
CHECKED BY: RHUBATCH
APPROVED BY: XX

WORK ORDER NO.
E170121B

SHEET NAME
E- 07
SHEET X OF X SHEETS

Q:\PROJECTS\CITY OF LA_BROOKSSCARPA\PROJECTLINE DRAWINGS\CAD\E-07.DWG 12/6/2021 8:05 AM



WORK ON THIS BRACKET ARE BY FACILITY FURNISHINGS AND EQUIPMENT (FF&E) CONTRACTOR

SINGLE LINE DIAGRAM - "MCC"

NTS

MCC - LOAD SUMARY & FEEDER SCHEDULE

ENCLOSURE: NEMA-1 — LOCATION: INDOOR

VOLTAGE: 480V, 3P, 3W — 35,000 AIC SYM, MINIMUM — DOUBLE ENDED BUS — 800 AMP BUS — 800 AMP MAIN CB

FEEDER			NO. OF SETS	CONDUIT (INCHES)	CONDUCTORS (AWG)	GROUND (AWG)	CONNECTED LOAD		FEEDER LENGTH*	VOLTAGE DROP	REMARKS
NUMBER	FROM	TO					AMPS	KVA			
MCC-1	MCC	C-1	1	3"	3 # 350 KCMIL	4	183.83	152.76	-		
MCC-2	MCC	C-2	1	3"	3 # 350 KCMIL	4	183.83	152.76	-		
MCC-3	MCC	P-3	1	3/4"	3 # 10	12	11.00	9.14	-		
MCC-4	MCC	P-4	1	3/4"	3 # 10	12	11.00	9.14	-		
MCC-5	MCC	CT-1	1	3/4"	3 # 12	12	7.60	6.32	-		
MCC-6	MCC	P-6	1	3/4"	3 # 12	12	3.00	2.49	-		
MCC-7	MCC	P-1	1	1 1/2"	3 # 2	8	52.00	43.21	-		
MCC-8	MCC	P-2	1	1 1/2"	3 # 2	8	52.00	43.21	-		
MCC-9	MCC	P-5	1	3/4"	3 # 12	12	3.40	2.83			
								421.87	SUBTOTAL		
								38.19	25% OF LARGEST MOTOR		
							553.36	460.06	TOTAL LOAD		

* FEEDER LENGTH IN FEET ARE INDICATED FOR VOLTAGE DROP CALCULATION ONLY AND SHALL NOT BE USED FOR QUANTITY TAKEOFFS.

NOTES:

1. FOR CONTINUATION, REFER TO MAIN SWITCHBOARD SINGLE LINE DIAGRAM - "MS", FEEDER MS-2, ON SHEET E0.08 AND SITE PLAN ON SHEET E0.05 FOR ROUTING OF CONDUIT
2. #2/0 GROUND WIRE TO 3/4" DIA x 10' GROUND ROD, UFER GROUND AND BUILDING STEEL.

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Design Standards

REGISTERED PROFESSIONAL ENGINEER
ROBERT D. GETTER
No. E 21884
Exp. 06-30-23
ELECTRICAL
11/17/2021

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED •

BUREAU OF ENGINEERING
VERTICAL CONTROL:
HORIZONTAL CONTROL:
SHEET TITLE: SINGLE LINE DIAGRAM & SCHEDULE-"MCC"
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

DEPARTMENT OF PUBLIC WORKS
CITY OF LOS ANGELES
GARY LEE MOORE, P.E., ENV SP
CITY ENGINEER:
DATE:
DESIGN GROUP
ENGINEER: RGETTER
DESIGNED BY: ACARRIE
DRAWN BY: JCHIN
CHECKED BY: RHUBATCH
APPROVED BY: XX

NO. | REVISIONS: | DATE: | BY:

CIP NO.

INDEX NO.

WORK ORDER NO.
E170121B

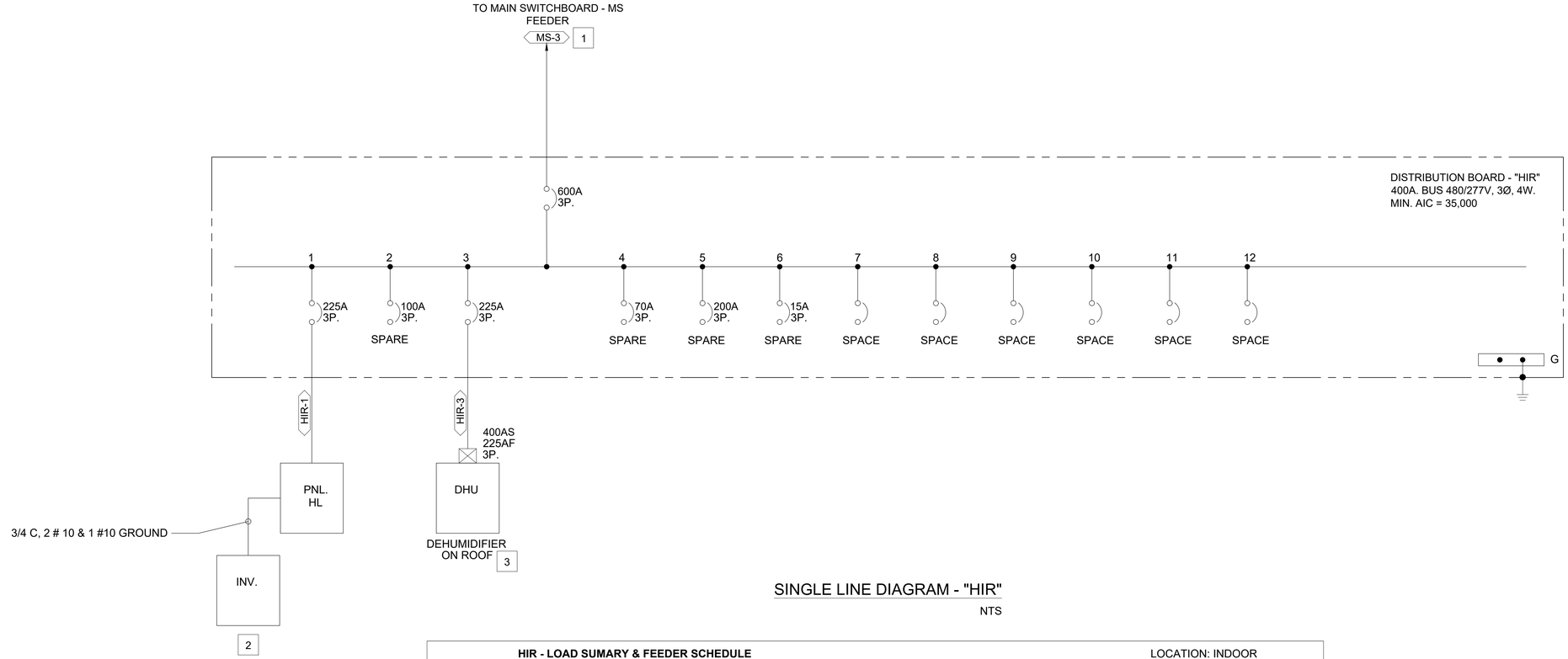
SHEET NAME
E-08
SHEET X OF X SHEETS

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REVISION DATES (RESEARCH STAGES ONLY)

Sheet Version 4.0

Q:\PROJECTS\CITY OF LA_BROOKSSCARPA\PROJECTLINE DRAWINGS\CAD\E-08.DWG 12/6/2021 8:04 AM



SINGLE LINE DIAGRAM - "HIR"

NTS

HIR - LOAD SUMARY & FEEDER SCHEDULE

LOCATION: INDOOR

ENCLOSURE: NEMA-1 — DOUBLE ENDED BUS — 400 AMP BUS

VOLTAGE: 277/480V, 3P, 4W — 35,000 AIC SYM, MINIMUM — 400 AMP MAIN CB

FEEDER			NO. OF SETS	CONDUIT (INCHES)	CONDUCTORS (AWG)	GROUND (AWG)	CONNECTED LOAD		FEEDER LENGTH*	VOLTAGE DROP	REMARKS
NUMBER	FROM	TO					AMPS	KVA			
HIR-1	HIR	HL	1	2"	4 # 1/0	6	32.40	27.00	31	0.05%	
HIR-2	HIR	SPARE	1						-		
HIR-3	HIR	DHU	1	2 1/2"	3 # 4/0	4	183.00	152.07	45'	0.24%	
HIR-4	HIR	SPARE							-		
HIR-5	HIR	SPARE									
HIR-6											
HIR-7											
HIR-8											
HIR-8											
HIR-8											
HIR-9											
HIR-10											
HIR-11											
HIR-12											
HIR-13											
								179.07	SUBTOTAL		
								38.0	25% OF LARGEST MOTOR		
							261.20	217.07	TOTAL LOAD		

* FEEDER LENGTH IN FEET ARE INDICATED FOR VOLTAGE DROP CALCULATION ONLY AND SHALL NOT BE USED FOR QUANTITY TAKEOFFS.

KEY NOTES:

1. FOR CONTINUATION, REFER TO MAIN SWITCHBOARD SINGLE LINE DIAGRAM - "MS", FEEDER MS-3, DRAWING E-05
2. LIGHTING INVERTER-"INV" BY MYERS EMERGENCY POWER SYSTEMS. 7.0 KVA. 277 INPUT 277 OUTPUT. MYERS MODEL # 1CR-5-G-N-A-20-8
3. DHU PROVIDED BY FFE CONTRACTOR. COORDINATE WIRING REQUIREMENTS WITH FFE.

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REVISION DATES
(DESIGN STAGE ONLY)

Sheet Version 4.0

Q:\PROJECTS\CITY OF LA_BROOKSSCARPA\PROJECTLINE DRAWINGS\CAD\E-09.DWG 12/7/2021 7:44 AM

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Design Standard

REGISTERED PROFESSIONAL ENGINEER
ROBERT D. GETTER
No. E 21884
Exp. 06-30-23
ELECTRICAL
11/17/2021

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED •

BUREAU OF ENGINEERING
VERTICAL CONTROL:
HORIZONTAL CONTROL:
SHEET TITLE: SINGLE LINE DIAGRAM & FEEDER SCHEDULE-"HIR"
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

DEPARTMENT OF PUBLIC WORKS
NO. | REVISIONS: | DATE: | BY:
CIP NO.
INDEX NO.

CITY OF LOS ANGELES
GARY LEE MOORE, P.E., ENV SP
CITY ENGINEER
DATE:
DESIGN GROUP
ENGINEER: RGETTER
DESIGNED BY: ACARRIE
DRAWN BY: JCHIN
CHECKED BY: RHUBATCH
APPROVED BY: XX

WORK ORDER NO.
E170121B

SHEET NAME
E-09
SHEET X OF X SHEETS

PIR — **CB OPT:** — 10kA **AIC RATING**

VOLTAGE : 120/208 VOLTS 3 PHASE, 4 WIRE

BUS RATING : 400 AMPS

MAIN : 250A MCB

OPTIONS: SURFACE MOUNTED

LOCATION: ELECTRICAL ROOM

		C N		CB	C O	PHASE			C O	CB		C N		
		K O	LOAD SERVED		B P				B P		LOAD SERVED	K O		
LOAD TYPE	LOAD (VA)	T		AMP/P	T	A	B	C	T	AMP/P		T	LOAD (VA)	LOAD TYPE
MISC	6100	1	PANEL PA	150/3		A				150/3	PANEL PB	2	19951	MISC
MISC	6620	3	-	-			B			-	-	4	20564	MISC
MISC	7167	5	-	-				C		-	-	6	17404	MISC
		7	SPARE	150/3		A				150/3	SPARE	8		
		9	-	-			B			-	-	10		
		11	-	-				C		-	-	12		
		13	SPARE	20/1		A				20/1	SPARE	14		
		15	SPARE	20/1			B			20/1	SPARE	16		
		17	SPARE	20/1				C		20/1	SPARE	18		
		19	SPARE	20/1		A				20/1	SPARE	20		
		21	SPARE	20/1			B			20/1	SPARE	22		
		23	SPACE					C			SPACE	24		
		25	SPACE			A					SPACE	26		
		27	SPACE				B				SPACE	28		
		29	SPACE					C			SPACE	30		
		31	SPACE			A					SPACE	32		
		33					B					34		
		35						C				36		
		37				A						38		
		39					B					40		
		41						C				42		

EXISTING METERED LOAD X 125%	PHASE A	PHASE B	PHASE C	FEED THROUGH PANEL		LOAD (kVA)

PANEL CALCULATIONS:								SUB FEED LOADS	AMP/P		LOAD TYPE
LOAD TYPE	LOAD (VA)		DEMAND FACTOR	DEMAND LOAD							
RECEPTACLE	0		PER NEC ARTICLE 220.14	0		VA					
LIGHTING	0.00		125%	0		VA		LOAD SUMMARY			
MOTOR	0.00		100%	0		VA		CONNECTED LOAD		VA	AMPS
0 KITCHEN	0.00		100%	0		VA		PHASE A		26051	217.1
0 ELEVATORS	0.00		100%	0		VA		PHASE B		27184	226.5
HEAT	0.00		100%	0		VA		PHASE C		24571	204.8
MISC	77806.00		100%	77806.00		VA					
	0			0		VA		TOTAL CONNECTED LOAD		77.8	kVA
	0.0000		100%	0		VA		TOTAL DEMAND LOAD		77.8	kVA
25% OF LARGEST MOTOR				0		VA		LINE TO LINE VOLTAGE		208.0	VOLTS
								PANEL AMPS		216.0	AMPS

PB — **CB OPT:** — 10kA **AIC RATING**

VOLTAGE : 120/208 VOLTS 3 PHASE, 4 WIRE

BUS RATING : 225 AMPS

MAIN : 225A MCB

OPTIONS: SURFACE MOUNTED

LOCATION: ELECTRICAL ROOM

		C N		CB	C O	PHASE			C O	CB		C N		
		K O	LOAD SERVED		B P				B P		LOAD SERVED	K O		
LOAD TYPE	LOAD (VA)	T		AMP/P	T	A	B	C	T	AMP/P		T	LOAD (VA)	LOAD TYPE
MOTOR	3500	1	TANKLESS WATER HEATER	40/2		A					SPARE	2		
MOTOR	3500	3	-	-			B			40/2	TANKLESS WATER HEATER	4	3500	MOTOR
MOTOR	2375	5	EWH	30/2				C		-	-	6	3500	MOTOR
MOTOR	2375	7	-	-		A				30/2	SPARE	8		
		9	SPARE	30/2			B			-	-	10		
		11	SPACE	-				C		20/1	CARBON DIOXIDE	12	200	MISC
MOTOR	660	13	EF-1A	20/1		A				20/1	EF-2	14	660	MOTOR
		15	SPARE				B			-	EF-4	16	525	MOTOR
MOTOR	525	17	EF-3	20/1				C		-	EF-6	18	656	MOTOR
MOTOR	656	19	EF-5	20/1		A				20/3	EF-8	20	623	MOTOR
MOTOR	656	21	EF-7	20/1			B			-	----	22	623	MOTOR
		23		20/1				C		-	----	24	623	MOTOR
MOTOR	9525	25	ACU-1	70/3		A				20/1	SPARE	26		
MOTOR	9525	27	----	-			B			20/1	SPARE	28		
MOTOR	9525	29	----	-				C		20/1	SPARE	30		
MOTOR	1875	31	TANKLESS WATER HEATER	20/2		A				20/1	HWCP	32	77	MOTOR
MOTOR	1875	33	-	-			B			20/1	RECEPTACLE	34	360	RECEPTACLE
		35	-	-				C		20/1	SPARE	36		
		37	SPARE	20/1		A				20/1	SPARE	38		
		39	SPACE	20/1			B			20/1	SPARE	40		
		41	SPARE	20/1				C		20/1	SPARE	42		

EXISTING METERED	PHASE A	PHASE B	PHASE C	FEED THROUGH PANEL		LOAD (kVA)
LOAD X 125%						

PANEL CALCULATIONS:								SUB FEED LOADS	AMP/P		LOAD TYPE
LOAD TYPE	LOAD (VA)		DEMAND FACTOR	DEMAND LOAD							
RECEPTACLE	360		PER NEC ARTICLE 220.14	360		VA					
LIGHTING	0		125%	0		VA		LOAD SUMMARY			
MOTOR	57359		100%	57359		VA		CONNECTED LOAD		VA	AMPS
0 KITCHEN	0		100%	0		VA		PHASE A		19951	166.3
0 ELEVATORS	0		100%	0		VA		PHASE B		20564	171.4
HEAT	0		100%	0		VA		PHASE C		17404	145.0
MISC	200		100%	200		VA					
	0			0		VA		TOTAL CONNECTED LOAD		57.9	kVA
	0		100%	0		VA		TOTAL DEMAND LOAD		65.1	kVA
25% OF LARGEST MOTOR				7144		VA		LINE TO LINE VOLTAGE		208	VOLTS
								PANEL AMPS		180.0	AMPS

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Design Consultant

REGISTERED PROFESSIONAL ENGINEER — ROBERT D. GETTER — No. E 21884 — Exp. 06-30-23 — ELECTRICAL — STATE OF CALIFORNIA
11/17/2021

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED •

BUREAU OF ENGINEERING
VERTICAL CONTROL:
HORIZONTAL CONTROL:
SHEET TITLE: PANEL SCHEDULE 1 OF 3
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

DEPARTMENT OF PUBLIC WORKS

NO.	REVISIONS:	DATE:	BY:

CIP NO.
INDEX NO.

CITY OF LOS ANGELES
CITY ENGINEER
GARY LEE MOORE, P.E., ENV SP
DATE:
DESIGN GROUP
ENGINEER: RGETTER
DESIGNED BY: ACARRIE
DRAWN BY: JCHIN
CHECKED BY: RHUBATCH
APPROVED BY: XX

WORK ORDER NO.
E170121B

SHEET NAME
E-10
SHEET X OF X SHEETS

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REVISION DATES (DESIGN STAGE ONLY)

Sheet Version 4.0

Q:\PROJECTS\CITY OF LA_BROOKSSCARPA\PROJECTLINE DRAWINGS\CAD\E-10.DWG 12/6/2021 8:03 AM

PA

CB OPT:

10 kA AIC RATING

VOLTAGE : 120/208 VOLTS 3 phase, 4 wire

BUS RATING : 225 AMPS

MAIN : 150A MCB

LOCATION: ELECTRICAL ROOM

OPTIONS

SURFACE MOUNTED

		C N		CB	C O	PHASE			C O	CB		C N		
		K O	LOAD SERVED		B P				B P		LOAD SERVED	K O		
LOAD TYPE	LOAD (VA)	T		AMP/P	T	A	B	C	T	AMP/P		T	LOAD (VA)	LOAD TYPE
RECEPTACLE	360	1	ELECT RM/GIRL'SRESTRM	20/1		A					LOCKER RM 1/ RESTRM	2	1080	RECEPTACLE
RECEPTACLE	600	3	DRINKING FOUNTAIN	20/1			B			20/1	LOCKER RM 2/ RESTRM	4	1080	RECEPTACLE
RECEPTACLE	900	5	REF ROOM	20/1				C		20/1	LOCKER RM 3/RESTRM	6	1260	RECEPTACLE
RECEPTACLE	720	7	ICE ROOM	20/1		A				20/1	LOCKER RM 4/RESTRM	8	1080	RECEPTACLE
RECEPTACLE	900	9	ICE ROOM	20/1			B			20/1	SKATE SHOP/RENTAL	10	720	RECEPTACLE
RECEPTACLE	360	11	PUBLIC RESTROOM	20/1				C		20/1	SKATE SHOP/RENTAL	12	720	RECEPTACLE
RECEPTACLE	900	13	BENCHES	20/1		A				20/1	SPARE	14		
RECEPTACLE	900	15	BENCHES	20/1			B			20/1	ICE RESURFACER ROOM	16	720	RECEPTACLE
MISC	100	17	LAVATORY SENSORS	20/1				C		20/1	PROJECTOR LIGHTS	18	200	LIGHTING
MISC	300	19	LAVATORY SENSORS	20/1		A				20/1	LAVATORY SENSORS	20	200	MISC
MISC	400	21	SCOREBOARD	20/1			B			20/1	SCOREBOARD	22	400	MISC
RECEPTACLE	900	23	SKATE RENTAL/OFFICE	20/1				C		20/1	DISPOSER	24	1127	MOTOR
RECEPTACLE	720	25	SKATE RENTAL/OFFICE	20/1		A				20/1	REFRIGERATOR	26	600	RECEPTACLE
RECEPTACLE	400	27	TOASTER	20/1			B			20/1	SKATE RENTAL/OFFICE	28	360	RECEPTACLE
RECEPTACLE	1600	29	MICROWAVE	20/1				C		20/1	SPARE	30		
MOTOR	140	31	SKATE SHARPENER	20/2		A				20/1	SPARE	32		
MOTOR	140	33	-	-			B			20/1	SPARE	34		
		35	SPACE	20/1				C		20/1	SPACE	36		
		37	SPACE	20/1		A				20/1	SPACE	38		
		39	SPACE	20/1			B			20/1	SPACE	40		
		41	SPACE	20/1				C		20/1	SPACE	42		

EXISTING METERED	PHASE A	PHASE B	PHASE C
LOAD X 125%			

PANEL CALCULATIONS:					
LOAD TYPE	LOAD (VA)	DEMAND FACTOR	DEMAND LOAD		
RECEPTACLE	16880	PER NEC ARTICLE 220.14	13440		VA
LIGHTING	200	125%	250		VA
MOTOR	1407	100%	1407		VA
0 KITCHEN	0	100%	0		VA
0 ELEVATORS	0	100%	0		VA
HEAT	0	100%	0		VA
MISC	1400	100%	1400		VA
	0		0		VA
	0	100%	0		VA
25% OF LARGEST MOTOR			282		VA

FEED THROUGH PANEL		LOAD (kVA)
SUB FEED LOADS	AMP/P	LOAD TYPE
LOAD SUMMARY		
CONNECTED LOAD	VA	AMPS
PHASE A	6100	50.8
PHASE B	6620	55.2
PHASE C	7167	59.7
TOTAL CONNECTED LOAD	19.9	kVA
TOTAL DEMAND LOAD	16.8	kVA
LINE TO LINE VOLTAGE	208.0	VOLTS
PANEL AMPS	46.6	AMPS

HL

CB OPT:

10kA **AIC RATING**

VOLTAGE : 277/480 VOLTS 3 PHASE, 4 WIRE

BUS RATING : 125 AMPS

MAIN : MLO

LOCATION: ELECTRICAL ROOM

OPTIONS

SURFACE MOUNTED

		C N		CB	C O	PHASE			C O	CB		C N		
		K O	LOAD SERVED		B P				B P		LOAD SERVED	K O		
LOAD TYPE	LOAD (VA)	T		AMP/P	T	A	B	C	T	AMP/P		T	LOAD (VA)	LOAD TYPE
LIGHTING	2425	1	SPARE	20/1		A				20/1	ICE RINK	2	3395	LIGHTING
LIGHTING	3395	3	ICE RINK	20/1			B			20/1	SKATE SHOP,OFFICE	4	346	LIGHTING
LIGHTING	346	5	ICE EQUIPT/ELECT RM	20/1				C		20/1	LOCKER ROOM	6	277	LIGHTING
LIGHTING	500	7	OUTDOOR	20/1		A				30/1	OUTDOOR	8	500	LIGHTING
		9	SPARE	20/1			B			20/1	ICE RINK	10	3395	LIGHTING
		11	SPARE	20/1				C		20/1	INVERTER	12	5600	LIGHTING
LIGHTING	1000	13	SPECIALITY LIGHTING	20/1		A				20/1	LCP	14	500	LIGHTING
		15	SPARE	20/1			B			20/1	SPARE	16		
		17	SPARE	20/1				C		20/1	SPARE	18		
		19		20/1		A				20/1	SPARE	20		
		21					B					22		
		23						C				24		
		25				A						26		
		27					B					28		
		29						C				30		
		31				A						32		
		33					B					34		
		35						C				36		
		37				A						38		
		39					B					40		
		41						C				42		

EXISTING METERED	PHASE A	PHASE B	PHASE C
LOAD X 125%			

PANEL CALCULATIONS:					
LOAD TYPE	LOAD (VA)	DEMAND FACTOR	DEMAND LOAD		
RECEPTACLE	0.00	PER NEC ARTICLE 220.14	0		VA
LIGHTING	21579.00	125%	26974		VA
MOTOR	0.00	100%	0		VA
0 KITCHEN	0.00	100%	0		VA
0 ELEVATORS	0.00	100%	0		VA
HEAT	0.00	100%	0		VA
MISC	0.00	100%	0		VA
	0.00		0		VA
	0.00	100%	0		VA
25% OF LARGEST MOTOR			0		VA

FEED THROUGH PANEL		LOAD (kVA)
SUB FEED LOADS	AMP/P	LOAD TYPE
LOAD SUMMARY		
CONNECTED LOAD	VA	AMPS
PHASE A	8320	30.0
PHASE B	7136	25.8
PHASE C	6123	22.1
TOTAL CONNECTED LOAD	21.6	kVA
TOTAL DEMAND LOAD	27.0	kVA
LINE TO LINE VOLTAGE	480.0	VOLTS
PANEL AMPS	32.4	AMPS

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Design Group

REGISTERED PROFESSIONAL ENGINEER
ROBERT D. GETTER
No. E 21884
Exp. 06-30-23
ELECTRICAL
11/17/2021

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED •

BUREAU OF ENGINEERING

VERTICAL CONTROL:
HORIZONTAL CONTROL:

SHEET TITLE: PANEL SCHEDULE 2 OF 3

PROJECT: RESEDA SKATE FACILITY

ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

DEPARTMENT OF PUBLIC WORKS

NO.	REVISIONS:	DATE:	BY:

CIP NO.

INDEX NO.

CITY OF LOS ANGELES
GARY LEE MOORE, P.E., ENV SP

CITY ENGINEER
DATE:
DESIGN GROUP
ENGINEER: RGETTER
DESIGNED BY: ACARRIE
DRAWN BY: JCHIN
CHECKED BY: RHUBATCH
APPROVED BY: XX

WORK ORDER NO.
E170121B

SHEET NAME
E-11
SHEET X OF X SHEETS

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REVISION DATES (DESIGN STAGE ONLY)

Sheet Version 4.0

Q:\PROJECTS\CITY OF LA_BROOKSSCARPA\PROJECTLINE DRAWINGS\CAD\E-10.DWG 11/30/2021 11:53 AM

INV — **CB OPT:** — 18kA **AIC RATING**

VOLTAGE : 277/480 VOLTS 1 PHASE, 3 WIRE

BUS RATING : 100 AMPS — **OPTIONS**

MAIN : MLO — SURFACE MOUNTED

LOCATION: ELECTRICAL ROOM

		C N		CB	C O	PHASE		C O	CB		C N		
		K O	LOAD SERVED		B P			B P		LOAD SERVED	K O		
LOAD TYPE	LOAD (VA)	T		AMP/ P	T	A	B	T	AMP/ P		T	LOAD (VA)	LOAD TYPE
LIGHTING	560	1	ICE/RESURF/OUTDOOR	20/1		A			20/1	ICE/ELECT/RESTRM/OUTDOOR	2	624	LIGHTING
LIGHTING	370	3	RESTRM/LOCKER RM	20/1			B		20/1	ICE RINK	4	1940	LIGHTING
LIGHTING	970	5	ICE RINK	20/1		A			20/1	SPARE	6		
		7	SPACE	20/1			B		20/1	SPACE	8		
		9				A					10		
		11					B				12		
		13				A					14		
		15					B				16		
		17				A					18		
		19					B				20		
		21				A					22		
		23					B				24		
		25				A					26		
		27					B				28		
		29				A					30		
		31					B				32		
		33				A					34		
		35					B				36		
		37				A					38		
		39					B				40		
		41				A					42		

EXISTING METERED	PHASE A	PHASE B		FEED THROUGH PANEL		LOAD (kVA)
LOAD X 125%						
PANEL CALCULATIONS:				SUB FEED LOADS	AMP/P	LOAD TYPE

LOAD TYPE	LOAD (VA)		DEMAND FACTOR	DEMAND LOAD		
RECEPTACLE	0		PER NEC ARTICLE 220.14	0		VA
LIGHTING	4464		125%	5580		VA
MOTOR	0		100%	0		VA
0 KITCHEN	0		100%	0		VA
0 ELEVATORS	0		100%	0		VA
HEAT	0		100%	0		VA
MISC	0		100%	0		VA
	0			0		VA
	0		100%	0		VA
25% OF LARGEST MOTOR				0		VA

LOAD SUMMARY			
CONNECTED LOAD		VA	AMPS
PHASE A		1184	4.3
PHASE B		2310	8.3
PHASE C		970	3.5
TOTAL CONNECTED LOAD		4.5	kVA
TOTAL DEMAND LOAD		5.6	kVA
LINE TO LINE VOLTAGE		480.0000	VOLTS
PANEL AMPS		6.7	AMPS

HP — **CB OPT:** — 10kA **AIC RATING**

VOLTAGE : 277/480 VOLTS 3 PHASE, 4 WIRE

BUS RATING : 100 AMPS — **OPTIONS**

MAIN : 100A MCB — NEMA 3R

LOCATION: OUTDOOR-NORTH LOT

		C N		CB	C O	PHASE		C O	CB		C N		
		K O	LOAD SERVED		B P			B P		LOAD SERVED	K O		
LOAD TYPE	LOAD (VA)	T		AMP/ P	T	A	B	T	AMP/ P		T	LOAD (VA)	LOAD TYPE
		1	SPARE	20/1		A			20/1	TYPE B	2	30	LIGHTING
		3	SPARE	20/1			B		20/1	TYPE B	4	30	LIGHTING
LIGHTING	1200	5	TYPE C	20/1		A			20/1	TYPE A	6	253	LIGHTING
LIGHTING	600	7	LCP-O	20/1			B		20/1	INVERTER-INV-2	8	3000	LIGHTING
		9	SPARE	20/1		A			20/1	SPACE	10		
		11	SPARE	20/1			B		20/1	SPARE	12		
		13	SPARE	20/1		A			20/1	SPARE	14		
MOTOR	4210	15	PUMP CONTROLLER	30/3			B		20/1	SPARE	16		
MOTOR	4210	17	-----	--		A			20/1	SPARE	18		
MOTOR	4210	19	-----	--			B		20/1	SPARE	20		
		21	SPARE	20/1		A			20/1	SPARE	22		
		23	SPARE				B		20/1	SPACE	24		
		25	SPARE			A			20/1	SPACE	26		
		27	SPARE				B		20/1	SPACE	28		
		29	SPARE			A			20/1	SPACE	30		
		31					B				32		
		33				A					34		
		35					B				36		
		37				A					38		
		39					B				40		
		41				A					42		

EXISTING METERED	PHASE A	PHASE B	PHASE C			FEED THROUGH PANEL			LOAD (kVA)
LOAD X 125%									
PANEL CALCULATIONS:						SUB FEED LOADS	AMP/P		LOAD TYPE

LOAD TYPE	LOAD (VA)		DEMAND FACTOR	DEMAND LOAD		
RECEPTACLE	0		PER NEC ARTICLE 220.14	0		VA
LIGHTING	5113		125%	6390		VA
MOTOR	12630		100%	12630		VA
0 KITCHEN	0		100%	0		VA
0 ELEVATORS	0		100%	0		VA
HEAT	0		100%	0		VA
MISC	0		100%	0		VA
	0			0		VA
	0		100%	0		VA
25% OF LARGEST MOTOR				3158		VA

LOAD SUMMARY			
CONNECTED LOAD		VA	AMPS
PHASE A		7840	28.3
PHASE B		4240	15.3
PHASE C		5663	20.4
TOTAL CONNECTED LOAD		17.7	kVA
TOTAL DEMAND LOAD		22.2	kVA
LINE TO LINE VOLTAGE		480	VOLTS
PANEL AMPS		26.7	AMPS

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REVISION DATES (DESIGN STAGE ONLY)

Sheet Version 4.0

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Design Standard

REGISTERED PROFESSIONAL ENGINEER — ROBERT D. GOETTER — No. E 21884 — Exp. 06-30-23 — ELECTRICAL — STATE OF CALIFORNIA — 11/17/2021

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED •

BUREAU OF ENGINEERING
VERTICAL CONTROL:
HORIZONTAL CONTROL:
SHEET TITLE: PANEL SCHEDULE 3 OF 3
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

DEPARTMENT OF PUBLIC WORKS
CITY ENGINEER — DATE:
DESIGN GROUP
ENGINEER: RGOTTER
DESIGNED BY: ACARRIE
DRAWN BY: JCHIN
CHECKED BY: RHUBATCH
APPROVED BY: XX
V'/ NO. | REVISIONS: | DATE: | BY:

CIP NO.
INDEX NO.

CITY OF LOS ANGELES
GARY LEE MOORE, P.E., ENV SP

WORK ORDER NO.
E170121B

SHEET NAME
E-12
SHEET X OF X SHEETS

Q:\PROJECTS\CITY OF LA_BROOKSSCARPA\PROJECTLINE DRAWINGS\CAD\E-10.DWG 11/30/2021 11:53 AM

INV 2 **CB OPT:** 10kA **AIC RATING**

VOLTAGE : 277/480 VOLTS 3 PHASE, 4 WIRE

BUS RATING : 100 AMPS **OPTIONS**

MAIN : 100A MCB NEMA 3R

LOCATION: OUTDOORS-NORTH LOT

		C N K O T	LOAD SERVED	CB AMP/P	C O B P T	PHASE A	PHASE B	C O B P T	CB AMP/P	LOAD SERVED	C N K O T	LOAD (VA)	LOAD TYPE
LOAD TYPE	LOAD (VA)												
LIGHTING	1138	1	TYPE-G	20/1		A			20/1	TYPE A	2	1044	LIGHTING
		3	SPARE	20/1			B		20/1	SPARE	4		
	1200	5	TYPE C	20/1		A			20/1	SPARE	6		
	600	7	SPARE	20/1			B		20/1	SPARE	8		
		9	SPARE	20/1		A			20/1	SPACE	10		
		11	SPARE	20/1			B		20/1	SPARE	12		
		13	SPARE	20/1		A			20/1	SPARE	14		
		15					B		20/1	SPARE	16		
		17				A			20/1	SPARE	18		
		19					B		20/1	SPARE	20		
		21				A			20/1	SPARE	22		
		23					B			SPACE	24		
		25				A				SPACE	26		
		27					B			SPACE	28		
		29				A				SPACE	30		
		31					B				32		
		33				A					34		
		35					B				36		
		37				A					38		
		39					B				40		
		41				A					42		

EXISTING METERED	PHASE A	PHASE B	PHASE C
LOAD X 125%			

PANEL CALCULATIONS:					
LOAD TYPE	LOAD (VA)		DEMAND FACTOR	DEMAND LOAD	
RECEPTACLE	0		PER NEC ARTICLE 220.14	0	VA
LIGHTING	2182		125%	2728	VA
MOTOR	0		100%	0	VA
0 KITCHEN	0		100%	0	VA
0 ELEVATORS	0		100%	0	VA
HEAT	0		100%	0	VA
MISC	0		100%	0	VA
	0			0	VA
	0		100%	0	VA
25% OF LARGEST MOTOR				0	VA

FEED THROUGH PANEL			LOAD (kVA)
SUB FEED LOADS	AMP/P		LOAD TYPE
LOAD SUMMARY			
CONNECTED LOAD		VA	AMPS
PHASE A		2128	7.9
PHASE B		0	0.0
PHASE C		0	0.0
TOTAL CONNECTED LOAD		2.2	kVA
TOTAL DEMAND LOAD		2.7	kVA
LINE TO LINE VOLTAGE		480	VOLTS
PANEL AMPS		3.3	AMPS

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REVISION DATES (DESIGN STAGE ONLY)

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Design Standards

REGISTERED PROFESSIONAL ENGINEER ROBERT D. GETTER No. E 21884 Exp. 06-30-23 STATE OF ELECTRICAL CALIFORNIA
11/17/2021

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED •

BUREAU OF ENGINEERING

VERTICAL CONTROL:
HORIZONTAL CONTROL:
SHEET TITLE: PANEL SCHEDULE 3 OF 3
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

DEPARTMENT OF PUBLIC WORKS

NO.	REVISIONS:	DATE:	BY:

CIP NO.
INDEX NO.

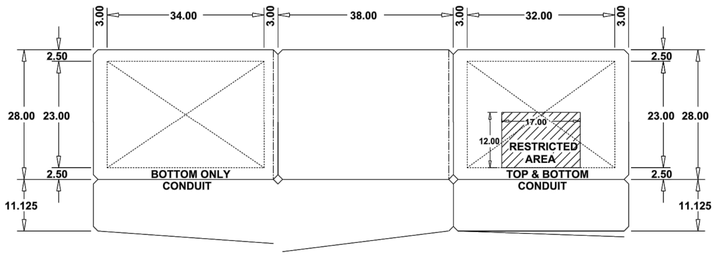
CITY OF LOS ANGELES
GARY LEE MOORE, P.E., ENV SP
CITY ENGINEER
DATE:
DESIGN GROUP
ENGINEER: RGETTER
DESIGNED BY: ACARRIE
DRAWN BY: JCHIN
CHECKED BY: RHUBATCH
APPROVED BY: XX

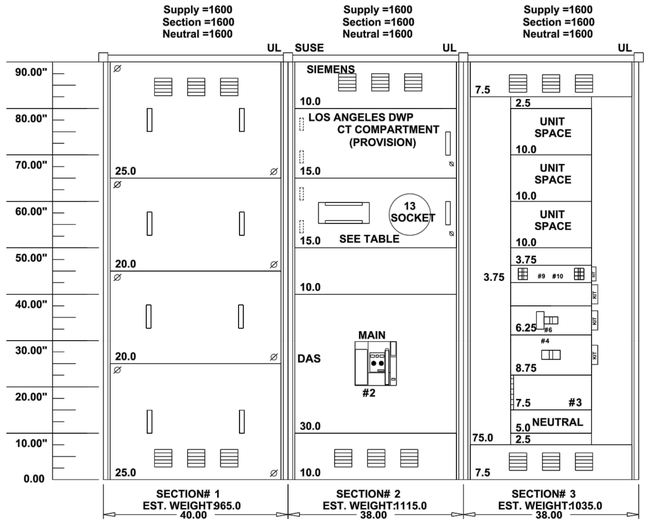
WORK ORDER NO.
E170121B

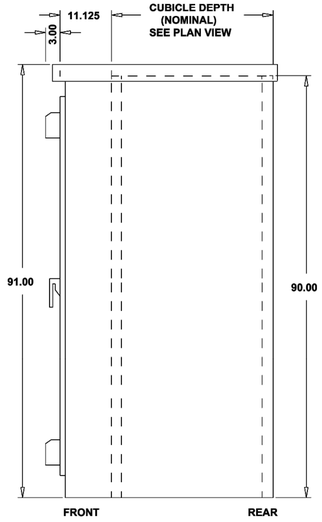
SHEET NAME
E-13
SHEET X OF X SHEETS

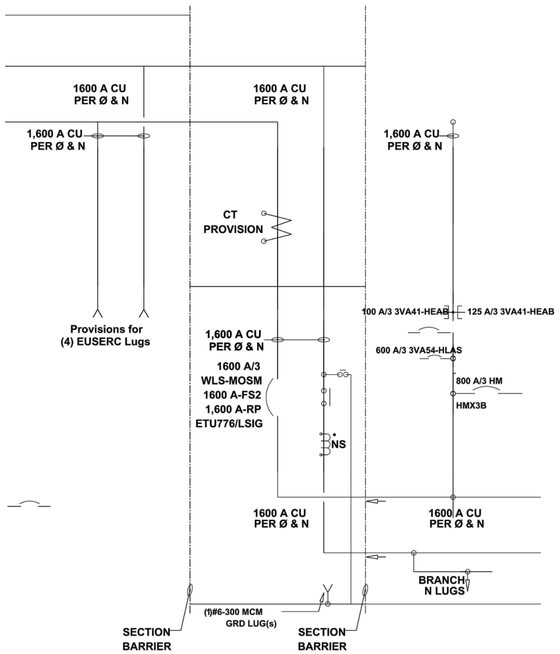
Sheet Version 4.0

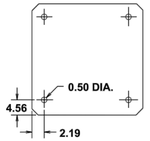
Q:\PROJECTS\CITY OF LA_BROOKSSCARPA\PROJECTLINE DRAWINGS\CAD\E-10.DWG 11/30/2021 11:52 AM











TYPICAL BOLTDOWN HOLE PROVISION FOR CUBICLE BOTTOM EACH SECTION

- INCOMING LUGS
- LOAD LUGS
- BARRIER
- NEUTRAL DISCONNECT LINK
- BONDING STRAP
- CONCEALED HINGES
- BARREL LOCK PROVISION
- SEALING DEVICE
- (S) STANDARD ACCURACY SEM3 METER
- (H) HIGH ACCURACY SEM3 METER
- (S P) STANDARD ACCURACY SEM3 METER w/ PULSE
- (H P) HIGH ACCURACY SEM3 METER w/ PULSE
- PROVISION DEVICE

NOTES

CONSTRUCTION	:SWITCHBOARD IS BUILT AND LABELED PER UL 891 IN EFFECT.
INCOMING	:AMPERES: 1,600
SERVICE	:SYSTEM VOLTAGE: 480Y/277 3Ø4W Wye AC
INTERRUPTING RATING	:THE SHORT CIRCUIT INTERRUPTING CAPABILITY IS 65,000 :RMS SYMMETRICAL AMPERES AT 480 VOLTS BASED ON THE LOWEST SHORT CIRCUIT CURRENT RATING OF THE INDIVIDUAL OR SERIES RATED COMBINATION DEVICES INSTALLED AT TIME OF MANUFACTURE OF BUSSING STRUCTURE. THE BUSSING STRUCTURE IS CONSTRUCTED TO WITHSTAND FAULTS OF 65,000 RMS SYMMETRICAL AMPERES.
ENCLOSURE	:ENCLOSURE IS TYPE NEMA 3R FOR OUTDOOR APPLICATION.
SEISMIC	:ENCLOSURE SHALL BE CONSTRUCTED TO MEET SEISMIC REQUIREMENTS.
EXTERIOR	:ANSI 61 LIGHT GREY PAINT.
TERMINATIONS	:TERMINATIONS ARE ACCESSIBLE FROM THE FRONT.
BUS BARS	:SILVER PLATED COPPER BUS BARS SIZED ON BASIS OF 65°C MAXIMUM TEMPERATURE RISE.
BUS BARS	:THE GROUND BUS IN THIS SWITCHBOARD IS Copper SIZED PER UL 891 OR GREATER.
UTILITY	:LOS ANGELES DWP
NAMEPLATE	:NAMEPLATES ATTACHED WITH ADHESIVE.
SECTION SKIDS	:SPECIAL SHIPPING SKID(S) REQUIRED FOR LARGE SECTIONS.

ABBREVIATIONS

'UL' INDICATES THAT THE MARKED SWITCHBOARD SECTION COMPLIES WITH ALL APPLICABLE UNDERWRITERS LABORATORIES STANDARDS AND IS IDENTIFIED WITH A UL LABEL.

'SUSE' INDICATES THAT THE MARKED SWITCHBOARD SECTION IS SUITABLE ONLY FOR USE AS SERVICE ENTRANCE EQUIPMENT.

'UNIT SPACE' INDICATES UNOCCUPIED AREA INTENDED FOR FUTURE USE.

'MOSM' INDICATES A MANUALLY OPERATED STATIONARY MOUNTED BREAKER.

'GFT' INDICATES GROUND FAULT TRIP.

'DAS' INDICATES DYNAMIC ARC FLASH SENTRY OR ARC ENERGY REDUCTION MODE WHICH COMPLIES WITH NEC 240.87

UTILITY CO. :
LOS ANGELES DWP
–
–
– / –
–

DESCRIPTION	PG NO.
CT COMPARTMENT	3-26, 3-27/EUSERC P322
UGPS	3-45, 3-47/EUSERC P345
LINE TERMINATION	2-12, 2-13, 2-14/EUSERC P347
METER PLATES	3-16, 3-17/EUSERC P332
SMM METERING	–
SUPPORT	3-30, 3-31/EUSERC P330

INSTALLATION NOTE

Caution: If switchboard is installed on a housekeeping slab greater than 2-1/2" the meter may be over the 6'3" maximum allowable meter height. Consult utility if you need more information.

NOTES:

1. REFERENCE SEIMENS DRAWING #glucg00_11172100.
2. MAIN SWITCHBOARD SHALL BE BY SEIMENS, OR EQUAL (CONTACT CARL PINO, PONTON INDUSTRIES, 714-998-9073)

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Design Standards

REGISTERED PROFESSIONAL ENGINEER
ROBERT D. GETTER
No. E 21884
Exp. 06-30-23
ELECTRICAL
11/17/2021

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED •

BUREAU OF ENGINEERING
VERTICAL CONTROL:
HORIZONTAL CONTROL:
SHEET TITLE: MAIN SWITCHBOARD (MS)
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

DEPARTMENT OF PUBLIC WORKS
CITY OF LOS ANGELES
GARY LEE MOORE, P.E., ENV SP
CITY ENGINEER
DATE:
DESIGN GROUP
ENGINEER: RGETTER
DESIGNED BY: ACARRIE
DRAWN BY: JCHIN
CHECKED BY: RHUBATCH
APPROVED BY: XX

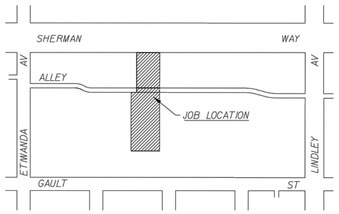
NO. | REVISIONS: | BY: | DATE:

CIP NO.
INDEX NO.
WORK ORDER NO. E170121B
SHEET NAME E-14
SHEET X OF X SHEETS

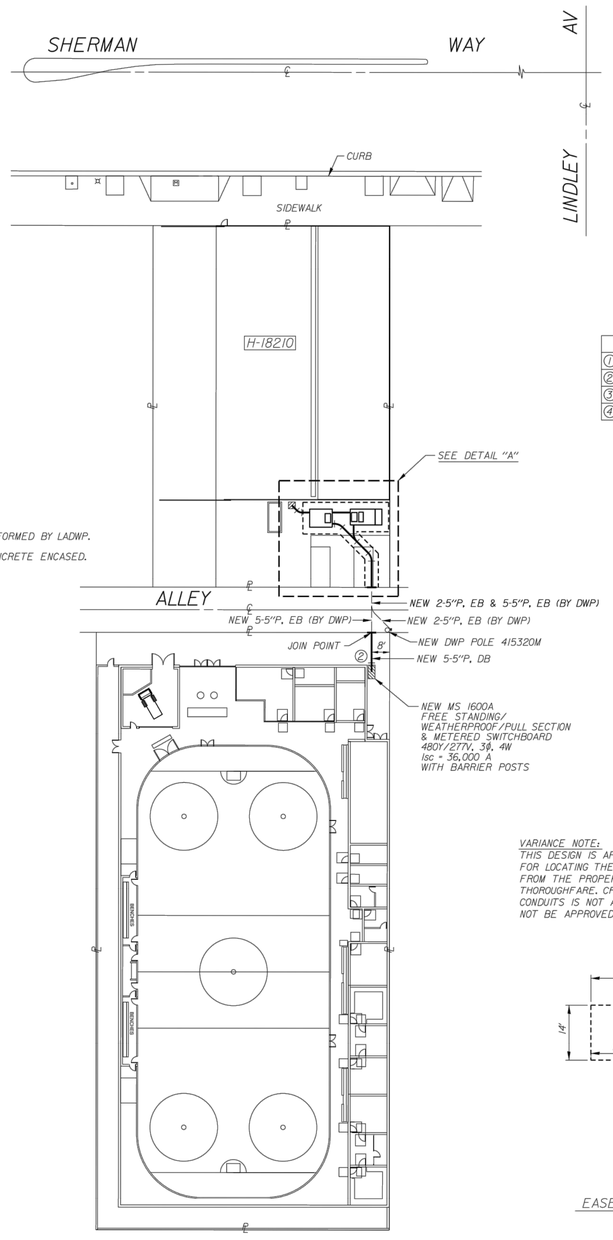
REVISION DATES (DESIGN STAGE ONLY)

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENT'S SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

CUST	1
ENGR (DP)	2
ESR (105)	2
DDFT	1
FILE	1
TOTAL	7



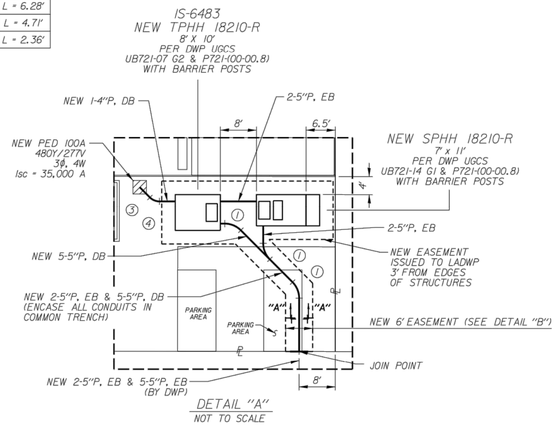
VICINITY MAP
NOT TO SCALE



ALLEY NOTES:

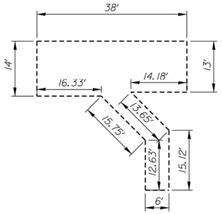
1. CONDUIT CONSTRUCTION IN THE ALLEY WILL BE PERFORMED BY LADWP.
2. ALL CONDUITS PASSING THROUGH ALLEY WILL BE CONCRETE ENCASED.

CURVE DATA		
①	Δ = 45°	R = 5' L = 3.93'
②	Δ = 90°	R = 4' L = 6.28'
③	Δ = 90°	R = 3' L = 4.71'
④	Δ = 45°	R = 3' L = 2.36'

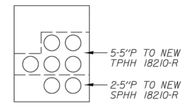


DETAIL "A"
NOT TO SCALE

VARIANCE NOTE:
THIS DESIGN IS APPROVED BASED ON A VARIANCE REQUEST FOR LOCATING THE TRANSFORMER ON A SEPARATE PROPERTY FROM THE PROPERTY BEING SERVED, DIVIDED BY A PUBLIC THOROUGHFARE, CROSSING THE ALLEY WITH LADWP SERVICE CONDUITS IS NOT AN APPROVED DESIGN METHOD AND WILL NOT BE APPROVED FOR FUTURE PROJECTS.



DETAIL "B"
EASEMENT REQUIREMENTS
NOT TO SCALE



SECTION "A-A"
2-5"P. EB & 5-5"P. DB

INSPECTION

1. FULL INSPECTION AND APPROVAL BY A DEPARTMENT OF WATER AND POWER (DWP) ELECTRIC SERVICE REPRESENTATIVE IS REQUIRED PRIOR TO THE INSTALLATION OF CABLE AND EQUIPMENT.
2. NOTIFY THE DWP ELECTRIC SERVICE REPRESENTATIVE, FOR AREA 105 TELEPHONE NUMBER (818) 771-4173, FIVE (5) NORMAL WORKING DAYS IN ADVANCE OF CONSTRUCTION.
3. THE CUSTOMER SHALL ARRANGE FOR ELECTRICAL INSPECTION BY THE LOS ANGELES DEPARTMENT OF BUILDING AND SAFETY FOR THEIR ELECTRICAL WORK. THE SERVICE WILL NOT BE ENERGIZED UNTIL NOTIFICATION OF APPROVAL HAS BEEN RECEIVED BY THE DWP.

GENERAL

1. ALL FACILITIES MUST BE PROVIDED AND INSTALLED IN ACCORDANCE WITH THE DWP'S ELECTRIC SERVICE REQUIREMENTS.
2. CONDUITS AND STRUCTURES SHALL BE INSTALLED PER DWP'S UNDERGROUND SPECIFICATION 104 AND APPENDIX 1 AS LAST REVISED.

SCHEDULE

1. IN ORDER TO AVOID SCHEDULING DELAYS IN THE INSTALLATION OF DWP EQUIPMENT FOR YOUR PROJECT, THE CUSTOMER MUST COMPLETE THE INSTALLATION AND DWP'S INSPECTION OF THE CONDUIT, TRANSFORMER PAD AND SWITCHBOARD A MINIMUM OF SIX (6) WEEKS PRIOR TO THE RELEASE FROM THE DEPARTMENT OF BUILDING AND SAFETY.
2. DWP WILL INSTALL ELECTRICAL METERS AND ENERGIZE THE ELECTRICAL SERVICE TYPICALLY WITHIN TEN (10) WORKING DAYS, AFTER ALL RELEASES HAVE BEEN OBTAINED FROM BOTH DWP AND THE DEPARTMENT OF BUILDING AND SAFETY.

CONDUIT

1. PRIMARY CONDUITS: 2-5" PLASTIC ENCASED BURIED TYPE (EB-35) CONDUITS ENCASED IN 3" OF CONCRETE. MINIMUM COVER FROM TOP OF CONCRETE ENVELOPE TO FINISHED GRADE, EXCEPT AT TRANSFORMER PAD, SHALL BE 30 INCHES IN PAVED AREAS AND 36 INCHES IN LANDSCAPED AREAS. WHEN TERMINATING CONDUIT FOR SUBSEQUENT CONNECTION BY THE DWP, THE DEPTH AT THE PROPERTY LINE MUST BE A MINIMUM OF 36 INCHES. DEPTH MEASUREMENTS AT PROPERTY LINE ARE TO BE TAKEN FROM GUTTER GRADE.
2. SECONDARY CONDUITS: 5-5" PLASTIC DIRECT BURIED TYPE (DB-120) CONDUITS. CONDUITS SHALL HAVE A MINIMUM COVER OF 24 INCHES. WHEN ENCASED IN 3" OF CONCRETE THE MINIMUM COVER FROM TOP OF THE CONCRETE ENVELOPE TO FINISHED GRADE SHALL BE A 24 INCHES. WHEN TERMINATING CONDUIT FOR SUBSEQUENT CONNECTION BY THE DWP, THE DEPTH AT THE PROPERTY LINE MUST BE A MINIMUM OF 30 INCHES. DEPTH MEASUREMENTS AT THE PROPERTY LINE ARE TO BE TAKEN FROM GUTTER GRADE.
3. WHEN THE PRIMARY CONDUITS ARE BEING INSTALLED ON FILLED GROUND, FOUR #4 REINFORCING BARS SHALL BE INSTALLED IN THE CONCRETE ENVELOPE.
4. FIVE-INCH CONDUIT RADIUS BENDS MAY NOT BE STOCKED BY LOCAL SUPPLIERS AND MUST BE ORDERED AT LEAST FOUR WEEKS IN ADVANCE OF CONSTRUCTION. BENDS AND OFFSETS MADE BY USING ANGLE OR OFFSET COUPLINGS WILL NOT BE ACCEPTED.
5. ALL PLASTIC CONDUIT SHALL BE IN ACCORDANCE WITH RECOGNIZED STANDARDS. FOR PVC THE STANDARD IS ASTM F-512 AS LAST REVISED. CONDUIT MAY BE SUBJECTED TO TESTING BY THE DWP AT THE REQUEST OF THE DWP ELECTRIC SERVICE REPRESENTATIVE.
6. CONDUIT SHALL BE MANDRELLED WITH A MANDREL PROVIDED BY THE DWP. INSTALL A FLAT, WOVEN MULTI-FIBER POLYESTER RIBBON, MINIMUM 3/8-INCH NOMINAL WIDTH AND 1250 POUND MINIMUM TENSILE STRENGTH PULLING TAPE IN ALL DUCTS. THE PULLING TAPE SHALL BE PRINTED WITH THE RATED TENSILE STRENGTH AND SEQUENTIAL FOOTAGE MARKINGS WITH LEGIBLE AND STABLE PRINT. THE TAPE SHALL BE IN ONE CONTINUOUS LENGTH THROUGH EACH DUCT WITH NO CUTS, SPLICES OR TIES ALLOWED.

STRUCTURE

1. PROVIDE AND INSTALL ONE 7' X 11' SWITCH PAD WITH HANDHOLE AND PROTECTIVE BARRIERS IN ACCORDANCE WITH DWP DRAWINGS P721-(00-00.8) & UB721-14 GROUP 1 AS LAST REVISED.
2. PROVIDE AND INSTALL ONE 8' X 10' TRANSFORMER PAD WITH HANDHOLE AND PROTECTIVE BARRIERS IN ACCORDANCE WITH DWP DRAWINGS & P721-(00-00.8) AND UB721-17 GROUP 2 AS LAST REVISED.
3. THE CONDUIT, STRUCTURES, AND SERVICE POINTS SHALL BE LOCATED AS SHOWN UNLESS CHANGES ARE APPROVED BY THE DWP DESIGN ENGINEER AND CONFIRMED BY THE CUSTOMER.

FAULT CURRENT

THE MAXIMUM AVAILABLE SYMMETRICAL FAULT CURRENT AT THE RESPECTIVE SERVICE POINTS WILL BE AS FOLLOWS:

SERVICE	AMPS	VOLTAGE	PHASE	WIRE	FAULT CURRENT
MS	1,600A	480Y/277V	3-PH	4W	36,000A
PED	100A	480Y/277V	3-PH	4W	35,000A

SWITCHBOARD APPROVAL

PRIOR TO FABRICATION OF THE SWITCHBOARDS, THE MANUFACTURER MUST SUBMIT DRAWINGS SHOWING PROPOSED SERVICE AND METERING FACILITIES. MAIL FOUR COPIES OF SWITCHBOARD DRAWINGS TO:

VALLEY SERVICE PLANNING
ATTENTION: MR. DANIEL PINTO
7501 TYRONE AVENUE
VAN NUYS, CA 91405
(818) 771-4100
(818) 771-4066 FAX

CUSTOMER CHARGES

1. THE DWP WILL BILL THE CUSTOMER $15,204.00 FOR TRANSFORMER DEPOSIT FEE. DEPOSIT FEE ELIGIBLE FOR REFUND AFTER FIVE YEARS PER DWP RULE 16-E, ELECTRIC SYSTEM OF THE RULES GOVERNING WATER AND ELECTRIC SERVICE.
2. THE DWP WILL BILL THE CUSTOMER $44,569.00 FOR THE INSTALLATION OF A PAD MOUNTED SWITCH ON PRIVATE PROPERTY.
3. THE DWP WILL BILL THE CUSTOMER APPROXIMATELY $100,000.00 PLUS PERMIT FEES FOR CONDUIT CONSTRUCTION IN PUBLIC PROPERTY.
4. YOUR PAYMENT OF A STREET DAMAGE RESTORATION FEE (SDRF), PAID DIRECTLY TO THE DEPARTMENT OF PUBLIC WORKS, IS REQUIRED PRIOR TO ISSUING AN EXCAVATION PERMIT. CONTACT THE DWP ENGINEER REGARDING THIS FEE.

PERMIT NOTE

AN APPROVED TRAFFIC CONTROL PLAN MAY BE REQUIRED FOR LADWP TO OBTAIN A CONSTRUCTION PERMIT FROM LOS ANGELES DEPARTMENT OF PUBLIC WORKS. THE CUSTOMER MAY BE REQUIRED TO HIRE A CONTRACTOR TO DEVELOP A TRAFFIC CONTROL PLAN AND PROVIDE LABOR AND MATERIALS TO MANAGE TRAFFIC DURING CONSTRUCTION. THE CUSTOMER SHALL OBTAIN APPROVAL OF THE PLAN BY THE LOS ANGELES DEPARTMENT OF TRANSPORTATION AND PROVIDE A COPY TO LADWP IF REQUIRED.

PROPERTY AND EASEMENT LINES

1. PROPERTY AND EASEMENT LINES ARE TO BE LOCATED BY THE CUSTOMER'S SURVEYOR. ALL EASEMENTS WILL BE RECORDED ON THE TRACT MAP UNLESS OTHERWISE SPECIFIED.
2. A DRAWING AND FULL LEGAL DESCRIPTION OF THE EASEMENT AS SHOWN IS TO BE FURNISHED TO THE DWP BY THE CUSTOMER. ALLOW SIX WEEKS FOR PROCESSING THE EASEMENT. THE DWP WILL NOT INSTALL CABLE AND EQUIPMENT UNTIL THE EASEMENT IS RECORDED.

THIS COMMITMENT IS VALID FOR SIX MONTHS ONLY.
ANY CHANGE IN LOAD OR DESIGN WILL REQUIRE
REVISED PLANS TO BE SUBMITTED FOR RE-EVALUATION

1"=30'

REVISION NO. 1

THIS DRAWING SUPERSEDES THE COMMITMENT MADE ON JANUARY 4, 2021.

No.	DATE	INIT'L	REVISION	APP'V'D
1	10/19/21	AM	REVISED CONDUIT LAYOUT & POLE LOCATION	DDP

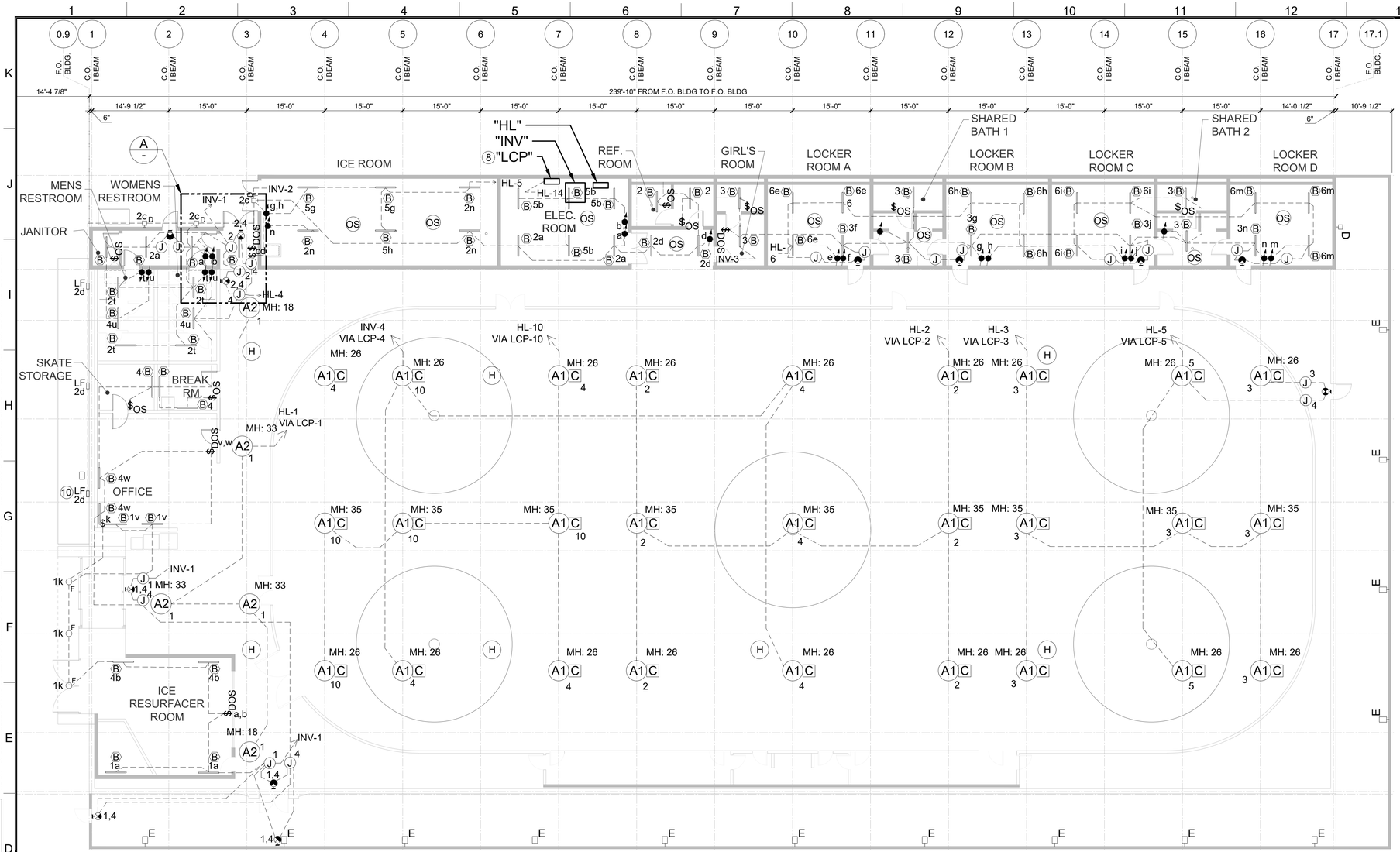
CITY OF LOS ANGELES
DEPARTMENT OF
WATER AND POWER
VALLEY SERVICE PLANNING

DESIGN D. PINTO PHONE (818) 771-4014
O.K. Daniel J. Pinto DRAFTING MSA
APPROVED Rodolfo Monroy DATE 01/04/21

WR #	PROJECT #	TO #
2101314	P291467	530-J5

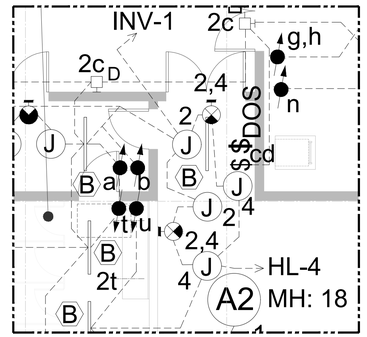
34.5KV CUSTOMER REQUIREMENTS
18210 SHERMAN WAY
RESEDA ICE RINK & SKATE RINK
IS-6483

20P0638 SHEET 1 OF 1



01 INDOOR LIGHTING PLAN

Scale: 3/32"=1'-0"



A ENLARGED PLAN (FOR REFERENCE)

Scale: 3/16"=1'-0"

CONTROL EQUIPMENT SCHEDULE

SYMBOL	QTY	PART NUMBER	DESCRIPTION
LCP	1	LIGHTING CONTROL PANEL	CONTROL PANEL WITH REMOTE GATEWAY
C	21	59-SCD1000EM - 120 / 277 LUMINAIRE CONTROLLER, EXTERNAL MOUNT	FIXTURE CONTROLLER
H	8	59-HBS1302	HIGH BAY MOTION SENSOR
OS	9		CEILING MOUNTED OCCUPANCY SENSOR
$OS	7		WALL SWITCH DUAL SENSOR TECHNOLOGY
$DOS	7		WALL SWITCH DUAL SENSOR TECHNOLOGY AND DIMMING
	8		DIMMER
8P	2	59-TSS1204	8 BUTTON SCENE/DIMMER SWITCH
$			WALL MOUNTED SWITCH

LIGHTING SCHEDULE

SYMBOL	QTY	PART NUMBER	DESCRIPTION	NOTES
A1 C MH: XX	27	HXB-B-UV-70L-M-50K-7-UL-SV w/HXB-GS30-OP	HIGH-BAY LIGHTING FIXTURE - CREE LIGHTING	1 2 4 5 6 7 8
A2 MH: XX	5	KBL-B-UV-30L-50K-7-UL-10V w/ AWR16	HIGH-BAY LIGHTING FIXTURE	1 3 6
B	59	LS4C-50L-40K-10V-FD	WALL/CEILING MOUNTED 4' LUMINAIRE	
	4		EXIT SIGN LOW PROFILE EMERGENCY LIGHT EXIT COMBO.	
	1			
	1			
	6			
D	4	WAC LIGHTING WS-W2604-AL	EXTERIOR EGRESS LIGHTS	CONNECTED TO INVERTER CIRCUIT (INV)
E	14	SUNLIKE 20W 5000K TYPE III-SO	OUTDOOR LED SOLAR LIGHT	
F	3	HALO - PR840D010	CEILING RECESSED AT ARCHITECTURAL CANOPY ON ENTRANCE	MOUNTING HEIGHT: 38 FT AFF

LOAD SUMMARY

FIXTURE	WATTS/FIXTURE	# OF FIXTURES
A1	485	27
A2	190	5
B	37	59
AND SIMILAR	4	12
D	30	4
F	43	3

NOTES:

1. PEAK Ceiling Height: 42' AFF
2. BOTTOM OF FIXTURE HEIGHT: SEE MH ON DRAWINGS
3. AWR16 (Clear Prismatic Reflector) TO MINIMIZE GLARE
4. HXB-GS30-OP (White Opaque Reflector) TO MINIMIZE GLARE
5. RINK LIGHT DESIGN IS BASED THE TYPE A1 PRODUCT (AVG. 103 FC, MIN.78 FC, MAX 127 FC, 5000k, 70 CRI). ANY PRODUCT USED OTHER THAN THE SPECIFIED PRODUCT WILL REQUIRE A POINT LIGHTING STUDY TO BE SUBMITTED FOR OWNER/ENGINEER REVIEW/APPROVAL. THE PRODUCT SUBMITTED SHALL BE OF EQUAL AND BETTER QUALITY AND PERFORMANCE
6. MH: IS THE FIXTURE HEIGHT IN FT
7. RINK FIXTURES ARE DIMMABLE AND ABLE TO PROVIDE AVERAGE OF 75 FC FOR CLASS III OF PLAY
8. PROVIDE ATHENA LIGHT MANAGEMENT HUBVIA BY LUTRON. CONTRACTOR SHALL SUBMIT LIGHTING CONTROL DIAGRAM AS SHOP DRAWING.
9. SEE SHEET EL-11 THROUGH EL-16 FOR LIGHTING EQUIPMENT CATALOG CUTS.
10. LF LANDSCAPE FIXTURES BY FFE. COORDINATE CONDUIT REQUIREMENTS WITH FFE CONTRACTOR.
11. LIGHTING SYSTEMS FOR ICE SKATING FACILITY, SHALL BE BY WESTERN LIGHTING AND ENERGY CONTOLS. (CONTACT BEN MOORE 310-717-0888)

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Design Contractor

REGISTERED PROFESSIONAL ENGINEER
ROBERT D. GETTER
No. E 21884
Exp. 06-30-23
ELECTRICAL
11/17/2021

THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED

BUREAU OF ENGINEERING
VERTICAL CONTROL:
HORIZONTAL CONTROL:
VERTICAL CONTROL
HORIZ CTRL
SHEET TITLE: INDOOR LIGHTING AND CONTROLS PLAN
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

DEPARTMENT OF PUBLIC WORKS
CITY OF LOS ANGELES
GARY LEE MOORE, P.E., ENV SP
CITY ENGINEER
DATE:
DESIGN GROUP
ENGINEER: RGETTER
DESIGNED BY: ACARRIE
DRAWN BY: JCHIN
CHECKED BY: RHUBATCH
APPROVED BY: XX

NO. REVISIONS: DATE: BY:
CIP NO.
INDEX NO.

WORK ORDER NO. E170121B

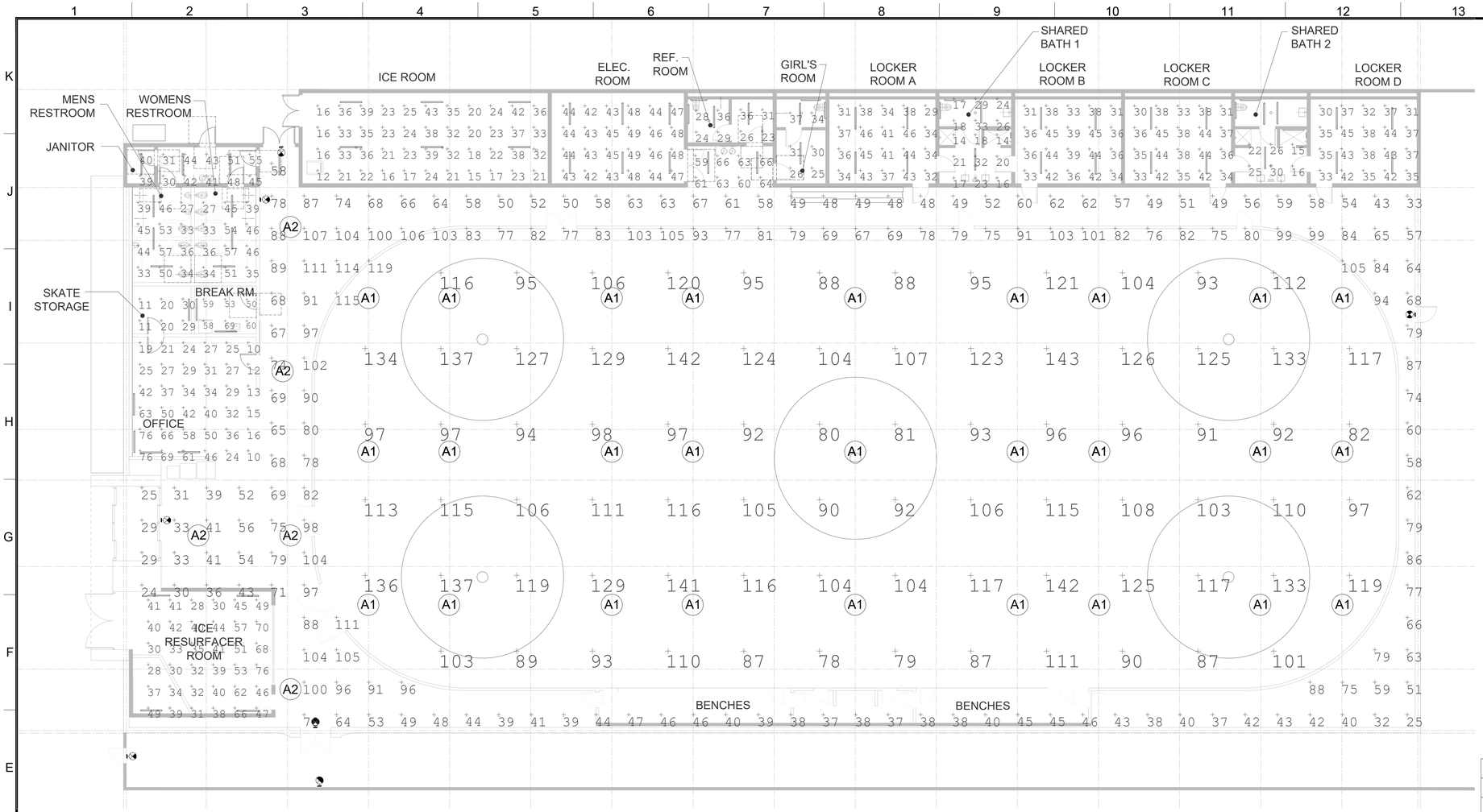
SHEET NAME EL-01
SHEET X OF X SHEETS

REVISION DATES (DESIGN STAGE ONLY)

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

Sheet Version 4.0

Q:\PROJECTS\CITY OF LA_BROOKSSCARPA\PROJECTLINE DRAWINGS\CAD\LIGHTING_PLAN.DWG 12/6/2021 7:56 AM



01 INDOOR FOOTCANDLE CALCULATIONS

Scale: 3/32"=1'-0"

N

NOTES:
1. LIGHT LOSS FACTOR = 0.85 FOR LED FIXTURES INDOORS.
2. ASSUMED REFLECTANCES:
   - CEILINGS 70%
   - WALLS 50%
   - FLOORS 20%

FOOTCANDLES SUMMARY					
ROOM	AVG (FC)	MAX (FC)	MIN (FC)	AVG/MIN	MAX/MIN
BREAK ROOM	58.33	69	50	1.17	1.38
ELECTRIC ROOM	45.21	49	42	1.08	1.17
GIRLS ROOM HALLWAY	62.75	66	59	1.06	1.12
HOCKEY RINK	107.88	143	78	1.38	1.83
ICE RESURFACE ROOM	43.42	76	28	1.55	2.71
ICE ROOM	26.64	43	12	2.22	3.58
INDIVIDUAL CHANGE ROOM	29.00	36	23	1.26	1.57
INDIVIDUAL RESTROOM	29.25	36	24	1.22	1.50
JANITOR CLOSET	39.50	40	39	1.01	1.03
LOCK A CHANGE ROOM	28.00	31	25	1.12	1.24
LOCKER A B RESTROOM	24.50	33	17	1.44	1.94
LOCKER A B SHOWER ROOM	19.44	32	14	1.39	2.29
LOCKER A RESTROOM	35.50	37	34	1.04	1.09
LOCKER C D REST ROOM	24.00	33	15	1.60	2.20
LOCKER C D SHOWER ROOM	22.33	30	15	1.49	2.00
LOCKER ROOM A	38.15	46	29	1.32	1.59
LOCKER ROOM B	37.85	45	31	1.22	1.45
LOCKER ROOM C	37.65	45	30	1.26	1.50
LOCKER ROOM D	37.45	45	30	1.25	1.50
MAIN RESTROOM CORRIDOR	43.00	55	30	1.43	1.83
MEN'S ROOM	41.42	57	27	1.53	2.11
OFFICE	36.00	76	10	3.60	7.60
PATHWAY AND SEATING AREA	66.34	119	24	2.76	4.96
SKATE	20.00	29	11	1.82	2.64
WOMEN'S RESTROOM	41.92	57	27	1.55	2.11

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REVISION DATES (DESIGN STAGE ONLY)

Sheet Version 4.0

Q:\PROJECTS\CITY OF LA_BROOKSSCARPA\PROJECTLINE DRAWINGS\CAD\LIGHTING_PLAN.DWG 12/6/2021 7:56 AM

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Design Standard

REGISTERED PROFESSIONAL ENGINEER
ROBERT D. GETTER
No. E 21884
Exp. 06-30-23
ELECTRICAL
11/17/2021

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED •

DEPARTMENT OF PUBLIC WORKS
BUREAU OF ENGINEERING
VERTICAL CONTROL:
HORIZONTAL CONTROL:
VERTICAL CONTROL
HORIZ CTRL
SHEET TITLE: INDOOR FOOTCANDLE CALCULATIONS
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

NO. | REVISIONS: | DATE: | BY:

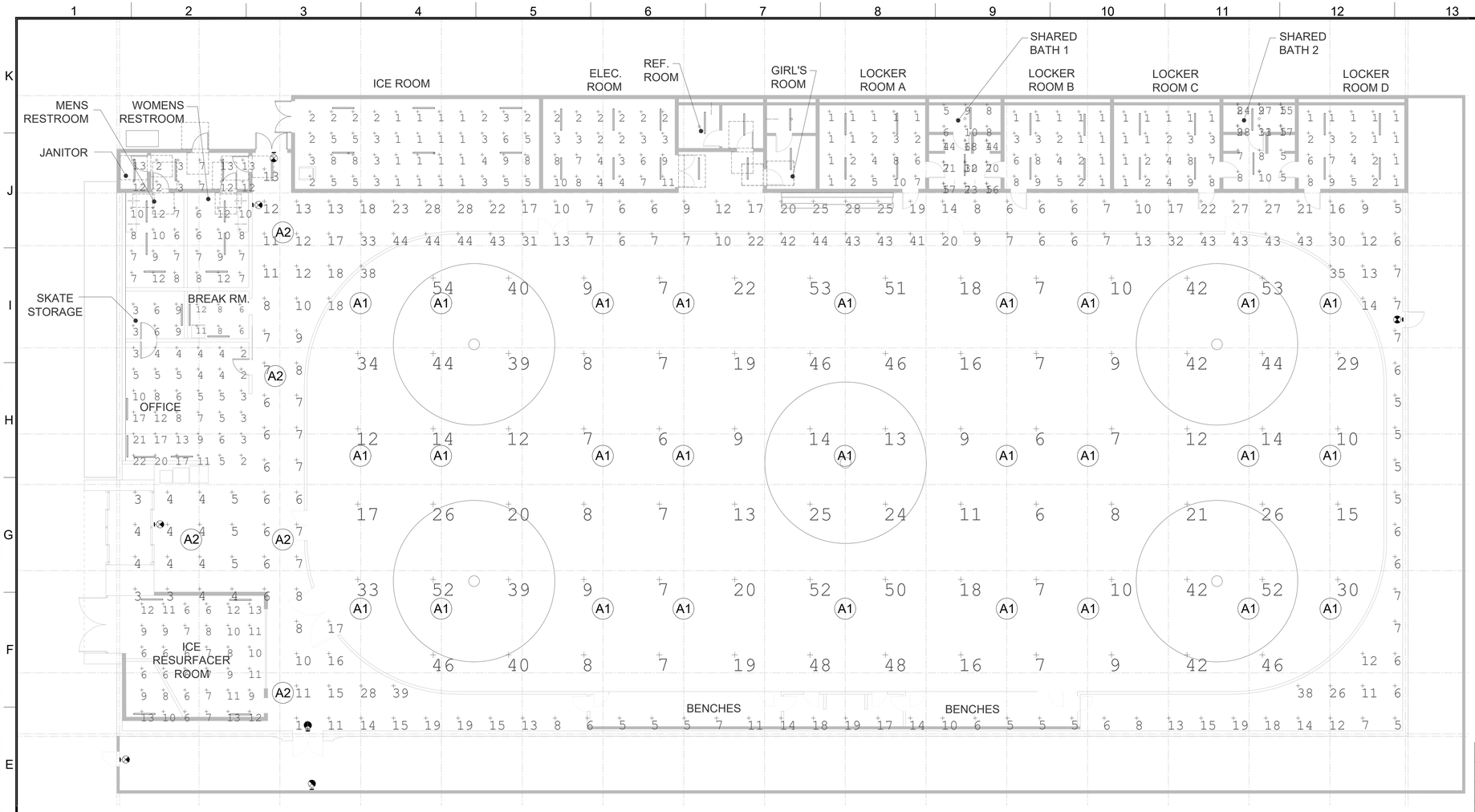
CIP NO.

INDEX NO.

CITY OF LOS ANGELES
GARY LEE MOORE, P.E., ENV SP
CITY ENGINEER
DESIGN GROUP
DATE:
ENGINEER: RGETTER
DESIGNED BY: ACARRIE
DRAWN BY: JCHIN
CHECKED BY: RHUBATCH
APPROVED BY: XX

WORK ORDER NO.
E170121B

SHEET NAME
EL-02
SHEET X OF X SHEETS



01 INDOOR EGRESS FOOTCANDLE CALCULATIONS

Scale: 3/32"=1'-0"

N

NOTES:
1. LIGHT LOSS FACTOR = 0.85 FOR LED FIXTURES INDOORS.

2. ASSUMED REFLECTANCES:
   - CEILINGS 70%
   - WALLS 50%
   - FLOORS 20%

FOOTCANDLES SUMMARY

LABEL	AVG (FC)	MAX (FC)	MIN (FC)	AVG/MIN	MAX/MIN
BREAK ROOM	8.50	12	6	1.42	2.00
ELECTRIC ROOM	4.54	11	2	2.27	5.50
GIRLS ROOM HALLWAY	16.50	18	14	1.18	1.29
HOCKEY RINK	23.56	54	6	3.93	9.00
ICE RESURFACE ROOM	8.69	13	6	1.45	2.17
ICE ROOM	2.98	9	1	2.98	9.00
INDIVIDUAL CHANGE ROOM	9.50	12	8	1.19	1.50
INDIVIDUAL RESTROOM	9.50	12	8	1.19	1.50
JANITOR CLOSET	12.50	13	12	1.04	1.08
LOCK A CHANGE ROOM	9.00	10	8	1.13	1.25
LOCKER A B RESTROOM	7.67	10	5	1.53	2.00
LOCKER A B SHOWER ROOM	6.11	10	4	1.53	2.50
LOCKER A RESTROOM	11.50	12	11	1.05	1.09
LOCKER C D REST ROOM	7.83	11	5	1.57	2.20
LOCKER C D SHOWER ROOM	7.17	10	5	1.43	2.00
LOCKER ROOM A	3.00	10	1	3.00	10.00
LOCKER ROOM B	3.05	9	1	3.05	9.00
LOCKER ROOM C	3.05	9	1	3.05	9.00
LOCKER ROOM D	2.95	9	1	2.95	9.00
MAIN RESTROOM CORRIDOR	7.40	13	2	3.70	6.50
MEN'S ROOM	8.58	12	6	1.43	2.00
OFFICE	7.81	22	2	3.91	11.00
PATHWAY AND SEATING AREA	14.21	44	3	4.74	14.67
SKATE	6.00	9	3	2.00	3.00
WOMEN'S RESTROOM	8.50	12	6	1.42	2.00

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

REGISTERED PROFESSIONAL ENGINEER
ROBERT D. GETTER
No. E 21884
Exp. 06-30-23
CIVIL
STATE OF CALIFORNIA
11/17/2021

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED •

BUREAU OF ENGINEERING
VERTICAL CONTROL:
HORIZONTAL CONTROL: HORIZ CTRL
SHEET TITLE: INDOOR EGRESS FOOTCANDLE CALCULATIONS
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

DEPARTMENT OF PUBLIC WORKS
DATE: BY:
NO. REVISIONS:
CIP NO.
INDEX NO.

CITY OF LOS ANGELES
GARY LEE MOORE, P.E., ENV SP
CITY ENGINEER
DATE:
DESIGN GROUP
ENGINEER: RGETTER
DESIGNED BY: ACARRIE
DRAWN BY: JCHIN
CHECKED BY: RHUBATCH
APPROVED BY: XX

WORK ORDER NO.
E170121B

SHEET NAME
EL-03
SHEET X OF X SHEETS

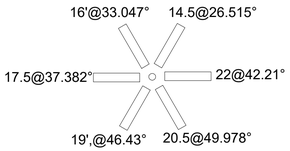
THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REVISION DATES (DESIGN STAGE ONLY)

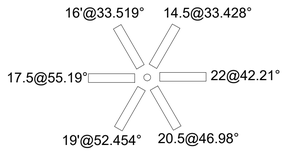
Sheet Version 4.0

Q:\PROJECTS\CITY OF LA_BROOKSSCARPA\PROJECTLINE DRAWINGS\CAD\LIGHTING_PLAN.DWG 12/6/2021 7:56 AM

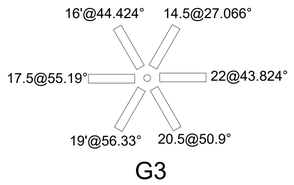
MOUNTING HEIGHT AND TILT DETAILS FOR TYPE G



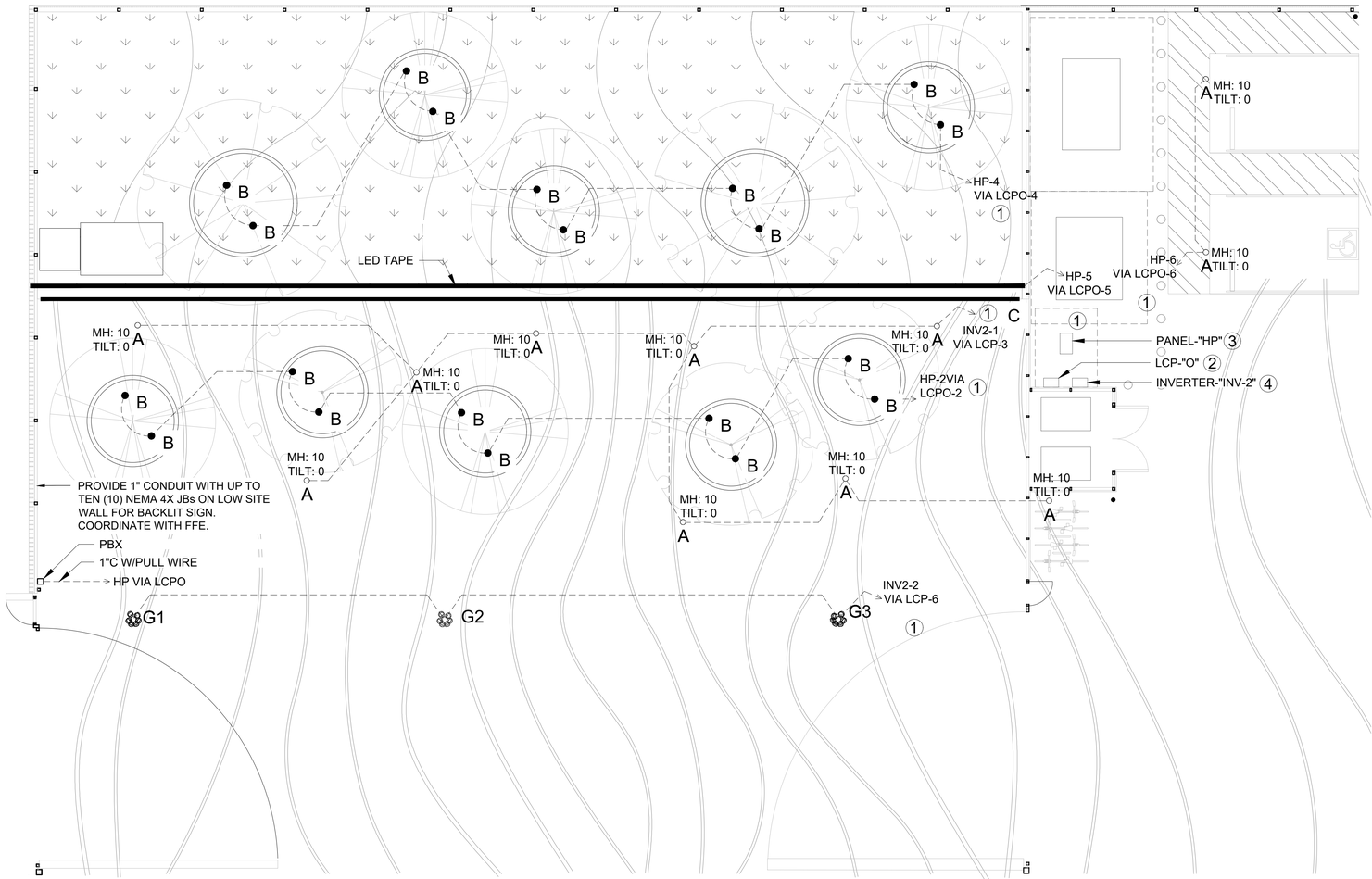
G1



G2



G3



01 OUTDOOR LIGHTING PLAN

Scale: 1/16"=1'-0"

N

NOTES:

1 1"C W/ 2 #10 & #12

2 DOUGLAS LIGHTING CONTROL PANEL - MODEL #DLP2-120/277V-16R16D-FM.

3 PANELBOARD WITH METER 100 A., 480V., 3PH, 4W, NEMA 3R.

4 EMERGENCY LIGHTING INVERTER SHALL BE NEMA 3R, 4KW EXT SERIES BY PERFECT POWER SYSTEMS.

5. SEE SHEETS EL-11 THROUGH EL-16 FOR LIGHTING EQUIPMENT CATALOG CUTS.

6. CONTRACTOR SHALL SUBMIT COLUMN AND POLE BASE ANCHORAGE DETAILS FOR A AND G FIXTURES WITH SHOP DRAWING SUBMITTALS. SUBMITTALS SHALL INCLUDE COLUMN AND POLE AND BASE ANCHORAGE DETAILS SIGNED AND STAMPED BY CA STRUCTURAL ENGINEER, AND CITY DBS APPROVAL OF POLE AND BASE ANCHORAGE FOR A AND G FIXTURES. COLUMN BASES FOR A FIXTURES SHALL BE MINIMUM 18" x 18" x 18" D WITH UP TO EIGHT (8) 3/4-INCH SST ABs, WITH MINIMUM 6-INCH EMBEDMENT, PER BASE. COLUMN BASES FOR G FIXTURES SHALL BE MINIMUM 24" x 24" x 24" D WITH UP TO EIGHT (8) 1-INCH SST ABs, WITH MINIMUM 10-INCH EMBEDMENT, PER BASE.

7. LIGHTING SYSTEMS FOR ROLLER SKATE AREA, INCLUDING FIXTURES A, B, C, AND G SHALL BE BY PLP SOCAL. (CONTACT CRISSY COSCI 626-482-8400).

LIGHTING FIXTURE SCHEDULE

SYMBOL	QTY	PART NUMBER	DESCRIPTION	NOTE
A	11	SELUX EXRL-10-R5S-5G105-40-9V-UNV-DM-PC	COLUMN MOUNTED	15 FT. MOUNTING HEIGHT. SEE NOTE 6.
B	10	BK LIGHTING AG12 LED	MOUNTED ABOVE GROUND IN GRADE	
C	1	ELITE HIGH OUTPUT	LED TAPE UNDER THE BENCH IN EXTRUSION	ORDER LENGTH PER PLAN
G	(3 EA) WITH 6 HEADS MH HEAD = PER DETAILS	SELUX OL GL-F80-SB6-2G130-30-SV-UNV	COLUMN MOUNTED - POLE HEIGHT 24 FEET	SEE NOTE 6.

LOAD SUMMARY

FIXTURE	WATTS/FIXTURE	# OF FIXTURES
B	12	20
G	58 x 6 = 348	3
C	3.2 W/FT x 24" = 77W	8
A	97	11

ENGINEERING
CITY OF LOS ANGELES

REGISTERED PROFESSIONAL ENGINEER
ROBERT D. GETTER
No. E 21884
Exp. 06-30-23
ELECTRICAL
11/17/2021

THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED

BUREAU OF ENGINEERING
VERTICAL CONTROL:
HORIZONTAL CONTROL: VERTICAL CONTROL
HORIZ CTRL
SHEET TITLE: OUTDOOR LIGHTING PLAN
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

DEPARTMENT OF PUBLIC WORKS
NO. | REVISIONS: | DATE: | BY:
CIP NO.
INDEX NO.

CITY OF LOS ANGELES
GARY LEE MOORE, P.E., ENV SP
CITY ENGINEER
DESIGN GROUP
ENGINEER: RGETTER
DESIGNED BY: ACARRIE
DRAWN BY: JCHIN
CHECKED BY: RHUBATCH
APPROVED BY: XX
DATE:

WORK ORDER NO.
E170121B

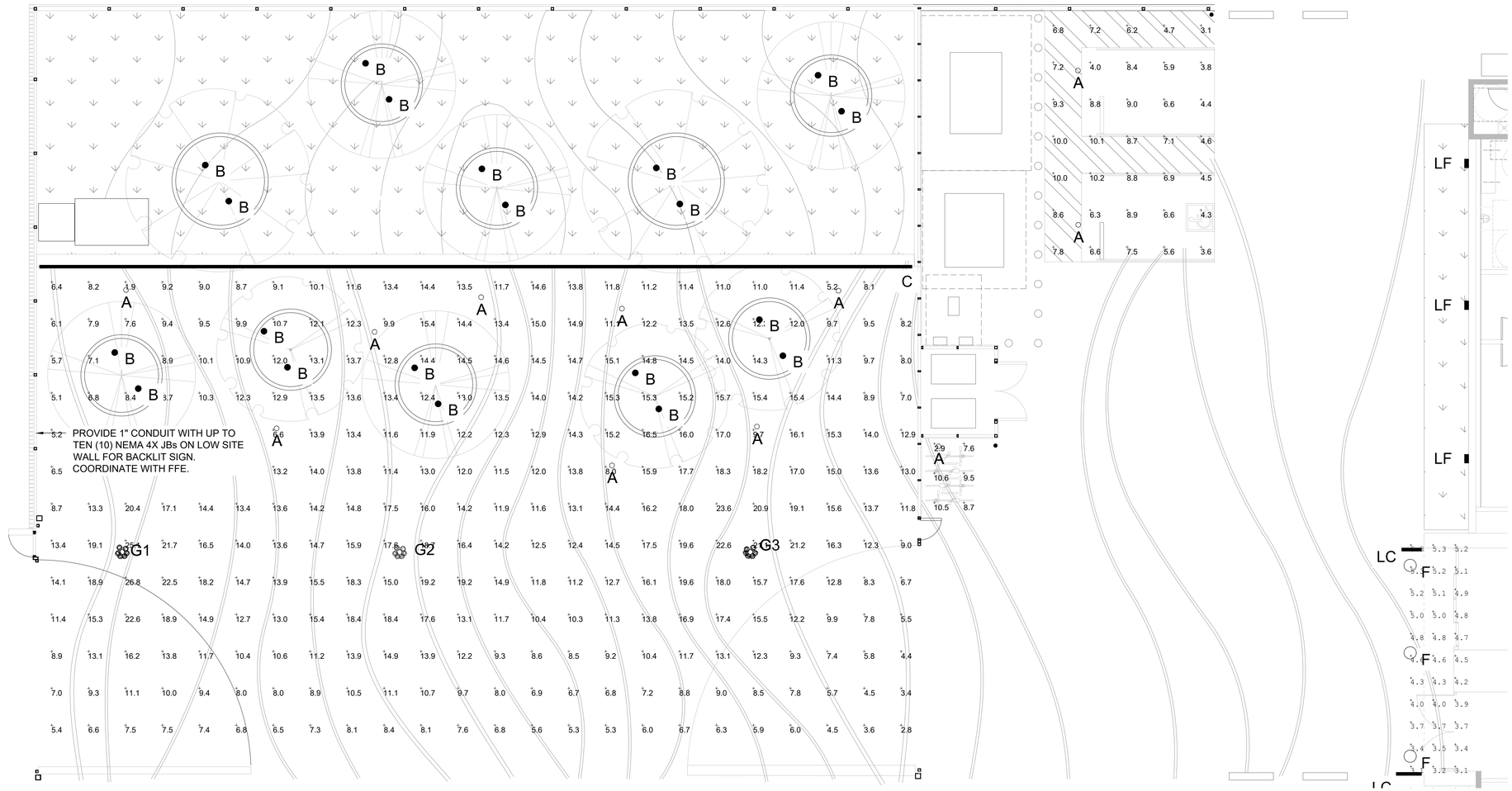
SHEET NAME
EL-04
SHEET X OF X SHEETS

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REVISION DATES (DESIGN STAGE ONLY)

Sheet Version 4.0

Q:\PROJECTS\CITY OF LA_BROOKSSCARPA\PROJECTLINE DRAWINGS\CAD\LIGHTING_PLAN.DWG 12/6/2021 7:55 AM



01 OUTDOOR PHOTOMETRIC CALCULATIONS

Scale: 1/16"=1'-0"

CALCULATION SUMMARY							
AREA	CALCTYPE	UNITS	Avg	Max	Min	Avg/Min	Max/Min
BIKE RACK	ILLUMINANCE	Fc	8.30	10.6	2.9	2.86	3.66
PARKING AREA	ILLUMINANCE	Fc	6.92	10.2	3.1	2.23	3.29
ROLLER AREA	ILLUMINANCE	Fc	12.21	26.8	1.9	6.43	14.11

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Design Consultant

REGISTERED PROFESSIONAL ENGINEER
ROBERT D. GETTER
No. E 21884
Exp. 06-30-23
CIVIL
ELECTRICAL
11/17/2021

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED •

DEPARTMENT OF PUBLIC WORKS
BUREAU OF ENGINEERING
VERTICAL CONTROL:
HORIZONTAL CONTROL: HORIZ CTRL
SHEET TITLE: OUTDOOR PHOTOMETRIC PLAN
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

NO. | REVISIONS: | DATE: | BY:

CIP NO.

INDEX NO.

CITY OF LOS ANGELES
DEPARTMENT OF PUBLIC WORKS
BUREAU OF ENGINEERING
GARY LEE MOORE, P.E., ENV SP
CITY ENGINEER
DESIGN GROUP
ENGINEER: RGETTER
DESIGNED BY: ACARRIE
DRAWN BY: JCHIN
CHECKED BY: RHUBATCH
APPROVED BY: XX
DATE:

WORK ORDER NO.
E170121B

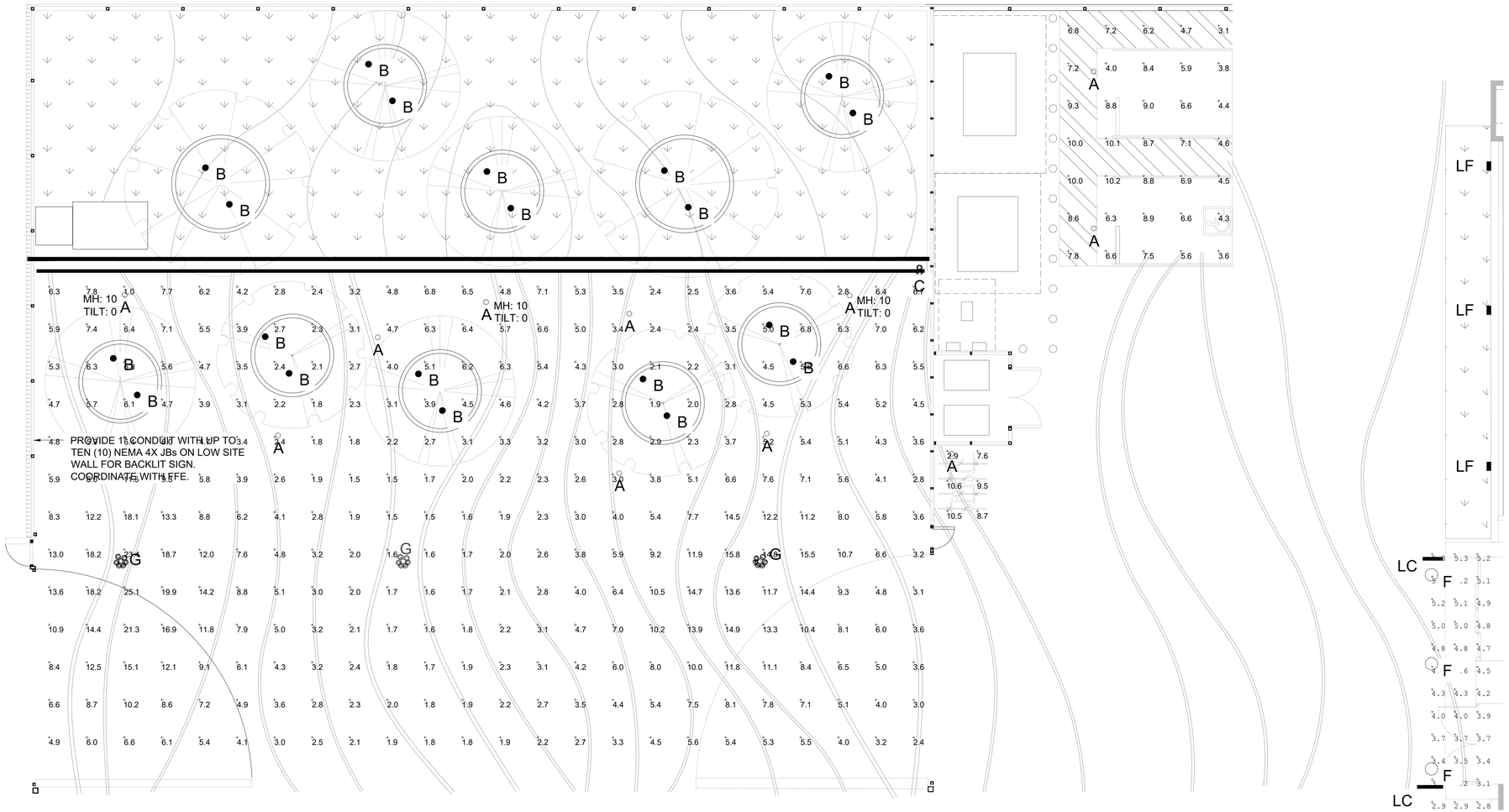
SHEET NAME
EL-05
SHEET X OF X SHEETS

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REVISION DATES
(DESIGN STAGE ONLY)

Sheet Version 4.0

Q:\PROJECTS\CITY OF LA_BROOKSSCARPA\PROJECTLINE DRAWINGS\CAD\LIGHTING_PLAN.DWG 12/6/2021 7:55 AM



01 OUTDOOR PHOTOMETRIC CALCULATIONS - EGRESS

Scale: 1/8"=1'-0"

N

FOOTCANDLES SUMMARY - EGRESS					
ROOM	AVG (FC)	MAX (FC)	MIN (FC)	AVG/MIN	MAX/MIN
ROLLER SKATING PARK	10.68	25.30	3.10	3.45	8.16
GATEWAY ENTRANCE	4.26	5.30	2.80	1.52	1.89

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Design Standards

REGISTERED PROFESSIONAL ENGINEER
ROBERT D. GETTER
No. E 21884
Exp. 06-30-23
STATE OF CALIFORNIA
11/17/2021

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED •

BUREAU OF ENGINEERING

VERTICAL CONTROL:
HORIZONTAL CONTROL: VERTICAL CONTROL
HORIZ CTRL

SHEET TITLE: OUTDOOR PHOTOMETRIC PLAN-EGRESS

PROJECT: RESEDA SKATE FACILITY

ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

DEPARTMENT OF PUBLIC WORKS

NO.	REVISIONS:	BY:	DATE:

CIP NO.

INDEX NO.

CITY OF LOS ANGELES

GARY LEE MOORE, P.E., ENV SP
CITY ENGINEER

DESIGN GROUP

DATE:

ENGINEER: RGETTER
DESIGNED BY: ACARRIE
DRAWN BY: JCHIN
CHECKED BY: RHUBATCH
APPROVED BY: XX

WORK ORDER NO.
E170121B

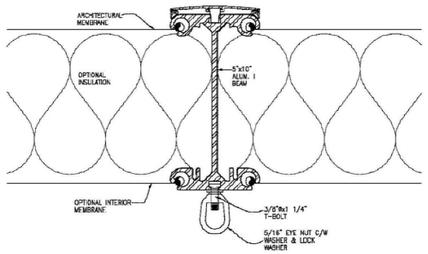
SHEET NAME
EL-06
SHEET X OF X SHEETS

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REVISION DATES
(DESIGN STAGE ONLY)

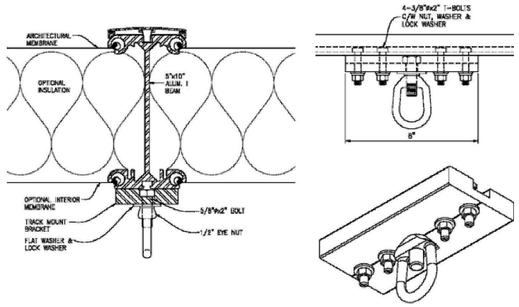
Sheet Version 4.0

Q:\PROJECTS\CITY OF LA_BROOKSSCARPA\PROJECTLINE DRAWINGS\CAD\LIGHTING_PLAN.DWG 12/6/2021 7:55 AM



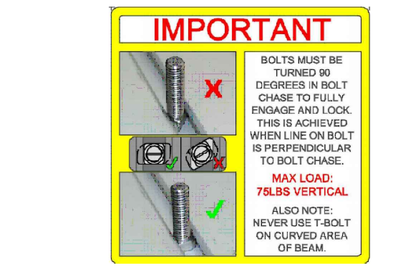
NOTES:
1) THE SINGLE EYE NUT 75 POUND CAPACITY BRACKET IS HELD IN PLACE WITH ONE BOLT
2) CONNECTIONS ATTACHED THROUGH THE BOLT CHASE SHOULD HAVE A MINIMUM SPACING OF 3'-0".
3) TURN T-BOLT CLOCKWISE 90 DEGREE TO LOCK INTO BOLT CHASE

1 75 LB EYE NUT BRACKET
SCALE: N.T.S

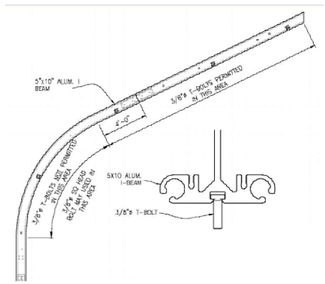


NOTES:
1) THE 300 POUND CAPACITY BRACKET IS HELD IN PLACE WITH A SERIES OF FOUR BOLTS
2) CONNECTIONS ATTACHED THROUGH THE BOLT CHASE SHOULD HAVE A MINIMUM SPACING OF 3'-0".
3) TURN T-BOLT CLOCKWISE 90 DEGREE TO LOCK INTO BOLT CHASE

2 300 LB EYE NUT BRACKET
SCALE: N.T.S



3 T-BOLT DETAIL
SCALE: N.T.S



4 ALLOWED T-BOLT PLACEMENT
SCALE: N.T.S

NOTES:
1) NEVER USE T-BOLT ON CURVED AREA ON BEAM

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division
REGISTERED PROFESSIONAL ENGINEER
ROBERT D. GETTER
No. E 21884
Exp. 06-30-23
STATE OF CALIFORNIA - ELECTRICAL
11/17/2021
• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED •

BUREAU OF ENGINEERING
VERTICAL CONTROL: VERTICAL CONTROL
HORIZONTAL CONTROL: HORIZ CTRL
SHEET TITLE: ROOF MOUNTING DETAILS
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

DEPARTMENT OF PUBLIC WORKS
NO. | REVISIONS: | DATE: | BY:
CIP NO.
INDEX NO.

CITY OF LOS ANGELES
GARY LEE MOORE, P.E., ENV SP
CITY ENGINEER
DESIGN GROUP
DATE:
ENGINEER: RGETTER
DESIGNED BY: ACARRIE
DRAWN BY: JCHIN
CHECKED BY: RHUBATCH
APPROVED BY: XX

WORK ORDER NO.
E170121B

SHEET NAME
EL-07
SHEET X OF X SHEETS

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REVISION DATES (DESIGN STAGE ONLY)

Sheet Version 4.0

Q:\PROJECTS\CITY OF LA_BROOKSSCARPA\PROJECTLINE DRAWINGS\CAD\EL-07.DWG 12/6/2021 8:48 AM

STATE OF CALIFORNIA
Indoor Lighting
NRCC-LTI-E (Created 10/20) — CALIFORNIA ENERGY COMMISSION — NRCC-LTI-E

CERTIFICATE OF COMPLIANCE

This document is used to demonstrate compliance with requirements in §110.9, §110.12(c), §130.0, §130.1, §140.6, and §141.0(b)2 for indoor lighting scopes using the prescriptive path.

Project Name:	RESEDA SKATE FACILITY	Report Page:	Page 1 of 8
Project Address:	18210 & 18132 SHERMAN WAY, RESEDA CA 91335	Date Prepared:	11-17-2021

A. GENERAL INFORMATION

01	Project Location (city)	RESEDA	04	Total Conditioned Floor Area (ft²)	27,750
02	Climate Zone		05	Total Unconditioned Floor Area (ft²)	
03	Occupancy Types Within Project (select all that apply):		06	# of Stories (Habitable Above Grade)	1

☐ Office ☐ Retail ☐ Warehouse ☐ Hotel/Motel ☐ School ☐ Support Areas
☐ Parking Garage ☐ High-Rise Residential ☐ Relocatable ☐ Healthcare ☑ Other (write in): SKATE FACILITY

B. PROJECT SCOPE

Table Instructions: Include any lighting systems that are within the scope of the permit application and are demonstrating compliance using the prescriptive path outlined in §140.6 or §141.0(b)2 for alterations. WARNING: Changing the Calculation Method in this table will result in the deletion of data previously input. If you need to change the calculation method, please open a new form or use "Save As".

Scope of Work	Conditioned Spaces		Unconditioned Spaces	
01	02	03	04	05
My Project Consists of (check all that apply):	Calculation Method	Area (ft²)	Calculation Method	Area (ft²)
☑ New Lighting System	Area Category	27,750		
☐ Altered Lighting System				
Total Area of Work (ft²):	**27,750**			

C. COMPLIANCE RESULTS

Table Instructions: If any cell on this table says "DOES NOT COMPLY" or "COMPLIES with Exceptional Conditions" refer to Table D. for guidance.

Lighting in conditioned and unconditioned spaces must not be combined for compliance per §140.6(b)1.	Allowed Lighting Power per §140.6(b) (Watts)					Adjusted Lighting Power per §140.6(a) (Watts)			Compliance Results
	01	02	03	04	05	06	07	08	09
	Complete Building §140.6(c)1 (See Table I)	Area Category §140.6(c)2 (See Table I)	Area Category Additional §140.6(c)2G (+) (See Table J)	Tailored §140.6(c)3 (+) (See Table K)	= **Total Allowed** (Watts)	≥ Total Designed (Watts) (See Table F)	Adjustments PAF Control Credits §140.6(a)2 (-) (See Table P)	= **Total Adjusted** (Watts) *Includes Adjustments	**05 Must be ≥ 08** §140.6
Conditioned:		24,973.5	0		= **24,973.5**	≥ 16,339	720.8	= **15,618.2**	**COMPLIES**
Unconditioned:					=	≥		=	

Table Continued

STATE OF CALIFORNIA
Indoor Lighting
NRCC-LTI-E (Created 10/20) — CALIFORNIA ENERGY COMMISSION — NRCC-LTI-E

CERTIFICATE OF COMPLIANCE

Project Name:	RESEDA SKATE FACILITY	Report Page:	Page 2 of 8
Project Address:	18210 & 18132 SHERMAN WAY, RESEDA CA 91335	Date Prepared:	11-17-2021

Controls Compliance (See Table H for Details)	
Rated Power Reduction Compliance (See Table Q for Details)	**Not Applicable**

D. EXCEPTIONAL CONDITIONS

This table is auto-filled with uneditable comments because of selections made or data entered in tables throughout the form.

No exceptional conditions apply to this project.

E. ADDITIONAL REMARKS

This table includes remarks made by the permit applicant to the Authority Having Jurisdiction.

F. INDOOR LIGHTING FIXTURE SCHEDULE

Table Instructions: Include all permanent designed lighting and all portable lighting in offices.

Designed Wattage: Conditioned Spaces

01	02	03	04	05	06	07	08	09	10	
Name or Item Tag	Complete Luminaire Description	Modular (Track) Fixture	Small Aperture & Color Change[1]	Watts per luminaire[2]	How Wattage is determined	Total number luminaires	Exempt per §140.6(a)3	Design Watts	Field Inspector Pass	Field Inspector Fail
		☐	☐		Mfr. Spec[2]		☐	0	☐	☐
A1	HIGH-BAY SPORTS LIGHTING	☐	☐	485	Mfr. Spec[2]	27	☐	13,095	☐	☐
A2	HIGH-BAY LIGHTING FIXTURE	☐	☐	190	Mfr. Spec[2]	5	☐	950	☐	☐
B	WALL/CEILING MOUNTED 4' LUMINA	☐	☐	37	Mfr. Spec[2]	62	☐	2,294	☐	☐
					Total Designed Watts CONDITIONED SPACES:			**16,339**		

[1] FOOTNOTE: Design Watts for small aperture and color changing luminaires which qualify per §140.6(a)4B is adjusted to be 75% of their rated wattage. Table F automatically makes this adjustment, the permit applicant should enter full rated wattage in column 05.
[2] Authority Having Jurisdiction may ask for Luminaire cut sheets to confirm wattage used for compliance per §130.0(c) Wattage used must be the maximum rated for the luminaire, not the lamp.

G. MODULAR LIGHTING SYSTEMS

This Section Does Not Apply

STATE OF CALIFORNIA
Indoor Lighting
NRCC-LTI-E (Created 10/20) — CALIFORNIA ENERGY COMMISSION — NRCC-LTI-E

CERTIFICATE OF COMPLIANCE

Project Name:	RESEDA SKATE FACILITY	Report Page:	Page 3 of 8
Project Address:	18210 & 18132 SHERMAN WAY, RESEDA CA 91335	Date Prepared:	11-17-2021

H. INDOOR LIGHTING CONTROLS (Not Including PAFs)

This Section Does Not Apply

I. LIGHTING POWER ALLOWANCE: COMPLETE BUILDING OR AREA CATEGORY METHODS

Table Instructions: Complete the table for each area complying using the Complete Building or Area Category Methods per §140.6(b). Indicate if additional lighting power allowances per §140.6(c) or adjustments per §140.6(a) are being used.

Conditioned Spaces

01	02	03	04	05	06	
Area Description	Complete Building or Area Category Primary Function Area	Allowed Density (W/ft²)	Area (ft²)	Allowed Wattage (Watts)	Additional Allowances / Adjustment: Area Category	Additional Allowances / Adjustment: PAF
ICE RESURFACE ROOM	Commercial and Industrial Storage	0.6	600	360	☐	☑
LOBBY	Corridor	0.6	1,575	945	☐	☑
OFFICE	Office (> 250 square feet)	0.65	480	312	☐	☑
SKATE SHOP	Retail Merchandise Sales, Wholesale Showroom	1	275	275	☐	☑
STORAGE	Commercial and Industrial Storage	0.6	135	81	☐	☑
RESTROOMS	Restroom	0.65	95	61.75	☐	☑
JANITOR	Multipurpose Rm (Low Vision)	0.95	50	47.5	☐	☑
VESTIBULE	Multipurpose Rm (Low Vision)	0.95	120	114	☐	☑
ICE ROOM	Electrical, Mechanical, Telephone Rooms	0.4	760	304	☐	☑
ELECTR. MEC. ROOM	Electrical, Mechanical, Telephone Rooms	0.4	427	170.8	☐	☑
REFEREE ROOM	Multipurpose Rm (Low Vision)	0.95	90	85.5	☐	☑
REFEREE BATHROOM	Restroom	0.65	60	39	☐	☑
GIRL'S ROOM	Locker/Dressing Room	0.45	57	25.65	☐	☑
GIRL'S BATHROOM	Restroom	0.65	60	39	☐	☑
LOCKER ROOM 1	Locker/Dressing Room	0.45	308	138.6	☐	☑
LOOCKER ROOM 2	Locker/Dressing Room	0.45	308	138.6	☐	☑
SHARED BATHROOM 1	Restroom	0.65	210	136.5	☐	☑
LOCKER ROOM 3	Locker/Dressing Room	0.45	308	138.6	☐	☑
LOCKER ROOM 4	Locker/Dressing Room	0.45	308	138.6	☐	☑
SHARED BATHROOM 2	Restroom	0.65	210	136.5	☐	☑
ICE RINK	Sports Arena - Class III	1.1	17,013	18,714.3	☐	☑

STATE OF CALIFORNIA
Indoor Lighting
NRCC-LTI-E (Created 10/20) — CALIFORNIA ENERGY COMMISSION — NRCC-LTI-E

CERTIFICATE OF COMPLIANCE

Project Name:	RESEDA SKATE FACILITY	Report Page:	Page 4 of 8
Project Address:	18210 & 18132 SHERMAN WAY, RESEDA CA 91335	Date Prepared:	11-17-2021

01	02	03	04	05	06	
Area Description	Complete Building or Area Category Primary Function Area	Allowed Density (W/ft²)	Area (ft²)	Allowed Wattage (Watts)	Additional Allowances / Adjustment: Area Category	Additional Allowances / Adjustment: PAF
SEATING AREA/BLEACHERS	Audience Seating Area	0.6	4,286	2,571.6	☐	☑
		TOTAL:	**27,735**	**24,973.5**	See Tables J or P for detail	

J. ADDITIONAL LIGHTING ALLOWANCE: AREA CATEGORY METHOD QUALIFYING LIGHTING SYSTEM

Table Instructions: Please complete the table for all areas indicated in Table I as using an additional allowance per the Area Category Method in Table 140.6-C.

K. TAILORED METHOD GENERAL LIGHTING POWER ALLOWANCE

This Section Does Not Apply

L. ADDITIONAL LIGHTING ALLOWANCE: TAILORED WALL DISPLAY

This Section Does Not Apply

M. ADDITIONAL LIGHTING ALLOWANCE: TAILORED FLOOR AND TASK LIGHTING

This Section Does Not Apply

N. ADDITIONAL LIGHTING ALLOWANCE: TAILORED ORNAMENTAL/SPECIAL EFFECTS

This Section Does Not Apply

O. ADDITIONAL LIGHTING ALLOWANCE: TAILORED VERY VALUABLE MERCHANDISE

This Section Does Not Apply

P. POWER ADJUSTMENT: LIGHTING CONTROL CREDIT (POWER ADJUSTMENT FACTOR (PAF))

Table Instructions: Please complete the table for all areas indicated in Table I or Table K as using a PAF credit described in §140.6(a)2.

LOBBY	☐	☐	☐	☐	☒	☐	D	68	3	204	20.4
OFFICE	☐	☐	☐	☒	☒	☐	D	68	3	204	61.2
SKATE SHOP	☐	☐	☐	☒	☒	☐	D	68	4	272	81.6

STATE OF CALIFORNIA
Indoor Lighting
NRCC-LTI-E (Created 10/20) — CALIFORNIA ENERGY COMMISSION — NRCC-LTI-E

CERTIFICATE OF COMPLIANCE

Project Name:	RESEDA SKATE FACILITY	Report Page:	Page 5 of 8
Project Address:	18210 & 18132 SHERMAN WAY, RESEDA CA 91335	Date Prepared:	11-17-2021

Table Instructions: JUSTMENTS: LIGHTING CONTROL CREDIT (POWER ADJUSTMENT FACTOR (PAF)) redit described in §140.6(a)2.

STORAGE	☐	☐	☒	☐	☒	☐	☐	☐	☐	☐	B	34	1	34	13.6
RESTROOMS	☐	☒	☐	☐	☒	☐	☐	☐	☐	☐	B	34	2	68	34
JANITOR	☐	☒	☐	☐	☒	☐	☐	☐	☐	☐	B	34	1	34	17
VESTIBULE	☐	☒	☐	☐	☒	☐	☐	☐	☐	☐	B	34	1	34	17
ICE ROOM	☐	☐	☐	☒	☒	☐	☐	☐	☐	☐	D	68	6	408	122.4
ELECTR. MEC. ROOM	☐	☐	☐	☒	☒	☐	☐	☐	☐	☐	D	68	2	136	40.8
REFEREE ROOM	☐	☒	☐	☐	☒	☐	☐	☐	☐	☐	B	34	1	34	17
REFEREE BATHROOM	☐	☒	☐	☐	☒	☐	☐	☐	☐	☐	B	34	1	34	17
GIRL'S ROOM	☐	☒	☐	☐	☒	☐	☐	☐	☐	☐	B	34	1	34	17
GIRL'S BATHROOM	☐	☒	☐	☐	☒	☐	☐	☐	☐	☐	B	34	1	34	17
LOCKER ROOM 1	☐	☐	☐	☒	☒	☐	☐	☐	☐	☐	D	68	2	136	40.8
LOOCKER ROOM 2	☐	☐	☐	☒	☒	☐	☐	☐	☐	☐	D	68	2	136	40.8
SHARED BATHROOM 1	☐	☐	☒	☐	☒	☐	☐	☐	☐	☐	B	34	3	102	40.8
LOCKER ROOM 3	☐	☐	☐	☒	☒	☐	☐	☐	☐	☐	D	68	2	136	40.8
LOCKER ROOM 4	☐	☐	☐	☒	☒	☐	☐	☐	☐	☐	D	68	2	136	40.8

STATE OF CALIFORNIA
Indoor Lighting
NRCC-LTI-E (Created 10/20) — CALIFORNIA ENERGY COMMISSION — NRCC-LTI-E

CERTIFICATE OF COMPLIANCE

Project Name:	RESEDA SKATE FACILITY	Report Page:	Page 6 of 8
Project Address:	18210 & 18132 SHERMAN WAY, RESEDA CA 91335	Date Prepared:	11-17-2021

Table Instructions: JUSTMENTS: LIGHTING CONTROL CREDIT (POWER ADJUSTMENT FACTOR (PAF)) redit described in §140.6(a)2.

SHARED BATHROOM 2	☐	☐	☒	☐	☒	☐	☐	☐	☐	☐	B	34	3	102	40.8
SEATING AREA/BLEACHERS	☐	☐	☐	☐	☒	☐	☐	☐	☐	☐	A2	190		0	0
ICE RINK	☐	☐	☐	☐	☒	☐	☐	☐	☐	☐	A1	485		0	0

[1] FOOTNOTES: PAFs outlined in Table 140.6-A include 1) Daylight dimming plus OFF; 2A) Occupant sensors in offices ≤ 125 ft²; 2B) Occupant sensors in offices from 126 - 250 ft²; 2C) Occupant sensors in offices from 251 - 500 ft²; 3A) Institutional tuning, non-daylit areas; 3B) Institutional tuning, daylit areas; 4) Demand response; 5) Clerestory fenestration; 6) Horizontal slats; 7) Light shelves.
[2] Luminaires that qualify for PAF 5, 6, or 7 can be used in conjunction with PAF 1.

Q. RATED POWER REDUCTION COMPLIANCE FOR ALTERATIONS

This Section Does Not Apply

R. 80% LIGHTING POWER FOR ALTERATIONS - CONTROLS EXCEPTIONS

This Section Does Not Apply

S. DAYLIGHT DESIGN POWER ADJUSTMENT FACTOR (PAF)

This Section Does Not Apply

T. DECLARATION OF REQUIRED CERTIFICATES OF INSTALLATION

Table Instructions: Selections have been made based on information provided in previous tables of this document. If any selection needs to be changed, please explain why in Table E. Additional Remarks. These documents must be provided to the building inspector during construction and can be found online at https://ww2.energy.ca.gov/title24/2019standards/2019_compliance_documents/Nonresidential_Documents/NRCI/

YES	NO	Form/Title	Field Inspector Pass	Field Inspector Fail
◉	○	NRCI-LTI-01-E - Must be submitted for all buildings	☐	☐
○	◉	NRCI-LTI-02-E - Must be submitted for a lighting control system, or for an Energy Management Control System (EMCS), to be recognized for compliance.	☐	☐

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.
REVISION DATES (DESIGN STAGE ONLY)
Sheet Version 4.0
Q:\PROJECTS\CITY OF LA_BROOKSSCARPA\PROJECTLINE DRAWINGS\CAD\EL-08.DWG 12/6/2021 8:50 AM

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

REGISTERED PROFESSIONAL ENGINEER — ROBERT D. GETTER — No. E 21884 — Exp. 06-30-23 — ELECTRICAL — 11/17/2021
• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED •

BUREAU OF ENGINEERING
VERTICAL CONTROL: VERTICAL CONTROL
HORIZONTAL CONTROL: HORIZ CTRL
SHEET TITLE: TITLE 24 FORMS 1 OF 3 INDOOR LIGHTING
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

DEPARTMENT OF PUBLIC WORKS
NO. | REVISIONS: | DATE: | BY:
CIP NO.
INDEX NO.

CITY OF LOS ANGELES
GARY LEE MOORE, P.E., ENV SP — CITY ENGINEER
DESIGN GROUP — DATE:
ENGINEER: RGETTER
DESIGNED BY: ACARRIE
DRAWN BY: JCHIN
CHECKED BY: RHUBATCH
APPROVED BY: XX

WORK ORDER NO. E170121B

SHEET NAME EL-08
SHEET X OF X SHEETS

STATE OF CALIFORNIA
Indoor Lighting
NRCC-LTI-E (Created 10/20) CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE		NRCC-LTI-E
Project Name: RESEDA SKATE FACILITY	Report Page:	Page 7 of 8
Project Address: 18210 & 18132 SHERMAN WAY, RESEDA CA 91335	Date Prepared:	11-17-2021

○	◉	NRCI-LTI-04-E - Must be submitted for two interlocked systems serving an auditorium, a convention center, a conference room, a multipurpose room, or a theater to be recognized for compliance.	☐	☐
◉	○	NRCI-LTI-05-E - Must be submitted for a Power Adjustment Factor (PAF) to be recognized for compliance.	☐	☐
○	◉	NRCI-LTI-06-E - Must be submitted for additional wattage installed in a video conferencing studio to be recognized for compliance.	☐	☐

U. DECLARATION OF REQUIRED CERTIFICATES OF ACCEPTANCE

Table Instructions: Selections have been made based on information provided in previous tables of this document. If any selection needs to be changed, please explain why in Table E. Additional Remarks. These documents must be provided to the building inspector during construction and any with "-A" in the form name must be completed through an Acceptance Test Technician Certification Provider (ATTCP). For more information visit: http://www.energy.ca.gov/title24/attcp/providers.html

YES	NO	Form/Title	Field Inspector Pass	Field Inspector Fail
○	◉	NRCA-LTI-02-A - Must be submitted for occupancy sensors and automatic time switch controls.	☐	☐
○	◉	NRCA-LTI-03-A - Must be submitted for automatic daylight controls.	☐	☐
○	◉	NRCA-LTI-04-A - Must be submitted for demand responsive lighting controls.	☐	☐
◉	○	NRCA-LTI-05-A - Must be submitted for institutional tuning power adjustment factor (PAF).	☐	☐
○	◉	NRCA-ENV-03-F - Must be submitted for daylighting design power adjustment factors (PAF).	☐	☐

STATE OF CALIFORNIA
Indoor Lighting
NRCC-LTI-E (Created 10/20) CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE		NRCC-LTI-E
Project Name: RESEDA SKATE FACILITY	Report Page:	Page 8 of 8
Project Address: 18210 & 18132 SHERMAN WAY, RESEDA CA 91335	Date Prepared:	11-17-2021

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT

I certify that this Certificate of Compliance documentation is accurate and complete

Documentation Author Name:	Robert Getter	Documentation Author Signature:	Robert Getter
Company:	ProjectLine	Signature Date:	11/17/21
Address:	2900 Bristol, D-103	CEA/ HERS Certification Identification (if applicable):	
City/State/Zip:	Costa Mesa, CA 92626	Phone:	949.351.9718

RESPONSIBLE PERSON'S DECLARATION STATEMENT

I certify the following under penalty of perjury, under the laws of the State of California:

1. **The information provided on this Certificate of Compliance is true and correct.**
2. **I am eligible under Division 3 of the Business and Professions Code to accept responsibility for the building design or system design identified on this Certificate of Compliance (responsible designer)**
3. **The energy features and performance specifications, materials, components, and manufactured devices for the building design or system design identified on this Certificate of Compliance conform to the requirements of Title 24, Part 1 and Part 6 of the California Code of Regulations.**
4. **The building design features or system design features identified on this Certificate of Compliance are consistent with the information provided on other applicable compliance documents, worksheets, calculations, plans and specifications submitted to the enforcement agency for approval with this building permit application.**
5. **I will ensure that a completed signed copy of this Certificate of Compliance shall be made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a completed signed copy of this Certificate of Compliance is required to be included with the documentation the builder provides to the building owner at occupancy.**

Responsible Designer Name:	Robert Getter	Responsible Designer Signature:	Robert Getter
Company :	ProjectLine	Date Signed:	11/17/21
Address:	2900 Bristol, D-103	License:	E21884
City/State/Zip:	Costa Mesa, CA 92626	Phone:	949.351.9718

CA Building Energy Efficiency Standards - 2019 Nonresidential Compliance: http://www.energy.ca.gov/title24/2019standards October 2020

STATE OF CALIFORNIA
Outdoor Lighting
NRCC-LTO-E (Created 01/21) CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE		NRCC-LTO-E
This document is used to demonstrate compliance with requirements in §110.9, §130.0, §130.2, §140.7, and §141.0(b)2L for outdoor lighting scopes using the prescriptive path.		
Project Name: RESEDA SKATE FACILITY	Report Page:	Page 1 of 7
Project Address: 18210 & 18132 SHERMAN WAY, RESEDA CA 91335	Date Prepared:	11-01-2021

A. GENERAL INFORMATION

01	Project Location (city)	RESEDA	04 Total Illuminated Hardscape Area (ft^2)	13,840
02	Climate Zone	9		
03	Outdoor Lighting Zone per Title 24, Part 1 §10-114 or as designated by Authority Having Jurisdiction (AHJ):			
☐ LZ-0: Very Low - Undeveloped Parkland	☐ LZ-2: Moderate - Rural Areas	☐ LZ-4: High - Must be reviewed by CA Energy Commission for Approval		
☐ LZ-1: Low - Developed Parkland	☑ LZ-3: Moderately High - Urban Areas			

B. PROJECT SCOPE

Table Instructions: Include any outdoor lighting systems that are within the scope of the permit application and are demonstrating compliance using the prescriptive path outlined in §140.7 or §141.0(b)2L for alterations.

My project consists of:

01	02		
☑ New Lighting System	Must Comply with Allowances from §140.7.		
☐ Altered Lighting System	Is your alteration increasing the connected lighting load (Watts)?	○ Yes	○ No
03	04	05	
% of Existing Luminaires Being Altered[1]	Sum Total of Luminaires Being Added or Altered	Calculation Method	

[1] FOOTNOTES: % of Existing Luminaires Being Altered = (Sum Total of Luminaires Being Added or Altered / Existing Luminaires within the Scope of the Permit Application) x 100

C. COMPLIANCE RESULTS

Table Instructions: If any cell on this table says "DOES NOT COMPLY" or "COMPLIES with Exceptional Conditions" refer to Table D. for guidance.

Calculation of Total Allowed Lighting Power (Watts) §140.7 or §141.0(b)2L												Compliance Results
01		02		03		04		05	OR	06	=	07		08		09
General Hardscape Allowance §140.7(d)1 (See Table I)	+	Per Application §140.7(d)2 (See Table J)	+	Sales Frontage §140.7(d)2 (See Table K)	+	Ornamental §140.7(d)2 (See Table L)	+	Per Specific Area §140.7(d)2 (See Table M)	OR	Existing Power §141.0(b)2L (See Table N)		Total Allowed (Watts)	≥	Total Actual (Watts) (See Table F)		07 Must be ≥ 08
757.825	+		+		+		+		OR		=	757.825	≥	530.5		COMPLIES
Cutoff Compliance (See Table G for Details)												DOES NOT COMPLY				
Controls Compliance (See Table H for Details)												COMPLIES				

STATE OF CALIFORNIA
Outdoor Lighting
NRCC-LTO-E (Created 01/21) CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE		NRCC-LTO-E
Project Name: RESEDA SKATE FACILITY	Report Page:	Page 2 of 7
Project Address: 18210 & 18132 SHERMAN WAY, RESEDA CA 91335	Date Prepared:	11-01-2021

D. EXCEPTIONAL CONDITIONS

This table is auto-filled with uneditable comments because of selections made or data entered in tables throughout the form.

Linear lighting has been indicated on Table F. For these luminaires, wattage reported in F03 is in "W/lf" and Total Number Luminaires reported in F05 indicates total linear feet (lf) of that luminaire type.

E. ADDITIONAL REMARKS

This table includes remarks made by the permit applicant to the Authority Having Jurisdiction.

F. OUTDOOR LIGHTING FIXTURE SCHEDULE

Table Instructions: For new or altered lighting systems demonstrating compliance with §140.7 (ie Table I has expanded for input), include all luminaires being installed and any existing luminaires remaining or being moved within the spaces covered by the permit application in the Table below. For altered lighting systems using the Existing Power method per §141.0(b)2L (ie Table N has expanded for input), include only new luminaires being installed and replacement luminaires being installed as part of the project scope (ie, do not include existing luminaires remaining or existing luminaires being moved).

Designed Wattage:

01 Name or Item Tag	02 Complete Luminaire Description		03 Watts per luminaire[1,2]	04 How Wattage is determined	05 Total number luminaires[2]	06 Luminaire Status[3]	07 Excluded per §140.7(a)	08 Design Watts	09 Cutoff Req. ≥ 6,200 initial lumen output §130.2(b)[4]	10 Field Inspector Pass	Fail
SOLAR/E	Soltech Sunlike	☐ Linear	20	Mfr. Spec[3]	14	New	☐	280	Yes	☐	☐
Egress-D	WAC WS-W2604-AL	☐ Linear	30	Mfr. Spec[3]	4	New	☐	120	Yes	☐	☐
Sports-A	Selux EXRL	☐ Linear	97	Mfr. Spec[3]	11	New	☑		Yes	☐	☐
Sports-G	Selux OLGL-F80-SB6	☐ Linear	58	Mfr. Spec[3]	348	New	☑		Yes	☐	☐
Egress-F	Halo PR840D010 LED	☐ Linear	43.5	Mfr. Spec[3]	3	New	☐	130.5	Yes	☐	☐
Tree-B	BK Lighting AGI2 LED	☐ Linear	12	Mfr. Spec[3]	20	New	☑			☐	☐
Bench-C	ELITE HIGH OUTPUT	☒ Linear	3.2	Mfr. Spec[3]	200	New	☑			☐	☐
		☐ Linear		Mfr. Spec[3]		New	☐	0		☐	☐
		☐ Linear					☐	0		☐	☐
		☐ Linear					☐	0		☐	☐
		☐ Linear					☐	0		☐	☐

Table Continued

STATE OF CALIFORNIA
Outdoor Lighting
NRCC-LTO-E (Created 01/21) CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE		NRCC-LTO-E
Project Name: RESEDA SKATE FACILITY	Report Page:	Page 3 of 7
Project Address: 18210 & 18132 SHERMAN WAY, RESEDA CA 91335	Date Prepared:	11-01-2021

01 Name or Item Tag	02 Complete Luminaire Description		03 Watts per luminaire[1,2]	04 How Wattage is determined	05 Total number luminaires[2]	06 Luminaire Status[3]	07 Excluded per §140.7(a)	08 Design Watts	09 Cutoff Req. ≥ 6,200 initial lumen output §130.2(b)[4]	10 Field Inspector Pass	Fail
		☐ Linear					☐	0		☐	☐
							Total Designed Watts:	**530.5**			

* NOTES: Selections with a * require a note in the space below explaining how compliance is achieved.
EX: Luminaire is lighting a statue; EXCEPTION 2 to §130.2(b).

[1] FOOTNOTES: Authority Having Jurisdiction may ask for Luminaire cut sheets to confirm wattage used for compliance per §130.0(c)
[2] For linear luminaires, wattage should be indicated as W/lf instead of Watts/luminaire. Total linear feet for the luminaire should be indicated in column 05 instead of number of luminaires.
[3] Select "New" for new luminaires in a new outdoor lighting project or for added luminaires in an alteration. Select "Altered" for replacement luminaires in an alteration. Select "Existing to Remain" for existing luminaires within the project scope that are not being altered and are remaining. Select "Existing Reinstalled" for existing luminaires which are being removed and reinstalled as part of the project scope
[4] Compliance with mandatory cutoff requirements is required for luminaires with initial lumen output ≥ 6,200 unless exempted by §130.2(b).

G. CUTOFF REQUIREMENTS (BUG)

Table Instructions: Complete this table for fixtures of ≥ 6,200 initial luminaire lumens indicated on Table F as needing to comply with Cutoff Requirements. Maximum lumens can be found in Title 24, Part 11, Section 5.106.8.

01 Name or Item Tag	02 Complete Luminaire Description	Backlight Rating[3] 03 Mounting Height from Property Line[1]	04 Max Allowable Backlight Rating[3]	05 Backlight Rating Per Design	Uplight Rating[3] 06 Lighting Type	07 Max Allowable Uplight Rating[3]	08 Uplight Rating Per Design	Glare Rating[3] 09 Mounting Height from Property Line[1]	10 Max Allowable Glare Rating[3]	11 Glare Rating Per Design	12 Field Inspector Pass	Fail
SOLAR/E	Soltech Sunlik	Back hemisphere < 0.5 MH from prop line	B1		All Other (including decorative)	U3		Front hemisphere < 0.5 MH from prop line	G0		☐	☐
Egress-D	WAC WS-W2	Back hemisphere 0.5-1 MH from prop line	B3		Area Lighting	U0		Front hemisphere 0.5-1 MH from prop line	G1		☐	☐

Table Continued

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

REGISTERED PROFESSIONAL ENGINEER
ROBERT D. GETTER
No. E 21884
Exp. 06-30-23
ELECTRICAL
11/17/2021

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED •

BUREAU OF ENGINEERING
VERTICAL CONTROL: VERTICAL CONTROL
HORIZONTAL CONTROL: HORIZ CTRL
SHEET TITLE: TITLE 24 FORMS 2 OF 3 INDOOR AND OUTDOOR LIGHTING
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

DEPARTMENT OF PUBLIC WORKS
NO. | REVISIONS: | DATE: | BY:
CIP NO.
INDEX NO.

CITY OF LOS ANGELES
GARY LEE MOORE, P.E., ENV SP
CITY ENGINEER
DESIGN GROUP
DATE:
ENGINEER: RGETTER
DESIGNED BY: ACARRIE
DRAWN BY: JCHIN
CHECKED BY: RHUBATCH
APPROVED BY: XX

WORK ORDER NO.
E170121B

SHEET NAME
EL-09
SHEET X OF X SHEETS

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REVISION DATES (DESIGN STAGE ONLY)

Sheet Version 4.0

Q:\PROJECTS\CITY OF LA_BROOKSSCARPA\PROJECTLINE DRAWINGS\CAD\EL-08.DWG 12/6/2021 8:52 AM

STATE OF CALIFORNIA
Outdoor Lighting
NRCC-LTO-E (Created 01/21) CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE		NRCC-LTO-E
Project Name: RESEDA SKATE FACILITY	Report Page:	Page 4 of 7
Project Address: 18210 & 18132 SHERMAN WAY, RESEDA CA 91335	Date Prepared:	11-01-2021

01	02	03	04	05	06	07	08	09	10	11	12	
Name or Item Tag	Complete Luminaire Description	Backlight Rating[2]			Uplight Rating[2]			Glare Rating[2]			Field Inspector	
		Mounting Height from Property Line[1]	Max Allowable Backlight Rating[3]	Backlight Rating Per Design	Lighting Type	Max Allowable Uplight Rating[3]	Uplight Rating Per Design	Mounting Height from Property Line[1]	Max Allowable Glare Rating[3]	Glare Rating Per Design	Pass	Fail
Sports-A	Selux EXRL	Back hemisphere 1-2 MH from prop line	B4	B3	Area Lighting	U0	U0	Front hemisphere < 0.5 MH from prop line	G0	G2	☐	☐
Sports-G	Selux OLGL-FI	Back hemisphere 0.5-1 MH from prop line	B3		Area Lighting	U0	U0	> 2 MH from property line	G3	G0	☐	☐
Egress-F	Halo PR840D	Back hemisphere 1-2 MH from prop line	B4		Area Lighting	U0		Front hemisphere 0.5-1 MH from prop line	G1		☐	☐

[1] *FOOTNOTES: Mounting Height is labeled MH in this table*
[2] *Authority having jurisdiction may ask for luminaire cut sheets or other documentation to confirm luminaire type, uplight ratings and glare ratings used for compliance per §130.2(b).*
[3] *BUG ratings with a lower number than the 'Max Allowable' are compliant. Ex. If Max Allowable is Bug Rating is B4, then B0, B1, B2, B3 and B4 are all compliant.*

H. OUTDOOR LIGHTING CONTROLS

Table Instructions: Complete this table demonstrating compliance with controls requirements for all new or altered luminaires installed as part of the permit application. For alteration projects, luminaires which are existing to remain (ie untouched) and luminaires which are removed and reinstalled (wiring only) do not need to be included in this table even if they are within the spaces covered by the permit application.
*When an option having a * is selected, the notes section of this table must be completed. The lighting controls section of the Compliance Summary Table on the first page will show "DOES NOT COMPLY" if the notes are left blank. For each requirement in columns 02 through 04, do not leave the field blank, instead select NA or Exempt* from the dropdown list to indicate not applicable or an exemption.*

Mandatory Controls

01	02	03	04	05	
Area Description	Shut-Off §130.2(c)1	Auto-Schedule §130.2(c)2	Motion Sensor §130.2(c)3	Field Inspector	
				Pass	Fail
ROLLER SKATING AREA	Photocontrol	Yes	Yes	☐	☐

Table Continued

STATE OF CALIFORNIA
Outdoor Lighting
NRCC-LTO-E (Created 01/21) CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE		NRCC-LTO-E
Project Name: RESEDA SKATE FACILITY	Report Page:	Page 5 of 7
Project Address: 18210 & 18132 SHERMAN WAY, RESEDA CA 91335	Date Prepared:	11-01-2021

01	02	03	04	05	
Area Description	Shut-Off §130.2(c)1	Auto-Schedule §130.2(c)2	Motion Sensor §130.2(c)3	Field Inspector	
				Pass	Fail
Alley Way	Astronomical Timer	Yes	Yes	☐	☐

*NOTES: Controls with a * require a note in the space below explaining how compliance is achieved.
EX: Not permitted by health & safety to be turned off; EXCEPTION 1 to §130.2(c).

I. LIGHTING POWER ALLOWANCE (per §140.7)

Table Instructions: Please complete this table for areas using the allowance calculations per §140.7. General Hardscape Allowance is per Table 140.7-A while "Use it or lost it" Allowances are per Table 140.7-B. Indicate which allowances are being used to expand sections for user input. Luminaires that qualify for one of the "Use it or lose it" allowances shall not qualify for another "Use it or lose it" allowance.

	01				
	"Use it or lose it" Allowances (select all that apply)				
☑ General Hardscape Allowance	☐ Per Application	☐ Sales Frontage	☐ Ornamental	☐ Per Specific Area	
Table I (below)	Table J	Table K	Table L	Table M	

Calculated General Hardscape Lighting Power Allowance per Table 140.7-A (LZ 2 & 3)

02	03	04	05	06	07	08	09	10
Area Description	Surface Type	Area Wattage Allowance (AWA)			Linear Wattage Allowance (LWA)			Total General AWA + LWA (Watts)
		Illuminated Area (ft²)	Allowed Density (W/ft²)	Area Allowance (Watts)	Perimeter Length (lf)	Allowed Density (W/lf)	Linear Allowance (Watts)	
roller skating	Concrete	8,249	0.03	247.47		0.4	0	247.47
parking spots/ladwp	Asphalt	1,475	0.025	36.875		0.25	0	36.875
alley way	Concrete	3,443	0.03	103.29		0.4	0	103.29
entrance	Concrete	673	0.03	20.19		0.4	0	20.19
						Initial Wattage Allowance for Entire Site (Watts):		**350**
						Total General Hardscape Allowance (Watts):		**757.825**

J. LIGHTING ALLOWANCE: PER APPLICATION

This Section Does Not Apply

STATE OF CALIFORNIA
Outdoor Lighting
NRCC-LTO-E (Created 01/21) CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE		NRCC-LTO-E
Project Name: RESEDA SKATE FACILITY	Report Page:	Page 6 of 7
Project Address: 18210 & 18132 SHERMAN WAY, RESEDA CA 91335	Date Prepared:	11-01-2021

K. LIGHTING ALLOWANCE: SALES FRONTAGE

This Section Does Not Apply

L. LIGHTING ALLOWANCE: ORNAMENTAL

This Section Does Not Apply

M. LIGHTING ALLOWANCE: PER SPECIFIC AREA

This Section Does Not Apply

N. EXISTING CONDITIONS POWER ALLOWANCE (alterations only)

This Section Does Not Apply

O. DECLARATION OF REQUIRED CERTIFICATES OF INSTALLATION

Table Instructions: Selections have been made based on information provided in previous tables of this document. If any selection needs to be changed, please explain why in Table E. Additional Remarks. These documents must be provided to the building inspector during construction and can be found online at https://www.energy.ca.gov/title24/2019standards/2019_compliance_documents/Nonresidential_Documents/NRCI/

YES	NO	Form/Title	Field Inspector	
			Pass	Fail
◉	○	NRCI-LTO-01-E - Must be submitted for all buildings.	☐	☐
◉	○	NRCI-LTO-02-E - Must be submitted for a lighting control system; or for an Energy Management Control System (EMCS), to be recognized for compliance.	☐	☐

P. DECLARATION OF REQUIRED CERTIFICATES OF ACCEPTANCE

Table Instructions: Selections have been made based on information provided in previous tables of this document. If any selection needs to be changed, please explain why in Table E. Additional Remarks. These documents must be provided to the building inspector during construction and must be completed through an Acceptance Test Technician Certification Provider (ATTCP). For more information visit: http://www.energy.ca.gov/title24/attcp/providers.html

YES	NO	Form/Title	Field Inspector	
			Pass	Fail
◉	○	NRCA-LTO-02-A - Must be submitted for all outdoor lighting controls except for alterations where controls area added to ≤ 20 luminaires.	☐	☐

STATE OF CALIFORNIA
Outdoor Lighting
NRCC-LTO-E (Created 01/21) CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE		NRCC-LTO-E
Project Name: RESEDA SKATE FACILITY	Report Page:	Page 7 of 7
Project Address: 18210 & 18132 SHERMAN WAY, RESEDA CA 91335	Date Prepared:	11-01-2021

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT

I certify that this Certificate of Compliance documentation is accurate and complete

Documentation Author Name:	Robert Getter	Documentation Author Signature:	Robert Getter (Digitally signed by Robert Getter, Date: 2021.11.17 17:59:55 -08'00')
Company:	ProjectLine	Signature Date:	11/17/21
Address:	2900 Bristol, D-103	CEA/ HERS Certification Identification (if applicable):	
City/State/Zip:	Costa Mesa, CA 92626	Phone:	949-351-9718

RESPONSIBLE PERSON'S DECLARATION STATEMENT
I certify the following under penalty of perjury, under the laws of the State of California:
1. The information provided on this Certificate of Compliance is true and correct.
2. I am eligible under Division 3 of the Business and Professions Code to accept responsibility for the building design or system design identified on this Certificate of Compliance (responsible designer)
3. The energy features and performance specifications, materials, components, and manufactured devices for the building design or system design identified on this Certificate of Compliance conform to the requirements of Title 24, Part 1 and Part 6 of the California Code of Regulations.
4. The building design features or system design features identified on this Certificate of Compliance are consistent with the information provided on other applicable compliance documents, worksheets, calculations, plans and specifications submitted to the enforcement agency for approval with this building permit application.
5. I will ensure that a completed signed copy of this Certificate of Compliance shall be made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a completed signed copy of this Certificate of Compliance is required to be included with the documentation the builder provides to the building owner at occupancy.

Responsible Designer Name:	Robert Getter	Responsible Designer Signature:	Robert Getter (Digitally signed by Robert Getter, Date: 2021.11.17 18:02:09 -08'00')
Company :	ProjectLine	Date Signed:	12/17/21
Address:	2900 Bristol, D-103	License:	E21884
City/State/Zip:	Costa Mesa, CA 92626	Phone:	949-351-9718

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

(REVISION DATES)
(DESIGN STAGE ONLY)

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Design Guidance

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED •
REGISTERED PROFESSIONAL ENGINEER ROBERT D. GETTER No. E 21884 Exp. 06-30-23 CIVIL ELECTRICAL
11/17/2021

BUREAU OF ENGINEERING
VERTICAL CONTROL:
HORIZONTAL CONTROL: HORIZ CTRL
SHEET TITLE: TITLE 24 FORMS 3 OF 3 OUTDOOR LIGHTING
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

DEPARTMENT OF PUBLIC WORKS
NO. | REVISIONS: | DATE: | BY:
CIP NO.
INDEX NO.

CITY OF LOS ANGELES
GARY LEE MOORE, P.E., ENV SP
CITY ENGINEER
DESIGN GROUP
DATE:
ENGINEER: RGETTER
DESIGNED BY: ACARRIE
DRAWN BY: JCHIN
CHECKED BY: RHUBATCH
APPROVED BY: XX

WORK ORDER NO.
E170121B

SHEET NAME
EL-10
SHEET X OF X SHEETS

Sheet Version 4.0

Q:\PROJECTS\CITY OF LA_BROOKSSCARPA\PROJECTLINE DRAWINGS\CAD\EL-08.DWG 12/6/2021 8:56 AM

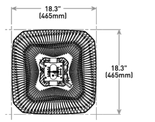
HXB Series
LED High-Bay Luminaire

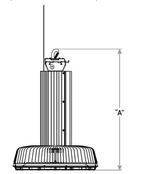
Product Description
The HXB Series LED High-Bay luminaire delivers 35,000 and 70,000 lumens with illumination performance to allow one-for-one replacement of 750W and 1000W HID luminaires. With exceptional rated lifetimes and operating temperatures, the HXB deliveries industry-leading lumens per watt while reducing maintenance in the toughest environments.
Applications: Industrial, manufacturing, warehouse, retail, convention centers, and arenas

Performance Summary
- **Initial Delivered Lumens:** 35,000 or 70,000
- **Efficacy:** Up to 150 LPW
- **CRI:** 70 or 80+
- **CCT:** 3500K, 4000K, or 5000K
- **Mounting:** Hook and cord or pendant
- **Input Voltage:** 120-277 VAC or 347-480 VAC (without step-down transformer)
- **Dimming:** 0-10V dimming to 10% (standard)
- **Operating Temperature Range:** -40°C to +60°C (-40° F - +140° F)
- **Lumen Maintenance:** L_{70} +/- 100,000 hours at +60°C (140°F)
- **Limited Warranty**[1]: 10 years on luminaire
- Assembled in the U.S.A. of U.S. and imported parts

[1] See http://lighting.cree.com/warranty for warranty terms

Shown w/Hook 35L Lumen Package and White Opaque Reflector Accessory w/Uplight





Lumen Package	DIM "A"	Weight
35L	16.5" (419mm)	60 lbs. (18.1kg)
70L	26.1" (664mm)	60 lbs. (27.2kg)

Accessories
Field-Installed

Anti-Spin Adaptor
HXB-AS
- Anti-spin accessory for hook and cord mounting configuration

Field-Installed NEMA® Plugs

AP-515P
- 15 amp 120V Straight Blade Plug

AP-L515P
- 15 amp 120V Twist Lock Plug

AP-L615P
- 15 amp 240V Twist Lock Plug

AP-L715P
- 15 amp 277V Twist Lock Plug

AP-L2420P
- 20 amp 347V Twist Lock Plug

AP-L820P
- 20 amp 480V Twist Lock Plug

Reflectors

Single Pack
HXB-GS30-OP: White Opaque Reflector
HXB-GS30-WH: Clear Translucent Reflector
HXB-GS30-OPU: White Opaque Reflector w/Uplight

- All reflectors are 30° (742mm) impact-resistant polycarbonate
- Single pack SKUs ship as one reflector per box

Multi Packs
HXB-GS30-OP-MP: White Opaque Reflector
HXB-GS30-WH-MP: Clear Translucent Reflector
HXB-GS30-OPU-MP: White Opaque Reflector w/Uplight

- Multi-pack SKUs require a minimum order of 4 pieces or more, and ship together in as few boxes as possible

Ordering Information
Example: HXB-B-UV-70L-M-35K-7-UL-SV

HXB	B	UV						SV
Product	**Version**	**Mounting**	**Lumen Package***	**Optic**	**CCT**	**CRI**	**Voltage**	**Color**
HXB	B	**UV** Universal Mount: hook and cord with 6ft cord, adaptor plate for pendant	**35L** 35,000 lumens **70L** 70,000 lumens	**M** Medium optic; 1.4SC **A** Aisle optic - 35L only	**35K** 3500K **40K** 4000K **50K** 5000K	**7** 70 CRI **8** 80 CRI	**UL** 120-277V **UH** 347-480V	**SV** Silver

* Lumen Package codes identify approximate light output only. Actual lumen output levels vary depending on CCT and reflector/lens selection. Refer to Delivered Lumens & Electrical Data and Reflector Illumination Performance tables for specific lumen values

Rev. Date: V9 10/04/2018

US: lighting.cree.com T (800) 236-6800 F (262) 504-5415
Canada: www.cree.com/canada T (800) 473-1234 F (800) 890-7507

KBL Series
LED Low-Bay/High-Bay Luminaire

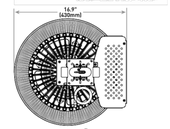
Rev. Date: V7 09/17/2020

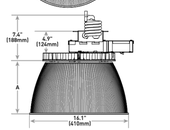
Product Description
KBL LED Low-Bay/High-Bay delivers 9,000 - 30,000 lumens, allowing for one-for-one replacement or fixture count reduction of 150W to 400W HID or up to six lamp 54W T5HO fixtures. With energy savings of up to 65% over traditional light sources, lightweight construction and multiple mounting options, the KBL is optimized for new construction or retrofit installations. The KBL delivers even illumination with reflector choices of aluminum, clear acrylic, clear polycarbonate, or white acrylic. Optional lenses offer enhanced uplight and maximum uniformity, making it ideal for a variety of applications including retail, gymnasiums, light manufacturing, and warehouses.
Applications: Retail, gymnasiums, industrial, manufacturing and warehouse spaces.

Performance Summary
- **Initial Delivered Lumens:** 9,000 - 30,000 lumens
- **Operating Temperature Range:** 9L - 18L Lumen Packages: -40°C to 50°C (-40°F to +122°F); 24L - 30L Lumen Packages: -40°C to 40°C (-40°F to +104°F); minimum operating temperature of -20°C (-4°F) for ML option, and 0°C (32°F) for EB, SWC and SWS
- **Efficacy:** Up to 156 LPW
- **CRI:** 70, 80+
- **CCT:** 3000K, 3500K, 4000K, 5000K
- **Input Voltage:** 120-277 VAC or 347-480 VAC (without step-down transformer)
- **L_{70} Lifetime:** > 100,000 hours at maximum operating temperature
- **Limited Warranty**[1]: 5 years on luminaire, ML, PML, SWC, SWS options; up to 5 years for Synapse® accessories; 1 year on luminaire accessories; 10-year luminaire warranty option also available
- **Limited Warranty Emergency Back Up (EB) Battery:** 1 Year Battery Back Up. Test regularly in accordance with local codes
- **Mounting:** Universal Hook & Cord or Pendant Mount or Dedicated Pendant Mount
- **Weight:** Maximum 14 lbs. (6.4kg)
- **Controls:** 0-10V dimming to 10%, Multi-Level /Programmable Multi-Level Occupancy
- Assembled in the U.S.A. of U.S. and imported parts

[1] See http://lighting.cree.com/warranty for warranty terms. For Synapse accessories, consult Synapse spec sheets for details on warranty terms.

24L Lumen Package Shown Fully Assembled with Prismatic Reflector and Universal Mount





Refer to pages 6-8 for EB1, EB2, ML, PML, low-profile reflectors, and wireless.

Reflector	"A" Height	Reflector	"A" Height
ALR16 (Aluminum)	9.0" (229mm)	PCR16 (Clear Polycarbonate)	8.5" (216mm)
ACR16 (Clear Prismatic Acrylic)	8.5" (216mm)	SACR16 (Low-Profile Clear Prismatic Acrylic)	4.5" (114mm)
AWR16 (White Acrylic)	8.5" (216mm)	SPCR16 (Low-Profile Clear Polycarbonate)	4.5" (114mm)

Ordering Information
Example: KBL-B-UV-24L-40K-7-UL-10V

KBL	B									
Product	**Version**	**Mounting**	**Lumen Package***	**CCT**	**CRI**	**Voltage**	**Controls**	**Cord**	**Plug**	**Options**
KBL	B	**UV** Universal Hook & Cord Mount w/ Adaptor Plate for Pendant Mount **PD** Pendant Dedicated Pendant Mount	**9L** 9,000 Lumens **12L** 12,000 Lumens **18L** 18,000 Lumens **24L** 24,000 Lumens **30L** 30,000 Lumens	**30K** 3000K **35K** 3500K **40K** 4000K **50K** 5000K	**7** 70 CRI **8** 80 CRI	**UL** Universal 120-277V **UH** Universal 347-480V **Dedicated Voltages for Use ONLY with Plugs** **12** 120V **25** 208-240V **27** 277V **34** 347V **48** 480V	**10V 0-10V Dimming** **ML Multi-Level** - Not for use with low-profile reflectors - Refer to ML install instructions for details - Coverage Lens Mounting Hts: 9L &12L: 7-10' (2.4-3.4m); 18L-30L: 13-43' (4.4-13.7m) - detects walking to 35' and fork lifts to 45' **PML Programmable Multi-Level** - Not for use with low-profile reflectors - Refer to PML spec sheet for details - Coverage Lens Mounting Hts: 9L &12L: 10-30' (3.0-9.1m); 18L-30L: up to 42' (12.2m) - detects walking to 30' and fork lifts to 40' **Wireless (120-277V only)** **SWC Synapse Wireless® Controls** - SimplySNAP On-Site Controller is required (see Accessory table on page 6) **SWS Synapse Wireless® Controls w/Network Sensor** - Not for use with low-profile reflectors - SimplySNAP On-Site Controller is required (see Accessory table on page 6)	**Blank (standard)** 6' 16/3 Cord (UV mount), no cord (PD mount), 3' 18/4 Cord (EB Options) **Cord Options for Use ONLY with UV Mount** **5C** 6' 16/5 Cord - Not available with Synapse controls **9C12** 12' 16/5 Cord - Not available with Synapse controls **9C15** 15' 16/5 Cord - Not available with Synapse controls **9C20** 20' 16/5 Cord - Not available with Synapse controls **C12** 12' 16/3 Cord **C15** 15' 16/3 Cord **C20** 20' 16/3 Cord	**Blank (standard)** No Plug **P Twist-Lock Plug** - Must specify voltage (12, 25, 27, 34, 48) - 15A for 120-277V - 20A for 347-480V - Not for use with 5-Conductor cord options **SP Straight Blade Plug** - Available only in 120V - Must specify voltage (12) - Not for use with 5-Conductor cord options	**UL** UL Listed **NOM** NOM Certified (not available with MX option) **MX NOM Certified** - Not available with SWC or SWS controls **PP Pallet Packaging (Qty. 45)** - Not available with EB options **W10 10-Year Limited Luminaire Warranty**

* Lumen Package codes identify approximate light output only. Actual lumen output levels vary depending on CCT and reflector/lens selection. Refer to Delivered Lumens & Electrical Data and Reflector Illumination Performance tables for specific lumen values

US: creelighting.com (800) 236-6800
Canada: creelighting-canada.com (800) 473-1234

HXB Series LED High-Bay Luminaire

Product Specifications
CONSTRUCTION & MATERIALS
- Aluminum bonded zipper fin heatsink
- IP65 rated optics
- Mounting choices of pendant or hook and cord
- Pendant mount has provision to accept ¾ IP pendant (by others)
- Hook mount is provided with factory installed spring lock hook for mounting and factory installed 6' (1.8m) 16/3 AWG white power cord
- Factory calibrated to hang straight; alignment required for pendant mount
- Includes tether to secure luminaire to building structure
- Not intended for use in environments containing airborne corrosive agents such as chemical solvents, cleaners, or cutting fluids

OPTICAL SYSTEM
- Fresnel lenslet optics for medium (1.4SC) and aisle lighting applications

ELECTRICAL SYSTEM
- **Input Voltage:** 120-277V or 347-480V 50/60Hz
- **Power Factor:** > 0.9
- **Total Harmonic Distortion:** < 20% at full load
- **Transient Protection:** 6kV/3kA tested in accordance to IEEE/ANSI
- **10V Source Current:** 0.15mA (35L); 0.30mA (70L)
- **Operating Temperature Range:** -40°C - +60°C (-40°F - +140°F)

REGULATORY & VOLUNTARY QUALIFICATIONS
- cULus Listed
- Suitable for damp locations
- Fittings used for mounting shall be suitable for the maximum weight to be supported
- Customer supplied J-boxes (outlet boxes) used for mounting shall be listed and marked for the maximum weight to be supported
- Requires minimum 90°C supply conductors
- Designed for downlight applications only
- Meets FCC Part 15, Subpart B, Class A standards for conducted and radiated emissions
- RoHS compliant. Consult factory for additional details
- Assembled in the U.S.A. of U.S. and imported parts
- DLC and DLC Premium qualified versions available. Please refer to https://www.designlights.org/search/ for most current information
- ⚠ **CA RESIDENTS WARNING:** Cancer and Reproductive Harm – www.p65warnings.ca.gov

HXB Series Ambient Adjusted Lumen Maintenance[1]						
Ambient	Lumen Package	Initial LMF	25K hr Projected[2] LMF	50K hr Projected[2] LMF	75K hr Calculated[3] LMF	100K hr Calculated[3] LMF
25°C (77°F)	35L/70L	1.00	0.99	0.96	0.94	0.91
30°C (86°F)	35L/70L	0.99	0.98	0.95	0.93	0.91
35°C (95°F)	35L/70L	0.98	0.97	0.94	0.92	0.90
40°C (104°F)	35L/70L	0.97	0.96	0.93	0.91	0.89
45°C (113°F)	35L/70L	0.96	0.95	0.92	0.90	0.88
50°C (122°F)	35L/70L	0.95	0.94	0.91	0.89	0.87
55°C (135°F)	35L/70L	0.94	0.93	0.90	0.88	0.86
60°C (140°F)	35L	0.92	0.91	0.89	0.86	0.84
	70L	0.92	0.90	0.87	0.84	0.82

[1] Lumen maintenance values at 25°C are calculated per TM-21 based on LM-80 data and in-situ luminaire testing. Luminaire ambient temperature factors (LATF) have been applied to all lumen maintenance factors
[2] In accordance with IESNA TM-21-11, Projected Values represent interpolated value based on time durations that are within (or times (ish) the IESNA LM-80-08 total test duration (in hours) for the device under testing (DUT) i.e. the packaged LED chip
[3] In accordance with IESNA TM-21-11, Calculated Values represent time durations that exceed six times (6X) the IESNA LM-80-08 total test duration (in hours) for the device under testing (DUT) i.e. the packaged LED chip

Reflector Illumination Performance		
Reflector	% of Uplight	Lumen Multiplier
HXB-GS30-WH Clear Translucent	0.3%	0.96
HXB-GS30-OPU White Opaque w/Uplight	4.5%	0.96
HXB-GS30-OP White Opaque	2.1%	0.96

Reference http://lighting.cree.com/products/indoor/high-bay-low-bay/hxb-series for detailed photometric data. IES files include reflector multipliers

HXB-GS30-WH

HXB-GS30-OPU

HXB-GS30-OP

Reflector Weights	
Single Pack	10 lbs. (4.5kg)
Multi Pack	35 lbs. (15.9kg)

Delivered Lumens & Electrical Data*											
Lumen Package	CCT	Delivered Lumens**		System Watts	Efficacy (LPW at 70 CRI)	Total Current (A)					
		70 CRI	80 CRI	120-480V		120V	208V	240V	277V	347V	480V
35L	3500K	38,400	35,600	276	133	2.33	1.34	1.16	1.01	0.80	0.57
	4000K	40,200	36,400		146						
	5000K	41,300	38,400		150						
70L	3500K	66,000	61,300	480	133	4.06	2.37	2.05	1.78	1.41	1.01
	4000K	66,400	64,200		137						
	5000K	71,700	66,200		148						

* Data provided at 25°C (77°F). Actual wattage may differ by +/- 10% when operating between 120-480V +/-10%. Actual production yield may vary between -10 and +10% of initial delivered lumens
** Initial delivered lumen values based on luminaire without reflector. Refer to reflector Illumination Performance table for lumen multipliers when using reflector accessory

© 2018 Cree, Inc. and/or one of its subsidiaries. All rights reserved. For informational purposes only. Content is subject to change. Patent www.cree.com/patents. Cree® and the Cree logo are registered trademarks of Cree, Inc. NEMA® is a registered trademark of the National Electrical Manufacturers Association. The UL logo is a registered trademark of UL LLC. The DLC QPL logo and the DLC QPL Premium logo are registered trademarks of Efficiency Forward, Inc.

US: lighting.cree.com T (800) 236-6800 F (262) 504-5415
Canada: www.cree.com/canada T (800) 473-1234 F (800) 890-7507

KBL Series LED Low-Bay/High-Bay Luminaire

Product Specifications
CONSTRUCTION & MATERIALS
- Die cast aluminum heatsink
- IP65 optics with tempered glass lens protect LEDs while keeping the dust out
- Low-profile, lightweight design provides ease of installation
- UV mount is provided with factory installed spring lock hook for mounting, and an adaptor plate to accept a 3/4 IP pendant (by others)
- Factory-installed 16/3 or 14/3 SEOW/STOW white cord standard; 16/5 SEOW/STOW or 14/5 SOOW white cord optional
- Optional cord lengths and plug accessories are also available
- 9L-24L luminaires come with a perforated driver cover, and 30L luminaires and luminaires with the W10 option include a heat sink driver cover
- PD mount is provided with factory installed pendant adaptor plate to accept a 3/4 IP pendant (by others)
- EB options come with factory installed 3' (0.9m) 18/4 STOW white cord w/1.5" (38mm) flying leads
- Factory calibrated to hang straight
- Designed for downlight applications only
- **Weight:** Maximum 14 lbs. (6.4kg); 20 lbs. (9.1kg) w/EB Options

ELECTRICAL SYSTEM
- **Input Voltage:** 120-277V or 347-480V 50/60Hz
- **Power Factor:** > 0.9 at full load
- **Total Harmonic Distortion:** < 20% at full load
- **Operating Temperature Range:** 9L - 18L Lumen Packages: -40°C to 50°C (-40°F to +122°F); 24L - 30L Lumen Packages: -40°C to 40°C (-40°F to +104°F); minimum operating temperature for ML option is -20°C (-4°F); minimum operating temperature for Synapse Wireless controls or EB options is 0°C (32°F)
- **Transient Protection:** 6kV/3kA tested in accordance to IEEE/ANSI
- When code dictates fusing, a slow blow fuse or type C/D breaker should be used to address inrush current
- EB options are wired for switched emergency mode (lights can be turned off without going into emergency mode)

0-10V DIMMING
- Continuous dimming to 10% with 0-10V DC control protocol
- 10V Source Current: 0.15mA
- Use only lighting controls with neutral connection or controls intended for use with LED fixtures
- Reference dimming document for additional information

MULTI-LEVEL OPTION [PIR]
- High/low occupancy, dim to min of 30%
- Available with UL and UH voltages
- Refer to KBL install instructions for details on sensor functionality, operation and lumen and power multipliers

PROGRAMMABLE MULTI-LEVEL OPTION [PIR]
- High/low/off photo/motion sensor
- Available with UL and UH voltages
- Refer to PML spec sheet for details on sensor functionality, operation and lumen and power multipliers

SYNAPSE WIRELESS
- Connected lighting via a wireless mesh network
- Utility grade power monitoring [+/-2%]
- Daylight harvesting accessory (see table on page 3)
- Scheduling, zonal control, alerts and notifications

REGULATORY & VOLUNTARY QUALIFICATIONS
- cULus Listed (UL1598; UL8750)
- Designed for indoor use only
- Suitable for damp locations
- Requires minimum 90°C supply conductors
- NOM Certified when ordered with MX option
- LED optics meet IP65 requirements
- UL924 (EB options). Refer to table at right for maximum mounting heights
- Meets FCC Part 15, Subpart B, Class A limits for conducted and radiated emissions
- Luminaire with SWC or SWS options meet FCC Part 15, Subpart C limits for conducted and radiated emissions
- Assembled in the U.S.A. of U.S. and imported parts
- DLC and DLC Premium qualified versions available. Please refer to https://www.designlights.org/search/ for most current information
- RoHS compliant. Consult factory for additional details
- ⚠ **CA RESIDENTS WARNING:** Cancer and Reproductive Harm – www.p65warnings.ca.gov

Product Specifications
SYNAPSE® SIMPLYSNAP INTELLIGENT CONTROL
The Synapse SimplySNAP platform is a highly intuitive connected lighting solution featuring zone dimming, motion sensing, and daylight harvesting with utility-grade power monitoring and support of up to 1000 nodes per gateway. The system features a reliable and robust self-healing mesh network with a browser-based interface that runs on smartphones, tablets, and PCs. The integrated Synapse® Wireless Controller (SWC) and Wireless Controller with Network Sensor (SWS) take the KBL Series to a new performance plateau, providing extreme energy productivity, code compliance and a better light experience.

Electrical Data*						
Lumen Package	System Watts 120-480V	Total Current (A)				
		120V	208V	240V	277V	347V	480V
9L	62	0.52	0.30	0.26	0.22	0.18	0.13
12L	85	0.72	0.41	0.36	0.31	0.24	0.18
18L	126	1.06	0.61	0.53	0.45	0.36	0.26
24L	164	1.38	0.79	0.69	0.59	0.47	0.34
30L	190	1.60	0.92	0.80	0.69	0.55	0.40

* Electrical data at 25°C (77°F). Actual wattage may differ by +/- 10% when operating between 120-277V or 347-480V +/- 10%.

Delivered Emergency Lumens at 70 CRI*				
Lumen Package	3000K	3500K	4000K	5000K
12L	1,430	1,430	1,510	1,510
12L w/ACR16	1,410	1,410	1,490	1,490
24L	2,930	2,930	3,090	3,090
24L w/ACR16	2,900	2,900	3,050	3,050

* To calculate approximate delivered lumens in EB mode, multiply the initial delivered lumen values on pages 4-5 by 0.12.

Maximum Mounting Height w/EB Options		
Lumen Package	With Prismatic Diffuser	With Prismatic Diffuser and Conic Lens
9L-12L	30' (9.1m)	23' (7.0m)
18L-30L	44' (13.4m)	33' (10.1m)

KBL Series (Version B) Ambient Adjusted Lumen Maintenance*					
Ambient	Initial LMF	25K hr Reported† LMF	50K hr Reported† LMF	75K hr Estimated‡ LMF	100K hr Estimated‡ LMF
25°C (77°F)	1.00	0.93	0.88	0.83	0.79
30°C (86°F)	0.99	0.92	0.87	0.82	0.78
35°C (95°F)	0.99	0.92	0.87	0.82	0.78
40°C (104°F)	0.98	0.90	0.86	0.79	0.75
45°C (113°F)	0.97	0.88	0.83	0.77	0.72
50°C (122°F)	0.97	0.88	0.82	0.76	0.71

* Lumen maintenance values at 25°C (77°F) are calculated per IES TM-21 based on IES LM-80 report data for the LED package and in-situ luminaire testing. Luminaire ambient temperature factors (LATF) have been applied to all lumen maintenance factors
† In accordance with IES TM-21, Reported values represent interpolated values based on time durations that are up to 6x the tested duration in the IES LM-80 report for the LED.
‡ Estimated values are calculated and represent time durations that exceed the 6x test duration of the LED.

US: creelighting.com (800) 236-6800
Canada: creelighting-canada.com (800) 473-1234

FIXTURE: A1
- LUMEN PACKAGE 70L
- 5000 CCT
- 485 W
- DIMMABLE

FIXTURE: A2
- LUMEN PACKAGE 30L
- 5000 K
- 190 W
- DIMMABLE

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

REGISTERED PROFESSIONAL ENGINEER
ROBERT D. GETTER
No. E 21884
Exp. 06-30-23
ELECTRICAL
11/17/2021

THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED

DEPARTMENT OF PUBLIC WORKS
BUREAU OF ENGINEERING
VERTICAL CONTROL:
HORIZONTAL CONTROL:
SHEET TITLE: LIGHTING CATALOG CUTS 3 - INTERIOR
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

NO.	REVISIONS:	BY:	DATE:

CIP NO.
INDEX NO.

CITY OF LOS ANGELES
GARY LEE MOORE, P.E., ENV SP
CITY ENGINEER
DESIGN GROUP
DATE:
ENGINEER: RGETTER
DESIGNED BY: ACARRIE
DRAWN BY: JCHIN
CHECKED BY: RHUBATCH
APPROVED BY: XX

WORK ORDER NO.
E170121B

SHEET NAME
EL-11
SHEET X OF X SHEETS

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REVISION DATES
DESIGN STAGE ONLY)

Sheet Version 4.0

Q:\PROJECTS\CITY OF LA_BROOKSSCARPA\PROJECTLINE DRAWINGS\CAD\EL-11.DWG 12/6/2021 9:00 AM

Date: _____ Customer: _____

Project: _____

Type: _____ Qty: _____

selux

Exelia Gen5 LED

Order Code: _____ - _____ - _____ - _____ - _____ - _____ - _____ - _____ - _____ - _____ - _____

Series	EXRL Exelia Gen5 LED								
Nominal Overall Ht.	08 8 ft	09 9 ft	10 10 ft	11 11 ft	12 12 ft	13 13 ft	14 14 ft		
	15 15 ft	16 16 ft	17 17 ft	18 18 ft	19 19 ft	20 20 ft			
Optic	R1 Type I	R2 Type II	R3 Type III	R3W Type III (Wide)	R4 Type IV	R5R Type V (Round)	R5S Type VS (Square)	R5Q Type V (Rectangular)	
Light Engine	5G350 nominal 35W	5G530 nominal 48W	5G700 nominal 64W	5G105 nominal 97W	5G140 nominal 126W				
CCT	30 3000K	40 4000K							For other CCT please consult factory
Finish	WH White	BK Black	BL Semi-Matte Black	BZ Bronze	SV Silver	SP Specify Premium Color			
Voltage	UNV 120-277V	120 120V	208 208V	240 240V	277 277V	347[1,2] 347V	480[1,2] 480V		1 Not available with HL50 2 Requires step-down transformer
Options	DM[1] Dimming 10-10V	HL50[3,4] Hi-Lo Switching Low Output 50%	HS[4] House Side Shield	REC[5,9] 120V GFCI Receptacle with weatherproof cover	REC2[6,9] 120V GFCI Receptacle with pod/lockable in-use cover	REC3[6,9] USB & Duplex Receptacle with weatherproof cover	REC4[6,9] USB-A, Duplex Receptacle with weatherproof pod/lockable in-use cover		3 120V, 240V and 277V only 4 Type I, II, III and IV only 5 See page 5 for details 6 DM or HL50 only, cannot be combined 7 Recommended depending on local site conditions regarding wind vibrations 8 120V only 9 See page 4 for details
	PC Photocell	VI[7] Vibration Dampener (consult factory)	MS[8] Motion Sensor						

Product Modifications

Please list modification requirements for review by factory:

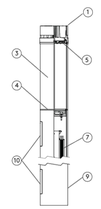
Approvals

Date:

UL Wet Location, UL Listed, Union Made, ASTM & PCI Finish, IK10, IP65, ETL

Exelia LED

EXRL



selux

Specifications

1. Luminaire Cover / External Heat Sink - Low copper, marine-grade aluminum die cast cover, with shroud for smooth crisp form to reflect and complement the column design. Designed for optimal heat dissipation even in high temperature environments.

2. Gasketing - (not shown) Continuous one piece gaskets made from UV and ozone resistant silicone. Molded gaskets ensure IP65 rating, dust, and insect control throughout the luminaire head.

3. Shielding - Clear, impact resistant, UV stabilized polycarbonate cylinder creates optical chamber, minimum wall thickness 0.118" (3mm). IK10 rated.

4. Column Fitter - Low copper, marine-grade aluminum die-cast fitter, with built-in gasketing ridges, for smooth transition to column.

5. LED Array - High Flux LEDs mounted to metal core PCB and attached to external heat sink for maximum LED performance and life. CCT tolerance within a 3 step bin and provided with a minimum CRI of 80. LED light engine has a reported lumen maintenance of 97.5% at 50,000 hours. L70 calculated greater than 100,000 hours.

6. LED Optics - (not shown) Proprietary technical Optics (R1, R2, R3, R4, R5S and R5R) use Selux signature light pattern acrylic lens holder to secure proprietary silicone optics. Internal micro house side shield available for distributions types I, II, III & IV.

7. LED Driver - LEDs are driven by RoHS compliant constant current programmable LED driver. Driver includes 0-10V dimming to 10%, meets the requirements of IP66. Driver assembly located inside the column and accessible through the upper hand hole.

8. Surge Protector - (not shown) Designed to protect luminaire from electrical surge (20kA).

9. Column Body - 200mm extruded smooth marine-grade aluminium, minimum wall thickness 0.118" (3mm).

10. Access Doors - Upper and lower 4" x 7" (76mm x 178mm) hand holes provided for in-field column assembly and maintenance. Flush cover and stainless steel tamper-resistant hardware included.

Ambient Temperature Chart (standard)	
Minimum	**Maximum**
-40° C (-40° F)	45° C (113° F)

Exterior Luminaire Finish - Selux utilizes a high quality Polyester Powder Coating. All Selux luminaires and poles are finished in our Tiger Drylac certified facility and undergo a five stage intensive pretreatment process where product is thoroughly cleaned, phosphated and sealed. Selux powder coated products provide excellent salt and humidity resistance as well as ultraviolet resistance for color retention. All products are tested in accordance with test specifications for coatings from ASTM and PCI.

Standard exterior colors are White (WH), Black (BK), Bronze (BZ), Semi-Matte Black (BL), and Silver (SV). Selux premium colors (SP) are available, please specify from your Selux color selection guide.

5 Year Limited LED Luminaire Warranty - Selux offers a 5 Year Limited Warranty to the original purchaser that the Exelia LED luminaire shall be free from defects in material and workmanship for up to five (5) years from date of shipment. This limited warranty covers the LED driver and LED array when installed and operated according to Selux instructions. For details, see "Selux Terms and Condition of Sale."

Listings and Ratings: Tested to NRTL Wet Location and IESNA LM-79-08 standards. LED tested to LM-80 standards. Luminaire and LED tested at 25°C (77°F) ambient temperature.

NRTL Listed (i.e. UL, CSA)

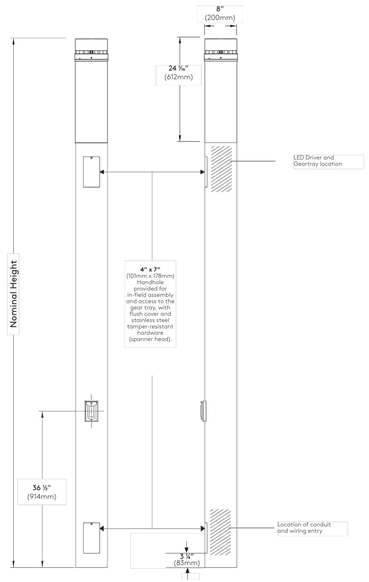
Visit selux.us for our LED End of Life recycling policy.

Exelia LED

Mounting Information
EXRL

Maximum weight: 80lbs

selux



EXELIA LED
Installation Instructions

selux

Step #	Tools Required (not included)
①③⑥⑧	#10 Spanner Screw Driver
②	1 1/8" Socket Wrench
④	M6 Hex Nut 10mm Wrench

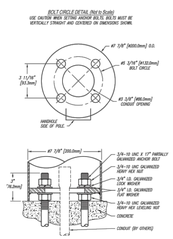
1. Remove the lower hand hole cover.
2. Install the Column.
3. Remove the upper hand hole cover.
4. Place the Fixture (head) on the top of the Column, orient to desired position, and secure head with the 4 sets of supplied washers and nuts through the hand hole.

Note: Ensure that silicone gasket on the underside of the column head is in good condition. If needed, reapply clear silicone bead to create seal between column head and column base.

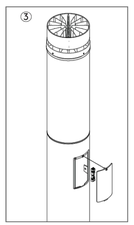
5. Make electrical connection between the fixture and the geartray at the upper hand hole (Electrical connection made via a quick disconnect).
6. Re-Install the upper hand hole.
7. Make electrical connection between the fixture/geartray and Line Voltage at the lower hand hole (Watertight electrical connection by others).
8. Replace the lower hand hole.
9. Test the function of the luminaire.

EXRL
(shown for reference)

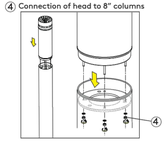
② Anchor Bolt Details for EXRL



③



④ Connection of head to 8" columns



ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

REGISTERED PROFESSIONAL ENGINEER
ROBERT D. GETTER
No. E 21884
Exp. 06-30-23
STATE OF CALIFORNIA
ELECTRICAL
11/17/2021

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED •

BUREAU OF ENGINEERING
VERTICAL CONTROL:
HORIZONTAL CONTROL:
SHEET TITLE: LIGHTING CATALOG CUTS I
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

DEPARTMENT OF PUBLIC WORKS
BY:
DATE:
NO. REVISIONS:
CIP NO.
INDEX NO.

CITY OF LOS ANGELES
GARY LEE MOORE, P.E., ENV SP
CITY ENGINEER
DESIGN GROUP
DATE:
ENGINEER: RGETTER
DESIGNED BY: ACARRIE
DRAWN BY: JCHIN
CHECKED BY: RHUBATCH
APPROVED BY: XX

WORK ORDER NO.
E170121B

SHEET NAME
EL-12
SHEET X OF X SHEETS

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REVISION DATES
DESIGN STAGE ONLY)

Sheet Version 4.0

Q:\PROJECTS\CITY OF LA_BROOKSSCARPA\PROJECTLINE DRAWINGS\CAD\EL-12.DWG 12/6/2021 9:10 AM

FIXTURE: B - EXTERIOR

AGI2 LED — IP68 RATED

DATE: | PROJECT: | TYPE:

CATALOG NUMBER LOGIC:

*Only available with x58-x63.

**Only available with x43-x45.

***Select up to 2. Accessory Holder required.

CATALOG NUMBER LOGIC
Example: B - AGI2 - 12 - LED - TR - x61 - SP - SAP - 10/11 - INC - MT - AH
MATERIAL
(Blank) - Aluminum B - Brass S - Stainless Steel
SERIES
AGI2 - Above Ground In-grade
HEIGHT ABOVE
12 - 12"
18 - 18"
SOURCE
LED - Chip on Board Technology
HOUSING
TR - Integral Housing
LED TYPE
x58 - 12W LED/2700K x61 - 20W LED/2700K x43 - 34W LED/2700K
x59 - 12W LED/3000K x62 - 20W LED/3000K x44 - 34W LED/3000K
x60 - 12W LED/4000K x63 - 20W LED/4000K x45 - 34W LED/4000K
OPTICS
SP - Spot (15°)* FL - Flood (35°)*
NFL - Narrow Flood (25°)** WFL - Wide Flood (60°)
FINISH (See page 2 for full-color swatches)
Standard Finishes (BZP, BZW, BLP, BLW, WHP, WHW, SAP, VER)
Premium Finish (ABP, AMG, AQW, BCM, BGE, BPP, CAP, CMG, CRI, CRM, HUG, MDS, NBP, OCP, RMG, SDS, SMG, TXF, WCP, WIR)
Also available in RAL Finishes
Brass Finishes (MAC, POL, MIT)
→ Stainless Steel Finishes (MAC, POL)
ACCESSORY* **
10 - Spread Lens
11 - Honeycomb Baffle
12 - Soft Focus Lens
13 - Rectilinear Lens
CONTROL TYPE
INC - Incandescent Dimming
010 - 0-10V Dimming
INPUT VOLTAGE
MT - 120-277 VAC Input
OPTIONS
AH - Accessory Holder

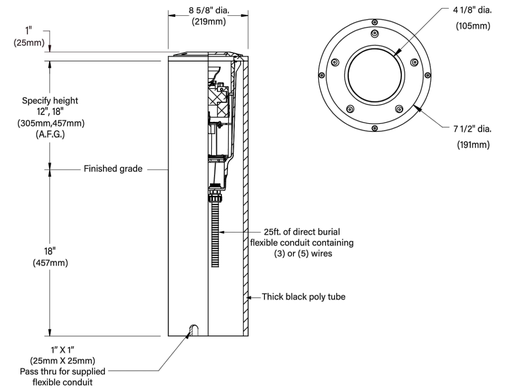
B-K LIGHTING | MADE IN THE USA | 559.438.5800 | INFO@BKLIGHTING.COM | BKLIGHTING.COM

THIS DOCUMENT CONTAINS PROPRIETARY INFORMATION OF B-K LIGHTING, INC. AND ITS RECEIPT OR POSSESSION DOES NOT CONVEY ANY RIGHTS TO REPRODUCE, DISCLOSE ITS CONTENTS, OR TO MANUFACTURE, USE OR SELL ANYTHING IT MAY DESCRIBE. REPRODUCTION, DISCLOSURE OR USE WITHOUT SPECIFIC WRITTEN AUTHORIZATION OF B-K LIGHTING, INC. IS STRICTLY FORBIDDEN.

03/02/2020 SKU-1338
SLIB-2816-00

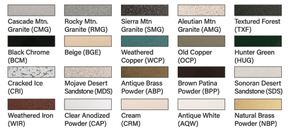
AGI2 LED — IP68 RATED

DATE: | PROJECT: | TYPE:



STANDARD FINISHES

PREMIUM FINISHES



Click Here to view larger, full-color swatches of all available finishes on our website.

B-K LIGHTING | MADE IN THE USA | 559.438.5800 | INFO@BKLIGHTING.COM | BKLIGHTING.COM

THIS DOCUMENT CONTAINS PROPRIETARY INFORMATION OF B-K LIGHTING, INC. AND ITS RECEIPT OR POSSESSION DOES NOT CONVEY ANY RIGHTS TO REPRODUCE, DISCLOSE ITS CONTENTS, OR TO MANUFACTURE, USE OR SELL ANYTHING IT MAY DESCRIBE. REPRODUCTION, DISCLOSURE OR USE WITHOUT SPECIFIC WRITTEN AUTHORIZATION OF B-K LIGHTING, INC. IS STRICTLY FORBIDDEN.

03/02/2020 SKU-1338
SLIB-2816-00

LAMP & DRIVER DATA (x58, x59, x60, x61, x62, x63, x43, x44, x45)

DATE: | PROJECT: | TYPE:

DRIVER ELECTRICAL DATA

Type	AC Input Range	Frequency Hz	Power Factor At Full Load (Efficiency)	THD	InRush Current	Operating Current	Operation Ambient Temperature	Dimmer Type	Dimmer Range
DI12INC	105-305Vac	50/60	> 0.94	≤9%	< 250mA	700mA	-30° C ~ 50°C	Incandescent	10-100%
DI20INC	105-305Vac	50/60	> 0.94	≤9%	< 250mA	700mA	-30° C ~ 50°C	Incandescent	10-100%
DI34INC	105-305Vac	50/60	> 0.94	≤9%	< 250mA	700mA	-30° C ~ 50°C	Incandescent	10-100%

		LM79 DATA			L70 DATA	OPTICAL DATA		
BK No.	CCT (Typ.)	CRI (Typ.)	Input Watts (Typ.)	Minimum Rated Life (hrs.) 70% of initial lumens (L_{70})	Angle	CBCP	Delivered Lumens
x58	2700K	80	12W	50,000	15°	3877	724
	2700K	80	12W	50,000	35°	1498	663
	2700K	80	12W	50,000	60°	629	625
x59	3000K	80	12W	50,000	15°	4059	758
	3000K	80	12W	50,000	35°	1568	694
	3000K	80	12W	50,000	60°	659	655
x60	4000K	80	12W	50,000	15°	4561	851
	4000K	80	12W	50,000	35°	1762	780
	4000K	80	12W	50,000	60°	740	736
x61	2700K	80	20W	50,000	15°	7098	1306
	2700K	80	20W	50,000	35°	2621	1124
	2700K	80	20W	50,000	60°	1048	1063
x62	3000K	80	20W	50,000	15°	7488	1378
	3000K	80	20W	50,000	35°	2765	1186
	3000K	80	20W	50,000	60°	1106	1121
x63	4000K	80	20W	50,000	15°	7800	1435
	4000K	80	20W	50,000	35°	2880	1235
	4000K	80	20W	50,000	60°	1152	1168
x43	2700K	80	34W	50,000	25°	5435	1915
	2700K	80	34W	50,000	60°	2697	1860
x44	3000K	80	34W	50,000	25°	5672	1998
	3000K	80	34W	50,000	60°	2814	1941
x45	4000K	80	34W	50,000	25°	5908	2081
	4000K	80	34W	50,000	60°	2931	2022

OPTICS

Optic	Angle
Spot	15°
Narrow Flood	25°
Flood	35°
Wide Flood	60°

B-K LIGHTING | MADE IN THE USA | 559.438.5800 | INFO@BKLIGHTING.COM | BKLIGHTING.COM

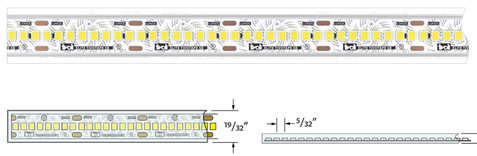
THIS DOCUMENT CONTAINS PROPRIETARY INFORMATION OF B-K LIGHTING, INC. AND ITS RECEIPT OR POSSESSION DOES NOT CONVEY ANY RIGHTS TO REPRODUCE, DISCLOSE ITS CONTENTS, OR TO MANUFACTURE, USE OR SELL ANYTHING IT MAY DESCRIBE. REPRODUCTION, DISCLOSURE OR USE WITHOUT SPECIFIC WRITTEN AUTHORIZATION OF B-K LIGHTING, INC. IS STRICTLY FORBIDDEN.

FIXTURE: C

ELITE | TivoTape™ Outdoor (factory installed power lead wires)

tivoli

Standard Brightness (SB)



3.2W/ft 328LM/ft | 4oz. Trace | High Efficacy | 99 CRI | Compliant | VHB Adhesive | Silicone Jacket

2200K | 2400K | 2700K | 3000K | 3500K | 4000K | 5000K

Ordering Information

cULus LISTED

PRODUCT CODE	INTENSITY	INSTALL	LED COLOR	VOLTAGE
TPLE	SB	O		24
TPLE = TivoTape ELITE	SB = Standard Brightness	O = Outdoor	22 = 2200K 24 = 2400K 27 = 2700K 30 = *3000K 35 = 3500K 40 = 4000K 50 = 5000K	24 = 24V DC

TivoTape Run Lengths & End Preps
Please specify length of run with quantity of run(s) and end prep type at time of ordering.
Note: Only (1) end prep needed for each run (see page 18)

*This product is in compliance with the California Energy Code Title 24 JA8-2016 in 3000K and only when incorporating a specific power supply.

Tivoli, LLC. reserves the right to modify this specification without prior notice.
Copyright © Tivoli 11/22/19

www.tivolilighting.com tel: 714-957-6101 fax: 714-427-3458

ELITE | TivoTape™ Outdoor (factory installed power lead wires)

tivoli

SB Data

Electrical & Photometric Data (Based on 97 CRI / 3000K)							
Input Voltage	24V DC						
Dimming Option	MLV/ELV/0-10V/DMX						
Power Supply	Class 2						
Wire Size (End Prep)	18 AWG, 2 wire						
Power Consumption	3.2 W/ft.						
Color Temperature (CCT)	2200K	2400K	2700K	3000K	3500K	4000K	5000K
Lumen Output	291	307	323	328	332	346	350
Efficacy	91	96	101	102	104	108	110
Color Rendering Index (CRI)	99	97	97	97	94	93	90
R9	92						
TM-30-15 Fidelity Index (R_f)	93						
TM-30-15 Gamut Index (R_g)	103						

Physical	
LED Package	2835
LEDs/ft	73
Operating Temperature	-40°F (-40°C) ~ +140°F (+60°C)
Environment	IP67 Wet Location
Maximum Run Length	29'
Maximum Run Length w/ JA8 Compliant Power Supply	24'
Copper Trace	4 Ounce
Adhesive	3M VHB Tape
Dimension	19/32" (15mm)

Performance	
Certification	UL Listed
Lumen Maintenance (L70) Hours	60,000
Binning Tolerance	1.5 Step MacAdam Elipse
Warranty	3 Years

Tivoli, LLC. reserves the right to modify this specification without prior notice.
Copyright © Tivoli 11/22/19

www.tivolilighting.com tel: 714-957-6101 fax: 714-427-3458

FIXTURE: D

WAC LIGHTING

Fixture Type:
Catalog Number:
Project:
Location:

Tube

Single & Double Wall Mount 3000K

Model & Size	Color Temp & CRI	Watt	Lumens	Finish
❍ WS-W2604 Double ❍ WS-W2605 Single	❍ 3000K 90 ❍ 3000K 90	30W 16W	1750 800	❍ AL Brushed Aluminum ❍ BK Black ❍ BZ Bronze ❍ GH Graphite ❍ WT White

Example: **WS-W2604-AL**

DESCRIPTION

A simple sconce with endless possibilities. This cylindrical wall luminaire delivers powerful lumen output, either upwards or downwards, or a combination of both, depending on theconfiguration and application. Built to last with die-cast aluminum construction and designed with no visible hardware, this low profile highly versatile Tube is perfect for your exterior

FEATURES

- Title 24 may not be available for all finishes, check for availability
- 2605 Single, 2604 Double
- Driver concealed within the fixture
- 5 year warranty

SPECIFICATIONS

Construction:	Die-cast Aluminum
Power:	16W, 30W
Input:	120-277 VAC, 50/60Hz
Dimming:	ELV: 100-15% , 0-10V: 100-10%
Light Source:	Integrated LED
Rated Life:	70000 Hours
Mounting:	Mounts directly to junction box, Can be mounted on wall in all orientations
Finish:	Electrostatically Powder Coated: White, Graphite, Bronze, Black, Brushed Aluminum
Operating Temp:	-40°F to 122°F (-40°C to 50°C)
Standards:	ETL, cETL, Wet Location Listed, IP65, Title 24 JA8-2019 Compliant

FINISHES:

LINE DRAWING:

waclighting.com | **Phone** (800) 526.2588 | **Fax** (800) 526.2585 | **Headquarters/Eastern Distribution Center** 44 Harbor Park Drive Port Washington, NY 11050

WAC Lighting retains the right to modify the design of our products at any time as part of the company's continuous improvement program, July 2021

1

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REVISION DATES (RESIGN STAMP ONLY)

Sheet Version 4.0

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

REGISTERED PROFESSIONAL ENGINEER
ROBERT D. GETTER
No. E 21884
Exp. 06-30-23
CIVIL ELECTRICAL
11/17/2021

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED •

BUREAU OF ENGINEERING
VERTICAL CONTROL:
HORIZONTAL CONTROL:
SHEET TITLE: LIGHTING CATALOG CUTS 2
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

DEPARTMENT OF PUBLIC WORKS
CITY OF LOS ANGELES
GARY LEE MOORE, P.E., ENV SP
CITY ENGINEER

NO.	REVISIONS:	DATE:	BY:

DESIGN GROUP
ENGINEER: RGETTER
DESIGNED BY: ACARRIE
DRAWN BY: JCHIN
CHECKED BY: RHUBATCH
APPROVED BY: XX
DATE:

CIP NO.

INDEX NO.

WORK ORDER NO.
E170121B

SHEET NAME
EL-13
SHEET X OF X SHEETS

Q:\PROJECTS\CITY OF LA_BROOKSSCARPA\PROJECTLINE DRAWINGS\CAD\EL-13.DWG 12/6/2021 9:15 AM

FIXTURE: E - EXTERIOR

APPLICATIONS

8W, 20W, 30W, 50W SUNLIKE Area Lights

This economical, easily-installed, off-grid lighting solution is ideal for areas such as pathways, parking lots, landscaping, parks, schools, trails, or any remote locations that have no access to conventional power.

Pittsburg Bart Station
Pittsburg CA, USA
Pathway Security Lighting Project

VA Medical Center
Sacramento CA, USA
Parking Lots Lighting Project

Kimberly. Clark Company
Costa Rica
Parking Lots Lighting Project

Wonderful Solar Company
Delano CA, USA
Road Lighting Project

* The above parameters are for reference only. Please refer to IES and DLC documents for details.
Soltech is continually improving its products. Specifications may change without notice.

FEATURES

8W, 20W, 30W, 50W SUNLIKE Area Lights

50+ Hours Max Autonomy
- UP to 691 WH battery capacity
- Full self-charging time less than 11 hrs
- One-key smart programing

High Brightness, Smart Power Consumption
- >200lm/W—the highest efficiency in the industry
- Microwave motion sensor and one-key automatic dimming
- Automatically switches to 40% energy saving mode during low battery capacity

Complete Universality
- 6 different mounting options
- Designed for round pole, square pole and wall pack applications
- Acts as a solar flood light

Greater Energy Production
- Up to 115W Mono Crystalline Solar Panel
- Adjustable angle for the fixture head allows maximum solar collection and self-cleaning of the solar panel surface

Longer Life
- Grade A LifePO⁴ Battery Pack, 2000+ full charging cycles
- Lumileds 5050 LED chips

Low Maintenance Design
- Field-replaceable battery functionality via quick connections
- Die cast A380 aluminum fixture housing is rust free
- 10+ year warranty options for city utility projects

SUNLIKE 50W

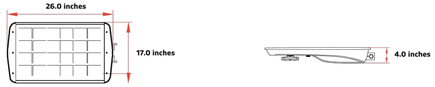
SUNLIKE 8W, 20W, 30W

* The above parameters are for reference only. Please refer to IES and DLC documents for details.
Soltech is continually improving its products. Specifications may change without notice.

DIMENSIONAL DRAWINGS

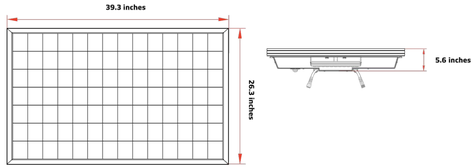
SUNLIKE 8W

SUNLIKE 20W



SUNLIKE 30W

SUNLIKE 50W



* The above parameters are for reference only. Please refer to IES and DLC documents for details.
Soltech is continually improving its products. Specifications may change without notice.

DESIGN & PERFORMANCE

8W, 20W, 30W, 50W SUNLIKE Area Lights

Affordable and user-friendly, SUNLIKE luminaires are perfect for awide range of applications, including schools, parks, parking lots and pathways. Constructed of corrosion-resistant aluminum, it's low-profile, fully-integrated design is both easy to install and attractive. SUNLIKE is available in four lumen packages.

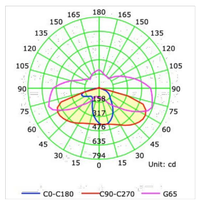
SPECIFICATIONS	**SUNLIKE** 8W	**SUNLIKE** 20W	**SUNLIKE** 30W	**SUNLIKE** 50W
LED NOMINAL POWER	8	20	30	50
SOLAR PANEL	18V 17W	18V 36W	18V 52W	18V 115W
LiFePO4 BATTERY	115WH 12.8V 9AH	256WH 12.8V 20AH	384WH 12.8V 30AH	691WH 12.8V 54AH
WEIGHT	11.7 Lbs	21.4 Lbs	29.8 Lbs	58.7 Lbs
LUMEN OUTPUT@5000K	1,600	4,000	6,000	9,000
EPA	2.67	4.75	6.26	8.62
IP RATING	IP65	IP65	IP65	IP65
CRI	CRI > 70	CRI > 70	CRI > 70	CRI > 70
CASTING	ALUMINUM	ALUMINUM	ALUMINUM	ALUMINUM
EFFICIENCY@5000K	200 LM/W	200 LM/W	200 LM/W	180 LM/W
LED CHIP	Lumileds 5050 (215 LM-CR>70)	Lumileds 5050 (215 LM-CR>70)	Lumileds 5050 (215 LM-CR>70)	Lumileds 5050 (210 LM-CR>70)
*CHARGING TIME	7 Hrs	7 Hrs	7 Hrs	11 Hrs
RUN TIME (@FULL POWER)	10 Hrs	10 Hrs	10 Hrs	13 Hrs
OPERATION MODE	REMOTE CONTROL AND ONE-KEY SETTING	REMOTE CONTROL AND ONE-KEY SETTING	REMOTE CONTROL AND ONE-KEY SETTING	REMOTE CONTROL AND ONE-KEY SETTING
INSTALLATION HEIGHT	6 to 13 ft	9 to 16 ft	9 to 20 ft	9 to 20 ft
*OPERATING TEMPERATURE	-4 °F to 122 °F	-4 °F to 122 °F	-4 °F to 122 °F	-4 °F to 122 °F
*CHARGING TEMPERATURE	32 °F to 149 °F	32 °F to 149 °F	32 °F to 149 °F	32 °F to 149 °F

* The temperature can impact the battery's charging and normal operation. If your site's temperature is under 32°F, we advice you to use the Sunlike Pro model to achieve better lighting results.
* The solar charge time data is base on 77 degree F ambient temperature with the panel pointed directly at the solar radiation. The standard radiation value is 1000W/m².

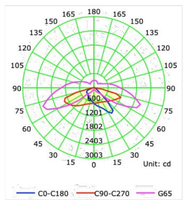
* The above parameters are for reference only. Please refer to IES and DLC documents for details.
Soltech is continually improving its products. Specifications may change without notice.

PHOTOMETRY

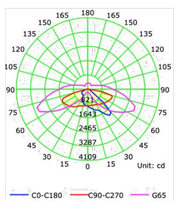
SUNLIKE 8W



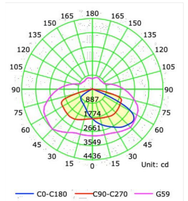
SUNLIKE 20W



SUNLIKE 30W



SUNLIKE 50W



* The above parameters are for reference only. Please refer to IES and DLC documents for details.
Soltech is continually improving its products. Specifications may change without notice.

PRODUCT NUMBER BUILDER

Example: TLSTC008B3TRSGY
This example product number is for SUNLIKE 8 watt, 3000K CCT, wall mount installation, with a gray finish.

SERIES	WATTAGE	COLOR TEMPERATURE	MOUNTING OPTIONS	FINISH
TLSTC=SUNLIKE	**008**=8W 1600 LUMENS	**X=3**=3000K	**YY=WM**=WALL MOUNT	**ZZ=GY**=GRAY
	020=20W 4000 LUMENS	**X=4**=4000K	**YY=TRR**=TRUNNION ROUND	**ZZ=BZ**=BRONZE
	030=30W 6000 LUMENS	**X=5**=5000K	**YY=TRS**=TRUNNION SQUARE	
	050=50W 9000 LUMENS	**X=6**=5700K	**YY=SF**=SLIP FITTER	
			YY=SA=STRAIGHT ARM	
			YY=MS=MOUNTING SLEEVE (only for SUNLIKE 50W)	

Sample Number: TLSTC008XYYZZ

Please **DO NOT** send the generic sample number directly to our salesperson. Use the information in the chart, above, to create a model number with the correct series, wattage, CCT, mounting options, and finish for the product options that you want.

* The above parameters are for reference only. Please refer to IES and DLC documents for details.
Soltech is continually improving its products. Specifications may change without notice.

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REVISION DATES
(DESIGN STAGE ONLY)

Sheet Version 4.0

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

REGISTERED PROFESSIONAL ENGINEER
ROBERT D. GETTER
No. E 21884
Exp. 06-30-23
CIVIL
ELECTRICAL
11/17/2021

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED •

BUREAU OF ENGINEERING
VERTICAL CONTROL:
HORIZONTAL CONTROL:
SHEET TITLE: LIGHTING CATALOG CUTS 3
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

DEPARTMENT OF PUBLIC WORKS
NO. | REVISIONS: | BY: | DATE:
CIP NO.
INDEX NO.

CITY OF LOS ANGELES
GARY LEE MOORE, P.E., ENV SP
CITY ENGINEER
DESIGN GROUP
ENGINEER: RGETTER
DESIGNED BY: ACARRIE
DRAWN BY: JCHIN
CHECKED BY: RHUBATCH
APPROVED BY: XX
DATE:

WORK ORDER NO.
E170121B

SHEET NAME
EL-14
SHEET X OF X SHEETS

Q:\PROJECTS\CITY OF LA_BROOKSSCARPA\PROJECTLINE DRAWINGS\CAD\EL-14.DWG 12/6/2021 9:27 AM

FIXTURE: F - EXTERIOR

Halo Commercial

DESCRIPTION

Recessed 8-inch shallow lensed LED downlight is available in multiple lumen and optical distribution combinations. Choose between 3000K, 3500K and 4000K CCT in the field with seleCCTable™ technology. Suitable for commercial new construction or renovation work. Coordinated retrofit and surface mount versions are also available. Use for general area lighting where high efficiency and long life are required.

		Type
Catalog #		
Project	RESEDA	G
Comments	GATEWAY	Date
Prepared by		

PR810
PR815
PR820
PR830
PR840

PR8M12
PR8M34

1000, 1500, 2000, 3000 & 4000 Lumen Series

8-Inch Shallow Lens LED Recessed Downlight

Medium, Wide & Wall Wash Distribution

seleCCTable™

SPECIFICATION FEATURES

MECHANICAL

Frame
Boat shaped galvanized steel frame with adjustable plaster lip accommodates ceilings up to 1/2" - 1-3/4" thick. May be used for new construction or renovation work. Provided with (2) remodel clips to secure frame when installed from below the ceiling.

Mounting Brackets
Bar hanger receivers adjusts 2" vertically from above the ceiling or thru the aperture. Use with No Fuss™ bar hangers or with 1/2" EMT. Removable to facilitate installation from below the ceiling.

No Fuss™ Bar Hangers
Captive preinstalled bar hanger locks to tee grid with a screwdriver or pliers. Centering mechanism allows consistent positioning of fixtures.

OPTICAL

LED Module
Self-flanged aluminum housing maximizes thermal performance. LED array uses a plurality of mid-power surface mount LED packages delivering high flux and excellent efficiency. Switch selectable 3000K, 3500K or 4000K CCT reduces ordering complexity and provides flexibility in the field. Color point accuracy within 3 SDCM and 80 CRI minimum provides color quality and uniformity. Passive thermal management achieves L70 at 50,000 hours. Integral connector allows quick connection to frame/housing flex.

Shielding
Field interchangeable lenses available in either medium or wide distributions. Optional field installed wall wash optic provides 360° rotation, allowing for the housing to be installed in any orientation.

Retention
Module retained with two torsion springs holding the flange tightly to the finished ceiling surface.

ELECTRICAL

Junction Box
(4) 1/2" and (2) 3/4" trade size pry outs positioned to allow straight conduit runs. Listed for (8) #12 AWG (four in, four out) 90°C conductors and feed thru branch wiring.

Driver
Integral UNV 120 - 277V 50/60 Hz constant current driver provides noise free operation. Continuous, flicker-free dimming from 100% to 1% using 0 -10V analog control.

Emergency Option
Available with Sure-Lites EBPLED 7 or 14 watt emergency battery pack with remote test switch / charge indicator light. Provides 90 minutes of standby lighting meeting most life safety codes for egress lighting.

COMPLIANCE
- cULus listed/certified, wet location labeled for covered ceilings.
- IP55 rated
- IC rated to 2000 lumens
- Thermally protected for 3000 and 4000 lumen versions. Insulation must be kept 3" from top and sides.
- Airtight per ASTM-E283
- Optional City of Chicago environmental air (CCEA) marking for plenum applications.
- EMI/RFI emissions per FCC 47CFR Part 18 non-consumer limits.
- Contains no mercury or lead and RoHS compliant.
- Photometric testing in accordance with IES LM-79-08 and TM-30-15.
- Lumen maintenance projections in accordance with IES LM-80-08 and TM-21-11.
- Can be used to comply with California Title 24 Non-Residential Lighting Controls requirements as a LED Luminaire.
- ENERGY STAR® Certified. See energystar.gov website for current information.

WARRANTY
Limited 5-year warranty, see website for details. www.eaton.com/lighting/legal

Lumens	1000 Series	
Input Voltage	120V	277V
Input Current	0.09A	0.04A
Input Power	10.5W	11.2W
Lumens	**1500 Series**	
Input Voltage	120V	277V
Input Current	0.125A	0.06A
Input Power	15W	15.5W

Lumens	2000 Series	
Input Voltage	120V	277V
Input Current	0.18A	0.08A
Input Power	22W	22.5W
Lumens	**3000 Series**	
Input Voltage	120V	277V
Input Current	0.24A	0.10A
Input Power	28.5W	28.5W

Lumens	4000 Series	
Input Voltage	120V	277V
Input Current	0.36A	0.16A
Input Power	43.5W	43W
THD: ≤ 20%		
PF: ≥ 0.90		
T Ambient -30 - +40°C		
Sound Rating ≤ 22dba		

TD517010EN
3/17/2017

Halo Commercial

PR810/PR815/PR820/PR830/PR840
PR8M12/PR8M34

ORDERING INFORMATION

FRAME SAMPLE NUMBER: PR840D010
A complete luminaire consists of a frame and LED module, order separately.

Housing	Lumens	Driver	Options[1,2]
PR8 = 8" aperture LED downlight frame **PR8CP** = 8" aperture LED downlight frame, CCEA listed for City of Chicago plenum requirements	**10** = 1,000 lumens (nominal) **15** = 1,500 lumens (nominal) **20** = 2,000 lumens (nominal) **30** = 3,000 lumens (nominal) **40** = 4,000 lumens (nominal)	**D010** = 120-277V 50/60Hz, 0-10V 100% to 1% dimming	**REM7** = 7W emergency battery pack with remote test switch and charge indicator light **REM14** = 14W emergency battery pack with remote test switch and charge indicator light

MODULE SAMPLE NUMBER: PR8M34MDMW
A complete luminaire consists of a frame and LED module, order separately.

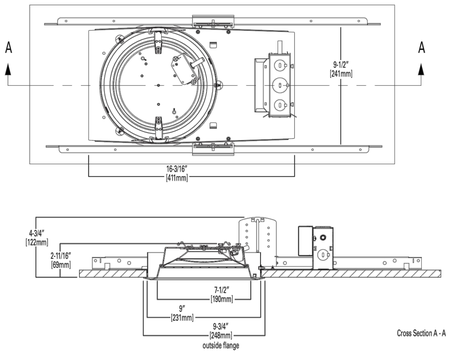
LED Module	Shielding	Flange Finish
PR8M12 = Downlight LED module for PR8 series, provides 1000, 1500 or 2000 lumens (nominal) depending on connected frame type **PR8M34** = Downlight LED module for PR8 series, provides 3000 or 4000 lumens (nominal) depending on connected frame type	**MD** = Medium distribution plastic lens **WD** = Wide distribution plastic lens	**MW** = Matte White **MB** = Matte Black **MMS** = Matte Metallic Silver

Accessories

HD120APK = L channel hanger bar, 26", 'No-Fuss', pair (replacement)
RMB22 = 22" long wood joist mounting bars, pair
PR8WW = Field Installed wall wash optic for PR8M12 and PR834 modules
PR8MD = Replacement 8" medium distribution lens for PR8M12 and PR8M34 modules
PR8WD = Replacement 8" wide distribution lens for PR8M12 and PR8M34 modules
PR8TC = Specular clear trim insert for PR8M12 and PR8M34 modules
PR8TH = Semi-specular clear trim insert for PR8M12 and PR8M34 modules
ABR10P = Oversize trim ring for max 10° ceiling opening - 11.3" flange
PORLWTPD1 = LumaWatt Pro Wireless Sensor Kit (0-10V only)

Notes: 1. REM not available with CP version.
2. REM UL qualified for UB only (not Canada).

DIMENSIONS



Halo Commercial

PR810/PR815/PR820/PR830/PR840
PR8M12/PR8M34

LUMEN TABLES

1000 Lumen, 10.5W	3000K		3500K		4000K	
	Lumens	LPW	Lumens	LPW	Lumens	LPW
Medium Distribution Lens, Matte White Trim	1176	112	1326	126	1245	119
Medium Distribution Lens, Matte Black Trim	1072	102	1209	115	1134	108
Medium Distribution Lens, Matte Metallic Silver Trim	1137	108	1282	122	1203	115
Wide Distribution Lens, Matte White Trim	1172	112	1322	126	1240	118
Wide Distribution Lens, Matte Black Trim	1063	101	1198	114	1125	107
Wide Distribution Lens, Matte Metallic Silver Trim	1126	107	1270	121	1192	114
Wall Wash Optic, Matte White Trim	996	95	1130	108	1061	101

1500 Lumen, 15W	3000K		3500K		4000K	
	Lumens	LPW	Lumens	LPW	Lumens	LPW
Medium Distribution Lens, Matte White Trim	1597	106	1800	120	1690	113
Medium Distribution Lens, Matte Black Trim	1455	97	1641	109	1540	103
Medium Distribution Lens, Matte Metallic Silver Trim	1543	103	1740	116	1633	109
Wide Distribution Lens, Matte White Trim	1591	106	1794	120	1684	112
Wide Distribution Lens, Matte Black Trim	1443	96	1627	108	1527	102
Wide Distribution Lens, Matte Metallic Silver Trim	1529	102	1724	115	1618	108
Wall Wash Optic, Matte White Trim	1349	90	1534	102	1440	96

2000 Lumen, 22W	3000K		3500K		4000K	
	Lumens	LPW	Lumens	LPW	Lumens	LPW
Medium Distribution Lens, Matte White Trim	2186	99	2465	112	2313	105
Medium Distribution Lens, Matte Black Trim	1992	91	2246	102	2108	96
Medium Distribution Lens, Matte Metallic Silver Trim	2113	96	2382	108	2236	102
Wide Distribution Lens, Matte White Trim	2179	99	2456	112	2305	105
Wide Distribution Lens, Matte Black Trim	1975	90	2227	101	2090	95
Wide Distribution Lens, Matte Metallic Silver Trim	2093	95	2360	107	2215	101
Wall Wash Optic, Matte White Trim	1847	84	2100	95	1971	90

3000 Lumen, 28.5W	3000K		3500K		4000K	
	Lumens	LPW	Lumens	LPW	Lumens	LPW
Medium Distribution Lens, Matte White Trim	3217	113	3630	127	3376	118
Medium Distribution Lens, Matte Black Trim	2917	102	3292	116	3062	107
Medium Distribution Lens, Matte Metallic Silver Trim	3092	108	3488	122	3244	114
Wide Distribution Lens, Matte White Trim	3200	112	3610	127	3358	118
Wide Distribution Lens, Matte Black Trim	2901	102	3274	115	3045	107
Wide Distribution Lens, Matte Metallic Silver Trim	3075	108	3469	122	3227	113
Wall Wash Optic, Matte White Trim	2702	95	3053	107	2840	100

4000 Lumen, 43.5W	3000K		3500K		4000K	
	Lumens	LPW	Lumens	LPW	Lumens	LPW
Medium Distribution Lens, Matte White Trim	4397	101	4961	114	4614	106
Medium Distribution Lens, Matte Black Trim	3987	92	4498	103	4184	96
Medium Distribution Lens, Matte Metallic Silver Trim	4225	97	4767	110	4433	102
Wide Distribution Lens, Matte White Trim	4372	101	4933	113	4588	105
Wide Distribution Lens, Matte Black Trim	3965	91	4473	103	4161	96
Wide Distribution Lens, Matte Metallic Silver Trim	4201	97	4740	109	4409	101
Wall Wash Optic, Matte White Trim	3698	85	4172	96	3880	89

FIXTURE: G - EXTERIOR

Date: _____ Customer: _____
Project: _____
Type: _____ Qty: _____

selux

Olivio Grande **LED** Sistema 2 Arm Mount

Order Code:

#1	OLGL	-	____	-	____	-	____	-	____	-	____	-	____	-	____	-	____
#2	OLGL	-	____	-	____	-	____	-	____	-	____	-	____	-	____	-	____
#3	OLGL	-	____	-	____	-	____	-	____	-	____	-	____	-	____	-	____
#4	OLGL	-	____	-	____	-	____	-	____	-	____	-	____	-	____	-	____
Fixture #	Series		Optics		Mounting		Light Engine		CCT		Finish		Voltage		Options		

Pole Order Code:

	-		-		-	RN	-		-		-		-		-		-		-		-	
Series		Height		Finish		Rivnut Pairs		Options		*Rivnut Locations												
Fixture #										A0, E1, I2, M3, Q4, U6												

*Refer to chart on page 5 for Rivnut locations

OLGL	Series	OLGL Olivio Grande LED			
	Optics	S09 Spot, 9°	F40 Flood medium, 44°	F80 Flood wide, 82°	ASM Asymmetric (no SLH or SLV option)
	Mounting	SBx Specify Arm Locations (x = number of luminaires per pole)			
	Light Engine	2G350 14W / 1190lm	2G725 28W / 2380lm	2G150 30W / 4900lm	* Based on F80 distribution and 3000K CCT.
	CCT	30[1] 3000K	40 4000K	RGBW (consult factory)	[1] Dark Sky approved with (DS) option only
	Finish	WH White	BK Black	BL Semi- Matte Black	BZ Bronze	SV Silver	SP Specify Premium Color
	Voltage	120 120V	208 208V	240 240V	277 277V	347 347V	
	Options	DS[1] Dark Sky 0° Tilt Option	DM Dimming, 0-10V	HL50[2,3] Hi Lo switching Low Output 50%	SLH Spread Lens Horizontal (fixed)	SLV Spread Lens Vertical (fixed)	PC Photocell (consult factory)
		HX[4] Micro Hexcell Honeycomb Louver	CF Color Filter (consult factory)				

[1] Dark Sky approved with (DS) option only, and 3000K CCT.
[2] Only available with 120V, 240V, or 277V.
[3] Cannot be combined with SLH, SLV, or ASM options.
[4] Cannot be combined with DM option

Product Modifications
Please list modification requirements for review by factory:

Approvals

Date:

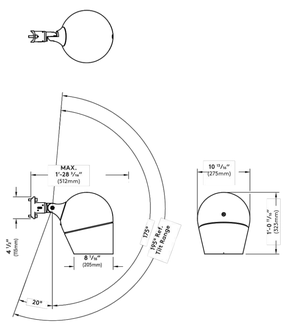
Selux Corporation © 2020, T 845-834-1400, 800-735-8927, F 845-834-1401, www.selux.us
In a continuing effort to offer the best product possible, we reserve the right to change, without notice, specifications or materials that in our opinion will not alter the function of the product. Specification sheets found at www.selux.us are the most recent versions and supersede all either printed or electronic versions.

Page 1 of 12
(Rev. 03/2020)
OLGL-SB_sx_v3.6

Olivio Grande LED - Sistema 2 Arm Mount

selux

OLGL-SB1



Specifications

1. Luminaire Housing - Two-piece high-pressure die-cast housing, made of low-copper aluminum alloy. Single recessed captive screw allows easy access to light engine & gear tray components.

2. Gasketing - (not shown) UV and ozone-resistant, silicone gasket between fixture housing and lens base provide IP67 level ingress protection. IP rated micro-membrane ensures pressure compensation.

3. Lens - (not shown) Tempered clear glass lens.

4. LED Light Engine - (not shown) made from high flux COB and vacuum metalized aluminum reflectors. Selux is using brand name LED manufacturers. Available in 3000K and 4000K, CRI minimum 80. Reflectors made from high purity aluminum to ensure high efficiencies throughout lifetime. Complete light engine can be removed easily for future upgrade. LED light engine provides a reported lumen maintenance of 84.3% at 60,000 hours. L70 calculated greater than 60,000 hours.

5. LED Driver - Selux uses brand name high efficiency LED drivers. LEDs are driven by RoHS compliant high-efficiency driver. Excellent for cold temperature starting and instant on. Min. operating temperature -40°C/ -40°F.

6. Surge Protector - (not shown) Designed to protect luminaire from electrical surge up to 20kA.

7. Arm – Cast aluminum mounting arms for flexible pole mounting. Fixture head joint provides tilt-swivel range from 0° to 175°, and 360° rotation. Locks down with set screws.

8. Rivnuts – (not shown) (2) Two rivnuts required per Fixture Arm and installed by manufacturer.

8. Power Cord - (not shown) Pre-installed at factory and hidden through the luminaire hinge and hinge arm. Power cords are specified to fit the length of the pole specified with the luminaire.

Exterior Luminaire Finish -
Selux utilizes a high quality Polyester Powder Coating. All Selux luminaires and poles are finished in our Tiger Drylac certified facility and undergo a five stage intensive pretreatment process where product is thoroughly cleaned, phosphated and sealed. Selux powder coated products provide excellent salt and humidity resistance as well as ultraviolet resistance for color retention. All products are tested in accordance with test specifications for coatings from ASTM and PCI. Standard exterior colors are White (WH), Black (BK), Semi-Matte Black (BL), Bronze (BZ), and Silver (SV). Selux premium colors (SP) are available, please specify from your Selux color selection guide.

5 Year Limited LED Luminaire Warranty -
Selux offers a 5 Year Limited Warranty to the original purchaser that the Olivio LED luminaire shall be free from defects in material and workmanship for up to five (5) years from date of shipment. This limited warranty covers the LED driver and LED Light engine when installed and operated according to Selux instructions. For details, see "Selux Terms and Condition of Sale."

Listings and Ratings: Luminaire and LED tested to IP67 and IESNA LM-79-08 standards. LED tested to LM-80 standards. Luminaire and LED tested at 25°C ambient temperature.

Olivio LED suitable for ambient temperatures of 40°C (104°F). Minimum operating temperature of luminaire at -40°C (-40°F).

NRTL Listed for wet location (i.e. UL, CSA)

Visit selux.us for our LED End of Life recycling policy.

Selux Corporation © 2020, T 845-834-1400, 800-735-8927, F 845-834-1401, www.selux.us
In a continuing effort to offer the best product possible, we reserve the right to change, without notice, specifications or materials that in our opinion will not alter the function of the product. Specification sheets found at www.selux.us are the most recent versions and supersede all either printed or electronic versions.

Page 2 of 12
(Rev. 03/2020)
OLGL-SB_sx_v3.6

Olivio Grande LED - Sistema 2 Arm Mount

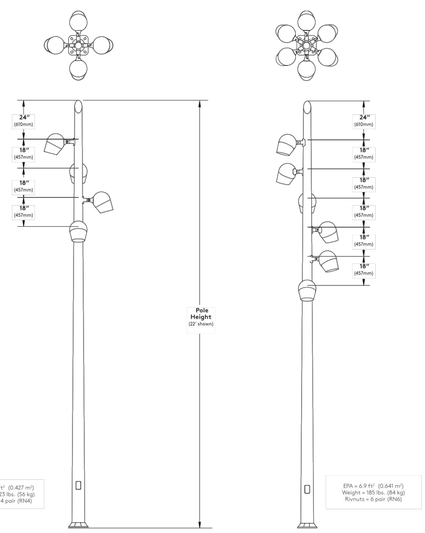
selux

Mounting

Mounting Configurations

Quadruple Pole Arms stepped at 90°
(Arm Location: 00-'04-25-5A)

Sextuple Pole Arms stepped at 60°
(Arm Locations: 0E-11-2H-3G-4U-5A)



Selux Corporation © 2020, T 845-834-1400, 800-735-8927, F 845-834-1401, www.selux.us
In a continuing effort to offer the best product possible, we reserve the right to change, without notice, specifications or materials that in our opinion will not alter the function of the product. Specification sheets found at www.selux.us are the most recent versions and supersede all either printed or electronic versions.

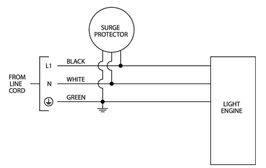
Page 4 of 12
(Rev. 03/2020)
OLGL-SB_sx_v3.6

Olivio Grande LED - Sistema 2 Arm Mount

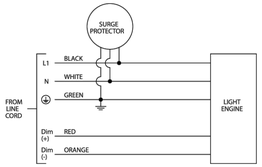
selux

Wiring

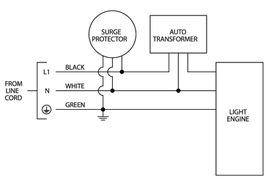
Standard Single Wiring



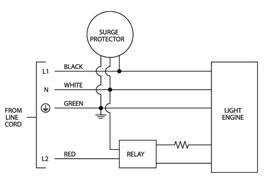
0-10V Dimming Option (DM) Wiring
120-277V. 347V available with step-down transformer.



347V



Hi-Lo Switching Option (HL) Wiring
120V, 240V, 277V. When red is energized, light output will be at "Lo" level. Low output is 50%



Selux Corporation © 2020, T 845-834-1400, 800-735-8927, F 845-834-1401, www.selux.us
In a continuing effort to offer the best product possible, we reserve the right to change, without notice, specifications or materials that in our opinion will not alter the function of the product. Specification sheets found at www.selux.us are the most recent versions and supersede all either printed or electronic versions.

Page 6 of 12
(Rev. 03/2020)
OLGL-SB_sx_v3.6

REVISION DATES (DESIGNER ONLY)

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

Sheet Version 4.0

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

REGISTERED PROFESSIONAL ENGINEER
ROBERT D. GETTER
No. E 21884
Exp. 06-30-23
ELECTRICAL
11/17/2021

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED •

BUREAU OF ENGINEERING
VERTICAL CONTROL:
HORIZONTAL CONTROL:
SHEET TITLE: LIGHTING CATALOG CUTS 4
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

CITY OF LOS ANGELES
DEPARTMENT OF PUBLIC WORKS
GARY LEE MOORE, P.E., ENV SP
CITY ENGINEER
DESIGN GROUP
DATE:
ENGINEER: RGETTER
DESIGNED BY: ACARRIE
DRAWN BY: JCHIN
CHECKED BY: RHUBATCH
APPROVED BY: XX

BY:
DATE:
NO. REVISIONS:

CIP NO.
INDEX NO.

WORK ORDER NO.
E170121B

SHEET NAME
EL-15
SHEET X OF X SHEETS

Q:\PROJECTS\CITY OF LA_BROOKSSCARPA\PROJECTLINE DRAWINGS\CAD\EL-15.DWG 12/6/2021 9:48 AM

DUAL-LITE®

DATE: LOCATION:

TYPE: PROJECT:

CATALOG #:

DLS Series

SINGLE PHASE CENTRAL LIGHTING INVERTER

FEATURES

- Uninterruptible emergency AC power system
- "No break" design transfers the load instantaneously when normal power is interrupted
- 90 minute emergency operation
- Single-phase
- Input/Output Voltage: 120VAC, 277VAC
- 60 Hz operation
- Sizes available from 400 VA/Watts to 2100 VA/Watts
- AC-output breaker standard on 400 and 525VA models
- For normally-on and normally-off loads
- For switched loads using ATSD 20 transfer switches
- 100% load compatible with any lighting source, including HID
- Off line design for high efficiency up to 98%
- Microprocessor controlled pulse width modulation (PWM) using IGBT technology

NFPA 70 NFPA 101 UL924

SYNCHRON

RELATED PRODUCTS

- LSN-D Series - Single Phase Inverters
- LitePower™ - LPS Series- Micro Inverters
- LiteGear® Series - Single Phase Inverters
- Trident TRF Series - 3 Phase Inverters

SPECIFICATIONS

APPLICATION
- Designed for indoor installation in commercial or industrial applications.

OPERATION
- When normal utility-supplied power is present, the Synchron central lighting inverter allows utility power to pass through to the connected load and charges the system batteries as required
- When utility-supplied power is interrupted, the system will automatically and instantaneously transfer to emergency mode without interruption to connected loads
- DC battery-derived emergency power is inverted to AC power and supplied in a pure sine wave output form for 90 minutes (standard run time)
- A low voltage battery disconnect circuit prevents "deep discharge" damage to the batteries during prolonged power outages
- When normal power is restored the system will automatically restart, providing power to connected loads and recharging the batteries
- The charging circuit will bring the batteries to full recharge within UL time standards

CONSTRUCTION
- The Synchron cabinet is constructed of NEMA 1 rated, painted steel.

INSTALLATION
- Input power entry point is from the cabinet top. Unit supplied with wall brackets for anchoring and features front service entry.

COMPLIANCES
- UL 924 Listed, Emergency Lighting and Power Equipment (standard 90 minute run time)
- National Electrical Code (NFPA 70)
- Life Safety Code (NFPA 101)
- OSHA, state and local codes
- Made in U.S.A.

FACTORY STARTUP
- Use accessory number FSS when ordering

WARRANTY
- Two years full on all components from date of shipment when a Factory Start-Up is ordered; one year full when a Factory Start-Up is not ordered.
- One year full, 9 years pro-rata for batteries.

Batteries must be connected to an energized charging circuit within 90 days from date of shipment or warranty is void.

Factory Start-Up is non-cancellable / non-returnable and must be performed within 6 months of inverter shipment to maintain 2 yr. full warranty. Order a quantity of 1 per system. Systems powered up by others are done so at their own risk.

WARRANTY
- 5 year warranty
- See HLI Standard Warranty for additional information

KEY DATA	
Wattage Range	400 - 2100 W/VA
Input/Output (VAC)	120/120 or 277/277
Power Factor Range	0.8 Lead to 0.75 Lag
Power Efficiency (offline)	98%

© 2021 Dual-lite, a division of Hubbell Lighting, Inc. Specifications subject to change without notice.
701 Millennium Blvd • Greenville, SC 29607 / Tel 864.678.1000 / Website www.dual-lite.com

HUBBELL Lighting

BROCHURE

DUAL-LITE®

DATE: LOCATION:

TYPE: PROJECT:

CATALOG #:

DLS Series

SINGLE PHASE CENTRAL LIGHTING INVERTER

ORDERING GUIDE

Example: DLS-400-120-LB

CATALOG # _____

DLS Housing	Capacity Rating (VA/Watts)[1]	Input/Output Voltage (VAC)	Output Circuit Breaker Type	Output Circuit Breaker Voltage Rating	Output Circuit Breaker Ampere Rating	Output Circuit Breaker Quantity[1,7]	Output Circuit Breaker Supervision[1]
DLS Single Phase Central Lighting Inverter	400	120	Blank Normally On	A 120VAC	15	01 to 10	Blank Monitored
	525	277	N Normally Off [4,5]	B 277VAC	20		U Unmonitored
	750				25		
	1000				30		
	1500						
	2100						

Notes:
1 Output Circuit Breakers
- 400VA and 525VA models: Supplied standard with one 15 amp normally-on output curcuit breaker only
- 750VA through 2100VA models: Output circuit breakers are optional

2 A maximum of 6 monitored or 10 unmonitored normally-on circuit breakers may be specified
3 A maximum of 4 normally-off circuit breakers may be specified
4 Maximum rating of normally-off circuit breakers is 20 amperes
5 Normally-off output circuit breakers include a built-in, 15 minute retransfer delay to accomodate HID lighting loads
6 Total quantity of monitored normally-off and normally-on breakers cannot exceed 6
7 Total quantity of unmonitored normally-off and normally-on breakers cannot exceed 10

SPECIFICATIONS

VA/Watts	400	525	750	1000	1500	2100
Power Factor Range	.8 lead to .75 lag					
Input/Output Voltage	120/120 or 277/277VAC ±10%					
AC Input Circuit Breaker Rating 120/277V	6/3 A	7/3 A	10/5 A	13/6A	20/8A	25/10A
Charger Size	2 Amps					
System DC Voltage	36	36	72	72	72	96
Cabinet Size	22"W x 23"H x 10"D (55.9cmW x 58.4cmH x 25.4cmD)		32"W x 36.5"H x 12"D (81.3cmW x 92.7cmH x 30.5cmD)			
BTU/Hour - Line/Inverter	70/260	92/341	131/382	175/510	263/765	368/886
Weight [lbs. (kg) - including batteries]	143 (65.1)	173 (78.8)	281 (128)	346 (157.6)	400 (182.2)	480 (218.7)

ELECTRONICS

SYSTEM SHORT CIRCUIT RATING: 18K AIC, RMS symmetrical
INPUT POWER CONNECTION: Terminal block
INPUT CIRCUIT BREAKER: Sized to system rating
POWER FACTOR: Unity 1.0 (VA = W)
POWER CONSUMPTION: Offline, 98% efficient
INVERTER DESIGN: Pulse width modulation via IGBT circuitry
INPUT FREQUENCY: 60 Hz, ±3%
SYNCHRONIZING SLEW RATE: 1 Hz per second, nominal
TRANSFER TIME: "No break" switching; instantaneous
Output Wave Shape: True AC sine wave
OUTPUT FREQUENCY: Normal: synchronized to utility; Inverter: +0.05 Hz
OUTPUT CIRCUIT BREAKERS: Single Pole; See "Ordering Guide"
OUTPUT REGULATION: (static) +10%, -5%, based on a 5% to 100% resistive load
OUTPUT DISTORTION: Less than 5% THD (linear load)
OVERLOAD RATING: 115% momentary
OVERLOAD/SHORT CIRCUIT PROTECTION: Circuit breakers, output fuse
AC LOCKOUT: Prevents battery discharge following installation when AC power is not present
COMPATIBILITY: Magnetic and electronic ballasts; incandescent, LED, fluorescent, compact fluorescent and HID lamps
TIME DELAY RETRANSFER: Supplied with "normally off" optional circuit breakers. Holds the unit in emergency mode for 15 minutes after normal AC power is restored, allowing utility power to stabilize and voltage sensitive lighting to resume normal operation.
LOW VOLTAGE BATTERY DISCONNECT: Protects the batteries from damaging "deep discharge" conditions during prolonged power outages
TEST MEANS: "Push-to-test" button provideD
INDICATORS: Visual LED indicators, audible alarm system
INTERIOR RELATIVE HUMIDITY: 95% non-condensing

BATTERY/CHARGING SYSTEM

CHARGING SYSTEM: Monitored – 3-step temperature compensated float
BATTERY CIRCUIT BREAKER: Sized to system rating
BATTERY: Type S – VRLA Lead Calcium
EXPECTED NORMAL LIFE: 10 years at 25°C (77°F)
OPERATING TEMPERATURE RANGE: 20°C to 30°C (68°F to 86°F)

© 2021 Dual-lite, a division of Hubbell Lighting, Inc. Specifications subject to change without notice.
701 Millennium Blvd • Greenville, SC 29607 / Tel 864.678.1000 / Website www.dual-lite.com

HUBBELL Lighting

DUAL-LITE®

DATE: LOCATION:

TYPE: PROJECT:

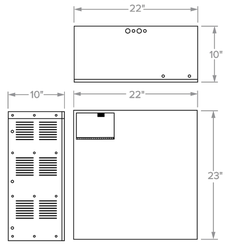
CATALOG #:

DLS Series

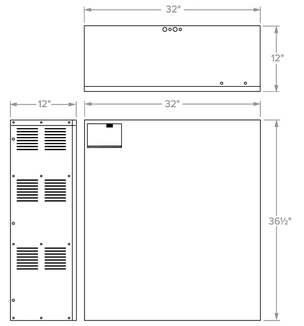
SINGLE PHASE CENTRAL LIGHTING INVERTER

DIMENSIONS

400VA to 525VA Models (can be wall mounted)



750VA to 2100VA Models (floor mount only)



© 2021 Dual-lite, a division of Hubbell Lighting, Inc. Specifications subject to change without notice.
701 Millennium Blvd • Greenville, SC 29607 / Tel 864.678.1000 / Website www.dual-lite.com

HUBBELL Lighting

LitePak™ 2 Standardized Lighting Control System

DOUGLAS LIGHTING CONTROLS

Project Name: _____

Part Number: _____ Date: _____

Features

- Relay and Relay/Dimming Capable Panels
- Central and Expansion Panels
- Dialog 2-Wire Network for Switches and Sensors
- Touchscreen Interface

LitePak™ 2 from Douglas Lighting Controls is a standardized digital lighting control system that provides automated and manual control over indoor and outdoor lighting. Contractors find standard off-the-shelf lighting control panels valuable for smaller projects due to their low cost and ease of installation.

New to LitePak 2: 0-10V dimming through independent dimming channels, an interface that follows the same format as our centralized relay panel lighting control unit (LCU), and peripherals connected using a 2-wire (#18/2), low voltage, polarity neutral, power and data network.

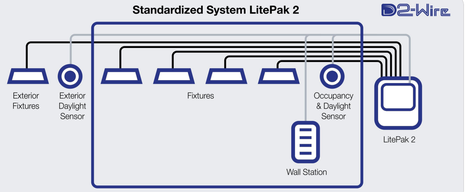
LitePak is available in 8 and 16 relay, dimming or non-dimming, Central and Expansion enclosures that can be used together to support up to 48 relay circuits. The Central panel contains the LCU and Expansion Panels are added to build a system up to 48 relay circuits. Panels are available with Surface mount or Flush mount covers. A NEMA type 4 enclosure is available for installing systems in harsh environments.

The touchscreen has a 365-day astronomical clock for time-of-day/sunrise/sunset control, ability to schedule up to 900 events, and connect with peripheral devices (wall switch stations, occupancy sensors, interior and exterior daylight sensors) to run a fully automated lighting system with daylight control. With the addition of dimming capabilities, daylight harvesting can be implemented.
LitePak 2 is designed to meet the requirements of ASHRAE 90.1 and Title 24 projects.

Typical Applications: Retail and Commercial projects including: Gas Stations, Convenience Stores, Warehouses, and Auto Dealerships

Standardized System LitePak 2

D2-Wire



LitePak™ 2 Standardized Lighting Control System

DOUGLAS LIGHTING CONTROLS

PART NUMBER	DESCRIPTION
DLP2-8R8D-SM	120/277VAC, 8 RELAY, 8 DIM, SURFACE MOUNT
DLP2-8R8D-FM	120/277VAC, 8 RELAY, 8 DIM, FLUSH MOUNT
DLP2-8R8D-N4	120/277VAC, 8 RELAY, 8 DIM, NEMA TYPE 4
DLP2-16R16D-SM	120/277VAC, 16 RELAY, 16 DIM, SURFACE MOUNT
DLP2-16R16D-FM	120/277VAC, 16 RELAY, 16 DIM, FLUSH MOUNT
DLP2-16R16D-N4	120/277VAC, 16 RELAY, 16 DIM, NEMA TYPE 4
DLP2-8R-SM	120/277VAC, 8 RELAY, SURFACE MOUNT
DLP2-8R-FM	120/277VAC, 8 RELAY, FLUSH MOUNT
DLP2-8R-N4	120/277VAC, 8 RELAY, NEMA TYPE 4
DLP2-16R-SM	120/277VAC, 16 RELAY, SURFACE MOUNT
DLP2-16R-FM	120/277VAC, 16 RELAY, FLUSH MOUNT
DLP2-16R-N4	120/277VAC, 16 RELAY, NEMA TYPE 4
DLP2-8R8D-SM-EXP	120/277VAC, 8 RELAY, 8 DIM, SURFACE MOUNT, EXPANSION PANEL
DLP2-8R8D-FM-EXP	120/277VAC, 8 RELAY, 8 DIM, FLUSH MOUNT, EXPANSION PANEL
DLP2-8R8D-N4-EXP	120/277VAC, 8 RELAY, 8 DIM, NEMA TYPE 4, EXPANSION PANEL
DLP2-16R16D-SM-EXP	120/277VAC, 16 RELAY, 16 DIM, SURFACE MOUNT, EXPANSION PANEL
DLP2-16R16D-FM-EXP	120/277VAC, 16 RELAY, 16 DIM, FLUSH MOUNT, EXPANSION PANEL
DLP2-16R16D-N4-EXP	120/277VAC, 16 RELAY, 16 DIM, NEMA TYPE 4, EXPANSION PANEL
DLP2-8R-SM-EXP	120/277VAC, 8 RELAY, SURFACE MOUNT, EXPANSION PANEL
DLP2-8R-FM-EXP	120/277VAC, 8 RELAY, FLUSH MOUNT, EXPANSION PANEL
DLP2-8R-N4-EXP	120/277VAC, 8 RELAY, NEMA TYPE 4, EXPANSION PANEL
DLP2-16R-SM-EXP	120/277VAC, 16 RELAY, SURFACE MOUNT, EXPANSION PANEL
DLP2-16R-FM-EXP	120/277VAC, 16 RELAY, FLUSH MOUNT, EXPANSION PANEL
DLP2-16R-N4-EXP	120/277VAC, 16 RELAY, NEMA TYPE 4, EXPANSION PANEL
DLP2C-8R-SM	120/347VAC, 8 RELAY, SURFACE MOUNT
DLP2C-8R-FM	120/347VAC, 8 RELAY, FLUSH MOUNT
DLP2C-8R-N4	120/347VAC, 8 RELAY, NEMA TYPE 4
DLP2C-16R-SM	120/347VAC, 16 RELAY, SURFACE MOUNT
DLP2C-16R-FM	120/347VAC, 16 RELAY, FLUSH MOUNT
DLP2C-16R-N4	120/347VAC, 16 RELAY, NEMA TYPE 4
DLP2C-8R8D-SM-EXP	120/347VAC, 8 RELAY, 8 DIM, SURFACE MOUNT, EXPANSION PANEL
DLP2C-8R8D-FM-EXP	120/347VAC, 8 RELAY, 8 DIM, FLUSH MOUNT, EXPANSION PANEL
DLP2C-8R8D-N4-EXP	120/347VAC, 8 RELAY, 8 DIM, NEMA TYPE 4, EXPANSION PANEL
DLP2C-16R16D-SM-EXP	120/347VAC, 16 RELAY, 16 DIM, SURFACE MOUNT, EXPANSION PANEL
DLP2C-16R16D-FM-EXP	120/347VAC, 16 RELAY, 16 DIM, FLUSH MOUNT, EXPANSION PANEL
DLP2C-16R16D-N4-EXP	120/347VAC, 16 RELAY, 16 DIM, NEMA TYPE 4, EXPANSION PANEL
DLP2C-8R-SM-EXP	120/347VAC, 8 RELAY, SURFACE MOUNT, EXPANSION PANEL
DLP2C-8R-FM-EXP	120/347VAC, 8 RELAY, FLUSH MOUNT, EXPANSION PANEL
DLP2C-8R-N4-EXP	120/347VAC, 8 RELAY, NEMA TYPE 4, EXPANSION PANEL
DLP2C-16R-SM-EXP	120/347VAC, 16 RELAY, SURFACE MOUNT, EXPANSION PANEL
DLP2C-16R-FM-EXP	120/347VAC, 16 RELAY, FLUSH MOUNT, EXPANSION PANEL
DLP2C-16R-N4-EXP	120/347VAC, 16 RELAY, NEMA TYPE 4, EXPANSION PANEL
DLP2C-8R8D-SM	120/347VAC, 8 RELAY, 8 DIM, SURFACE MOUNT
DLP2C-8R8D-FM	120/347VAC, 8 RELAY, 8 DIM, FLUSH MOUNT
DLP2C-8R8D-N4	120/347VAC, 8 RELAY, NEMA TYPE 4
DLP2C-16R16D-SM	120/347VAC, 16 RELAY, 16 DIM, SURFACE MOUNT
DLP2C-16R16D-FM	120/347VAC, 16 RELAY, 16 DIM, FLUSH MOUNT
DLP2C-16R16D-N4	120/347VAC, 16 RELAY, 16 DIM, NEMA TYPE 4

PARTS NUMBERING SYSTEM

DLP2 - 16R16D - FM - EXP

- Douglas LitePak 2
- No Character = 120/277VAC; C = Canadian = 120/347VAC
- Relays and Dimming Channels
- Cover/Enclosure
- Expansion Panel

*NEMA 4 Enclosure option

INPUT VOLTAGE	• 120VAC/277VAC or 120/347VAC (DLP2C); 60Hz models
0-10V SINK CURRENT	• 100mA
WIRING LIMITS	• Max. 1000' from LitePak to furthest device; Total Wire Length Max. 3000'
LOAD RATINGS (PER RELAY)	• 30A 300VAC General Use • 1/2HP at 110-125VAC • 347VAC General Use • 2400W 120VAC Tungsten • 1-1/2HP at 220-277VAC • 2400W 120VAC Tungsten • 20A 300 VAC Standard Ballast • SCCR 18,000A 277VAC • 20A 347VAC Ballast • 16A 277VAC Electronic Ballast • CSA
REGULATORY	• UL 508A • CSA 22.2 #14 • Designed to meet ASHRAE 90.1 requirements • Designed to meet California Title 24 requirements
DIMENSIONS	• 8 Relay/8 Dimming 16"H x 12"W x 4.5"D; 22 lbs.; NEMA 4: 20.5"H x 16"W x 6.5"D, 49.5lbs. • 16 Relay/16 Dimming 24"H x 12"W x 4.5"D; 32 lbs.; NEMA 4 29.75"H x 16"W x 7"D, 70.5lbs.
WARRANTY	• Standard 1-year

*Patent Pending Rev. 6/17/21

Toll Free: 877-873-2797 or Direct 604-873-2797 | lighting@douglaslightingcontrols.com | www.douglaslightingcontrols.com

POWERRIDE I

Single Phase, 2.1 to 17kW

office buildings • factories • warehouses
hospitals • hotels • motels • schools • universities
shopping centers • airports • casinos • supermarkets
military installations • apartment buildings
train and bus terminals • houses of worship

EMERGENCY LIGHTING INVERTERS

HID, Incandescent, Fluorescent, LED
120, 208, 240, 277, or 480 Volts
Listed to UL924 Lighting and UL1778 UPS by CSA

STANDARD FEATURES

- Back-lit LCD Display for monitoring
- System pre-wired for optional Global Monitoring System (GMS)
- Battery Breaker
- Inverter Test Switch
- Generator Compatible with Automatic Governor (Slew Rate 0.2Hz/sec.)
- Battery Management Software
- High Frequency PWM with Digital Signal Processing Technology
- Built-in Input Power Factor Correction

POWERRIDE I
ON-LINE // STANDBY-BY/FAST TRANSFER

The PowerRide I incorporates state of the art technology with PWM (Pulse Width Modulated), double conversion design for emergency lighting applications. When utility power fails, the Inverter provides uninterrupted output power to the emergency lighting circuits in compliance with UL924 Life Safety Code for 90 minutes of egress illumination.

PERFECT POWERSYSTEMS

KEY FEATURES:

- Fast Transfer, Standby, and Double Conversion "no-break" online system are available
- Efficiency: 94% Online / 98% Standby/Fast Transfer (Typical)
- Automatic monthly and annual self-testing
- Latest technology microprocessor controlled electronics with PWM (Pulse Width Modulated) design for true Sine Wave output
- Continuous self-diagnostic and self-testing system
- LCD backlit panel for comprehensive monitoring of power line conditions and inverter status
- Sealed maintenance-free lead calcium batteries with 10 year prorated warranty
- Battery Exerciser
- Single Cabinet design for ease of installation, convenient front access
- 2 Year Warranty*

*Second Year, months 13 to 24 only valid with factory performed preventive maintenance

www.perfectpowersystems.com

LOS ANGELES, CA
Tel: 800-786-6915
710-DS-11-20

TECHNICAL SPECIFICATIONS

POWERRIDE I

EMERGENCY LIGHTING INVERTERS

Power Rating: 2.1, 3, 5, 6, 7.5, 8, 10, 12.5, 15 & 17 kW
Input Voltage: 2.1 - 5KW, 6KW; 120, 208, 240, 277, or 480 VAC (-15% to +10%)
7.5 - 17KW; 208, 240, 277, or 480 VAC (-15% to +10%)
Output Voltage: 120, 208, 240, 277, or 480 VAC
Output Frequency (Inverter Operation): 60Hz ±0.5Hz.
Voltage Regulation: ±3% Typical
Output Wave Form: Sine-wave
Optional Input Protection: Input Circuit Breaker provided protection to the unit, load, and personnel and is rated at (10 KAIC) standard, higher interruption up to 65 (KAIC) optional.
Output Protection: Internal Electronic overload protection. Circuit breaker provides inherent over-load protection. Factory selectable voltage 120, 208, 240, 277, or 480 for input or output voltages. If input is different from output or output different from input, an internally mounted transformer is required.
Surge Protection: The inverter will protect itself and the load against surge as defined in ANSI/IEEE C62.45 category A and B.
Noise Isolation: -120 dB. Common-Mode.; 60 dB. Transverse-Mode
Isolation: Output is completely isolated from input and with multi voltages

KW	Input/Output Voltages	MODEL NUMBERS	DC Volts	Cabinet Size (W x H x D)	Wgts (lbs)	
2.1	120/120 208/208 240/240 277/277 480/277 X = 208, 277, 120/240 Y = 277 & 480	PD2.1AO120N1-NA PD2.1BO120N1-NA PD2.1DO400N1-NA PD2.1EO208N1-NA PD2.1HO208N1-NA PD2.1IO480T1-NA PD2.1JY277T1-NA	96	39" x 68" x 18" 48" H Optional	896	
3.0	120/120 208/208 240/240 277/277 480/277 X = 208, 277, 120/240 Y = 277 & 480	PD3.0AO120N1 PD3.0BO208N1 PD3.0DO400N1 PD3.0RO208N1 PD3.0HO208N1 PD3.0IO480T1 PD3.0KY277T1	96	39" x 68" x 18" 48" H Optional	1066	
3.5	120/120 208/208 240/240 277/277 480/277 X = 208, 277, 120/240 Y = 277 & 480	PD3.5AO120N1-NA PD3.5BO208N1-NA PD3.5DO400N1-NA PD3.5HO208N1-NA PD3.5IO480T1-NA PD3.5JY277T1-NA	120	39" x 68" x 18"	1171	
5.0	120/120 208/208 240/240 277/277 480/277 X = 208, 277, 120/240 Y = 277 & 480	PD5.0AO120N1 PD5.0BO208N1 PD5.0DO400N1 PD5.0HO208N1 PD5.0IO480T1 PD5.0KY277T1	120	39" x 68" x 18"	1284	
6.0	120/120 208/208 240/240 277/277 480/277 X = 208, 277, 120/240 Y = 277 & 480	PD6.0AO120N1 PD6.0BO208N1 PD6.0DO400N1 PD6.0HO208N1 PD6.0IO480T1 PD6.0KY277T1	144	39" x 68" x 18"	1284	
7.5	208/208 240/240 277/277 480/277 X = 208, 277, 120/240 Y = 277 & 480	PD7.5BO208N1 PD7.5DO400N1 PD7.5HO208N1 PD7.5IO480T1 PD7.5KY277T1	120	51" x 70" x 30.5"	1074	
8.0	208/208 240/240 277/277 480/277 X = 208, 277, 120/240 Y = 277 & 480	PD8.0BO208N1 PD8.0DO400N1 PD8.0HO208N1 PD8.0IO480T1 PD8.0KY277T1	192	39" x 68" x 18"	1464	◇
10	208/208 240/240 277/277 480/277 X = 208, 277, 120/240 Y = 277 & 480	PD10BT208N1 PD10DT400N1 PD10HT208N1 PD10IT480N1 PD10KT277N1	192	51" x 70" x 30.5"	2870	◇
12.5	208/208 240/240 277/277 480/277 X = 208, 277, 120/240 Y = 277 & 480	PD12B2400N1 PD12D2400N1 PD12H2208N1 PD12I2480T1 PD12K2277N1	192	51" x 70" x 30.5"	3777	◇ ◇
15.0	208/208 240/240 277/277 480/277 X = 208, 277, 120/240 Y = 277 & 480	PD15B1208N1 PD15D1240N1 PD15H1208N1 PD15I1480T1 PD15K1277N1	240	51" x 70" x 30.5"	4512	◇
17.0	208/208 240/240 277/277 480/277 X = 208, 277, 120/240 Y = 277 & 480	PD17B1208N1 PD17D1240N1 PD17H1208N1 PD17I1480T1 PD17K1277N1	240	51" x 70" x 30.5"	4512	◇

* Input Voltage "**X**": **A** = 120, **B** = 208, **D** = 240, **R** = 277, **H** = 480 VAC
* Input Voltage "**Y**": **R** = 277 or **H** = 480 VAC
* Output Voltage "5800" = 120/240, or 208, or 277 VAC
* Output Voltage "5899" = 277 & 480 VAC

All units are 90 minutes battery back-up time at full load. For other back-up times (up to 6 hours), consult factory
Consult factory for 120V and other voltages

Efficiency: 98% standby - fast transfer / 94% online
Power Factor: Unity
Creat Factorr: 3:1
Battery : Sealed maintenance free (SMF).
Battery Management System: Utilizes a microprocessor technology to monitor the batteries critical levels and apply changing cycles in a method to substantially increase battery life.
Housing: Free standing NEMA 1 Enclosure powder coated paint Front access only Multiple conduit entries. Refer to chart for dimensions.
Recharge Time: Conforms to UL924
ENVIRONMENTAL:
Humidity: 0-95% RH w/no condensation
Operating temperature:
UPS: 0˚ to 40˚C. (32˚ to 104˚F)
BATTERY: 20˚ to 25˚C (68˚ to 77˚F)
Storage temperature: -20˚ to 70˚C. (-4 to 158˚F)
Safety Agencies: CSA Listed to UL 924, UL 924A, UL1778

OPTIONS

- Secondary Auxiliary Circuit Breakers (up to 16 or 24 one-pole OCB's): Normally On, Normally Off, Normally Off w/ Delay, Trip Alarm
- Dry Contact: With Single Common, N/O, N/C contacts with individual isolated Common
- Remote Status Panel Unit with Audio Alarm and Silence Switch
- Local Audio Alarm with Silence Switch
- Make Before Break Internal Maintenance Bypass Switch
- External Maintenance Bypass Switch (wrap around type)
- Main Input and/or Output Circuit Breaker (with custom KAIC)
- Input Transient Voltage Surge Suppressor (TVSS)
- Battery Thermal Runaway
- Certified Zone 4 Seismic Bracket: Adds approx. 4" of additional floor space to each side of cabinet
- Extended Warranty and Service Plans
- Long Life Battery: Check with factory for number of cabinets
- Battery Monitoring System
- Event logging
- Monitoring via RS232 and RS485

Optional Global Monitoring System (GMS)

- Provide SNMP, MIB to monitor & log UPS status
- Auto-sense 10M/100M Fast Ethernet
- Manage & configure via Telnet, Web Browser or NMS
- Support TCP/IP, UDP, SNMP, Telnet, SNTP, PPP, HTTP, SMTP Protocol
- Sending both of SNMP TRAP and Email for events notification.
- Auto email daily Battery Backup history report (configurable)
- Basic NetAgent: LAN or WIFI
- Advance NetAgent: LAN, WIFI, Dial-up Modem, or GPRS Modem

Consult factory for more features and choices of remote communication. Specifications are subject to change without prior notification.

PERFECT POWERSYSTEMS 710-DS-11-20

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED

REGISTERED PROFESSIONAL ENGINEER
ROBERT D. GETTER
No. M 30752
Exp. 09-30-22
STATE OF CHANGE
11/17/2021

DEPARTMENT OF PUBLIC WORKS
BUREAU OF ENGINEERING
GARY LEE MOORE, P.E., ENV SP
CITY ENGINEER

NO.	REVISIONS:	DATE:	BY:

DESIGN GROUP

ENGINEER: RGETTER
DESIGNED BY: ACARRIE
DRAWN BY: JCHIN
CHECKED BY: RHUBATCH
APPROVED BY: XX

VERTICAL CONTROL:
HORIZONTAL CONTROL:

SHEET TITLE: LIGHING CATALOG CUTS 5

PROJECT: RESEDA SKATE FACILITY

ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

CIP NO.

INDEX NO.

CITY OF LOS ANGELES

WORK ORDER NO.
E170121B

SHEET NAME
EL-16
SHEET X OF X SHEETS

(REVISION DATES)
(DESIGN STAGE ONLY)

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

Sheet Version 4.0

Q:\PROJECTS\CITY OF LA_BROOKSSCARPA\PROJECTLINE DRAWINGS\CAD\EL-16.DWG 12/6/2021 9:52 AM

MECHANICAL NOTES:

1. CONTRACTOR SHALL FURNISH AND INSTALL COMPLETE AND FULLY OPERATIONAL HVAC SYSTEMS, INCLUDING ALL LABOR AND MATERIALS NECESSARY. ALL EQUIPMENT AND INSTALLATIONS SHALL BE IN ACCORDANCE WITH THE LATEST EDITIONS OF APPLICABLE CODES AND STANDARDS, AND IN ACCORDANCE WITH CITY OF LOS ANGELES REQUIREMENTS AND 2020 LAMC.
2. PER CA MECHANICAL CODE, CONTRACTOR SHALL PROVIDE SHUTOFF FOR SMOKE CONTROL FOR ALL AIR MOVING SYSTEMS SUPPLYING OVER 2,000 CFM TO BUILDING SPACES. AUTOMATIC SHUTOFF SHALL BE ACCOMPLISHED BY INTERRUPTING THE POWER SOURCE OF THE AIR MOVING EQUIPMENT ON DETECTION OF SMOKE IN RELATED MAIN SUPPLY DUCT. SMOKE DETECTORS SHALL BE SELECTED TO DETECT PRODUCTS OF COMBUSTION, AND FOR COMPATIBILITY WITH AIR TEMPERATURES, VELOCITIES, HUMIDITY, AND PRESSURES. SMOKE DETECTORS SHALL COMPLY WITH CBC, BE UL LABELLED FOR USE IN AIR-DUCTS, INSTALLED IN ACCORDANCE WITH MANUFACTURER RECOMMENDATIONS, AND WIRED TO ACTIVATE THE FIRE ALARM SYSTEM.
3. MATERIALS OF CONSTRUCTION
   a. CONDENSATE DRAIN PIPING SHALL BE 1" DIA GALV. STEEL, AND ROUTED TO NEAREST FLOOR DRAINS. COORDINATE WITH PLUMBING CONTRACTOR.
   b. DUCT FABRICATION AND INSTALLATION SHALL CONFORM TO THE "HVAC DUCT CONSTRUCTION STANDARDS" AS PUBLISHED BY S.M.A.C.N.A. 2006 OR UL 181. ALL DUCTWORK (ASTM A525, A526, A527, A528), ACCESSORIES, AND SUPPORT COMPONENTS SHALL COMPLY WITH THE UNIFORM MECHANICAL CODE (CHAPTER 6 DUCT SYSTEMS) AND SHALL BE GALVANIZED STEEL CONSTRUCTED AND SUPPORTED FOR 2 INCHES OF WATER COLUMN, MINIMUM 18 GAUGE. ALL SUPPORT COMPONENTS SHALL BE GALVANIZED STEEL. FLEXIBLE DUCTS, IF ANY, SHALL NOT BE LONGER THAN 5 FT. ALL DUCT JOINTS AND SEAMS SHALL BE SEALED. PAINT ALL EXPOSED PIPING, DUCTWORK AND SUPPORTS WHITE. APPLY PAINT IN ACCORDANCE WITH MFG RECOMMENDATIONS:
      - ONE COAT AMERLOCK (2 MIN. 5 MIL DFT)
      - ONE COAT AMERSHIELD (170 MIN. 5 MIL DFT)
      - PAINT SYSTEM BY AMERON, TNEMEC, OR EQUAL.
   c. ALL SA DUCTWORK SHALL BE INSULATED. INSULATION SHALL BE U.L. AND STATE FIRE MARSHAL APPROVED. INSULATION SHALL HAVE A FLAME SPREAD OF NOT MORE THAN 25 AND A SMOKE DEVELOPED RATING OF NOT MORE THAN 50 WHEN TESTED AS A COMPOSITE INSTALLATION INCLUDING INSULATION FACING MATERIALS, TAPES AND ADHESIVE.INSULATION MATERIALS SHALL MEET THE CALIFORNIA QUALITY STANDARD PER SECTION 118 E.E.S. - LATEST EDITION. ALL PIPING AND DUCTWORK INSULATION SHALL BE CONSISTENT WITH THE REQUIREMENTS OF SECTIONS 118, 123, 124 TITLE 24 ENERGY STANDARDS AND TABLE 6-6A AND 6-6B OF CMC.
   d. ANCHORAGE OF PIPING, DUCTWORK AND EQUIPMENT SHALL BE IN ACCORDANCE WITH LATEST EDITIONS OF SMACNA AND CALIFORNIA BUILDING CODE, SECTION 16. ALL DUCTWORK SHALL BE SUPPORTED AT INTERVALS NOT TO EXCEED 8 FEET WITH 1-5/8" UNISTRUT (HOT DIPPED GALVANIZED), HILTI KWIK BOLT II ANCHORS, AND GALVANIZED STEEL BOLTS AND STRAPS.
   e. ALL MECHANICAL EQUIPMENT, DUCTWORK, AND PIPING SHALL BE BRACED AND ANCHORED TO RESIST A HORIZONTAL FORCE ACTING IN ANY DIRECTION AS DESIGNED/ SIGNED/ SEALED BY CONTRACTOR'S CIVIL OR STRUCTURAL ENGINEER.
4. CONTRACT DRAWINGS INDICATE LOCATION OF DUCTWORK AND EQUIPMENT APPROXIMATELY. EXACT LOCATIONS OF SAME SHALL BE DETERMINED BY THE CONTRACTOR BASED ON COORDINATION WITH OTHER TRADES. CONTRACTOR SHALL IDENTIFY ANY CONFLICTS BETWEEN OTHER TRADES AND REQUIREMENTS SHOWN ON THE DRAWINGS, PRIOR TO SUBMITTAL OF SHOP DRAWINGS. CONTRACTOR SHOP DRAWINGS SHALL INCLUDE RESULTS OF THIS COORDINATION, WITH PROPOSED RESOLUTION OF ANY CONFLICTS IDENTIFIED.
5. COORDINATE DUCT LAYOUT WITH OTHER DISCIPLINES AND SUBMIT DUCT COORDINATION DRAWINGS PRIOR TO INSTALLATION.
6. ENSURE THAT ALL EQUIPMENT WILL FIT IN THE AVAILABLE SPACE. MAKE FIELD MEASUREMENTS TO DETERMINE SPACE REQUIREMENTS, INCLUDING FOR CONNECTIONS, AND PROVIDE ARCHITECT WITH SCALED INSTALLATION AND COORDINATION DRAWINGS. INSTALL EQUIPMENT IN ACCESSIBLE LOCATIONS AND PROVIDE ADEQUATE SERVICE CLEARANCE FOR NORMAL MAINTENANCE WITHOUT REMOVING ARCHITECTURAL, STRUCTURAL OR ELECTRICAL ELEMENTS.
7. PROVIDE ACCESS DOORS IN DUCTWORK FOR EASY ACCESS TO DAMPERS, DUCT-MOUNTED COILS, DUCT SMOKE DETECTORS, AND OTHER DEVICES. ACCESS DOOR SIZES SHALL MATCH DUCT SIZE UP TO 18"X18"MAXIMUM SIZE.
8. ALL ELBOWS IN DUCTWORK SHALL BE 1.5 X RADIUS ELBOWS UNLESS NOTED OTHERWISE. WHERE RECTANGULAR ELBOWS ARE INDICATED, PROVIDE DOUBLE-WIDTH TURNING VANES.
9. PROVIDE SECURITY BARS ON ALL EXHAUST FAN OPENINGS AND GRAVITY VENT OPENINGS THROUGH ROOF THAT ARE LARGER THAN 16"X16". PROVIDE BIRD AND INSECT SCREENS ON ALL LOUVERS AND VENT OPENINGS.
10. PROVIDE CORROSION-RESISTANT SHEET METAL WEATHER HOOD COVER FOR ALL DAMPER ACTUATORS, SMOKE DETECTORS, AND MOTORS LOCATED OUTDOORS.
11. WHERE DUCTWORK CONNECTS TO EXTERIOR LOUVERS, DUCTWORK SHALL BE PRIMED AND PAINTED BLACK TO PREVENT DUCTWORK FROM BEING VISIBLE TROUGH THE LOUVER.
12. PROVIDE ALL ELECTRICAL AND CONTROL CONNECTIONS FOR THE EQUIPMENT PROVIDED. COORDINATE WITH ELECTRICAL SUBCONTRACTOR FOR LOCATION OF JUNCTION BOXES, DISCONNECTS, AND CIRCUIT BREAKERS (PANEL BOARDS).
13. CONDENSATE OVERFLOW DRAINS SHALL BE IN ACCORDANCE WITH ONE OF THE METHODS OUTLINED IN SECTION 301.2 (LAMC 602.1)

HVAC SEQUENCE OF OPERATION:

1. SINGLE-ZONE PACKAGE HEAT PUMP (ACU-1)
   A. GENERAL: HEAT PUMP SUPPLY FAN SHALL BE STARTED AND STOPPED BASED ON SPACE TEMPERATURE, OCCUPANCY SENSORS, OR SIGNAL FROM FACP. EACH OF THE OPERATING MODES SHALL BE TURNED ON AND OFF (ENABLED OR DISABLED) INDEPENDENTLY AT THE CONTROLLER. THE HEAT PUMP WILL BE 100% OUTSIDE AIR, TO SERVE RESTROOMS AND LOCKER ROOMS. OPERATION OF ROOF-MOUNTED EXHAUST FANS, EACH SERVING SEPARATE SPACES, WILL BE INITIATED WHEN SUPPLY AIR FAN STARTS. SETBACK THERMOSTAT SHALL BE PROVIDED TO REDUCE HEATING, AND ELIMINATE COOLING, WHEN THE FACILITY IS UNOCCUPIED. EACH RESTROOM AND LOCKER ROOM WILL BE EQUIPPED WITH OCCUPANCY SENSOR WIRED TO HEAT PUMP CONTROLLER LOCATED IN MECHANICAL ROOM.
   B. OPERATING MODES:
      - OCCUPIED MODE. HEAT PUMP SYSTEM WILL RUN CONTINUOUSLY TO MAINTAIN SETPOINT TEMPERATURE AND CONSTANT VENTILATION RATES TO ALL SPACES WHEN ANY OF THE SPACES ARE OCCUPIED. THERMOSTAT WILL BE LOCATED IN CENTRALLY-LOCATED ROOM REPRESENTATIVE OF OTHER SPACES.
      - UNOCCUPIED MODE. HEAT PUMP SYSTEM WILL RUN AS-NEEDED TO MAINTAIN SPACE TEMPERATURE WITHIN SETPOINT.
      - TIME-CLOCK MODE. SET-BACK THERMOSTAT WITH TIME CLOCK WILL BE PROGRAMMABLE TO OVERRIDE UNOCCUPIED MODE, ALLOWING FOR SCHEDULE PROGRAMMING OF HVAC CONTROL.
   C. COOLING MODE:
      - WHEN SPACE TEMPERATURE RISES ABOVE SETPOINT, HEAT PUMP WILL OPERATE IN COOLING MODE TO CONTROL SPACE SETPOINT TEMPERATURE.
      - COOLING CAPACITY SHALL MODULATE TO MAINTAIN DISCHARGE AIR TEMPERATURE DOWN TO AN ADJUSTABLE MINIMUM BELOW SPACE SETPOINT.
      - THE SEQUENCE SHALL UNWIND IN REVERSE.
   D. HEATING MODE:
      - WHEN SPACE TEMPERATURE FALLS BELOW SETPOINT, HEAT PUMP WILL OPERATE IN HEATING MODE TO CONTROL SPACE SETPOINT TEMPERATURE.
      - HEATING CAPACITY SHALL MODULATE TO MAINTAIN DISCHARGE AIR TEMPERATURE UP TO A MAXIMUM OF 85 DEG. F OR 20 DEG. F ABOVE SPACE SETPOINT.
      - THE SEQUENCE SHALL UNWIND IN REVERSE.
   E. VENTILATION-ONLY MODE:
      - WHEN SPACE TEMPERATURE IS WITHIN SETPOINT, SUPPLY AIR FAN SHALL BE STARTED AND STOPPED BASED ON OCCUPANCY SENSORS IN EACH OF THE OCCUPIED SPACES (VENTILATION ONLY).
      - VENTILATION ONLY MODE SHALL BE INDEPENDENT FROM HEATING AND COOLING MODES, AND WHEN ENABLED, HEATING AND COOLING MODES SHALL OVERRIDE VENTILATION ONLY MODE.
   F. DUCT-MOUNTED SMOKE DETECTORS. SYSTEM OPERATION WILL SHUT DOWN AND ALARM TO FACP ON DETECTION OF SMOKE IN EXHAUST FAN DUCTS.
2. ICE ROOM VENTILATION.
   A. NORMAL OPERATION: ROOF-MOUNTED ICE ROOM EXHAUST FAN (EF-2) WILL OPERATE CONTINUOUSLY, AT LOW SPEED WITH FRESH AIR ADMITTED TO ICE ROOM THROUGH LOUVERED DOORS.
   B. REFRIGERANT LEAK OPERATION: ICE ROOM WILL BE EQUIPPED WITH REFRIGERANT LEAK DETECTION INSTRUMENT (FF&E SCOPE), AND ON DETECTION OF LEAK, EF-8 WILL SWITCH ON TO EVACUATE AIR FROM ICE ROOM AND EF-2 WILL BE STOPPED. REFRIGERANT LEAK ALARM SIGNAL WILL BE WIRED TO FACP, AND WILL INITIATE AUDIBLE AND VISUAL ALARMS INSIDE ICE ROOM.
   C. EF-8 SHALL ALSO BE EQUIPPED WITH CONTROL SWITCH LOCATED OUTSIDE ICE ROOM FOR MANUAL START/STOP OF FAN. MANUAL SWITCH WILL OVERRIDE AUTOMATIC FAN OPERATION.
3. ELECTRICAL ROOM VENTILATION FAN (EF-3). ROOF-MOUNTED EXHAUST FAN WILL OPERATE BASED ON ROOM OCCUPANCY SENSORS. HVAC CONTROLS WILL BE PROVIDED TO ALLOW OVERRIDE OF OCCUPANCY SENSORS AND CONTINUOUS/MANUAL FAN OPERATION.
4. ICE RINK VENTILATION AND DEHUMIDIFICATION SYSTEM (FF&E SCOPE).
   A. GENERAL: ICE RINK VENTILATION AND DEHUMIDIFICATION (DHU) SYSTEM SHALL PROVIDE REQUIRED FRESH AIR AND VENTILATION TO ICE RINK AREA, WHILE MAINTAINING RELATIVE HUMIDITY (DEW POINT TEMPERATURE) AND ADJUSTING OUTSIDE AIR FOR INDOOR AIR QUALITY. DHU SHALL BE CLIMATE BY DESIGN MODEL DH-142-5.8-ESOTSLOMCM, OR EQUAL. DHU SYSTEM SHALL INCLUDE:
      - DEHUMIFIER WITH CONTROLLABLE OUTSIDE AIR (OA) DAMPER, AND 100 LB/HR MOISTURE REMOVAL CAPACITY.
      - SUPPLY AIR FAN (SAF), 5,800 CFM CAPACITY WITH ADJUSTABLE SPEED DRIVE.
      - HEATING COIL FOR DESSICANT REGENERATION, 48,000 BTU/HR CAPACITY.
      - DHU PROGRAMMABLE CONTROLLER, WITH NEMA 4X ENCLOSURE, LOCATED IN MECHANICAL ROOM.
      - ICE AREA EXTERIOR WALLS (NORTH AND SOUTH) SHALL EACH BE EQUIPPED WITH ONE WEIGHTED RELIEF DAMPER TO MAINTAIN ICE AREA POSITIVE STATIC PRESSURE BELOW 0.04".
      - SYSTEM BALANCING AND TESTING SHALL ADJUST DHU CONTROLS AND OPERATION TO MAINTAIN ICE AREA STATIC PRESSURE WITHIN RANGE OF 0.01" AND 0.04" WITHOUT RELIEF DAMPERS OPENING UNDER NORMAL RANGE OF OPERATING CONDITIONS. RELIEF DAMPERS SHALL ONLY OPEN DURING EVENT MODE OR UPSET CONDITIONS.
      - SUPPLY AND RETURN AIR DUCTWORK SHALL BE EQUIPPED WITH DUCT-MOUNTED SMOKE DETECTORS WIRED TO FACP, WHICH WILL SHUT DOWN THE DHU SYSTEM AND ALARM ON DETECTION OF SMOKE. DHU WILL ALSO ACCEPT ALARM SHUTDOWN SIGNAL FROM FACP IN THE EVENT OF FIRE DETECTION OR SPRINKLER SYSTEM ALARM.
      - ICE AREA WILL BE EQUIPPED WITH DP SENSOR WIRED TO DHU CONTROL SYSTEM TO MAINTAIN ICE AREA RELATIVE HUMIDITY (RH) WITHIN ADJUSTABLE SETPOINTS (E.G. 55% - 65% RH).
      - ICE AREA WILL BE EQUIPPED WITH CO, CO2 AND N GAS DETECTION DEVICES WIRED TO VENTILATION CONTROL SYSTEM TO BOOST OUTSIDE AIR VENTILATION RATE ON DETECTION OF ALARM CONCENTRATIONS ABOVE SETPOINTS. GAS DETECTION ALARMS WILL BE WIRED FOR ALARM TO FACP.
   B. UNOCCUPIED MODE: WHEN ICE AREA AMBIENT CONDITIONS (DP AND CO2) ARE WITHIN SETPOINTS, AND SPACE IS UNOCCUPIED, DHU WILL EITHER BE OFF OR OPERATED WITHOUT OUTSIDE AIR, TO MAINTAIN A MINIMUM RECIRCULATING AIR VENTILATION RATE. DHU WILL OPERATE AS NEEDED TO MAINTAIN DP SETPOINT.
   C. OCCUPIED MODE: WHEN ICE AREA AMBIENT CONDITIONS ARE WITHIN SETPOINTS AND ICE AREA IS OCCUPIED, DHU WILL OPERATE WITH ADJUSTABLE OUTSIDE AIR FOR VENTILATION AND DEHUMIDIFICATION. OA DAMPER WILL OPEN TO ALLOW AN ADJUSTABLE MINIMUM FRESH AIR (E.G. 0%-20% OUTSIDE AIR) TO BE MIXED WITH RA.
   D. AIR QUALITY (AQ) EVENT MODE. ON DETECTION OF AQ ALARM CONDITIONS, DHU WILL BE OPERATED WITH 100% OUTSIDE AIR, AND RELIEF DAMPERS WILL OPEN TO EVACUATE AIR FROM THE ICE AREA.

ABBREVIATIONS:

AABC	ASSOCIATED AIR BALANCE COUNCIL
AFF	ABOVE FINISHED FLOOR
ACU	AIR CONDITIONING UNIT
ASTM	AMERICAN SOCIETY FOR TESTING MATERIALS
BTU	BRITISH THERMAL UNIT
CDU	CONDENSING UNIT
CFC	CHLOROFLUOROCARBON
CFM	CUBIC FEET PER MINUTE
CMC	CALIFORNIA MECHANICAL CODE
COP	COEFFICIENT OF PERFORMANCE
DFT	DRY FILM THICKNESS
DHU	DEHUMIDIFICATION UNIT
DP	DEW POINT
EAR	EXHAUST AIR REGISTER
E.E.R.	ENERGY EFFICIENCY RATIO
E.E.S.	ENERGY EFFICIENCY STANDARDS
EF	EXHAUST FAN
FF&E	FACILITY FURNISHINGS AND EQUIPMENT
HVAC	HEATING, VENTILATION, AND AIR CONDITIONING
LAMC	CITY OF LA MECHANICAL CODE
MERV	MINIMUM EFFICIENCY REPORTING VALUE
MFG	MANUFACTURER
NEBB	NATIONAL ENVIRONMENTAL BALANCING BUREAU
OEL	OCCUPATIONAL EXPOSURE LIMIT
RA	RETURN AIR
RH	RELATIVE HUMIDITY
SA	SUPPLY AIR
SAR	SUPPLY AIR REGISTER
S.M.A.C.N.A.	SHEET METAL AND AIR CONDITIONING CONTRACTOR'S NATIONAL ASSOCIATION
SS	STAINLESS STEEL
U.L	UNDERWRITERS LABORATORIES
WT	WEIGHT

PROVIDE DHU AND AC UNITS WITH:

A. HINGED ACCESS PANELS W/ MERV 13 FILTERS FOR OUTSIDE AND RETURN AIR.
B. EPOXY-COATED CONDENSER COILS.
C. UNIT-MOUNTED DISCONNECT.
D. CONVENIENCE OUTLET.
E. MICROPROCESSOR CONTROL WITH ALARMS FOR CLOGGED FILTER, FAN FAILURE, HIGH TEMPERATURE, AND DRAIN PAN OVERFLOW. TOUCHSCREEN PROGRAMMABLE THERMOSTAT.
F. STAINLESS STEEL CONDENSATE DRAIN PAN WITH PRIMARY AND SECONDARY DRAINS AND LEVEL ALARMS.
G. MAX 65 dBA AT 3 FT.
H. PROVIDE DUCT-MOUNTED SMOKE DETECTORS IN BOTH SUPPLY AND RETURN DUCTS OF DHU. PROVIDE CONTROL WIRING TO SHUT DOWN DHU AND AC UNITS ON DETECTION OF SMOKE.
I. OUTSIDE AIR AND EXHAUST DAMPER CONTROL.

HVAC SYMBOLS:

- SECTION - SUPPLY AIR GRILLE
- SECTION - RETURN AIR GRILLE
- 30 x 18 — DUCT SIZE IN INCHES
- SUPPLY AIR
- RETURN AIR
- 90° ELBOW WITH TURNING VANES
- CHANGE IN ELEVATION
- FIRE SMOKE DAMPER
- P-TRAP (SIDE)
- UNION
- ELBOW IN VERTICAL
- GRAVITY VENT INTAKE
- GRATIVITY BACKDRAFT DAMPER
- BALL VALVE
- CHECK VALVE
- CAP
- GATE VALVE
- P-TRAP (TOP)
- (ES) E-STOP SWITCH FOR ICE EQUIPMENT
- (S) CONTROL SWITCH FOR EF-8
- (T) THERMOSTAT
- (R) REFRIGERANT SENSOR
- (CO) CARBON MONOXIDE SENSOR
- (CO2) CARBON DIOXIDE SENSOR
- (DP) WALL-MOUNTED DEW POINT SENSOR
- (TE) TEMPERATURE SENSOR
- (SD) SMOKE DETECTOR
- (N) NO2 SENSOR
- [L] DOOR OR WALL LOUVER

NEW PACKAGE HEAT PUMP EQUIPMENT SCHEDULE

EQUIPMENT TAG #	LOCATION	AREAS SERVED	MANUFACTURER & MODEL NO.	V/PH/HZ	COOLING CAPACITY (BTU/H)	HEATING CAPACITY (BTU/H)	CFM	EFFICIENCY RATINGS	WEIGHT (LB)	REMARKS
ACU-1	ROOF MOUNTED	RESTROOMS, LOCKER ROOMS	DAIKIN DPS005A OR EQUAL (SEE NOTE 2)	208/3/60	82,000	49,000	1800	12.3 EER	1309 LB	100% OUTSIDE AIR MICROTECH III CONTROLS

NOTES: 1. ACU CONDENSATE DRAIN SHALL BE PROVIDED WITH LEVEL DETECTION DEVICE THAT WILL SHUT DOWN THE ACU AND ALARM IF PRIMARY DRAIN IS BLOCKED.
2. LOCAL REP FOR DAIKIN UNIT IS NSWC (CONTACT ERIC YANG 714-321-6612).
3. PROVIDE ACU-1 WITH MERV 13 FILTERS AS REQUIRED.

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Contract Division

REGISTERED PROFESSIONAL ENGINEER — ROBERT D. GETTER — No. M 30752 — Exp. 09-30-22 — MECHANICAL — 11/17/2021

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED

BUREAU OF ENGINEERING
VERTICAL CONTROL:
HORIZONTAL CONTROL:
SHEET TITLE: MECHANICAL NOTES & LEGEND
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY., RESEDA CA 91335

DEPARTMENT OF PUBLIC WORKS
NO. REVISIONS: DATE: BY:
CIP NO.
INDEX NO.

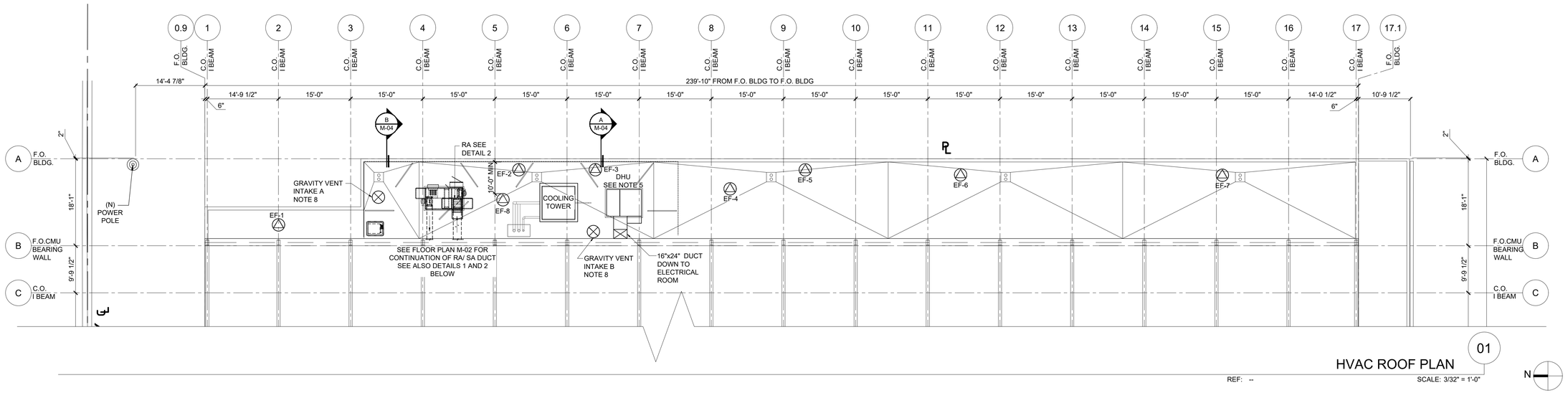
CITY OF LOS ANGELES
GARY LEE MOORE, P.E., ENV SP — CITY ENGINEER
DESIGN GROUP — DATE:
ENGINEER: RGETTER
DESIGNED BY: XX
DRAWN BY: JCHIN
CHECKED BY: RHUBATCH
APPROVED BY: XX
WORK ORDER NO. E170121B
SHEET NAME M-01
SHEET X OF X SHEETS

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REVISION DATES (DESIGN STAGES ONLY)

Sheet Version 4.0

Q:\PROJECTS\CITY OF LA_BROOKSSCARPA\PROJECTLINE DRAWINGS\CAD\M-01.DWG 12/3/2021 6:44 AM

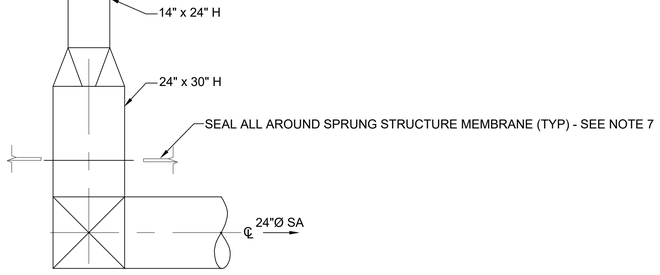


HVAC ROOF PLAN

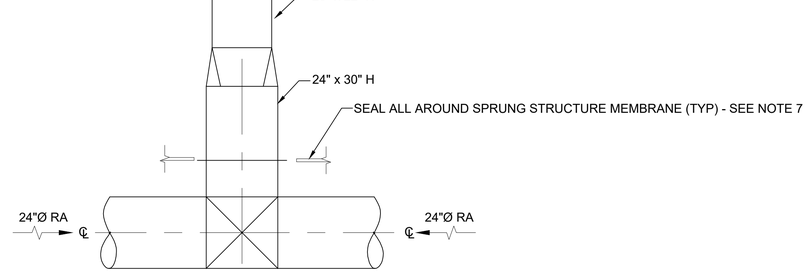
01

REF: --

SCALE: 3/32" = 1'-0"



DETAIL 1:
SUPPLY AIR DUCT
SCALE: 1/2"=1'-0"



DETAIL 2:
RETURN AIR DUCT
SCALE: 1/2"=1'-0"

FAN SCHEDULE									
FAN #	TYPE	CFM	SP	HP	VOLTAGE	PHASE	MODEL	WEIGHT	AREA SERVED
EF-1	DIRECT DRIVE CENTRIFUGAL ROOF	500	0.30 IN. WG	1/6	115V	1Ø	GREENHECK MODEL G-097-VG	100 LB	PUBLIC RESTROOMS
EF-2	DIRECT DRIVE CENTRIFUGAL ROOF	500	0.30 IN. WG	1/6	115V	1Ø	GREENHECK MODEL G-095-VG	100 LB	ICE ROOM
EF-3	DIRECT DRIVE CENTRIFUGAL ROOF	215	0.30 IN. WG	1/10	115V	1Ø	GREENHECK MODEL G-080-VG	100 LB	ELECTRICAL ROOM
EF-4	DIRECT DRIVE CENTRIFUGAL ROOF	101	0.26 IN. WG	1/15	115V	1Ø	GREENHECK MODEL G-060-VG	100 LB	REFEREE ROOM
EF-5	DIRECT DRIVE CENTRIFUGAL ROOF	115	0.26 IN. WG	1/15	115V	1Ø	GREENHECK MODEL G-060-VG	100 LB	GIRL'S ROOM
EF-6	DIRECT DRIVE CENTRIFUGAL ROOF	500	0.3 IN. WG	1/6	115V	1Ø	GREENHECK MODEL G-095-VG	100 LB	LOCKER ROOM A/B
EF-7	DIRECT DRIVE CENTRIFUGAL ROOF	500	0.3 IN. WG	1/6	115V	1Ø	GREENHECK MODEL G-095-VG	100 LB	LOCKER ROOM C/D
EF-8	DIRECT DRIVE CENTRIFUGAL ROOF	3,500	0.3 IN. WG	2	208V	3Ø	GREENHECK MODEL G-200-VG	200 LB	ICE ROOM - PURGE AIR FOR REFRIGERANT GAS DETECTION

NOTES:

1. FANS SHALL BE GREENHECK MODEL LISTED ABOVE, OR EQUAL. GREENHECK REP: NSWC (CONTACT: ERIC YANG 714-321-6612).
2. PROVIDE FANS WITH MOTORS, BACKDRAFT DAMPERS, AND GPI FAN CURBS.
3. ADJUST FAN MOTOR SPEED IN FIELD TO MATCH DESIRED CFM.
4. SEE STRUCTURAL DRAWINGS FOR CEILING AND ROOF MEMBRANES.
5. DHU UNIT WILL BE PROVIDED AS FF&E SCOPE. DHU SHALL BE MODEL DH-142 OR EQUAL:
   - 5800 CFM @2" WC
   - 4 x 32 KW HEATERS
   - MAX REACTIV. MBH = 436.7
   - FOR EQUIPMENT WEIGHTS, SEE M-09
6. GRAVITY INTAKE VENTS SHALL BE GREENHECK MODEL GRSI, OR EQUAL. PROVIDE WITH ROOF CURB AND BIRD SCREEN.
7. PROVIDE INSULATED, FRAMED OPENING ASSEMBLIES FOR DHU DUCT PENETRATIONS THROUGH BUILDING ENVELOPE INSULATED MEMBRANE. OPENING ASSEMBLIES SHALL BE COORDINATED WITH MEMBRANE STRUCTURE SUPPLIER. PROVIDE FLASHING, SEAL AND INSULATION BETWEEN FRAMED OPENINGS AND DUCTS/DAMPERS.
8. GRAVITY VENT INTAKES:
   A: 3500 cfm@ 0.20" WG MAX PRESSURE DROP. GREEHECK GRSI-24 OR EQUAL
   B: 250 cfm@ 0.10" WG MAX PRESSURE DROP. GREEHECK GRSI-8 OR EQUAL
9. INSTALL BACKDRAFT DAMPERS IN MAKEUP AIR INTAKES
10. EXHAUST VENTILATION SHALL TERMINATE OUTSIDE ACCORDING TO THE FOLLOWING REQUIREMENTS: FOR REFRIGERANTS HAVING FLAMMABILITY CLASSIFICATION OF 1 (A1, B1) NOT LESS THAN 10 FEET FROM PROPERTY LINE, 3 FEET FROM EXTERIOR WALLS OR ROOFS, 10 FEET FROM OPENINGS INTO THE BUILDING, AND 10 FEET ABOVE ADJOINING GRADE (LAMC 502.2.2; 1106.2.3; 1106.2.4; 1106.2.5)

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Design Collaborative

REGISTERED PROFESSIONAL ENGINEER
ROBERT D. GETTER
No. M 30752
Exp. 09-30-22
CIVIL
STATE OF CALIFORNIA
11/17/2021

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED •

BUREAU OF ENGINEERING
VERTICAL CONTROL:
HORIZONTAL CONTROL:
SHEET TITLE: HVAC ROOF LAYOUT PLAN AND DETAILS
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

DEPARTMENT OF PUBLIC WORKS
NO. | REVISIONS: | DATE: | BY:
CIP NO.
INDEX NO.

CITY OF LOS ANGELES
GARY LEE MOORE, P.E., ENV SP
CITY ENGINEER
DESIGN GROUP
DATE:
ENGINEER: RGETTER
DESIGNED BY: XX
DRAWN BY: JCHIN
CHECKED BY: RHUBATCH
APPROVED BY: XX

WORK ORDER NO.
E170121B

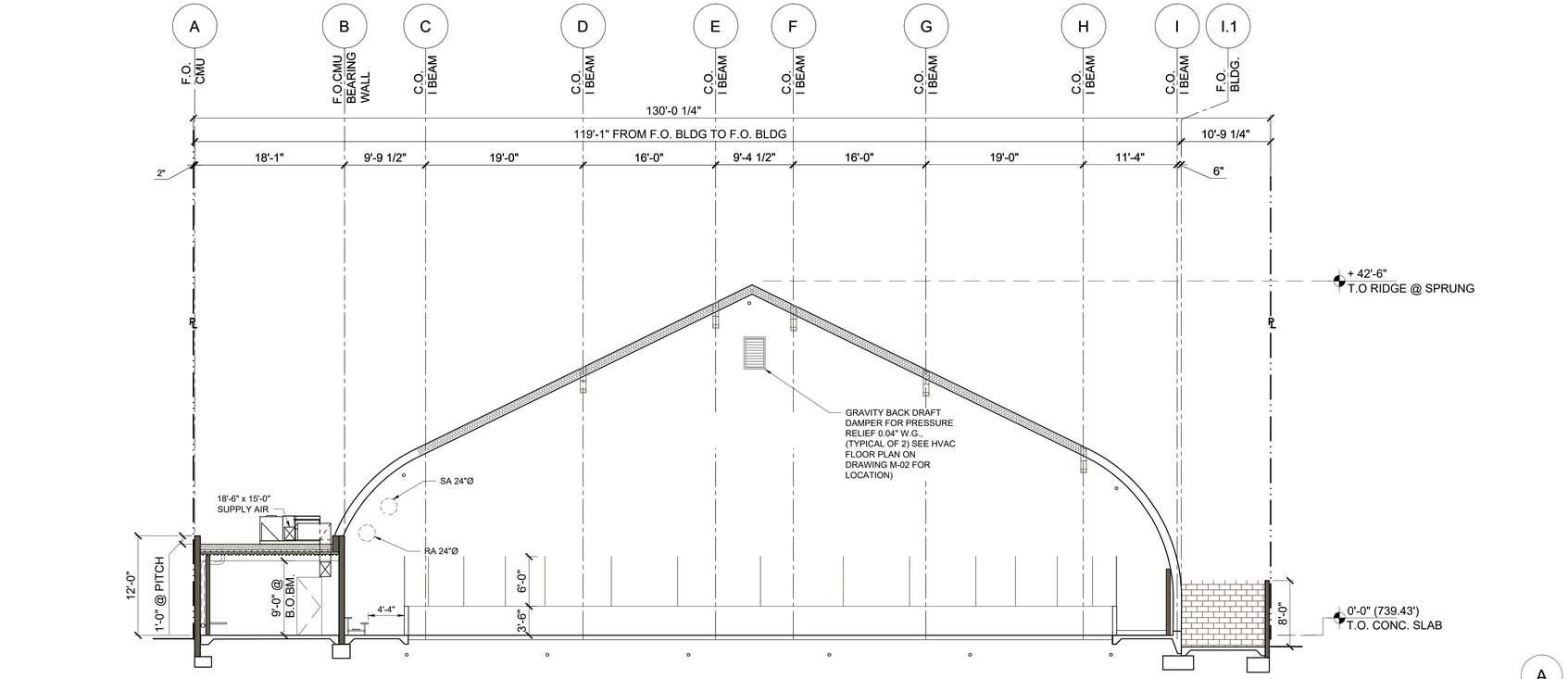
SHEET NAME
M-03
SHEET X OF X SHEETS

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REVISION DATES (DESIGN STAGE ONLY)

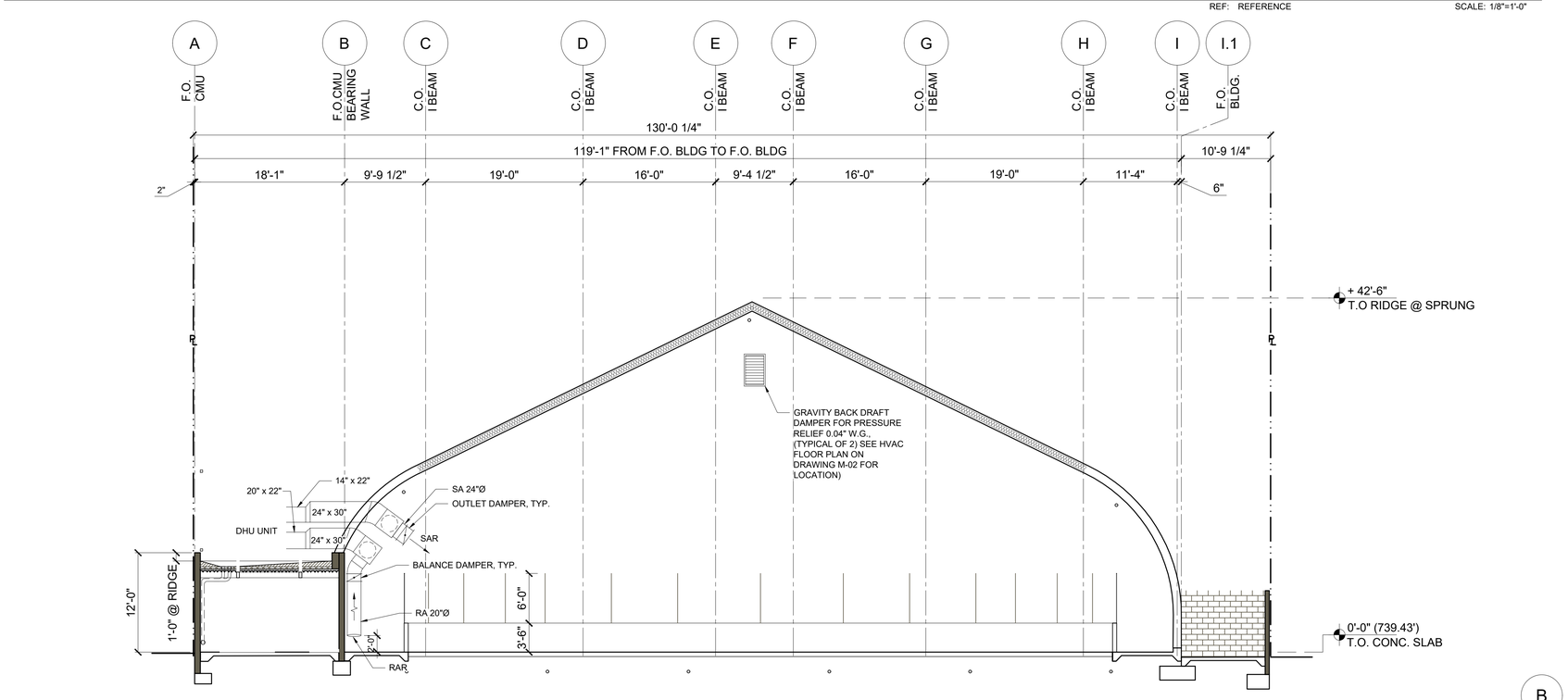
Sheet Version 4.0

Q:\PROJECTS\CITY OF LA_BROOKSSCARPA\PROJECTLINE DRAWINGS\CAD\M-03.DWG 12/3/2021 6:50 AM



SECTION_LOOKING-SOUTH

REF: REFERENCE SCALE: 1/8"=1'-0"



SECTION_LOOKING-SOUTH

REFERENCE SCALE: 1/8"=1'-0"

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REVISION DATES (DESIGN STAGE ONLY)

Sheet Version 4.0

Q:\PROJECTS\CITY OF LA_BROOKSSCARPA\PROJECTLINE DRAWINGS\CAD\M-04.DWG 12/3/2021 6:42 AM

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED

REGISTERED PROFESSIONAL ENGINEER
ROBERT D. GETTER
No. M 30752
Exp. 09-30-22
MECHANICAL
STATE OF CALIFORNIA
11/17/2021

BUREAU OF ENGINEERING

VERTICAL CONTROL:
HORIZONTAL CONTROL:

SHEET TITLE: HVAC SECTIONS

PROJECT: RESEDA SKATE FACILITY

ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

DEPARTMENT OF PUBLIC WORKS

NO.	REVISIONS:	DATE:	BY:

CIP NO.

INDEX NO.

CITY OF LOS ANGELES

GARY LEE MOORE, P.E., ENV SP

CITY ENGINEER

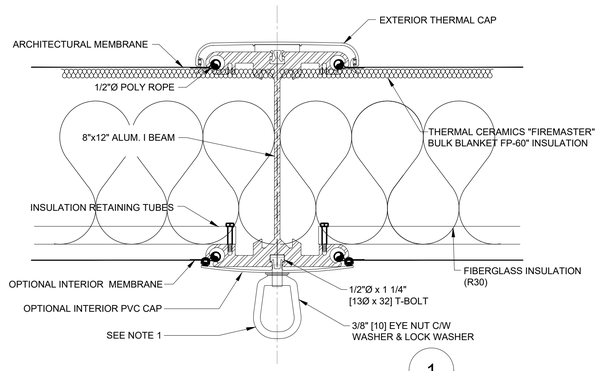
DESIGN GROUP

DATE:

ENGINEER: RGETTER
DESIGNED BY: XX
DRAWN BY: JCHIN
CHECKED BY: XX
APPROVED BY: XX

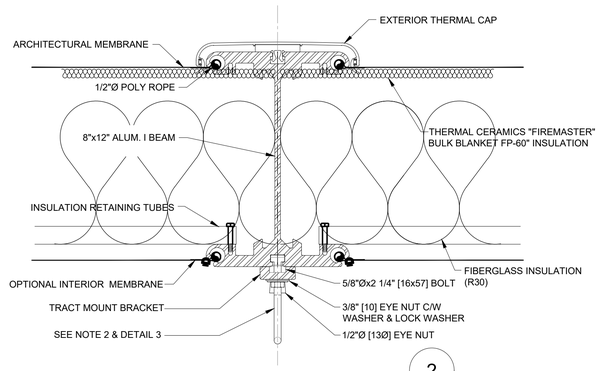
WORK ORDER NO.
E170121B

SHEET NAME
M-04
SHEET X OF X SHEETS



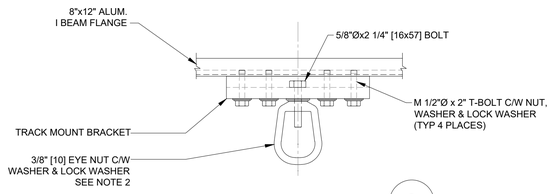
BEAM HANGER - BOLT CHASE 1

M-04 SCALE: 3"=1'



BEAM HANGING BRACKET 2

M-04 SCALE: 3"=1'



TRACK MOUNT BRACKET 3

- SCALE: 3"=1'

1. FASTENER CAPACITY 75 POUNDS. QUANTITY AND LOCATION PROPOSED BY CONTRACTOR TO SUPPORT MOUNTING OF DEVICES, AND SUBMITTED TO CITY TO BE VERIFIED BY ENGINEER.
2. FASTENER CAPACITY 300 POUNDS. QUANTITY AND LOCATION PROPOSED BY CONTRACTOR TO SUPPORT MOUNTING OF DEVICES, AND SUBMITTED TO CITY TO BE VERIFIED BY ENGINEER.
3. CONTRACTOR SHALL USE APPROVED RODS HANGERS AND DUCT CLAMPS.

THIS SHEET FOR REFERENCE ONLY

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REVISION DATES (DESIGN STAGE ONLY)

Sheet Version 4.0

Q:\PROJECTS\CITY OF LA_BROOKSSCARPA\PROJECTLINE DRAWINGS\CAD\M-05.DWG 12/3/2021 6:40 AM

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

REGISTERED PROFESSIONAL ENGINEER
ROBERT D. GETTER
No. M 30752
Exp. 09-30-22
STATE OF CHANNEL
11/17/2021

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED •

BUREAU OF ENGINEERING
VERTICAL CONTROL:
HORIZONTAL CONTROL:
SHEET TITLE: HANGERS DETAILS
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

DEPARTMENT OF PUBLIC WORKS
BY:
DATE:
NO. REVISIONS:
CIP NO.
INDEX NO.

CITY OF LOS ANGELES
GARY LEE MOORE, P.E., ENV SP
CITY ENGINEER
DATE:
DESIGN GROUP
ENGINEER: RGETTER
DESIGNED BY: XX
DRAWN BY: JCHIN
CHECKED BY: RHUBATCH
APPROVED BY: XX

WORK ORDER NO.
E170121B

SHEET NAME
M-05
SHEET X OF X SHEETS

STATE OF CALIFORNIA
Mechanical Systems
NRCC-MCH-E (Created 09/2020) CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE NRCC-MCH-E
This document is used to demonstrate compliance for mechanical systems that are within the scope of the permit application and are demonstrating compliance using the prescriptive path outlined in §140.4, or §141.0(b)2 for alterations.

Project Name:	Reseda Skate Facility	Report Page:	Page 1 of 11
Project Address:	18210 Sherman Way	Date Prepared:	2021-04-07

A. GENERAL INFORMATION

01	Project Location (city)	Reseda	04	Total Conditioned Floor Area	2,350
02	Climate Zone	3	05	Total Unconditioned Floor Area	25,650
03	Occupancy Types Within Project:		06	# of Stories (Habitable Above Grade)	1

☑ Office (B) ☐ Retail (M) ☐ Non-refrigerated Warehouse (S)
☐ Hotel/ Motel Guest Rooms (R-1) ☐ School (E) ☐ Healthcare Facility (I)
☐ High-Rise Residential (R-2/R-3) ☐ Relocatable Class Bldg (E) ☑ Other (Write In):

[1] *FOOTNOTES: Climate zone can be determined on the California Energy Commission's website at http://www.energy.ca.gov/maps/renewable/building_climate_zones.html*

B. PROJECT SCOPE

Table Instructions: Include any mechanical systems that are within the scope of the permit application and are demonstrating compliance using the prescriptive path outlined in §140.4, or §141.0(b)2 for alterations.

My project consists of (check all that apply)

01 Air System(s)	02 Wet System Components	03 Dry System Components
☑ Heating Air System	☐ Water Economizer	☐ Air Economizer
☑ Cooling Air System	☐ Pumps	☐ Electric Resistance Heat
Mechanical Controls	☐ Hydronic System Piping	☑ Fan Systems
☐ Mechanical Controls (existing to remain, altered or new)	☐ Cooling Towers	☑ Ductwork (existing to remain, altered or new)
	☐ Chillers	☑ Ventilation
	☐ Boilers	☐ Zonal Systems/ Terminal Boxes

C. COMPLIANCE RESULTS

Table Instructions: If any cell on this table says "DOES NOT COMPLY" or "COMPLIES with Exceptional Conditions" refer to Table D. for guidance.

01		02		03		04		05		06		07		08		09
System Summary §110.1, §110.2, §140.4	AND	Pumps §140.4(k)	AND	Fans/ Economizers §140.4(c), §140.4(e)	AND	System Controls §110.2, §120.2, §140.4(f)	AND	Ventilation §120.1	AND	Terminal Box Controls §140.4(d)	AND	Distribution §120.3, §140.4(l)	AND	Cooling Towers §110.2(e)2		**Compliance Results**
(See Table F)		(See Table G)		(See Table H)		(See Table I)		(See Table J)		(See Table K)		(See Table L)		(See Table M)		
Yes	AND		AND	No	AND	Yes	AND	No	AND		AND	Yes	AND			**DOES NOT COMPLY**
																Mandatory Measures Compliance (See Table Q for Details)	**DOES NOT COMPLY**

D. EXCEPTIONAL CONDITIONS

This table is auto-filled with uneditable comments because of selections made or data entered in tables throughout the form.

Table H indicates a Fan Power System Index that exceeds the maximum allowed per §140.4(c). Please revise to demonstrate compliance.
Please review Table J for compliance: all fields which are not grey must be completed; either column 01 must indicate that ventilation calculations are attached to the permit application or each system must demonstrate that Outside Airflow + Transfer Air > Required Min. Outside Airflow.
Selections made in Table O have been changed by the permit applicant. See Table E. Additional Remarks for permit applicant's explanation.

E. ADDITIONAL REMARKS

This table includes remarks made by the permit applicant to the Authority Having Jurisdiction.

HVAC systems include single-zone 1800 cfm, 6-ton, 100% outside air heat pump serving restrooms, showers and locker rooms. Ice rink and ancillary spaces are ventilation-only.

F. HVAC SYSTEM SUMMARY (DRY & WET SYSTEMS)

Table Instructions: Complete the following equipment schedules to show compliance with mandatory requirements found in §110.1 and §110.2(a) and prescriptive requirements found in §140.4(a), §140.4(b) and §140.4(k) or §141.0(b)2 for alterations.

Dry System Equipment Sizing (includes air conditioners, condensers, heat pumps, VRF, furnaces and unit heaters)

01	02	03	04	05	06	07	08	09	10	11
				Equipment Sizing per Mechanical Schedule (kBtu/h) §140.4 (a&b)						
				Heating Output[2,3]			Cooling Output[2,3]		Load Calculations[3,4]	
Name or Item Tag	Equipment Category per Tables 110.2	Equipment Type per Tables 110.2 & Title 20	Smallest Size Available[1] §140.4(a)	Per Design (kBtu/h)	Rated (kBtu/h)	Supp. Heating Output (kBtu/h)	Sensible Per Design (kBtu/h)	Rated (kBtu/h)	Total Heating Load (kBtu/h)	Total Sensible Cooling Load (kBtu/h)
ACU-1	Unitary heat pumps	Air cooled, package roof-top (3 phase)	Yes	49	80		82	82	49	82

[1] *FOOTNOTES: Equipment shall be the smallest size, within the available options of the desired equipment line, necessary to meet the design heating and cooling loads of the building per §140.4(a). Healthcare facilities are excepted.*
[2] *It is common practice to show rated output capacity on the equipment schedule. Sensible cooling output comes from specification sheet tables.*
[3] *If equipment is heating only, leave cooling output and load blank. If equipment is cooling only, leave heating output and load blank.*
[4] *Authority Having Jurisdiction may ask for load calculations used for compliance per §140.4(b).*
Table Continued

Air cooled, split (3 phase)

Dry System Equipment Efficiency (other than Package Terminal Air Conditioners (PTAC) and Package Terminal Heat Pumps (PTHP))

01	02	03	04	05	06	07	08	09
		Heating Mode				Cooling Mode		
Name or Item Tag	Size Category (Btu/h)	Rating Condition (°F)	Efficiency Unit	Min Efficiency Required per Tables 110.2/ Title 20	Design Efficiency	Efficiency Unit	Min Efficiency Required per Tables 110.2/ Title 20	Design Efficiency
ACU-1	≥65,000 and <135,000	47°Fdb/43°Fwb OSA	COP	3.3	4.05	EER	11	13.5
						IEER	12.2	25.3

G. PUMPS

This Section Does Not Apply

H. FAN SYSTEMS & AIR ECONOMIZERS

Table Instructions: Complete the following Table for fan systems to demonstrate compliance with prescriptive requirements found in §140.4(c), §140.4(e) and §140.4(m). First document the system details, then add fans within that system to document compliance with fan power requirements. Fan systems serving only process loads are exempt from these requirements and do not need to be included in Table H.

System Name: AHU-1 **Economizer:[1]** **Economizer Controls:** **System Fan Type:** Constant Volume

01	02	03	04	05	06	07	08
						Fan Power Pressure Drop Adjustment - Table 140.4-B	
Fan Name or Item Tag	Fan Function	Qty	Maximum Design Supply Airflow (CFM)	HP Unit[2]	Design HP	Device	Design Airflow through Device (CFM)
ACU-1	Supply	1	1,800	Nameplate HP	0.5		
						Calculated Adjustment (in H_2O)	
Total System Design Supply Airflow (CFM):		1,800	Total System Design (B)HP:		0.5	**Maximum System Fan Power (B)HP:**	

[1] *FOOTNOTE: Computer room economizers must meet requirements of §140.9(a) and will be documented on the NRCC-PRC-E document.*
[2] *The unit used for HP must be consistent for all fans within a system.*

I. SYSTEM CONTROLS

Table Instructions: Complete the following Table to demonstrate compliance with mandatory controls in §110.2 and §120.2 and prescriptive controls in §140.4(f) and (n) or requirements in §141.0(b)2E for altered space conditioning systems.

01	02	03	04	05	06	07	08	09
System Name	System Zoning	Conditioned Floor Area Being Served (ft²)	Thermostats §110.2(b) & (c)[1], §120.2(a) or §141.0(b)2E	Shut-Off Controls §120.2(e)	Isolation Zone Controls §120.2(g)	Demand Response §110.12 and §120.2(b)	Supply Air Temp. Reset §140.4(f)	Window Interlocks per §140.4(n)
ACU-1	single zone	≤ 25,000 ft²	Setback Thermostat	Occ. Sensor	NA: Continuous Heat/Cool	NA: PTAC, PTHP, Rm AC, HP	NA: Single Zone	NA: No operable windows

[1] *FOOTNOTES: Gravity gas wall heaters, gravity floor heaters, gravity room heaters, non-central electric heaters, fireplaces or decorative gas appliances, wood stoves are not required to have setback thermostats.*
[4] *NOTES: Controls with a * require a note in the space below explaining how compliance is achieved.*
EX: System 1: SA Temp Reset: Exempt because zones compliant with §140.4(d); EXCEPTION 1 to §140.4(f)

J. VENTILATION AND INDOOR AIR QUALITY

Table Instructions: Complete the following Table to demonstrate compliance with mandatory ventilation requirements in §120.1 and §120.2(e)3B for all nonresidential, high-rise residential and hotel/motel occupancies. For alterations, only ventilation systems being altered within the scope of the permit application need to be documented in this table. In lieu of this table, the required outdoor ventilation rates and airflows may be shown on the plans or the calculations can be presented in a spreadsheet.

01	☐	Check the box if the project is showing ventilation calculations on the plans, or attaching the calculations instead of completing this table.
02	☐	Check this box if the project includes Nonresidential or Hotel/Motel spaces.
	☐	Check this box if the project includes new or altered high-rise residential dwelling units
03	☐	Check the box if the project is using natural ventilation in any spaces to meet required ventilation rates per §120.1(c)2.

[1] *FOOTNOTES: System CFM should include both mechanical and natural ventilation for the zone/system.*
[2] *Air filtration requirements apply to the following three system types per §120.1(c)1A: space conditioning systems utilizing ducts to supply air to occupiable space; supply-only ventilation systems providing outside air to occupiable space; supply side of balanced ventilation systems including heat recovery and energy recovery ventilation systems providing outside air to occupiable space.*
[3] *Uniform Mechanical Code may have more stringent ventilation requirements; the most stringent code requirement takes precedence.*
[4] *See Standards Tables 120.1-A and 120.1-B*
[5] *For lecture halls with fixed seating, the expected number of occupants shall be determined in accordance with the California Building Code.*
[6] *§120.2(e)3 requires systems serving rooms that are required by §130.1(c) to have lighting occupancy sensing controls to also have occupancy sensing zone controls for ventilation. Examples of spaces which require lighting occupancy sensors include offices 250ft² or smaller, multipurpose rooms less than 1,000ft², classrooms, conference rooms, restrooms, aisles and open areas in warehouses, library book stack aisles, corridors, stairwells, parking garages, and loading and unloading zones, unless excepted by §130.1(c).*

K. TERMINAL BOX CONTROLS

This Section Does Not Apply

L. DISTRIBUTION (DUCTWORK AND PIPING)

Table Instructions: Complete the following tables to show compliance with mandatory pipe insulation requirements found in §120.3 and prescriptive requirements found in §140.4(l) for duct leakage testing.

Duct Leakage Sealing

The answers to the questions below apply to the following duct system(s):		Duct leakage testing triggered for these systems?	No
11	No	The scope of the project includes only duct systems serving healthcare facilites.	
12	Yes	Duct system provides conditioned air to an occupiable space for a constant volume, single zone, space-conditioning system.	
13	Yes	The space conditioning system serves less than 5,000 ft² of conditioned floor area.	
14	No	The combined surface area of the ducts in the following locations is more than 25% of the total surface area of the entire duct system:	
	☐	Outdoors	
	☐	In a space directly under a roof that has a U-factor greater than the U-factor of the ceiling, or if the roof does not meet the requirements of §140.3(a)1B or if the roof has fixed vents or openings to the outside/ unconditioned spaces	
	☐	In an unconditioned crawlspace	
	☐	In other unconditioned spaces	
15	No	The scope of the project includes extending an existing duct system, which is constructed, insulated or sealed with asbestos.	
16	No	The scope of the project includes an existing duct system that is documented to have been previously sealed as confirmed through field verification and diagnostic testing in accordance with procedures in the Reference Nonresidential Appendix NA2.	

Table Continued

Table Continued

17		Duct system shall be sealed in accordance with the California Mechanical Code.

M. COOLING TOWERS

This Section Does Not Apply

N. DECLARATION OF REQUIRED CERTIFICATES OF INSTALLATION

Table Instructions: Selections have been made based on information provided in previous tables of this document. If any selection needs to be changed, please explain why in Table E. Additional Remarks. These documents must be provided to the building inspector during construction and can be found online at https://www.energy.ca.gov/title24/2019standards/2019_compliance_documents/Nonresidential_Documents/NRCI/

YES	NO	Form/Title	Systems To Be Field Verified	Field Inspector Pass	Field Inspector Fail
◉		NRCI-MCH-01-E - Must be submitted for all buildings.		☐	☐

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

REGISTERED PROFESSIONAL ENGINEER ROBERT D. GETTER No. M 30752 Exp. 09-30-22 STATE OF CHANNEL ISLANDS 11/17/2021

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED •

BUREAU OF ENGINEERING
VERTICAL CONTROL:
HORIZONTAL CONTROL:
SHEET TITLE: MECHANICAL SYSTEMS - TITLE 24 1 OF 2
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

DEPARTMENT OF PUBLIC WORKS
NO. | REVISIONS: | DATE: | BY:
CIP NO.
INDEX NO.

CITY OF LOS ANGELES
GARY LEE MOORE, P.E., ENV SP
CITY ENGINEER
DESIGN GROUP
DATE:
ENGINEER: RGETTER
DESIGNED BY: XX
DRAWN BY: JCHIN
CHECKED BY: RHUBATCH
APPROVED BY: XX

WORK ORDER NO.
E170121B

SHEET NAME
M-06
SHEET X OF X SHEETS

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REVISION DATES (DESIGN STAGE ONLY)

Sheet Version 4.0

Q:\PROJECTS\CITY OF LA_BROOKSSCARPA\PROJECTLINE DRAWINGS\CAD\M-06.DWG 12/3/2021 6:39 AM

STATE OF CALIFORNIA
Mechanical Systems
NRCC-MCH-E (Created 09/2020) CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE		NRCC-MCH-E
Project Name: Reseda Skate Facility	Report Page:	Page 7 of 11
Project Address: 18210 Sherman Way	Date Prepared:	2021-04-07

O. DECLARATION OF REQUIRED CERTIFICATES OF ACCEPTANCE

Table Instructions: Selections have been made based on information provided in previous tables of this document. If any selection needs to be changed, please explain why in Table E. Additional Remarks. These documents must be provided to the building inspector during construction and can be found online at https://www.energy.ca.gov/title24/2019standards/2019_compliance_documents/Nonresidential_Documents/NRCA/

YES	NO	Form/Title	Systems To Be Field Verified	Field Inspector Pass	Field Inspector Fail
◉	○	NRCA-MCH-02-A Outdoor Air must be submitted for all newly installed HVAC units. *Note: MCH02-A can be performed in conjunction with MCH-07-A Supply Fan VFD Acceptance (if applicable) since testing activities overlap.*		☐	☐
○	◉	NRCA-MCH-03-A Constant Volume Single Zone HVAC *NOTE: This form does not automatically move to "Yes". If Constant Volume Single Zone HVAC Systems are included in the scope, permit applicant should move this form to "Yes".*		☐	☐
○	◉	NRCA-MCH-04-A Air Distribution Duct Leakage		☐	☐
○	◉	NRCA-MCH-05-A Air Economizer Controls		☐	☐
○	◉	NRCA-MCH-06-A Demand Control Ventilation Systems Acceptance must be submitted for all systems required to employ demand controlled ventilation (refer to §120.1(c)3) can vary outside ventilation flow rates based on maintaining interior carbon dioxide (CO2) concentration setpoints.		☐	☐
○	◉	NRCA-MCH-07-A Supply Fan Variable Flow Controls		☐	☐
○	◉	NRCA-MCH-08-A Valve Leakage Test		☐	☐
○	◉	NRCA-MCH-09-A Supply Water Temperature Reset Controls		☐	☐
○	◉	NRCA-MCH-10-A Hydronic System Variable Flow Controls		☐	☐
○	◉	NRCA-MCH-11-A Automatic Demand Shed Controls		☐	☐

STATE OF CALIFORNIA
Mechanical Systems
NRCC-MCH-E (Created 09/2020) CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE		NRCC-MCH-E
Project Name: Reseda Skate Facility	Report Page:	Page 8 of 11
Project Address: 18210 Sherman Way	Date Prepared:	2021-04-07

○	◉	NRCA-MCH-12-A FDD for Packaged Direct Expansion Units		☐	☐
○	◉	NRCA-MCH-13-A Automatic FDD for Air Handling Units and Zone Terminal Units Acceptance		☐	☐
○	◉	NRCA-MCH-14-A Distributed Energy Storage DX AC Systems Acceptance *NOTE: This form does not automatically move to "Yes". If Distributed Energy Storage DX AC Systems are included in the scope, permit applicant should move this form to "Yes".*		☐	☐
○	◉	NRCA-MCH-15-A Thermal Energy Storage (TES) System Acceptance *NOTE: This form does not automatically move to "Yes". If Chilled Water Storage, Ice-on-Coil Internal Melt, Ice-on-Coil External Melt, Ice Harvester, Brine, Ice-Slurry, Eutectic Salt, Clathrate Hydrate Slurry (CHS), Cryogenic or Encapulated (Ice Ball) Systems are included in the scope, permit applicant should move this form to "Yes".*		☐	☐
○	◉	NRCA-MCH-16-A Supply Air Temperature Reset Controls		☐	☐
○	◉	NRCA-MCH-17-A Condenser Water Temperature Reset Controls		☐	☐
○	◉	NRCA-MCH-18 Energy Management Control Systems		☐	☐
◉	○	NRCA-MCH-19 Occupancy Sensor Controls		☐	☐
○	◉	NRCA-MCH-20 Multi-Family Ventilation		☐	☐
○	◉	NRCA-MCH-21 Multi-Family Envelope Leakage		☐	☐

STATE OF CALIFORNIA
Mechanical Systems
NRCC-MCH-E (Created 09/2020) CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE		NRCC-MCH-E
Project Name: Reseda Skate Facility	Report Page:	Page 9 of 11
Project Address: 18210 Sherman Way	Date Prepared:	2021-04-07

P. DECLARATION OF REQUIRED CERTIFICATES OF VERIFICATION

Table Instructions: Selections have been made based on information provided in previous tables of this document. If any selection needs to be changed, please explain why in Table E. Additional Remarks. These documents must be completed by a HERS Rater and provided to the building inspector during construction. The final documents must be created by a HERS Providers registry, but drafts can be found online at https://www.energy.ca.gov/title24/2019standards/2019_compliance_documents/Nonresidential_Documents/NRCV/

YES	NO	Form/Title	Field Inspector Pass	Field Inspector Fail
○	◉	NRCV-MCH-04-H Duct Leakage Test *NOTE: Must be completed by a HERS Rater*	☐	☐
○	◉	NRCV-MCH-24 Enclosure Air Leakage Worksheet *NOTE: Must be completed by a HERS Rater*	☐	☐
○	◉	NRCV-MCH-27 High-rise Residential *NOTE: Must be completed by a HERS Rater*	☐	☐
○	◉	NRCV-MCH-32 Local Mechanical Exhaust *NOTE: Must be completed by a HERS Rater*	☐	☐

STATE OF CALIFORNIA
Mechanical Systems
NRCC-MCH-E (Created 09/2020) CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE		NRCC-MCH-E
Project Name: Reseda Skate Facility	Report Page:	Page 10 of 11
Project Address: 18210 Sherman Way	Date Prepared:	2021-04-07

Q. MANDATORY MEASURES DOCUMENTATION LOCATION

Table Instructions: Indicate where mandatory measures are documented in the plan set or construction documentation. For any mandatory measures that do not apply, mark the plan sheet or construction document location as "N/A", any active cells that are left blank will result in non-compliance in Table C.

01	02
	Plan sheet or construction document location
Compliance with Mandatory Measures documented through MCH Mandatory Measures Note Block:	

STATE OF CALIFORNIA
Mechanical Systems
NRCC-MCH-E (Created) CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE		NRCC-MCH-E
Project Name: Reseda Skate Facility	Report Page:	Page 11 of 11
Project Address: 18210 Sherman Way	Date Prepared:	2021-04-07

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT

1. I certify that this Certificate of Compliance documentation is accurate and complete.

Documentation Author Name:	Robert Getter, P.E.	Documentation Author Signature:	Robert Getter (Digitally signed by Robert Getter Date: 2021.04.06 01:17:24 -07'00')
Company:	ProjectLine	Signature Date:	11/5/21
Address:	2900 Bristol, D-103	CEA/ HERS Certification Identification (if applicable):	
City/State/Zip:	Costa Mesa, CA 92626	Phone:	949-351-9718

RESPONSIBLE PERSON'S DECLARATION STATEMENT

I certify the following under penalty of perjury, under the laws of the State of California:

1. The information provided on this Certificate of Compliance is true and correct.
2. I am eligible under Division 3 of the Business and Professions Code to accept responsibility for the building design or system design identified on this Certificate of Compliance (responsible designer)
3. The energy features and performance specifications, materials, components, and manufactured devices for the building design or system design identified on this Certificate of Compliance conform to the requirements of Title 24, Part 1 and Part 6 of the California Code of Regulations.
4. The building design features or system design features identified on this Certificate of Compliance are consistent with the information provided on other applicable compliance documents, worksheets, calculations, plans and specifications submitted to the enforcement agency for approval with this building permit application.
5. I will ensure that a completed signed copy of this Certificate of Compliance shall be made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a completed signed copy of this Certificate of Compliance is required to be included with the documentation the builder provides to the building owner at occupancy.

Responsible Designer Name:	Robert Getter, P.E.	Responsible Designer Signature:	Robert Getter (Digitally signed by Robert Getter Date: 2021.04.06 03:17:44 -07'00')
Company :	ProjectLine	Date Signed:	11/5/21
Address:	2900 Bristol, D-103	License:	M30752
City/State/Zip:	Costa Mesa, CA 92626	Phone:	949-351-9718

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REVISION DATES (DESIGN STAGE ONLY)

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Design Contractor

REGISTERED PROFESSIONAL ENGINEER
ROBERT D. GETTER
No. M 30752
Exp. 09-30-22
STATE OF CHANNEL
11/17/2021

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED •

BUREAU OF ENGINEERING
VERTICAL CONTROL:
HORIZONTAL CONTROL:
SHEET TITLE: MECHANICAL SYSTEMS - TITLE 24 2 OF 2
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

DEPARTMENT OF PUBLIC WORKS
NO. | REVISIONS: | DATE: | BY:
CIP NO.
INDEX NO.

CITY OF LOS ANGELES
GARY LEE MOORE, P.E., ENV SP
CITY ENGINEER
DESIGN GROUP
DATE:
ENGINEER: RGETTER
DESIGNED BY: XX
DRAWN BY: JCHIN
CHECKED BY: RHUBATCH
APPROVED BY: XX

WORK ORDER NO.
E170121B

SHEET NAME
M-07
SHEET X OF X SHEETS

Sheet Version 4.0

Q:\PROJECTS\CITY OF LA_BROOKSSCARPA\PROJECTLINE DRAWINGS\CAD\M-07.DWG 12/3/2021 6:39 AM

STATE OF CALIFORNIA
Domestic Water Heating System
NRCC-PLB-E (Created 10/20) — CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE		NRCC-PLB-E
Project Name: Reseda Skate Facility	Report Page:	Page 1 of 5
Project Address: 18210 Sherman Way	Date Prepared:	2021-04-08

This document is used to demonstrate compliance for nonresidential occupancies with requirements in §110.1, §110.3, §120.3, and §140.5, and with requirements in §141.0 for additions and alterations, for domestic water heating scopes using the prescriptive path. For high-rise residential and hotel/motel occupancies, compliance is demonstrated with requirements in §110.1, §110.3, §120.3, §150.0 and §150.1(c)8, and with requirements in §150.2 for additions and alterations.

A. GENERAL INFORMATION

01	Project Location (city)	Reseda	02	Climate Zone	3

03 Occupancy Types Within Project (select all that apply):

- [x] Nonresidential
- [ ] High-Rise Residential
- [ ] Hotel/ Motel
- [ ] State Building
- [ ] Healthcare Facility
- [ ] Other (Write In):

B. PROJECT SCOPE

Table Instructions: Include any domestic water heating systems that are within the scope of the permit application and are demonstrating compliance using the prescriptive paths outlined in §140.5, §150.1(c)8, and §141.0(a), or §141.0(b)2N for additions or alterations. Solar water heating systems should be documented on the NRCC-SRA compliance document. Combined hydronic water heating systems should be documented on the NRCC-MCH compliance document.

01	02	03		
My project consists of (check all that apply):	System Type[1,2]	System Components		
[x] New System (DHW system being installed for the first time in newly constructed building)	Individual System (serving nonresidential spaces)[1]	[x] Equipment	[x] Distribution	[x] Controls
[ ] System Alteration (equipment, distribution or controls)		[ ] Equipment	[ ] Distribution	[ ] Controls

[1] FOOTNOTE: Point of use water heaters, or other non-central systems used to serve nonresidential spaces, are considered individual systems.
[2] Dwelling units refers to hotel/ motel guest rooms and units in a high-rise residential occupancy.

C. COMPLIANCE RESULTS

Table Instructions: Table C will indicate if the project data input into the compliance document is compliant with water heating requirements. This table is not editable by the user. If this table says "DOES NOT COMPLY" or "COMPLIES with Exceptional Conditions" refer to Table D., or the table indicated as not compliant for guidance.

01	02	03	04
Domestic Hot Water Equipment	Distribution Systems	Controls	**Compliance Results**
(See Table F)	(See Table G)	(See Table H)	
Yes	Yes	Yes	**COMPLIES**

STATE OF CALIFORNIA
Domestic Water Heating System
NRCC-PLB-E (Created 10/20) — CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE		NRCC-PLB-E
Project Name: Reseda Skate Facility	Report Page:	Page 2 of 5
Project Address: 18210 Sherman Way	Date Prepared:	2021-04-08

D. EXCEPTIONAL CONDITIONS

This table is auto-filled with uneditable comments because of selections made or data entered in tables throughout the form.

No exceptional conditions apply to this project.

E. ADDITIONAL REMARKS

This table includes remarks made by the permit applicant to the Authority Having Jurisdiction.

See water heater literature for equipment rating and efficiency data (Item F).

F. DOMESTIC HOT WATER EQUIPMENT

Table Instructions: Complete the following table to demonstrate compliance with mandatory equipment requirements in §110.1 and §110.3. For high-rise residential and hotel/ motel occupancies, compliance with prescriptive requirements in §150.1(c)8 must also be demonstrated and with §150.2 for addition and alteration scopes.

Equipment Schedule: Individual Systems

01	02	03	04	05	06
Name or Item Tag	Equipment Type	Volume (gal)	Max GPM/ First Hour Rating (FHR)	Rated Uniform Energy Factor (UEF)	Minimum Required Uniform Energy Factor (UEF)[1]
EWH-1	Electric Storage	>75	0 ≤ FHR < 18	2.36	1.84

[1] FOOTNOTE: Compliant equipment may be found in the Modernized Appliance Efficiency Database System (MAEDBS) on the Energy Commission website: https://cacertappliances.energy.ca.gov/Pages/Search/AdvancedSearch.aspx

Water Heating Equipment All Occupancies

	Yes	No	Not Applicable	Requirement
18	(•)	( )	( )	Unfired storage tank insulation shall have Internal + External ≥ R-16 OR External ≥ R-12. Label required per §110.3(c)3
19	( )	( )	(•)	New state buildings 60% of energy for service water heating from site solar energy or recovered energy per §110.3(c)5
20	( )	( )	(•)	Isolation valves for instantaneous water heater with input rating > 6.8 kBTUH or 2 kW has been specified per §110.3(c)6

G. DOMESTIC HOT WATER DISTRIBUTION SYSTEM

Table Instructions: Complete the following table to demonstrate compliance for nonresidential occupancies with distribution requirements in §120.3 and §140.5. For high-rise residential and hotel/motel occupancies, compliance is demonstrated with requirements in §110.3(c), §120.3, §150.0, §150.1.

Table Continued

STATE OF CALIFORNIA
Domestic Water Heating System
NRCC-PLB-E (Created 10/20) — CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE		NRCC-PLB-E
Project Name: Reseda Skate Facility	Report Page:	Page 3 of 5
Project Address: 18210 Sherman Way	Date Prepared:	2021-04-08

Table Continued

Mandatory Pipe Insulation All Occupancies

12	[x]	For systems serving nonresidential spaces, pipe insulation for the following applications is specified to comply with Table 120.3-A (see below) per §120.3: - Recirculating system piping, including supply and return piping of the water heater - The first 8 ft of hot and cold outlet piping for a nonrecirculating storage system - Pipes that are externally heated
13	[x]	Insulation shall be protected from damage, including that due to sunlight, moisture, equipment maintenance, and wind. Insulation exposed to weather shall be installed with a cover suitable for outdoor service per §120.3(b) and §150.0(j)3

TABLE 120.3-A PIPE INSULATION THICKNESS

Fluid Temperature Range (°F)	Conductivity Range (Btu-in per hour per ft² per °F)	Insulation Mean Rating Temp (°F)	Nominal Pipe Diameter (in)		
			<1	1 to < 1.5	1.5 to < 4
			Minimum Insulation Required		
105-140	0.22-0.28	100	**1.0 in or R-7.7**	**1.5 in or R-12.5**	**1.5 in or R-11**

H. DOMESTIC HOT WATER SYSTEM CONTROLS

Table Instructions: Complete the following table to demonstrate compliance with controls requirements in §110.3 for all occupancies. For high-rise residential and hotel/motel occupancies, compliance is demonstrated with requirements in §150.1(c)8.

	Yes	No	Not Applicable	Requirement
01	(•)	( )	( )	Construction documents require manufacturer certification that service water-heating systems are equipped with automatic temperature controls capable of adjusting temperature settings per §110.3(a)
02	( )	( )	(•)	Systems with capacity > 167,000 BTUH equipped with outlet temperature controls per §110.3(c)1 unless covered by California Plumbing Code Section 613.0.
03	(•)	( )	( )	Controls for circulating pumps or electrical heat trace systems are capable of automatically turning off the system per §110.3(c)2 unless system serves healthcare facility.
04	( )	( )	(•)	For recirculation systems serving multiple dwelling units, design includes automatic pump controls per §150.1(c)8Bii, or §150.2 for additions or alterations
05	( )	( )	(•)	For recirculation systems serving individual dwelling units, design includes manual on/off controls as specified in Reference Appendix RA 4.4.9 per §150.1(c)8.
06	( )	( )	(•)	For replacement single heat pump water heaters serving individual dwelling units in climate zones 1-15, design includes communication interface that meets demand responsive control requirements of §110.12(a) per §150.2(b)1Hiii.

STATE OF CALIFORNIA
Domestic Water Heating System
NRCC-PLB-E (Created 10/20) — CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE		NRCC-PLB-E
Project Name: Reseda Skate Facility	Report Page:	Page 4 of 5
Project Address: 18210 Sherman Way	Date Prepared:	2021-04-08

I. DECLARATION OF REQUIRED CERTIFICATES OF INSTALLATION

Table Instructions: Selections have been made based on information provided in previous tables of this document. If any selection needs to be changed, please explain why in Table E. Additional Remarks. These documents must be provided to the building inspector during construction and can be found online at https://www.energy.ca.gov/title24/2019standards/2019_compliance_documents/Nonresidential_Documents/NRCI/

YES	NO	Form/Title	Field Inspector Pass	Field Inspector Fail
(•)	( )	NRCI-PLB-01-E - Must be submitted for all buildings	☐	☐
( )	(•)	NRCI-PLB-02-E - Must be submitted for high-rise residential and hotel/ motel central hot water distribution systems to be recognized for compliance.	☐	☐
( )	(•)	NRCI-PLB-03-E - Must be submitted for high-rise residential and hotel/ motel single dwelling unit hot water distribution systems to be recognized for compliance.	☐	☐

J. DECLARATION OF REQUIRED CERTIFICATES OF ACCEPTANCE

There are no Certificates of Acceptance applicable to service water heating requirements.

K. DECLARATION OF REQUIRED CERTIFICATES OF VERIFICATION

Table Instructions: Selections have been made based on information provided in previous tables of this document. If any selection needs to be changed, please explain why in Table E. Additional Remarks. These documents must be completed by a HERS Rater and provided to the building inspector during construction. The final documents must be created by a HERS Providers registry, but drafts can be found online at https://www.energy.ca.gov/title24/2019standards/2019_compliance_documents/Nonresidential_Documents/NRCV/

YES	NO	Form/Title	Field Inspector Pass	Field Inspector Fail
( )	(•)	NRCV-PLB-21-H High-rise Residential Central Hot Water Distribution HERS Verification	☐	☐
( )	(•)	NRCV-PLB-22-H High-rise Residential Individual Dwelling Unit Hot Water Distribution HERS Verification	☐	☐

STATE OF CALIFORNIA
Domestic Water Heating System
NRCC-PLB-E (Created 10/20) — CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE		NRCC-PLB-E
Project Name: Reseda Skate Facility	Report Page:	Page 5 of 5
Project Address: 18210 Sherman Way	Date Prepared:	2021-04-08

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT

I certify that this Certificate of Compliance documentation is accurate and complete

Documentation Author Name:	Robert Getter	Documentation Author Signature:	Robert Getter — Digitally signed by Robert Getter Date: 2021.04.08 10:50:41 -07'00'
Company:	ProjectLine	Signature Date:	11/5/21
Address:	2900 Bristol, D-103	CEA/ HERS Certification Identification (if applicable):	
City/State/Zip:	Costa Mesa, CA 92626	Phone:	949-351-9718

RESPONSIBLE PERSON'S DECLARATION STATEMENT

I certify the following under penalty of perjury, under the laws of the State of California:

1. **The information provided on this Certificate of Compliance is true and correct.**
2. **I am eligible under Division 3 of the Business and Professions Code to accept responsibility for the building design or system design identified on this Certificate of Compliance (responsible designer)**
3. **The energy features and performance specifications, materials, components, and manufactured devices for the building design or system design identified on this Certificate of Compliance conform to the requirements of Title 24, Part 1 and Part 6 of the California Code of Regulations.**
4. **The building design features or system design features identified on this Certificate of Compliance are consistent with the information provided on other applicable compliance documents, worksheets, calculations, plans and specifications submitted to the enforcement agency for approval with this building permit application.**
5. **I will ensure that a completed signed copy of this Certificate of Compliance shall be made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a completed signed copy of this Certificate of Compliance is required to be included with the documentation the builder provides to the building owner at occupancy.**

Responsible Designer Name:	Robert Getter, P.E.	Responsible Designer Signature:	Robert Getter — Digitally signed by Robert Getter Date: 2021.04.08 10:50:58 -07'00'
Company :	ProjectLine	Date Signed:	11/5/21
Address:	2900 Bristol, D-103	License:	M30752
City/State/Zip:	Costa Mesa, CA 92626	Phone:	949.351.9718

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Design Contract

REGISTERED PROFESSIONAL ENGINEER — ROBERT D. GETTER — No. M 30752 — Exp. 09-30-22 — STATE OF CHANNEL — 11/17/2021

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED •

BUREAU OF ENGINEERING
VERTICAL CONTROL:
HORIZONTAL CONTROL:
SHEET TITLE: DOMESTIC WATER HEATING SYSTEM - TITLE 24
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

DEPARTMENT OF PUBLIC WORKS
NO.	REVISIONS:	DATE:	BY:

CIP NO.
INDEX NO.

CITY OF LOS ANGELES
GARY LEE MOORE, P.E., ENV SP
CITY ENGINEER
DESIGN GROUP
DATE:
ENGINEER: RGETTER
DESIGNED BY: XX
DRAWN BY: JCHIN
CHECKED BY: RHUBATCH
APPROVED BY: XX

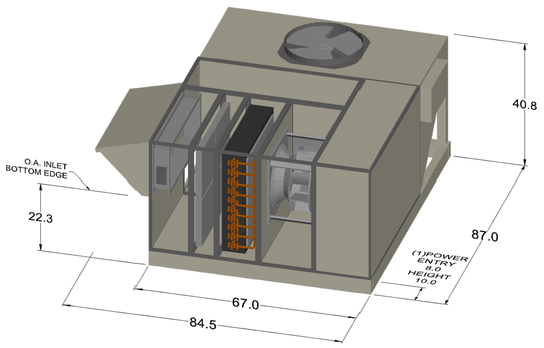
WORK ORDER NO.
E170121B

SHEET NAME
M-08
SHEET X OF X SHEETS

REVISION DATES
(DESIGN STAGE ONLY)

Sheet Version 4.0

Q:\PROJECTS\CITY OF LA_BROOKSSCARPA\PROJECTLINE DRAWINGS\CAD\M-08.DWG 12/3/2021 6:38 AM

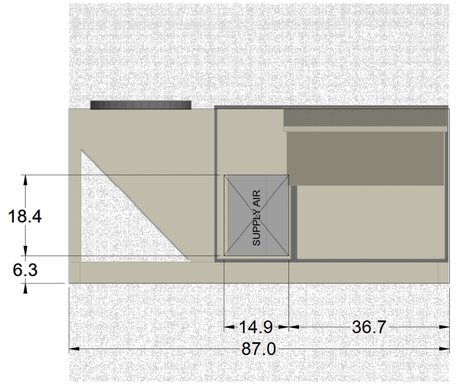


Notes:
(1) Recommended location for optional field cut side power connection.

Product Drawing	Unit Tag: Rebel 001		Sales Office: Norman S. Wright-Climatec Mechl Equip			
Product:	Project Name: Reseda Skate Facility		Sales Engineer:			
Model: DPS005A	Apr. 29, 2021	Ver/Rev:	Sheet: 1 of 1	Scale: NTS	Tolerance: +/- 0.25"	Dwg Units: in [mm]

DAIKIN
13600 Industrial Park Blvd. Minneapolis, MN 55441
www.DaikinApplied.com Software Version: 08.90

No change to this drawing may be made unless approved in writing by Daikin Applied. Purchaser must determine that the equipment is fit and sufficient for the job specifications.

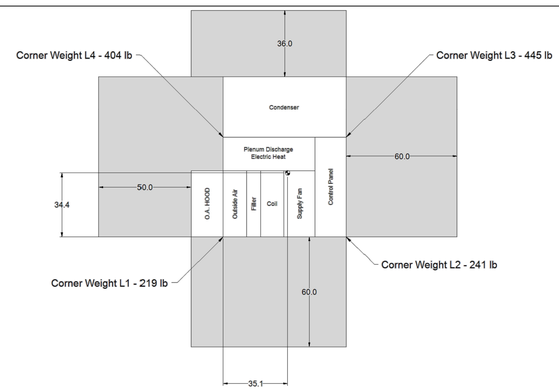


ELEVATION VIEW - SIDE OPENING LOCATION

Product Drawing	Unit Tag: Rebel 001		Sales Office: Norman S. Wright-Climatec Mechl Equip			
Product:	Project Name: Reseda Skate Facility		Sales Engineer:			
Model: DPS005A	Apr. 29, 2021	Ver/Rev:	Sheet: 1 of 1	Scale: NTS	Tolerance: +/- 0.25"	Dwg Units: in [mm]

DAIKIN
13600 Industrial Park Blvd. Minneapolis, MN 55441
www.DaikinApplied.com Software Version: 08.90

No change to this drawing may be made unless approved in writing by Daikin Applied. Purchaser must determine that the equipment is fit and sufficient for the job specifications.



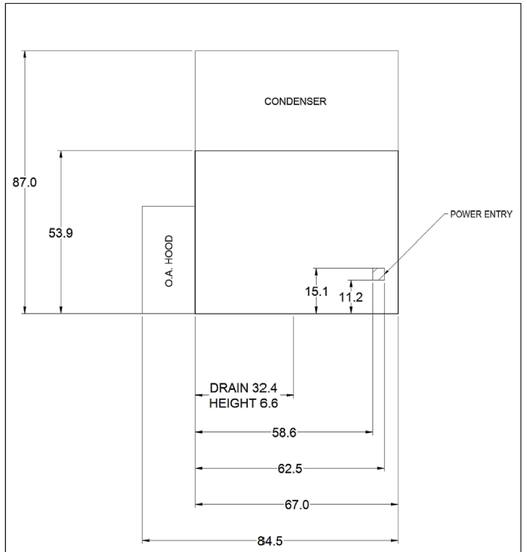
PLAN VIEW - CG, CORNER WEIGHTS, SERVICE CLEARANCE

Notes:
(1) Center of Gravity Height = 20.5
(2) Total Weight = 1308 lb

Product Drawing	Unit Tag: Rebel 001		Sales Office: Norman S. Wright-Climatec Mechl Equip			
Product:	Project Name: Reseda Skate Facility		Sales Engineer:			
Model: DPS005A	Apr. 29, 2021	Ver/Rev:	Sheet: 1 of 1	Scale: NTS	Tolerance: +/- 0.25"	Dwg Units: in [mm]

DAIKIN
13600 Industrial Park Blvd. Minneapolis, MN 55441
www.DaikinApplied.com Software Version: 08.90

No change to this drawing may be made unless approved in writing by Daikin Applied. Purchaser must determine that the equipment is fit and sufficient for the job specifications.



PLAN VIEW - OPENINGS & OVERALL

Product Drawing	Unit Tag: Rebel 001					
Product:	Project Name: Reseda Skate Facility					
Model: DPS005A	Sales Office: Norman S. Wright-					
Sales Engineer:	Apr. 29, 2021	Ver/Rev:	Sheet 1 of 1	Scale: NTS	Tolerance: +/-0.25"	Dwg Units: in [mm]

DAIKIN
13600 Industrial Park Blvd. Minneapolis, MN 55441
www.DaikinApplied.com Software Version: 08.90

No change to this drawing may be made unless approved in writing by Daikin Applied. Purchaser must determine that the equipment is fit and sufficient for the job specifications.

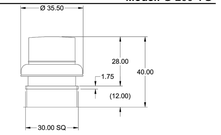
GREENHECK
Building Value In Air.

Printed Date: 04/28/2021
Job: ProjectLine_Reseda Skate Facility
Mark: EF-8
Model: G-200-VG

Model: G-200-VG

Direct Drive Centrifugal Roof Exhaust Fan

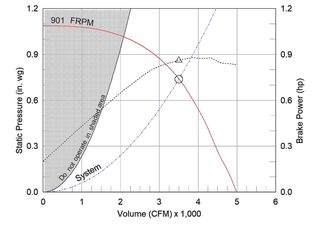
Previously: G-203-VG



OVERALL HEIGHT MAY BE GREATER DEPENDING ON MOTOR, ADAPTER, AND/OR HINGE BASE.

Dimensional	
Quantity	1
Weight w/o Acc's (lb)	151
Weight w/ Acc's (lb)	167
Weight w/ Acc's and Curb (lb)	196
Standard Curb Cap Size (in.)	30 x 30
Optional Damper (in.)	18 x 18
Roof Opening (in.)	20.5 x 20.5

Performance	
Requested Volume (CFM)	3,500
Actual Volume (CFM)	3,500
Total External SP (in. wg)	0.738
Fan RPM	901
Operating Power (hp)	0.86
Elevation (ft)	325
Airstream Temp.(F)	70
Air Density (lb/ft3)	0.074
Tip Speed (ft/min)	5,045
Static Eff. (%)	47



Motor	
Motor Mounted	Yes
Size (hp)	2
Voltage/Cycle/Phase	208/60/3
Enclosure	TEFC
Motor RPM	1200
Efficiency Rating	High
Windings	1
FLA (Amps)	9.7

△ Operating Bhp point
○ Operating point at Total External SP
Fan curve
System curve
Brake horsepower curve

Static Pressure Calculations

External SP	0.3 in. wg
Damper	0.438 in. wg
Total External SP	0.738 in. wg

Sound Power by Octave Band

Sound Data	62.5	125	250	500	1000	2000	4000	8000	LwA	dBA	Sones
Inlet	79	80	77	72	63	63	60	54	74	62	12.0

Notes:
All dimensions shown are in units of in.
*Please consult factory for actual motor amp draw
LwA - A weighted sound power level, based on ANSI S1.4
dBA - A weighted sound pressure level, based on 11.5 dB attenuation per Octave band at 5 ft - dBA levels are not licensed by AMCA International
Sones - calculated using ANSI/AMCA 301 at 5 ft

CAPS 4.35.918

F:\Caps\Jobs\eyang\ProjectLine_Reseda Skate Facility.gfcj
Generated by: eyang@nswcla.com

GREENHECK
Building Value In Air.

Printed Date: 04/28/2021
Job: ProjectLine_Reseda Skate Facility
Mark: EF-8
Model: G-200-VG

Model: G-200-VG

Direct Drive Centrifugal Roof Exhaust Fan

Standard Construction Features:

- Aluminum housing - Backward inclined composite (sizes 60-95) or aluminum (sizes 97-300) wheel - Aluminum curb cap with prepunched mounting holes - Birdscreen - Ball bearing motors (sizes 85-300 and all Vari Green), sleeve bearing motors (sizes 60-80) - Motor isolated on shock mounts - Corrosion resistant fasteners

Selected Options & Accessories:

Motor - Vari-Green EC motor
Control - Dial for balancing
Standard Curb Cap Size - 30 in. Square
UL/cUL 705 Listed - "Power Ventilators"
Switch, NEMA-1, Toggle, Shipped with Unit
Junction Box Mounted & Wired
Damper Shipped Loose, WD-100-PB-18X18, Gravity Operated, Not Coated
Birdscreen: Galvanized, nom. 84% Free Area
Unit Warranty: 1 Yr (Standard)

Selected Sub Marks

See individual submittals for full details
GPI-30-G12

CAPS 4.35.918

F:\Caps\Jobs\eyang\ProjectLine_Reseda Skate Facility.gfcj
Generated by: eyang@nswcla.com

THIS SHEET FOR REFERENCE ONLY

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REVISION DATES
(DESIGN STAGE ONLY)

Sheet Version 4.0

Q:\PROJECTS\CITY OF LA_BROOKSSCARPA\PROJECTLINE DRAWINGS\CAD\M-09.DWG 12/3/2021 6:38 AM

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

REGISTERED PROFESSIONAL ENGINEER
ROBERT D. GETTER
No. M 30752
Exp. 09-30-22
MECHANICAL
11/17/2021

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED •

BUREAU OF ENGINEERING
VERTICAL CONTROL:
HORIZONTAL CONTROL:
SHEET TITLE: OUTDOOR HEAT PUMP AND FAN CUT SHEET
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

DEPARTMENT OF PUBLIC WORKS
NO. | REVISIONS: | DATE: | BY:
CIP NO.
INDEX NO.

CITY OF LOS ANGELES
GARY LEE MOORE, P.E., ENV SP
CITY ENGINEER
DESIGN GROUP
DATE:
ENGINEER: RGETTER
DESIGNED BY: XX
DRAWN BY: JCHIN
CHECKED BY: RHUBATCH
APPROVED BY: XX

WORK ORDER NO.
E170121B

SHEET NAME
M-09
SHEET X OF X SHEETS

Rebel® Packaged Rooftop System

Job Information	*Technical Data Sheet*
Job Name	Reseda Skate Facility
Date	4/29/2021
Submitted By	Eric Yang
Software Version	08.90
Unit Tag	Rebel 001

Unit Overview

Model Number	Voltage V/Hz/Phase	Design Cooling Capacity UOM_OSelected_CoilTotal	EER@95/75 EAT & 200 CFM/ton EER	EER@95/75 EAT & 200 CFM/ton SEER	ASHRAE 90.1
DPS005A	208/60/3	68576	12.3	Not Applicable	ASHRAE 90.1-2016 compliant

Unit

Model Number:	DPS005A
Model Type:	Heat Pump
Heat Type:	Electric
Hot Gas Reheat:	MHGRH with Combination Space Temperature and Humidity Sensor
Energy Recovery:	None
Application:	Variable Air Volume, Single Zone (Mixed Air or 100% OA)
Controls:	Microtech III
Outside Air:	100% Outside Air
Altitude:	0 ft
Approval	cETLus

Physical

Dimensions and Weight

Length	Height	Width	Weight
67.0 in	40.8 in	87.0 in	1308 lb

Corner Weights

L1	L2	L3	L4
219 lb	241 lb	445 lb	404 lb

Construction

Exterior	Insulation and Liners	Air Opening Location	
		Return	Supply
Painted Galvanized Steel	1" Injected Foam, R-7, Galvanized Steel Liner	None	Horizontal

Electrical

Unit FLA	MCA	MROPD	SCCR
52.2 A	63.5 A	70 A	5 kAIC

Note: Use only copper supply wires with ampacity based on 75° C conductor rating. Connections to terminals must be made with copper lugs and copper wire.

Return/Outside/Exhaust Air

Outside Air Option

Type	Damper Pressure Drop	Exhaust Air Type
None	0.09 inH_2O	None

Rebel® Packaged Rooftop System

Filter Section

Physical

Type	Quantity / Size	Face Area	Face Velocity	Air Pressure Drop
2" MERV 8 & 4" MERV 14 Filters	4 / 16 in x 16 in x 2 in & 4 / 16 in x 16 in x 4 in	7.1 ft²	211.3 ft/min	0.11

DX Cooling Coil

Physical

Coil Type	Refrigerant Type	Fins per Inch	Rows	Face Area	Face Velocity	Air Pressure drop	Drain Pan Material
Cu Tube/ Al Fin	R410A	14	4	6.0 ft²	248.3 ft/min	0.18 inH_2O	Stainless Steel

Cooling Performance

Capacity Total Btu/hr	Capacity Sensible Btu/hr	Moisture Removal lb/h	Indoor Air Temperature Entering Dry Bulb °F	Entering Wet Bulb °F	Leaving Dry Bulb °F	Leaving Wet Bulb °F	Leaving Dewpoint °F	Ambient air Temperature °F
68576	68576	0.0	96.7	66.8	54.9	51.3	48.5	96.7

Condensate Connection Size: 3/4 in. Male NPT

Heating Performance

Total Capacity Btu/hr	Refrigerant Type	Indoor Air Temperature Dry Bulb Entering °F	Leaving °F	Ambient Air Temperature °F
56659	R410A	45.0	79.5	40.6

Hot Gas Reheat Coil Section

Type	Face Area	Air Pressure Drop	Total Capacity	Leaving Air Temperature Dry Bulb	Leaving Air Temperature Wet Bulb
Aluminum Tube Micro-Channel	5.5 ft²	0.04 inH_2O	24589 Btu/hr	70.0 °F	57.3 °F

Fan Section

Fan

Type	Fan Wheel Diameter	Fan Isolation
SWSI AF	14 in	None

Performance

Airflow	Total Static Pressure	Fan Speed	Brake Horsepower	Altitude
1500 CFM	2.1 inH_2O	1973 rpm	0.90 HP	0 ft

Motor

Type	Horsepower	Efficiency	FLA	Drive Type
ECM Motor	2.3	Premium	5.0 A	Direct Drive

Rebel® Packaged Rooftop System

Electric Heat Section

Physical Airflow	Physical Size	Control	Electrical FLA A
1500 CFM	12 kW	SCR control	33.3

Performance

Capacity Btu/hr	Air Temperature Entering °F	Air Temperature Leaving °F	Air Pressure Drop inH_2O
40956	40.6	65.8	0.22

Unit Discharge Conditions

AirTemperature

Motor Heat Btu/hr	Moisture Removal lb/h	Unit Leaving Dry Bulb °F	Unit Leaving Wet Bulb °F	Unit Leaving Dewpoint °F
2871	0.0	56.7	51.9	48.5

Condensing Section

Compressor

Type	Quantity	Refrigerant Charge lb	Total Power	Capacity Control	Compressor Isolation
Inverter Scroll	1	19.7	3.41 kW	Mod Control with Inverter Compressors	Rubber in Shear

Compressor Amps:

Compressor 1	11.9 A

Condenser Coil

Type	Fins per Inch	Fin Material
Copper Tube	23	Aluminum

Condenser Fan Motors

Number of Motors	Full Load Current (Total)
1	2.0 A

Internal Pressure Drop Calculation

External Static Pressure:	1.50 inH_2O
Filter:	0.11 inH_2O
Outside Air:	0.09 inH_2O
DX Coil:	0.18 inH_2O
Hot Gas Reheat:	0.04 inH_2O
Electric Heat:	0.22 inH_2O
Total Static Pressure:	2.14 inH_2O

Sound

Sound Power (db)

Frequency	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz
Inlet	71	70	78	73	75	74	69	64
Discharge	71	73	81	78	81	80	77	72
Radiated	82	82	78	75	73	68	61	54

Options

Electrical

Field Connection:	Power Block

Rebel® Packaged Rooftop System

Factory Installed Sensors

- Leaving Coil/Entering Fan Temperature Sensor
- Duct High Limit Switch
- Discharge Air Temperature sensor – Wired in unit, mounted in supply duct
- Outside Air Temperature Sensor
- Dirty Filter On/Off Switch
- Supply Fan Air Proving Via Modbus

Warranty

Parts:	Standard One Year
Compressor:	Standard One Year

Notes

Accessories

Mandatory

Part Number	Description
910191961	Combo Digital Temp and Humidity Sensor w/Adj setpoint and tenent override

THIS SHEET FOR REFERENCE ONLY

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

REGISTERED PROFESSIONAL ENGINEER
ROBERT D. GETTER
No. M 30758
Exp. 09-30-22
STATE OF CHANGE
11/17/2021

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED

DEPARTMENT OF PUBLIC WORKS
BUREAU OF ENGINEERING
VERTICAL CONTROL:
HORIZONTAL CONTROL:
SHEET TITLE: DAIKEN (ROOFTOP SYSTEM) CUT SHEET
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

NO. | REVISIONS: | DATE: | BY:

CIP NO.

INDEX NO.

CITY OF LOS ANGELES
CITY ENGINEER
GARY LEE MOORE, P.E., ENV SP
DATE:
DESIGN GROUP
ENGINEER: RGETTER
DESIGNED BY: XX
DRAWN BY: JCHIN
CHECKED BY: RHUBATCH
APPROVED BY: XX

WORK ORDER NO.
E170121B

SHEET NAME
M-10
SHEET X OF X SHEETS

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REVISION DATES (DESIGN STAGE ONLY)

Sheet Version 4.0

Q:\PROJECTS\CITY OF LA_BROOKSSCARPA\PROJECTLINE DRAWINGS\CAD\M-10.DWG 12/3/2021 6:37 AM

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

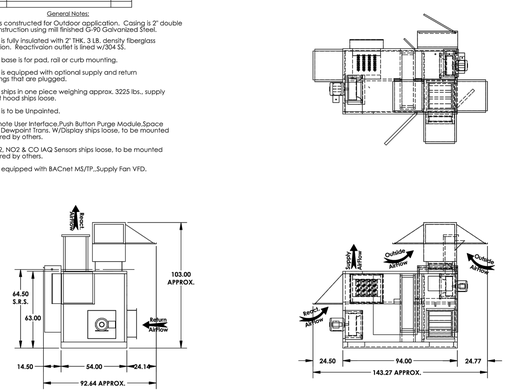
PRELIMINARY DRAWING

DATE	REV	REVISION DESCRIPTION	BY

All Dimensions and specifications are preliminary and may change. Please consult factory for final dimensions and specifications.

General Notes:

1. Unit is constructed for Outdoor application. Casing is 2" double wall construction using mill finished G-90 Galvanized Steel.
2. Unit is fully insulated with 2" THK, 3 LB. density fiberglass insulation. Reactivaion outlet is lined w/304 SS.
3. Unit base is for pad, rail or curb mounting.
4. Unit is equipped with optional supply and return openings that are plugged.
5. Unit ships in one piece weighing approx. 3225 lbs., supply air inlet hood ships loose.
6. Unit is to be Unpainted.
7. Remote User Interface,Push Button Purge Module,Space Mount Dewpoint Trans. W/Display ships loose, to be mounted and wired by others.
8. CO2, NO2 & CO IAQ Sensors ships loose, to be mounted and wired by others.
9. Unit equipped with BACnet MS/TP,.Supply Fan VFD.



* S.P.S. = Standing Roof Seam

See Sheet 2 of 2 for opening locations & sizes.

Unit Information		
SUPPLY AIR	CFM @ ESP	5,800 @ 2.0 W.C.
	BHP / RPM	8.26 / 3,510
	FAN MODEL	18" BIA, CLS 3.75%
	MOTOR HP / RPM	10 / 3,600
	MOTOR TYPE	NEMA PREM. TEFC
	MOTOR FLA	11.5
FILTERS	FILTER SIZE/QTY	1)25x25x2,(3) 16x25x2
	FILTER TYPE	MERV 8
RECIRCULATION AIR	CFM @ ESP	1,566 @ 0.0 W.C.
	BHP / RPM	2.42 / 3,490
	FAN MODEL	14" BIA, CLS 3.37%
	MOTOR HP / RPM	3.0 / 3,600
	MOTOR TYPE	NEMA PREM. TEFC
	MOTOR FLA	3.53
FILTERS	FILTER SIZE/QTY	1)24x24x2
	FILTER TYPE	MERV 8
ELECTRIC	HEATER TYPE	(4) 32 KW HEATERS
	REACT. KW / AMPS	128 KW / 160.9 AMPS
	MAX. REACT. MBH	436.7

Electrical Information	
SUPPLY VOLTAGE	460V 3PHASE 60Hz
UNIT FLA	178.2
UNIT MCA	183
UNIT MOP	200
SCCR	5,000
ELECTRICAL DWG NO.	-

Climate by Design INTERNATIONAL
2100 Park Drive NW
Owatonna, MN 55060
phone: 507.451.2198
fax: 507.451.1177
www.cdihvac.com

PROJECT: Reseda Ice Skating Facility

TAG (S): DH-1

WORK: DH-142-5.8-E50TSLOCM

SHEET: P-015038-001

CAD GENERATED DRAWING. DO NOT MANUALLY UPDATE		
	APPROVED	DATE
REVISION	NK	11/4/2021
2021022		

OPENING TOLERANCES ARE:	
FRACTIONS ..DECIMALS ..ANGLES	
± 1/16" ± .06" ± 1°	
PART TOLERANCES ARE:	
FRACTIONS ..DECIMALS ..ANGLES	
± 1/4" ± .25" ± 1°	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES

SHEET 1 OF 2

THIS DRAWING IS THE PROPERTY OF CONCEPTS AND DESIGNS, INC. THE INFORMATION HEREON IS TO BE TREATED AS CONFIDENTIAL. IT IS NOT TO BE USED, COPIED, OR DISCLOSED TO OUTSIDE PARTIES WITHOUT THE EXPRESS WRITTEN CONSENT OF CONCEPTS BY DESIGN INTERNATIONAL

ARID-Ice by Climate by Design INTERNATIONAL

PRELIMINARY DRAWING

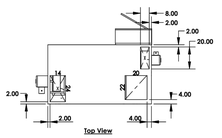
PRELIMINARY DRAWING

DATE	REV	REVISION DESCRIPTION	BY

All Dimensions and specifications are preliminary and may change. Please consult factory for final dimensions and specifications.

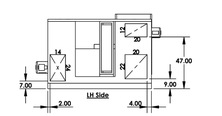
Service Clearances:
Side (RH) - 62.00"
Side (LH) - 44.00"
End (Inlet) - 48.00"
End (Discharge) - 48.00"

Access Door Sizes:
Pre-Filter Door - 20" x 50"
DH Door (Large) - 36" x 50"
DH Door (Small) - 12" x 48"
Electrical Cabinet Door - 30" x 50"

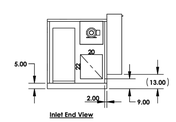


Top View

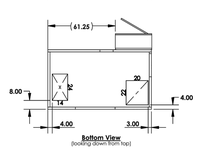
Discharge End View



LH Side



Inlet End View



Bottom View
(looking down from top)

Notes:
1. Dampers extends 8.00" from casing when they are needed.

Climate by Design INTERNATIONAL
2100 Park Drive NW
Owatonna, MN 55060
phone: 507.451.2198
fax: 507.451.1177
www.cdihvac.com

PROJECT: Reseda Ice Skating Facility

TAG (S): DH-1

WORK: DH-142-5.8-E50TSLOCM

SHEET: P-015038-001

CAD GENERATED DRAWING. DO NOT MANUALLY UPDATE		
	APPROVED	DATE
REVISION	NK	11/4/2021
2021022		

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES

SHEET 2 OF 2

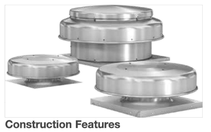
THIS DRAWING IS THE PROPERTY OF CONCEPTS AND DESIGNS, INC. THE INFORMATION HEREON IS TO BE TREATED AS CONFIDENTIAL. IT IS NOT TO BE USED, COPIED, OR DISCLOSED TO OUTSIDE PARTIES WITHOUT THE EXPRESS WRITTEN CONSENT OF CONCEPTS BY DESIGN INTERNATIONAL

ARID-Ice by Climate by Design INTERNATIONAL

PRELIMINARY DRAWING

Spun Aluminum Model GRSI/GRSR/GRSF

GREENHECK Building Value in Air.



Construction Features

When you buy a Greenheck gravity ventilator, you receive a ventilator with the industry's best performance and durability for intake (model GRSI) or relief (model GRSR) for natural gravity or positive pressure systems. Exceptional low silhouette design and construction features make this unit a rugged, efficient, and economical air inlet or outlet.

- Broadest performance in the industry, up to 18,400 cfm (31,300 m³/hr)
- Most advanced weather protection of any ventilator in its class
- Greenheck subjects these products to extensive life testing, ensuring the ventilator will provide years of reliable performance

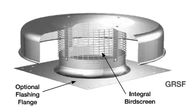
- **All aluminum exterior for corrosion-resistant construction**
- **Integral birdscreen to prevent the entry of birds and/or small objects**
- **Built-in curb cap with pre-punched holes for easy attachment to roof curbs**
- **Optional built-in flashing flange (model GRSF) with pre-punched holes for quick and easy installations without a roof curb.**

Use the GRS with the following accessories:

Gravity or motorized dampers to ensure weather tightness.

Prefab curbs to reduce installation time.

Protective coatings to extend the life of the unit or blend its color with other equipment.

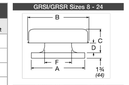


Dimensions

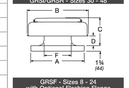
Model Size	A	B	C	D	E	F	Damper Size	Curb Thickness	Shroud Thickness	Unit Weight
8	19 (483)	20½ (521)	7⅛ (184)	1⅛ (36)	20½ (514)	8⅛ (210)	8 x 8 (203 x 203)	0.051 (1.3)	0.051 (1.3)	7 (3)
10	19 (483)	20½ (521)	7⅛ (197)	2 (51)	20½ (514)	10½ (260)	10 x 10 (254 x 254)	0.051 (1.3)	0.051 (1.3)	8 (4)
12	22 (559)	29 (737)	10 (254)	3½ (89)	29½ (591)	12½ (311)	12 x 12 (305 x 305)	0.064 (1.6)	0.064 (1.6)	10 (5)
15	22 (559)	29 (737)	10 (254)	3½ (89)	29½ (591)	14½ (362)	16 x 16 (406 x 406)	0.064 (1.6)	0.064 (1.6)	13 (6)
16	26 (660)	29 (737)	11 (279)	4½ (108)	29½ (591)	16½ (413)	16 x 16 (406 x 406)	0.064 (1.6)	0.064 (1.6)	16 (7)
18	30 (762)	35½ (902)	9⅝ (245)	1⅝ (44)	31½ (794)	20½ (514)	18 x 18 (457 x 457)	0.064 (1.6)	0.064 (1.6)	19 (8)
20	30 (762)	35½ (902)	11½ (286)	3½ (89)	31½ (794)	20½ (514)	18 x 18 (457 x 457)	0.064 (1.6)	0.064 (1.6)	24 (11)
24	34 (864)	38½ (972)	11 (279)	4 (102)	35½ (895)	24½ (622)	24 x 24 (610 x 610)	0.064 (1.6)	0.064 (1.6)	29 (13)
30	40 (1016)	48 (1219)	18⅛ (476)	5¼ (138)	"	30½ (775)	30 x 30 (762 x 762)	0.064 (1.6)	0.064 (1.6)	35 (16)
36	46 (1168)	58½ (1441)	21⅛ (540)	10 (254)	"	36½ (927)	36 x 36 (914 x 914)	0.064 (1.6)	0.080 (2.0)	45 (20)
42	52 (1321)	63½ (1607)	24⅛ (616)	11½ (296)	"	42½ (1088)	42 x 42 (1067 x 1067)	0.064 (1.6)	0.080 (2.0)	60 (27)
48	58 (1473)	72 (1829)	26½ (667)	11½ (296)	"	48½ (1232)	48 x 48 (1219 x 1219)	0.064 (1.6)	0.080 (2.0)	80 (36)

All dimensions are in inches (millimeters) and the weight in pounds (kilograms). NOTE: Sizes GRS-8 through 24 have a one-piece cover and shroud. Access is gained through the removal of screws. Sizes GRS-30 through 48 have a removeable cover, separate from the shroud, to facilitate maintenance and servicing of dampers.

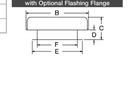
GRSI/GRSR Sizes 8 - 24



GRSI/GRSR - Sizes 30 - 48



GRSF - Sizes 8 - 24 with Optional Flashing Flange



Spun Aluminum Model GRSI/GRSR

GREENHECK Building Value in Air.

Performance

Performance data for these units was obtained through actual testing. The information is presented in capacity versus total pressure drop through the GRS. Total pressure drop includes the static and velocity pressure drops. To find the static drop alone, use the following equations.

$$\text{Throat Velocity} = \left[\frac{\text{CFM}}{\text{Throat Area}}\right]$$

$$\text{Static Pressure} = \left[\text{Total Pressure}\right] - \left[\text{Velocity Pressure}\right]$$

$$\text{Velocity Pressure (in. wg)}^{*} = \left[\frac{\text{Throat Velocity}^{2}}{4008.6}\right]$$

*1 inch wg = *249 Pa*

The data is presented for both discharge and intake units. The intake velocity of the intake unit should not exceed 600 feet per minute. Above this velocity, airborne particles may be carried into the building. The table below displays the maximum recommended values for the respective intake units. In areas where snow depths may be a problem, 12 inch *(305 mm)* **or higher curbs are recommended.**

			Volume (CFM)									Recommended Maximum Intake Capacities	
	GRSI Size	Throat Area (ft²)	Total Pressure Drop (in. wg)									Intake Area (ft²)	Max. CFM Intake
			0.04	0.06	0.08	0.10	0.15	0.20	0.25	0.30	0.35		
Model GRSI Intake Performance	8	0.37	178	218	252	282	345	398	445	488	527	1.30	780
	10	0.57	279	342	395	442	541	624	698	765	826	1.72	1032
	12	0.82	400	490	566	633	775	895	1001	1097	1184	2.52	1512
	15	1.12	553	677	782	874	1071	1237	1383	1515	1636	2.57	1542
	16	1.45	742	908	1049	1173	1436	1658	1854	2031	2194	3.02	1812
	18	1.83	901	1104	1274	1425	1745	2015	2253	2468	2665	3.42	2052
	20	2.25	1096	1343	1550	1733	2123	2452	2741	3002	3243	4.43	2658
	24	3.24	1542	1888	2180	2438	2985	3447	3854	4222	4560	4.95	2970
	30	5.03	2013	2465	2847	3183	3898	4501	5032	5512	5954	7.49	4496
	36	7.29	2921	3577	4130	4618	5656	6531	7301	7998	8639	10.2	6111
	42	9.77	3911	4791	5532	6185	7574	8746	9779	10712	11570	12.0	7159
	48	12.8	5139	6294	7268	8126	9952	11491	12848	14074	15201	15.5	9286
	GRSR Size	Throat Area (ft²)	Total Pressure Drop (in. wg)										
			0.04	0.06	0.08	0.10	0.15	0.20	0.25	0.30	0.35		
Model GRSR Relief Performance	8	0.37	231	282	326	365	446	516	576	631	682		
	10	0.57	331	406	468	524	641	741	828	907	980		
	12	0.82	468	573	662	740	907	1047	1171	1282	1385		
	15	1.12	663	811	937	1048	1283	1481	1656	1814	1960		
	16	1.45	870	1065	1230	1375	1685	1945	2175	2382	2573		
	18	1.83	1060	1298	1499	1676	2052	2370	2649	2902	3135		
	20	2.25	1284	1572	1815	2029	2486	2870	3209	3515	3797		
	24	3.24	1879	2301	2657	2971	3638	4201	4697	5145	5558		
	30	5.03	2281	2794	3226	3607	4418	5101	5703	6247	6748		
	36	7.29	3279	4016	4637	5184	6349	7331	8197	8979	9699		
	42	9.77	4672	5722	6607	7387	9047	10447	11680	12795	13820		
	48	12.8	6211	7607	8783	9820	12027	13888	15527	17009	18372		

Table is based on 600 ft/min, maximum intake velocity. Above these values (numbers in gray), provisions should be made to contain incoming moisture.

THIS SHEET FOR REFERENCE ONLY

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Design Standard

REGISTERED PROFESSIONAL ENGINEER
ROBERT D. GETTER
No. M 30752
Exp. 09-30-22
STATE OF CHANNEL
11/17/2021

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED •

BUREAU OF ENGINEERING
VERTICAL CONTROL:
HORIZONTAL CONTROL:
SHEET TITLE: ROOF EQUIPMENT - SHEET (1of 2)
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

DEPARTMENT OF PUBLIC WORKS
CITY ENGINEER
DATE:
DESIGN GROUP
ENGINEER: RGETTER
DESIGNED BY: XX
DRAWN BY: JCHIN
CHECKED BY: RHUBATCH
APPROVED BY: XX

NO.	REVISIONS:	BY:	DATE:

CIP NO.

INDEX NO.

CITY OF LOS ANGELES
GARY LEE MOORE, P.E., ENV SP

WORK ORDER NO.
E170121B

SHEET NAME
M-11
SHEET X OF X SHEETS

REVISION DATES
(UNLESS OTHERS NOTED)

Sheet Version 4.0

Q:\PROJECTS\CITY OF LA_BROOKSSCARPA\PROJECTLINE DRAWINGS\CAD\M-11.DWG 12/3/2021 6:37 AM

CBD6
Counterbalanced Backdraft Damper

RUSKIN
AUTHORITY IN AIR CONTROL

APPLICATION

The CBD6 counterbalanced backdraft damper will relieve at extremely low pressures (approximately .02" w.g.). It also features heavy duty aluminum construction, with the ability to handle large air flows and has maximum spot velocities up to 3,500 fpm. To maintain quiet operation synthetic corrosion resistant bearings are used. The CBD6 also offers excellent weather resistance for relief air applications in exterior walls.

STANDARD CONSTRUCTION

Frame	6063T6 extruded aluminum .125" (3.2) wall thickness
Blades	6063T6 extruded aluminum .070" (1.8) wall thickness with extruded vinyl edge seals
Bearings	Zytel
Linkage	1/8 " x 1/2 " (3 x 13) aluminum tiebars
Counterbalance	Zinc plated bar on blades (except top blade). Adjustable for final "on the job" setting
Finish	Mill
Maximum Size	Single section – 48"w x 52"h (1219 x 1321). Assembly of sections – unlimited
Minimum Size	6" w x 10"h (152 x 254)
Temperature Limits	-40°F (-40°C) minimum and +200°F (93°C) maximum

AIR BUILDING CONFERENCE MEMBER

ISO 9001 REGISTERED

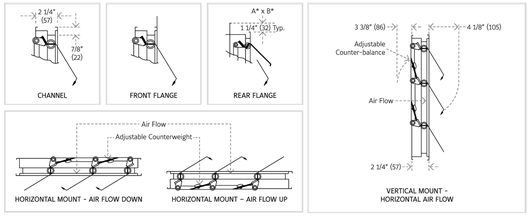
5 YEAR LIMITED WARRANTY

VARIATIONS

The following variations to the CBD6 are available at additional cost:

- Special finishes
- Bird or insect screens

FRAME CONSTRUCTION

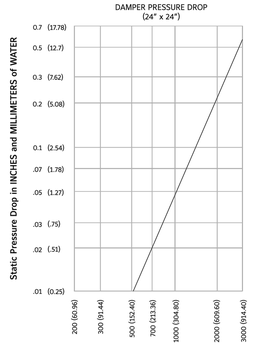


Note:
- Unit furnished approx. 1/4" (6) smaller than given opening dimensions.
- Dimensions shown in parentheses ( ) indicate millimeters.

PERFORMANCE DATA

Damper Performance						
Damper Width	Maximum Back Pressure	Maximum System Velocity	Leakage*		Blades Start To Open	Blades Fully Open
			% Of Max. Flow	CFM/Sq. Ft.		
48" (1219)	4.0" w.g.	2500 FPM	0.6%	15	0.01" w.g.	0.05" w.g.
36" (914)	8.0" w.g.	2500 FPM	0.6%	15		
24" (610)	12.0" w.g.	2500 FPM	0.7%	17.5		
12" (305)	16.0" w.g.	2500 FPM	1%	25		

*Leakage information based on pressure differential of 1" w.g. tested per AMCA Std. 500.



Air Velocity in FEET and METERS per minute through FACE AREA.
Tested per AMCA Std. 500, Fig. 5.3, ductwork upstream and downstream.

INSTALLATION

- When used in fan discharge applications, damper should be located at least one-half the fan diameter away from the fan.
- For proper operation, damper must be installed square and free from racking.
- Bracing of multiple section assemblies:
  The CBD6 is intended to be self supporting only in the largest single section size. Multiple section damper assemblies may require bracing to support the weight of the assembly and to hold against system pressure. Ruskin recommends appropriate bracing to support the damper horizontally at least once for every 8 feet of damper width. Vertical assemblies and higher system pressures may require more bracing.

SUGGESTED SPECIFICATION

Furnish and install, at locations shown on plans or in accordance with schedules, heavy duty backdraft dampers that meet the following minimum construction standards: Frame shall be .125" (3.2) wall thickness 6063T6 extruded aluminum with 12 gage (2.8) galvanized steel structural brace at each corner. Blades shall be .070" (1.8) wall thickness 6063T6 extruded aluminum with extruded vinyl blade edge seals mechanically locked into blade edge. Adhesive or clip on type seals are unacceptable. Bearings shall be corrosion resistant, long life synthetic type for quiet operation. Linkage shall be 1/2" (13) wide tiebar connected to stainless steel pivot pins. Dampers shall be designed for maximum 3500 fpm spot velocities and minimum 4 inches w.g. back pressure depending on damper size. Dampers shall be in all respects equivalent to Ruskin model CBD6.

LINKS TO IMPORTANT DOCUMENTS

Document Title
Limited Warranty Document

RUSKIN
AUTHORITY IN AIR CONTROL
3900 Doctor Greaves Road
Grandview, MO 64030
Website: www.ruskin.com
Phone: (816) 761-7476

RUSKIN®

3900 Dr. Greaves Rd. • Kansas City, MO 64030 • (816) 761-7476 • FAX (816) 765-8955

CD102 CONTROL DAMPER
OD102 FAN OUTLET DAMPER
Aluminum Airfoil Blades

STANDARD CONSTRUCTION

FRAME
8" x 8" x 12 gage (203 x 51 x 2.8) steel channel.

BLADES
7⅛" (197) wide, .080 (2.1) thick, 6063T5 extruded aluminum airfoil blade.

AXLES
¾" (19) diameter plated steel.

BEARINGS
CD102 - Stainless steel sleeve pressed into frame.
OD102 - Stainless steel bolted to frame.

LINKAGE
Side linkage out of airstream; 10 gage (3.5) galvanized steel clevis-type arms, ⅝" x ¾" (4.8 x 19) plated steel tie bars and ⅜ " diameter (9.5) stainless steel pivot pins with lock-type retainers.

OPERATING LEVER
Hand Quadrant for manual operation. A crank lever for motor operation is available at no extra cost.

FINISH
Mill galvanized frame with mill finish blades.

MAXIMUM TEMPERATURE
300°F (149°C) maximum.

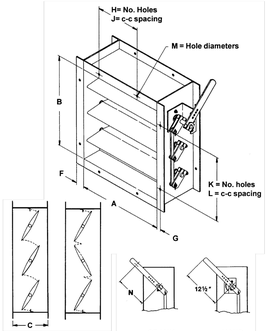
MINIMUM SIZE
Single blade damper – 6" w x 6"h (152 x 152).
Multiple blade damper – 6" w x 14"h (152 x 356).

MAXIMUM SIZE
60"w x 96"h (1524 x 2438).

VARIATIONS

The CD/OD102 can be furnished with a number of variations to meet special requirements. These variations, available at additional cost include:
- 10" (254) deep frame.
- Special finishes.
- Electric and pneumatic actuators.
- Other frame materials.

NOTE: Dimensions in parentheses ( ) indicate millimeters.



FRAME	BLADES	AXLES	BEARINGS	LINKAGE	SEALS (OPT)	ACCESSORIES
8" x 8" x 12 GA (203 x 51 x 2.8) GALVANIZED STEEL 8" x 5" x 10 GA (203 x 127 x 3.5) GALVANIZED STEEL 8" x 4" 12G (203 x 51 x 3.2) ALUMINUM	7⅛" (197) WIDE .080" (2.1) THK 6063T5 EXTRUDED ALUMINUM AIRFOIL	¾" (19) DIA. 'S' PLATED STEEL ¾" (19) DIA. 'S' STAINLESS STEEL (OPT) ¾" (19) DIA. 'S' ALUMINUM (OPT)	SS SLEEVE PRESSED INTO FRAME (CD) OR CAST IN FRAME (OD) ON OD102 (STANDARD) SS SLEEVE IN CAST FRAME (OPT) BOLT ON BRNG W/INTEGRAL SHAFT SEALS (OPT)	SIDE LINKAGE (CONCEALED)	BLADE SEALS SILICONE .400°F (204°C) MAX SS JAMB SEALS	HAND QUADRANT (HQ) CRANK LEVER (CL) BOLT HOLES ONE FLANGE (OPT) BOLT HOLES BOTH FLANGES (OPT) PNEUMATIC ACTUATOR (OPT) ELECTRIC ACTUATOR (OPT) 1¼" (38) TO 4" (102) FLANGES (OPT)

QTY.	BLADE ACTION		DIMENSIONS											LEVER TYPE		COMMENTS	TAG
	PB	OB	A	B	C	F	G	H	J	K	L	M	HQ	CL		
JOB													LOCATION				
ARCH./ENGR.													CONTRACTOR				
REPRESENTATIVE													DATE				

PRESSURE DROP INFORMATION
AREA FACTOR TABLE

B Dimension Height in Inches (mm)	A Dimension—Width in Inches (mm)																
	6" (152)	9" (229)	12" (305)	15" (381)	18" (457)	21" (533)	24" (610)	27" (686)	30" (762)	33" (838)	36" (914)	39" (991)	42" (1067)	45" (1143)	48" (1219)	51" (1295)	54" (1372)	57" (1448)	60" (1524)
6" (152)	6.65	4.43	3.33	2.66	2.22	1.90	1.66	1.48	1.33	1.21	1.11	1.02	.95	.89	.83	.85	.80	.76	.72
9" (229)	3.93	2.62	1.96	1.57	1.31	1.12	.98	.87	.79	.71	.65	.60	.56	.52	.49	.48	.46	.43	.41
12" (305)	2.75	1.84	1.38	1.10	.92	.79	.69	.61	.55	.50	.46	.42	.39	.37	.34	.34	.33	.31	.29
15" (381)	2.05	1.37	1.02	.82	.68	.59	.51	.46	.41	.37	.34	.32	.29	.23	.26	.25	.24	.23	.21
18" (457)	1.74	1.16	.87	.69	.58	.50	.43	.39	.35	.32	.29	.27	.25	.27	.22	.22	.20	.19	.18
24" (610)	1.27	.85	.63	.51	.42	.36	.32	.28	.25	.23	.21	.20	.18	.17	.16	.16	.15	.14	.13
30" (762)	.96	.64	.48	.39	.32	.28	.24	.21	.19	.18	.16	.15	.14	.13	.12	.12	.11	.11	.10
36" (914)	.80	.53	.40	.32	.27	.23	.20	.18	.16	.15	.13	.12	.11	.11	.10	.10	.09	.09	.08
42" (1067)	.68	.46	.34	.27	.23	.20	.17	.15	.14	.12	.11	.10	.09	.09	.09	.08	.08	.08	.07
48" (1219)	.60	.40	.30	.24	.20	.17	.15	.13	.12	.11	.10	.09	.09	.08	.07	.07	.07	.07	.06
54" (1372)	.53	.35	.26	.21	.18	.15	.13	.12	.11	.10	.09	.08	.08	.07	.07	.07	.06	.06	.06
60" (1524)	.47	.31	.23	.19	.16	.13	.12	.10	.09	.08	.08	.07	.07	.06	.06	.06	.05	.05	.05
66" (1676)	.42	.28	.21	.17	.14	.12	.11	.09	.08	.08	.07	.07	.06	.06	.05	.05	.05	.05	.04
72" (1829)	.39	.26	.19	.16	.13	.11	.10	.09	.08	.07	.06	.06	.06	.05	.05	.05	.04	.04	.04
78" (1981)	.36	.24	.18	.14	.12	.10	.09	.08	.07	.07	.06	.06	.05	.05	.04	.04	.04	.04	.04
84" (2134)	.33	.22	.17	.13	.11	.10	.08	.07	.07	.06	.06	.05	.05	.04	.04	.04	.04	.04	.03
90" (2286)	.31	.21	.16	.12	.10	.09	.08	.07	.06	.06	.05	.05	.04	.04	.04	.04	.04	.03	.03
96" (2438)	.29	.19	.14	.12	.10	.08	.07	.06	.06	.05	.05	.04	.04	.04	.04	.03	.03	.03	.03

DETERMINING PRESSURE DROP

Use the Area Factor Table and Pressure Drop Chart to determine pressure drop through Ruskin CD/OD102 Dampers.

1. Determine area factor for damper by entering the Area Factor Table through duct width and height.
2. Find the conversion velocity (CV) by multiplying the selected size damper's area factor by the flow rate in CFM:
   CV = Area Factor x CFM
3. Enter the Pressure Drop Chart at the determined area factor and proceed up to appropriate conversion velocity (CV) line. Then, read across to static pressure drop at left side of chart.

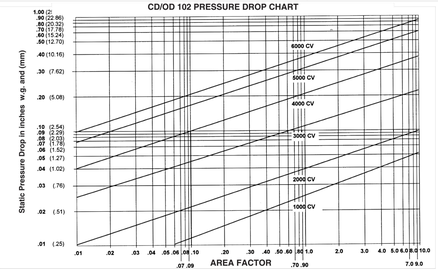
Example:

1. Find the pressure drop across an 18" wide x 18" high Model CD/OD102 Damper handling 8570 CFM. From the Area Factor Table, area factor is determined to be .58.
   CFM x AREA FACTOR EQUALS CONVERSION VELOCITY
2. Therefore, CV (Conversion Velocity) = 8570 CFM x .58 = 5000. Using the Pressure Drop Chart, pressure drop = .28 inches water gage.

NOTES:

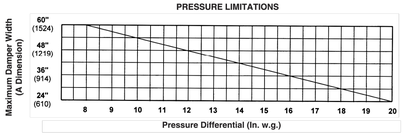
1. Ratings are based on AMCA Standard 500 using Test Setup Apparatus Figure 5.3 (damper is installed with duct upstream and downstream).
2. Static Pressure and Conversion Velocities are corrected to .075 lb./cu. ft. air density.

CD/OD 102 PRESSURE DROP CHART



CD/OD102 PERFORMANCE DATA

PRESSURE LIMITATIONS



The OD102 damper can be mounted in any position for fan discharge. Ideal for medium to heavy duty commercial or industrial applications, the OD102 can be used to control or modulate the volume of air delivered by the fan, to shut off fan air flow and to balance the system.

The graph shows the maximum allowable pressure differentials across a closed CD/OD102 damper. Dampers with a 60" (1524) width (A dimension) can withstand 8 in. w.g. Dampers with smaller widths (A dimension) can withstand higher pressures. For example, a 48" (1219) A dimension damper can withstand a maximum of 12 in. w.g. and a 36" (914) A dimension damper can withstand a maximum of 16" w.g.

Note that CD/OD102 dampers are not recommended for use in abrasive or high temperature atmospheres due to the aluminum blade construction. Consult your Ruskin representative for a listing of Ruskin models suited to abrasive environments.

TOTAL CFM LEAKAGE AT ONE INCH
WATER GAGE STATIC PRESSURE DIFFERENTIAL
(For Damper Equipped with Optional Seals)

DAMPER WIDTH	DAMPER HEIGHT											
	12" (305)	18" (457)	24" (610)	30" (762)	36" (914)	42" (1067)	48" (1219)	54" (1372)	60" (1524)	66" (1676)	72" (1829)	78" (1981)	84" (2134)	90" (2286)	96" (2438)
12" (305)	15	23	30	38	45	53	60	68	75	83	90	98	105	113	120
24" (610)	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160
36" (914)	24	36	48	60	72	84	96	108	120	132	144	156	168	180	192
48" (1219)	32	48	64	80	96	112	128	144	160	176	192	208	224	240	256
60" (1524)	40	60	80	100	120	140	160	180	200	220	240	260	280	300	320

LEAKAGE CORRECTION FACTOR

Static Pressure (in.w.g.)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Correction Factor	1.0	1.4	1.7	2.0	2.2	2.4	2.6	2.8	3.0	3.2	3.3	3.5	3.6	3.7	3.9	4.0	4.1	4.2	4.4	4.5

DETERMINING LEAKAGE

To determine leakage at static pressure differentials higher than one inch water gage, multiply leakage at one inch (determined from table) by correction factor for higher static pressure (determined from the Leakage Correction Factor Table).

Example:
Find leakage for a 36" wide x 24" high damper at 3 inches water gage: 48 CFM x 1.7 = 81.6 CFM leakage at 3 inches water gage.

Leakage ratings are based on AMCA Standard 500 using Test Setup Apparatus Figure 5.5. Torque applied holding damper closed at 10 in. lbs. per sq. ft. of damper with minimum of 20 in. lbs.

INSTALLATION

For proper operation, damper must be installed square and free from racking. Opposed blade dampers must be operated from a power blade or drive axle.

NOTE:

Dampers are designed for operation with blades running horizontally. Dampers to be installed with vertical blades require thrust collars be added at time of damper manufacture and at additional cost. Some standard features are not available with vertical bladed dampers.

CD102 SUGGESTED SPECIFICATION

Furnish and install, at locations shown in plans or in accordance with schedules, industrial grade control dampers meeting the following construction standards: Frames shall be minimum 8" deep x 2" flanged 12 gage steel channel (203 x 51 x 2.6). The blades shall be maximum 7⅛" (197) wide, minimum .080" (2) thick, 6063T5 extruded aluminum airfoil shaped with integral structural reinforcing tube running full length of each blade. Axles shall be minimum ¾" (19) diameter with machined edge to provide positive locking connection to blades and linkage. Full round axles are not acceptable. Bearings shall be stainless steel sleeve pressed into frame. Linkage shall be located in jamb out of airstream and constructed of 10 gage (3.5) galvanized steel clevis type arms, ⅝x" x ¾" (4.7 x 19) plated steel tie bars and ⅜" (9.5) diameter stainless steel pivot pins with lock type retainers.

Submittal must include leakage, pressure drop and maximum pressure data based on AMCA Publication 500 testing. Damper shall be Ruskin model CD102 Control Damper.

ADD TO SPECIFICATION IF REQUIRED:
Dampers shall be equipped with blade and jamb seals for low leakage application. Blade seals shall be extruded silicone rubber mechanically locked into extruded blade slots. Adhesive type seals are not acceptable. Jamb seals shall be flexible stainless steel located between blade edge and jamb for maximum sealing compression. Wind stop type seals are not acceptable.

OD102 SUGGESTED SPECIFICATION

Furnish and install, at locations shown in plans or in accordance with schedules, fan outlet dampers meeting the following construction standards: Frames shall be minimum 8" deep x 2" flanged 12 gage steel channel (203 x 51 x 2.8). The blades shall be maximum 7⅛" (197) wide, minimum .080" (2) thick, 6063T5 extruded aluminum airfoil shaped with integral structural reinforcing tube running full length of each blade. Axles shall be minimum ¾" (19) diameter with machined edge to provide positive locking connection to blades and linkage. Full round axles are not acceptable. Bearings shall be stainless steel sleeve bolted to frame. Bearings pressed nto frame are not acceptable. Linkage shall be located in jamb out of airstream and constructed of 10 gage (3.5) galvanized steel clevis type arms, ⅝x" x ¾" (4.7 x 19) plated steel tie bars and ⅜" (9.5) diameter stainless steel pivot pins with lock type retainers.

Submittal must include leakage, pressure drop and maximum pressure data based on AMCA Publication 500 testing. Damper shall be capable of being mounted in any position for fan discharge and shall be capable of controlling or modulating the volume of air delivered by the fan, to shut off fan air flow and balance the system. Damper shall be Ruskin model OD102 Control Damper.

ADD TO SPECIFICATION IF REQUIRED:
Dampers shall be equipped with blade and jamb seals for low leakage application. Blade seals shall be extruded silicone rubber mechanically locked into extruded blade slots. Adhesive type seals are not acceptable. Jamb seals shall be flexible stainless steel located between blade edge and jamb for maximum sealing compression. Wind stop type seals are not acceptable.

RUSKIN®

3900 Dr. Greaves Rd.
Kansas City, MO 64030
(816) 761-7476
FAX (816) 765-8955
www.ruskin.com

THIS SHEET FOR REFERENCE ONLY

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Design Consultant

REGISTERED PROFESSIONAL ENGINEER
ROBERT D. GETTER
No. M 30752
Exp. 09-30-22
STATE OF CHANNEL
11/17/2021

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED •

BUREAU OF ENGINEERING
VERTICAL CONTROL:
HORIZONTAL CONTROL:
SHEET TITLE: RUSKIN CBD6 BACKDRAFT DAMPER CUT SHEETS
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

DEPARTMENT OF PUBLIC WORKS

NO.	REVISIONS:	DATE:	BY:

CIP NO.
INDEX NO.

CITY OF LOS ANGELES
GARY LEE MOORE, P.E., ENV SP
CITY ENGINEER
DATE:
DESIGN GROUP
ENGINEER: RGETTER
DESIGNED BY: XX
DRAWN BY: JCHIN
CHECKED BY: RHUBATCH
APPROVED BY: XX

WORK ORDER NO.
E170121B

SHEET NAME
M-12
SHEET X OF X SHEETS

REVISION DATES (RESEARCH STAGE ONLY)

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

Sheet Version 4.0

Q:\PROJECTS\CITY OF LA_BROOKSSCARPA\PROJECTLINE DRAWINGS\CAD\M-12.DWG 12/3/2021 6:37 AM

MODEL PBX

Heat Pump Water Heater

Fully Integrated Heat Pump Water Heater (HPWH)
40-119 Gallon Capacity

Features

Highest Efficiency
- √ Heat Pump transfers heat from surrounding air into the hot water tank
- √ Industry leading efficiency
- √ Insulated with 3" thick CFC free polyurethane foam insulation to minimize stand-by heat loss

Long Life
- √ Hydrastone Cement lining ensures long tank life
- √ Proven Heat Pump technology
- √ Incoloy Sheathed back-up electric heaters resist corrosion and mineral build up

Simple Operation
- √ Fully Integrated water heater easily replaces a standard electric water heater
- √ User friendly electronic controller simplifies operation, maintenance, and trouble shooting
- √ Low maintenance design
- √ Designed for simple installation and service by a professional plumber

Applications

- Residential
- Restaurants
- Schools
- Office Buildings

NO GLASS LINING

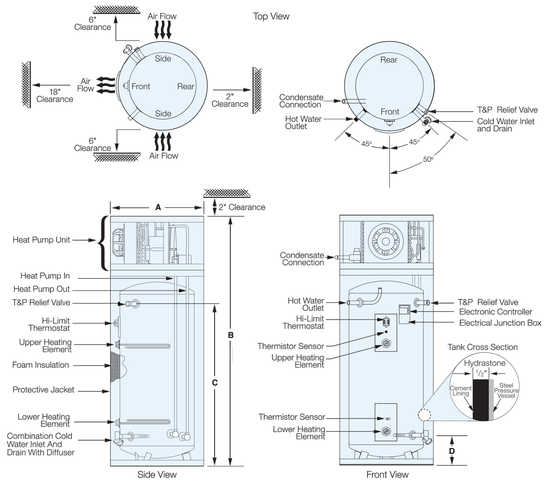
A Long Lasting and Reliable Heat Pump Water Heater

The Hubbell Model PBX water heater incorporates a number of features not found in other conventional heaters which makes it better suited to resist the highly corrosive effects of hot water. The heart of a Hubbell water heater is a superior storage vessel which utilizes a specially formulated Hydrastone cement lining, solid copper-silicon threaded tank openings and a built-in heat trap device, all of which ensure a longer lasting and energy efficient water heater.

When you specify and install a Hubbell Model PBX, you will have confidence in knowing that the owner will be provided with a long lasting, trouble-free water heater.

A High Efficiency Long Lasting Water Heater

Outline Dimensions



Dimensional Data

Storage Capacity (Gallons)	Base Model Number	Dimensions (Inches) Overall Diameter "A"	Overall Height "B"	Floor to T&P and HW Outlet "C"	Floor to CW Inlet "D"	Shipping Weight (lbs.)
40	**PBX40SL**	28	49	26	8	450
50	**PBX50SL**	25	66	43	8	500
65	**PBX65SL**	28	63	40	8	540
80	**PBX80SL**	28	73.5	50	8	615
119	**PBX120SL**	30	84	61	8	695

Cement Lined Tanks Provide Longer Service Life

Q? What is the most common reason why a water heater fails?

A! Failure of a tank's protective lining allows water to come into direct contact with the steel tank causing it to corrode and leak.

Therefore, the type of protective lining is the single most important feature when determining the quality of any water heater. The ability of a lining to protect the steel tank is primarily based upon its thickness and complete coverage of all steel surfaces.

Two common internal tank linings are *Glass* & *Cement*.

Glass

Glass lining is approximately 5 mils (.005") thick & *does not cover* all internal surfaces.

To compensate, all glass lined tanks require a sacrificial anode rod which must be periodically inspected and replaced.

Cement

Hydrastone cement lining is a minimum of ½" thick (100 times thicker than glass lining) and is guaranteed to uniformly cover 100% of all internal tank surfaces. The result is a significantly longer lasting tank which does not require a sacrificial anode.

Threaded tapping material is critical for tank longevity.

Glass lined tanks are constructed with regular steel tappings which are continuously attacked by corrosive hot water due to the lack of glass lining on the internal threads. The Hubbell Model PBX water heater tank is constructed with *solid non-ferrous copper-silicon tank tappings* which are impervious to the corrosive effects of hot water.

The Hubbell Model PBX is a longer lasting water heater based upon the construction features found in the Hydrastone cement lined storage tank and the result is that when you specify and install a Hubbell Model PBX, you will have confidence in knowing that the owner will be provided with a trouble-free and long lasting water heater.

Thickness
Each Hubbell Model PBX storage tank is lined with a minimum of ½" thick Hydrastone cement to ensure protection of the steel tank.

Coverage
The Hydrastone cement lining covers a guaranteed 100% of all interior tank surfaces and is free from flaws or imperfections. Full coverage is achieved by injecting the precise amount of Hydrastone cement into each tank and then centrifugally spinning it at 250 RPM to ensure complete and uniform coverage of the lining on all interior surfaces.

Corrosion Resistance
Hydrastone cement is a specifically formulated high density lining designed to provide maximum protection from the corrosive effects of hot water.

Tank Cross Section
(Actual Thickness Shown)

Reduced Operating Costs
The Hubbell Model PBX water heater significantly reduces the total ownership cost of a water heater due to the longer life and maintenance-free benefits derived from a Hydrastone cement lined tank. Longer tank life is directly attributable to the unmatched tank protection provided by the Hydrastone cement lining and copper-silicon tappings. Additionally, the Model PBX reduces operating expenses by eliminating the periodic inspection and replacement costs associated with maintaining a sacrificial anode in a glass lined tank.

How the Hubbell Heat Pump Water Heater Works

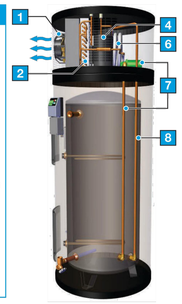
The Hubbell Model PBX Heat Pump Water Heater uses a small amount of electricity to transfer heat from the air to water. In comparison, traditional electric water heaters use resistive heating elements to directly heat water. The Hubbell Model PBX is significantly more energy efficient compared to a conventional electric water heater because less electricity is required for a heat pump water heater to produce the same amount of hot water as a traditional electric water heater.

Quite simply, a heat pumps works like a refrigerator in reverse. A refrigerator moves heat from inside the refrigerator (making things cold) and transfers that heat energy to the surrounding room. A heat pump water heater on the other hand pulls free and essentially unlimited heat from the surrounding air and transfers that heat to the hot water stored in the tank.

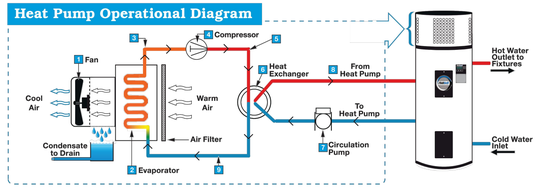
The Hubbell Model PBX Heat Pump Water Heater can pull heat out of air as cool as 40°F, and if it cannot provide enough heating capacity to meet demand, the water heater includes back-up resistive heating elements to ensure the unit provides sufficient hot water. The heat pump process of removing heat from the air and transferring it to the water results in the exhaust of cooler dryer air, with as much as 0.4 gallons per hour of "free" dehumidification provided by the heat pump when the unit is heating water.

Heat Pump Functions

- 1. The built in fan draws room air into the water heater heat pump compartment and across an evaporator coil, and exhausts cooler and slightly dryer (dehumidified) air.
- 2. The evaporator coil captures heat energy in the air and transfers that energy to a specially formulated CFC free refrigerant contained within the evaporator.
- 3. The refrigerant changes from a liquid to a gas as it gets warmer.
- 4. The refrigerant, now as a warm gas, exits the evaporator and passes into a compressor.
- 5. The warm gas is compressed, causing it to become a superheated hot gas and then flows to the heat exchanger.
- 6. The heat exchanger transfers heat energy from the superheated hot gas to the cold water from the tank.
- 7. The pump circulates cold water from the tank through the heat exchanger resulting in a continuous transfer of heat energy from the superheated gas to the water.
- 8. Hot water exits the heat exchanger and is stored in the tank.
- 9. The superheated gas condenses back to a liquid and awaits to repeat the process.



Heat Pump Operational Diagram



Model PBX Water Heater Specifications

Tank:	Hydrastone Cement Lined Steel	**Hi-Limit:**	190°F Manual Reset
Storage:	40, 50, 65, 80, 119 Gallons	**Pressure Rating:**	150 psi WP, 300 psi TP
Orientation:	Vertical	**First Hour Rating:**	**(Gallons)**
Voltages:	208-240 Volt	PBX40SL:	46
Phase:	1 Φ	PBX50SL:	61
Frequency:	60 Hz	PBX65SL:	70
Inlet Size:	¾" Female NPT	PBX80SL:	82
Outlet Size:	¾" Male NPT	PBX120SL:	120
Drain Size:	¾" GHT	**Standby Heat Loss:**	**(°F/hr)**
Condensate Size:	¼" Tube	PBX40SL:	0.45
Relief Valve Size:	¾" Female NPT	PBX50SL:	0.36
Relief Valve Type:	T&P, 210°F, 150 psi	PBX65SL:	0.35
Heat Pump:		PBX80SL:	0.28
Refrigerant:	R426A (CFC Free)	PBX120SL:	0.28
ODP:	0	**Energy Factor:**	2.33
GWP:	1349	**COP:**	2.36
Over Pressure Safety:	Manual Reset	**Average Power Consumption:**	
Field Chargeable:	No	High Fan:	680 Watts
Ambient Air:		Low Fan:	614 Watts
Air Flow (High Fan):	450 CFM	**Electric Elements:**	Incoloy Sheathed 3800 W @ 240V
Air Flow (Low Fan):	250 CFM	**Insulation:**	3" Polyurethane Foam
Air Filtration:	Washable/Removable	**Sound Level:**	62db Average @ 3 Feet
Temperature Range:	40-110°F	**Warranty:**	
Thermostat Range:	50-160°F (°F or °C) +/- 3°F	Tank:	10 Years
Error Indication:	Visual and Audible	Parts:	6 Years
Demand Response Capable:	Yes	**Approvals:**	cULus
Child Lock Capable:	Yes	**Jacket:**	High Impact Composite
		Color:	White with Black Trim

Selectable Operating Modes

Economy — This mode controls the heater such that the heat pump provides essentially all of the heating capacity. This is typically the lowest operating cost mode.

Hybrid — This mode controls the heater in a way to optimize its efficiency and user experience and is the default setting. This mode operates the water heater such that the heat pump provides the vast majority of heating capacity and automatically switches to electric resistance heater mode only when necessary to meet high demand or to optimize efficiency.

Electric — This mode controls the heater such that it only heats using the electric resistance heaters and operates as a traditional electric water heater. The heat pump will not operate in this mode.

Super — This mode controls the heater such that both the heat pump and the electric resistance elements can operate simultaneously. This mode provides the fastest recovery option possible by providing heating capacity from both the heat pump and the electric resistance heaters at the same time.

Vacation — This mode prevents the heater from heating (regardless of what mode it is in) as a way to improve efficiency during long periods of no usage (i.e. vacation). In this mode the only time the heater will heat is if the unit is in danger of freezing. The user sets the number of days to be in vacation mode (adjustable from 2 to 99 days or Off), and the unit resumes its previous mode of operation at the end of this period.

Temporary Modes

Max Heat — Simply pressing one button maximizes heating capacity by temporarily putting the heater into super mode.

Fan Off — Simply pressing one button temporarily lowers the fan speed which reduces the airflow and minimizes operating noise. Pressing the button twice turns the fan off for a user adjustable time period.

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REVISION DATES (DESIGN STAGE ONLY)

Sheet Version 4.0

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Contract Division

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED •

..\..\..\B+S STD TEMPLATES\Lorry Stamp.jpg

10/31/2021

DEPARTMENT OF PUBLIC WORKS
BUREAU OF ENGINEERING
VERTICAL CONTROL:
HORIZONTAL CONTROL:
SHEET TITLE: HEAT PUMP WATER HEATER CUT SHEET
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

NO.	REVISIONS:	BY:	DATE:

CIP NO.

INDEX NO.

CITY OF LOS ANGELES
GARY LEE MOORE, P.E., ENV SP
DESIGN GROUP
ENGINEER:
DESIGNED BY:
DRAWN BY:
CHECKED BY:
APPROVED BY:
CITY ENGINEER
DATE:

WORK ORDER NO.
E170121B

SHEET NAME
M-12
SHEET X OF X SHEETS

Q:\PROJECTS\CITY OF LA_BROOKSSCARPA\PROJECTLINE DRAWINGS\CAD\M-13.DWG 11/1/2021 11:25 AM

Hubbell™ MODEL PBX

Heat Pump Water Heater

Fully Integrated Heat Pump Water Heater (HPWH)
40-119 Gallon Capacity

Features

- **Highest Efficiency**
  - √ Heat Pump transfers heat from surrounding air into the hot water tank
  - √ Industry leading efficiency
  - √ Insulated with 3" thick CFC free polyurethane foam insulation to minimize stand-by heat loss
- **Long Life**
  - √ Hydrostone Cement lining ensures long tank life
  - √ Proven Heat Pump technology
  - √ Incoloy Sheathed back-up electric heaters resist corrosion and mineral build up
- **Simple Operation**
  - √ Fully Integrated water heater easily replaces a standard electric water heater
  - √ User friendly electronic controller simplifies operation, maintenance, and trouble shooting
  - √ Low maintenance design
  - √ Designed for simple installation and service by a professional plumber

Model PBX

Applications

- Residential
- Restaurants
- Schools
- Office Buildings

NO GLASS LINING

A Long Lasting and Reliable Heat Pump Water Heater

The Hubbell Model PBX water heater incorporates a number of features not found in other conventional heaters which makes it better suited to resist the highly corrosive effects of hot water. The heart of a Hubbell water heater is a superior storage vessel which utilizes a specially formulated Hydrastone cement lining, solid copper-silicon threaded tank openings and a built-in heat trap device, all of which ensure a longer lasting and energy efficient water heater.

When you specify and install a Hubbell Model PBX, you will have confidence in knowing that the owner will be provided with a long lasting, trouble-free water heater.

Hubbell™ **A High Efficiency Long Lasting Water Heater**

Cement Lined Tanks Provide Longer Service Life

Q? What is the most common reason why a water heater fails?

A! Failure of a tank's protective lining allows water to come into direct contact with the steel tank causing it to corrode and leak.

Therefore, the type of protective lining is the single most important feature when determining the quality of any water heater. The ability of a lining to protect the steel tank is primarily based upon its thickness and complete coverage of all steel surfaces.

Two common internal tank linings are *Glass* & *Cement*.

Glass

Glass lining is approximately 5 mils (.005") thick & *does not cover* all internal surfaces.

To compensate, all glass lined tanks require a sacrificial anode rod which must be periodically inspected and replaced.

Cement

Hydrostone cement lining is a minimum of ½" thick (100 times thicker than glass lining) and is guaranteed to uniformly cover 100% of all internal tank surfaces. The result is a significantly longer lasting tank which does not require a sacrificial anode.

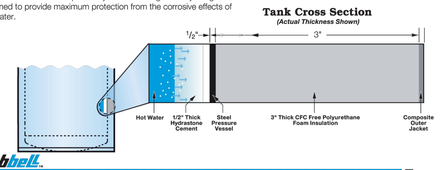
Threaded tapping material is critical for tank longevity.

Glass lined tanks are constructed with regular steel tappings which are continuously attacked by corrosive hot water due to the lack of glass lining on the internal threads. The Hubbell Model PBX water heater tank is constructed with *solid non-ferrous copper-silicon tank tappings* which are impervious to the corrosive effects of hot water.

The Hubbell Model PBX is a longer lasting water heater based upon the construction features found in the Hydrastone cement lined storage tank and the result is that when you specify and install a Hubbell Model PBX, you will have confidence in knowing that the owner will be provided with a trouble-free and long lasting water heater.

- **Thickness**
  Each Hubbell Model PBX storage tank is lined with a minimum of ½" thick Hydrastone cement to ensure protection of the steel tank.
- **Coverage**
  The Hydrastone cement lining covers a guaranteed 100% of all interior tank surfaces and is free from flaws or imperfections. Full coverage is achieved by injecting the precise amount of Hydrastone cement into each tank and then centrifugally spinning it at 250 RPM to ensure complete and uniform coverage of the lining on all interior surfaces.
- **Corrosion Resistance**
  Hydrastone cement is a specifically formulated high density lining designed to provide maximum protection from the corrosive effects of hot water.
- **Reduced Operating Costs**
  The Hubbell Model PBX water heater significantly reduces the total ownership cost of a water heater due to the longer life and maintenance-free benefits derived from a Hydrastone cement lined tank. Longer tank life is directly attributable to the unmatched tank protection provided by the Hydrastone cement lining and copper-silicon tappings. Additionally, the Model PBX reduces operating expenses by eliminating the periodic inspection and replacement costs associated with maintaining a sacrificial anode in a glass lined tank.

Tank Cross Section
(Actual Thickness Shown)



Hubbell™

How the Hubbell Heat Pump Water Heater Works

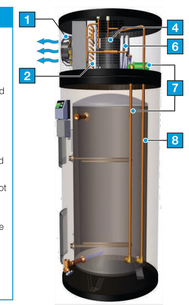
The Hubbell Model PBX Heat Pump Water Heater uses a small amount of electricity to transfer heat from the air to water. In comparison, traditional electric water heaters use resistive heating elements to directly heat water. The Hubbell Model PBX is significantly more energy efficient compared to a conventional electric water heater because less electricity is required for a heat pump water heater to produce the same amount of hot water as a traditional electric water heater.

Quite simply, a heat pumps works like a refrigerant in reverse. A refrigerator moves heat from inside the refrigerator (making things cold) and transfers that heat energy to the surrounding room. A heat pump water heater on the other hand pulls free and essentially unlimited heat from the surrounding air and transfers that heat to the hot water stored in the tank.

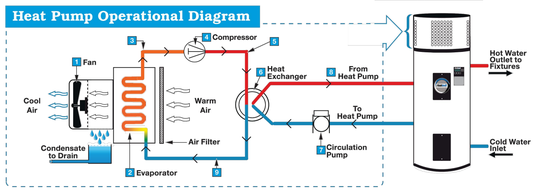
The Hubbell Model PBX Heat Pump Water Heater can pull heat out of air as cool as 40°F, and if it cannot provide enough heating capacity to meet demand, the water heater includes back-up resistive heating elements to ensure the unit provides sufficient hot water. The heat pump process of removing heat from the air and transferring it to the water results in the exhaust of cooler dryer air, with as much as 0.4 gallons per hour of "free" dehumidification provided by the heat pump when the unit is heating water.

Heat Pump Functions

1. The built in fan draws room air into the water heater heat pump compartment and across an evaporator coil, and exhausts cooler and slightly dryer (dehumidified) air.
2. The evaporator coil captures heat energy in the air and transfers that energy to a specially formulated CFC free refrigerant contained within the evaporator.
3. The refrigerant changes from a liquid to a gas as it gets warmer.
4. The refrigerant, now as a warm gas, exits the evaporator and passes into a compressor.
5. The warm gas is compressed, causing it to become a superheated hot gas and then flows to the heat exchanger.
6. The heat exchanger transfers heat energy from the superheated hot gas to the cold water from the tank.
7. The pump circulates cold water from the tank through the heat exchanger resulting in a continuous transfer of heat energy from the superheated gas to the water.
8. Hot water exits the heat exchanger and is stored in the tank.
9. The superheated gas condenses back to a liquid and awaits to repeat the process.



Heat Pump Operational Diagram



Hubbell™

Model PBX Water Heater Specifications

Tank:	Hydrastone Cement Lined Steel	**Hi-Limit:**	190°F Manual Reset
Storage:	40, 50, 65, 80, 119 Gallons	**Pressure Rating:**	150 psi WP, 300 psi TP
Orientation:	Vertical	**First Hour Rating:**	**(Gallons)**
Voltages:	208-240 Volt	PBX40SL:	46
Phase:	1 Φ	PBX50SL:	61
Frequency:	60 Hz	PBX65SL:	70
Inlet Size:	¾" Female NPT	PBX80SL:	82
Outlet Size:	¾" Male NPT	PBX120SL:	120
Drain Size:	¾" GHT	**Standby Heat Loss:**	**(°F/hr)**
Condensate Size:	¼" Tube	PBX40SL:	0.45
Relief Valve Size:	¾" Female NPT	PBX50SL:	0.36
Relief Valve Type:	T&P, 210°F, 150 psi	PBX65SL:	0.35
Heat Pump:		PBX80SL:	0.28
Refrigerant:	R426A (CFC Free)	PBX120SL:	0.28
CDP:	0	**Energy Factor:**	2.33
GWP:	1349	**COP:**	2.36
Over Pressure Safety:	Manual Reset	**Average Power Consumption:**	
Field Chargeable:	No	High Fan:	680 Watts
Ambient Air:		Low Fan:	614 Watts
Air Flow (High Fan):	450 CFM	**Electric Elements:**	Incoloy Sheathed 3800 W @ 240V
Air Flow (Low Fan):	250 CFM	**Insulation:**	3" Polyurethane Foam
Air Filtration:	Washable/Removable	**Sound Level:**	62db Average @ 3 Feet
Temperature Range:	40-110°F	**Warranty:**	
Thermostat Range:	50-160°F (°F or °C) +/- 3°F	Tank:	10 Years
Error Indication:	Visual and Audible	Parts:	6 Years
Demand Response Capable:	Yes	**Approvals:**	cULus
Child Lock Capable:	Yes	**Jacket:**	High Impact Composite
		Color:	White with Black Trim

Selectable Operating Modes

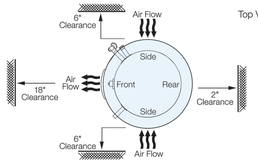
- **Economy** — This mode controls the heater such that the heat pump provides essentially all of the heating capacity. This is typically the lowest operating cost mode.
- **Hybrid** — This mode controls the heater in a way to optimize its efficiency and user experience and is the default setting. This mode operates the water heater such that the heat pump provides the vast majority of heating capacity and automatically switches to electric resistance heater mode only when necessary to meet high demand or to optimize efficiency.
- **Electric** — This mode controls the heater such that it only heats using the electric resistance heaters and operates as a traditional electric water heater. The heat pump will not operate in this mode.
- **Super** — This mode controls the heater such that both the heat pump and the electric resistance elements can operate simultaneously. This mode provides the fastest recovery option possible by providing heating capacity from both the heat pump and the electric resistance heaters at the same time.
- **Vacation** — This mode prevents the heater from heating (regardless of what mode it is in) as a way to improve efficiency during long periods of no usage (i.e. vacation). In this mode the only time the heater will heat is if the unit is in danger of freezing. The user sets the number of days to be in vacation mode (adjustable from 2 to 99 days or Off), and the unit resumes its previous mode of operation at the end of this period.

Temporary Modes

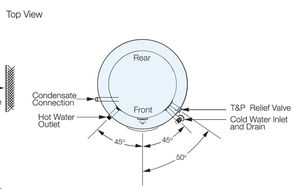
- **Max Heat** — Simply pressing one button maximizes heating capacity by temporarily putting the heater into super mode.
- **Fan Off** — Simply pressing one button temporarily lowers the fan speed which reduces the airflow and minimizes operating noise. Pressing the button twice turns the fan off for a user adjustable time period.

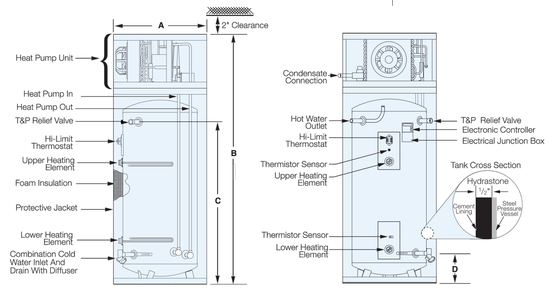
Hubbell™

Outline Dimensions



Top View





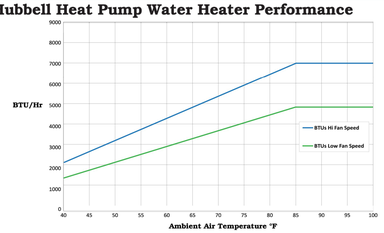
Dimensional Data

Storage Capacity (Gallons)	Base Model Number	Dimensions (Inches) Overall Diameter "A"	Overall Height "B"	Floor to T&P and HW Outlet "C"	Floor to CW Inlet "D"	Shipping Weight (lbs.)
40	PBX40SL	28	49	26	8	450
50	PBX50SL	25	66	43	8	500
65	PBX65SL	28	63	40	8	540
80	PBX80SL	28	73.5	50	8	615
119	PBX120SL	30	84	61	8	695

Hubbell™

Performance Chart

Hubbell Heat Pump Water Heater Performance



Energy Consumption Chart

Annual Energy Consumption (EST)

Ambient Air Temperature	Energy Factor (EF)	Coefficient of Performance (COP)	Annual Energy Consumption and Operating Cost in Various Operating Modes: Economy kW-Hrs	Economy Operating Cost $	Hybrid kW-Hrs	Hybrid Operating Cost $	Electric kW-Hrs	Electric Operating Cost $	Super kW-Hrs	Super Operating Cost $
50°F	1.39	1.42	3159	$336	3159	$336	4671	$497	4368	$465
70°F	2.33	2.36	1884	$201	1884	$201	4671	$497	3851	$410
90°F	3.07	3.07	1430	$152	1430	$152	4671	$497	3527	$376

Energy Factor and Average Annual Operating Costs based on 2007 D.O.E. (Department of Energy) test procedures. D.O.E. national average fuel rate electricity 10.65¢/KWH. Energy Factor (EF) based upon heater operating in Hybrid mode.

Recovery Rating Chart

Continuous Recovery Rating (GPH)

Ambient Air Temp	Continuous Recovery Rating (GPH) in Various Operating Modes: Economy 60°F ΔT	Economy 70°F ΔT	Economy 80°F ΔT	Hybrid 60°F ΔT	Hybrid 70°F ΔT	Hybrid 80°F ΔT	Electric 60°F ΔT	Electric 70°F ΔT	Electric 80°F ΔT	Super 60°F ΔT	Super 70°F ΔT	Super 80°F ΔT
50°F	6.5	5.6	4.9	25.9	22.2	19.4	25.9	22.2	19.4	32.4	27.8	24.3
70°F	10.9	9.4	8.2	25.9	22.2	19.4	25.9	22.2	19.4	36.8	31.6	27.6
90°F	14.2	12.2	10.6	25.9	22.2	19.4	25.9	22.2	19.4	40.1	34.4	30.0

Continuous Recovery rating based upon 240V power supplied to heater and fan operating in high speed mode.
ΔT represents the °F temperature rise for hot water.

Heating Chart

Heating Capacity Chart (BTU/Hr)

Ambient Air Temp	BTU/Hr Rating in Various Operating Modes: Economy	Hybrid	Electric	Super
50°F	3,240	12,965	12,965	16,205
70°F	5,400	12,965	12,965	18,365
90°F	7,020	12,965	12,965	19,985

Heating Capacity based on 240V power to heater and fan operating in high speed mode.

These units are designed to meet or exceed ANSI (American National Standards Institute requirements and have been tested according to D.O.E. test procedures and meet or exceed the energy efficiency requirements of NAECA, ASHRAE standard 90, ICC Code and all state energy efficiency performance criteria for energy consuming appliances.

Hubbell™

Amperage Chart

Amperage Rating Chart (Amps)

Supply Voltage	Total Maximum AMP Draw in Various Operating Modes: Economy	Hybrid	Electric	Super
240V	2.6	15.8	15.8 (3800 Watts)	18.4
220V	2.8	14.5	14.5 (3200 Watts)	17.3
208V	3.0	13.7	13.7 (2850 Watts)	16.7

Over current circuit protection rated minimum 25 amp required, reference all local, state and national codes.

Variables To Solve For:

Solve for the unknown using the formulas stated below.

1. **BTU/Hr Requirement:**
   _____ GPH x _____ °F ΔT x 8.33 = _____ BTU/Hr
2. **Temperature Rise:**
   _____ BTU/Hr ÷ 8.33 ÷ _____ GPH = _____ °F ΔT
3. **Flow Rate:**
   _____ BTU/Hr ÷ 8.33 ÷ _____ °F ΔT = _____ GPH

Electrical

Watts / Volts = Amps 1 Φ

Watts / Volts ÷ 1.73 = Amps 3 Φ

Installation Requirements

Installed location must be at least a 10' x 10' x 7' room (700 cubic feet of air space). If smaller, there must be louver installed to provide sufficient airflow.

Installed room location must not be cooler than 40°F.

Installed locations with warmer ambient air temperature (i.e. furnace room) provides abundant "free" heat and is advantageous.

The heat pump dehumidifies the air and as a result produces condensate which must be piped to drain or outdoors.

The washable air filter requires periodic cleaning. Frequency depends upon environmental conditions.

Optional Equipment

- ☐ **1.** 1½" Male NPT inlet and outlet water connections
- ☐ **2.** Solid (Copper-Alloy, Type 304L, Type 316L stainless steel) storage tank for maximum life
- ☐ **3.** Tank installed heat exchanger for use with solar or radiant heating systems
- ☐ **4.** ASME tank construction
- ☐ **5.** Alternate voltages (1 or 3 phase), alternate wattages or 50 Hz available. Please consult factory
- ☐ **6.** Condensate removal pump (120V plug-in) to remove and lift condensate to drain

Please note: optional equipment may impact overall dimensions and weight. Please request submittal drawing from factory.

Metric Conversions

Liters x 0.2641 = Gallons	°F = (°C x 1.8) + 32	kPa x 0.1456 = psi
Gallons x 3.79 = Liters	°C = (°F - 32) x 0.556	Lbs x 0.4536 = Kg
Gallons x 0.003785 = m^3	psi x 0.06896 = Bar	Kg x 2.2 = Lbs
m^3 x 264.2 = Gallons	Bar x 14.5 = psi	BTU/Hr ÷ 3412 = kW-Hr
1°CΔT = 1.8°FΔT	psi x 6.86 = kPa	kW-Hr x 3412 = BTU/Hr

Hubbell™

Master Specification: Model PBX

JOB NAME _____ ENGINEER / ARCHITECT _____

REPRESENTATIVE _____ CONTRACTOR _____

GENERAL

Provide a quantity of _____ high efficiency heat pump electric water heater(s) Model No. _____ as manufactured by HUBBELL Electric Heater Co., Stratford, CT. The entire unit is to be complete with all operating controls and require only plumbing and electrical service connections. The tank shall be all welded steel commercial construction designed for 150 psi working pressure and contain (40, 50, 65, 80, 119) gallons of storage. The tank is to be lined with seamless Hydrastone cement to a minimum thickness of ½" on 100% of all interior tank surfaces and does not require any type of sacrificial anode. The tank shall be designed and fabricated with non-ferrous copper-silicon threaded tappings and non-ferrous inlet and outlet piping for maximum corrosion resistance. Steel tank tappings will not be acceptable. The entire tank is to be insulated with a minimum of 3" thick CFC free polyurethane foam insulation that exceeds the latest ASHRAE standard for stand-by heat loss. The complete heater shall be supplied with a high impact colorized composite protective jacket which cannot rust or corrode and does not require painting. The unit shall bear the cULus listing mark certifying the entire water heater.

The cold water inlet shall be ¾" Female NPT (☐**Optional Specification:** 1½" Male NPT) and include a non-corrosive strata-flow diffuser which prevents incoming cold water from mixing too rapidly with hot water in the tank. A ¾" hose connection drain is supplied. The hot water outlet shall be ¾" Male NPT (☐**Optional Specification:** 1 ½" Male NPT) and shall include a factory installed built-in heat trap to prevent water from radiating through the piping during stand-by periods. A ¼" tube condensate connection shall be provided for connection to suitable drain. A separate ¾" Female NPT tapping is to be provided for relief valve installation. An ASME/CSA rated automatic reseating combination temperature and pressure safety relief valve set at 150 psi and 210°F shall be factory supplied.

HEATING CAPABILITY

The water heater shall be factory integrated with a built in air to water heat pump module rated to provide up to 7000 BTU/Hr heating capacity. The heat pump shall be capable of operating in ambient air temperature as low as 40°F and must be installed in a 10' x 10' x 7' room (700 Ft³), or if smaller, louvers shall be provided sufficiently sized to allow 450 CFM air flow. The fan shall be two speed type in order to optimize efficiency and minimize airflow when desired. The refrigerant shall be CFC free environmentally friendly R426A. The heat exchanger shall be non ferrous construction rated for 150psi WP. Two incoloy sheathed immersion electric resistance heating elements rated 3800 watts each at 240 volt 1 phase (☐**Optional Specification:** Watts, Volts, Phase, Hz.) shall be installed in the _____ storage tank to provide back up heating capability. An integrated electronic controller with digital display shall provide the user interface and shall display operating and service information.

In addition, the water heater shall be supplied with the following optional features:

☐Option _____
☐Option _____
☐Option _____

Hubbell shall warranty all electrical components against defects in workmanship and material for a period of one (1) year from date of start-up, all heat pump components for six (6) years and the pressure vessel for ten (10) years from date of start-up, provided that the unit is started within three (3) months of date of shipment and installed and operated within the scope of the tank design and operating capability. Each water heater shall be shipped with a complete set of installation and operating instructions including spare parts list and approved drawings.

Hubbell™

Committed to continuous improvement...
Continuing research results in product improvement; therefore specifications are subject to change without notice. For the most updated information, consult the factory directly.

MADE IN THE USA — CERTIFIED ISO 9001

The Electric Heater Company ■ P.O. Box 288 ■ Stratford, CT 06615-0288 ■ Phone: 203-378-2659 ■ Fax: 203-378-3593
info@hubbellheaters.com ■ ***www.hubbellheaters.com***

Rev.E

THIS SHEET FOR REFERENCE ONLY

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

REGISTERED PROFESSIONAL ENGINEER — ROBERT D. GETTER — No. M 30752 — Exp. 09-30-22 — STATE OF CALIFORNIA — CIVIL — 11/17/2021

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED •

BUREAU OF ENGINEERING
VERTICAL CONTROL:
HORIZONTAL CONTROL:
SHEET TITLE: HEAT PUMP WATER HEATER CUT SHEET
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

DEPARTMENT OF PUBLIC WORKS
CITY OF LOS ANGELES
GARY LEE MOORE, P.E., ENV SP
CITY ENGINEER
DESIGN GROUP
DATE:

NO.	REVISIONS:	DATE:	BY:

ENGINEER: RGETTER
DESIGNED BY: XX
DRAWN BY: JCHIN
CHECKED BY: RHUBATCH
APPROVED BY: XX

CIP NO.
INDEX NO.
WORK ORDER NO. E170121B
SHEET NAME M-13
SHEET X OF X SHEETS

REVISION DATES (RESIGN STAGES ONLY)
A
B
C
D
E
F
G
H
I
J
K

THE CITY OF LOS ANGELES OR IT'S OFFICERS OR AGENT'S SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16

Sheet Version 4.0

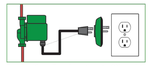
Q:\PROJECTS\CITY OF LA_BROOKSSCARPA\PROJECTLINE DRAWINGS\CAD\M-13.DWG 12/3/2021 6:36 AM

Plumbing

SmartPlug Instant Hot Water Control® — SP115-1

The patented SmartPlug lets you upgrade any hot water recirculation pump with a power cord to "Smart" operation. Simply connect the SmartPlug to any 110V power outlet then plug the circulator power cord into the SmartPlug. Using a sensor that mounts to the hot water supply pipe, the SmartPlug will record the daily hot water usage pattern in a home and adjust the circulator run time automatically. Hot water will always be available when needed.

No Programming, Timers or Aquastats Required • Sensor Included



For use with any Taco domestic water 00* circulator with a 110 Volt Line Cord. Circulator sold separately.

U.S. Pat# 8,594,853 and 9,207,682

Taco Comfort Solutions®
A Taco Family Company

©Taco Catalog # 100-133
Supersedes: 10/14/16

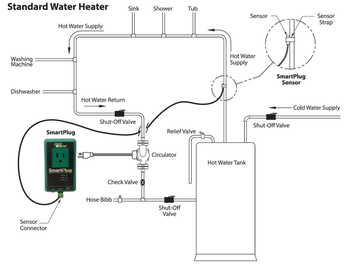
Effective Date: 12/21/16
Printed in USA

Submittal Data #101-179
Supersedes: 10/14/16

Effective: 12/21/16

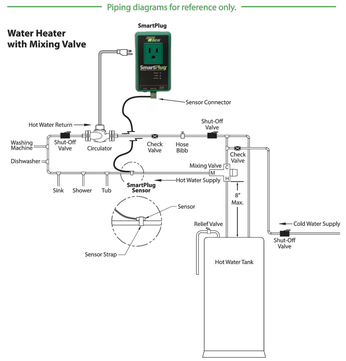
Submittal Data Information SmartPlug Instant Hot Water Control®

Standard Water Heater



Piping diagrams for reference only.

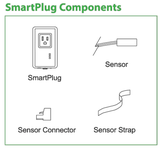
Water Heater with Mixing Valve



Specifications

- Input: 120VAC, 50/60HZ, single phase, 6A
- Output: 120VAC, 50/60HZ, Single phase, 1/2 hp (limited to 6 FLA, 36LRA)
- Sensor: NTC Thermistor, 10K ohm @ 77°F, B= 3392
- Fuse: 125V, 6A, Medium Acting 5x20 mm glass, Littelfuse® p/n 0233006 mxp
- Ambient Operating Temp: 50-104°F, 10-40°C

SmartPlug Components



c UL us **FOR INDOOR USE ONLY**

Application & Benefits

Application:

The Taco SmartPlug is designed to upgrade any hot water recirculation system. SmartPlug replaces inefficient timers and aquastats typically used in recirculation systems. It adds intelligence to your system by learning when hot water is used in the home. The pipe-mounted temperature sensor records daily hot water usage patterns during the course of a week. Recorded data is used to automatically run the circulator at the same times the following week. So hot water is always available when it's needed. If usage pattern changes, the SmartPlug adjusts automatically.
— No programming required.

Benefits:

- **Easy to install:** Upgrades any recirculation pump to "Smart" operation.
- **Water conservation:** The average residence can save up to 12,000 gallons* of water per year by eliminating the wait for hot water to arrive at fixtures and taps.
- **Comfort and convenience:** Hot water is available in seconds. No timers or programming required.
- **Efficiency:** "Smart" setting maximizes hot water comfort and energy savings.
- **Reliability:** The SmartPlug, when combined with a Taco domestic hot water circulator, provides whisper quiet operation and industry leading electronics for proven performance and dependability.

** Source: Department of Energy study*

SmartPlug Control Options / Features:

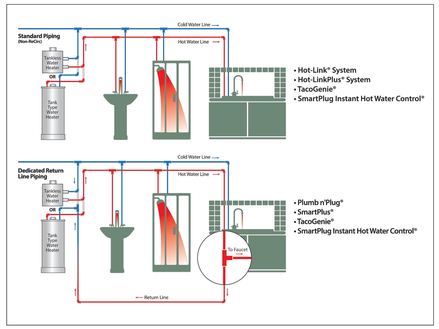
"Smart" Mode: When set to "Smart" mode, the SmartPlug monitors and records the home's hot water usage pattern over a 7 day period. The SmartPlug will use the preceding week's usage pattern to automatically cycle the circulator ON, so hot water is always available when it's needed. The recording and repeating process is continuous, week after week.

"Pulse" Mode: When set to "Pulse" mode, the SmartPlug will continuously cycle the circulator ON for 5 minutes, then OFF for 10 minutes to maintain hot water at all fixtures.

Vacation Mode: After 36 hours of no hot water usage, the SmartPlug will automatically turn the circulator OFF and remain off until hot water usage is detected.

Exercise Function: While in vacation mode the SmartPlug will cycle the circulator for 10 seconds every 7 days to prevent any corrosion or scale build up.

LED Indicator lights:
Green: Power
Yellow: Mode Setting
Red: Error code diagnostics



- Hot-Link® System
- Hot-LinkPlus® System
- TacoGenie®
- SmartPlug Instant Hot Water Control®
- Plumb n'Plug®
- SmartPlus®
- TacoGenie®
- SmartPlug Instant Hot Water Control®

Taco Comfort Solutions®
A Taco Family Company

Taco Inc., 1160 Cranston Street, Cranston, RI 02920 / (401) 942-8000 / Fax (401) 942-2360
Taco (Canada) Ltd., 8450 Lawson Road, Unit #3, Milton, Ontario L9T 0J8 / (905) 564-9422 / Fax (905) 564-9436

www.TacoComfort.com

FlowCo™

Point-of-use non-thermostatic heater- Ideal for handwashing and fixed-flow applications

Specifications
Electric Tankless Water Heater

Applications

- Handwashing
- Kitchen/bar/utility sinks
- Fixed-flow
- Designed for a single sensor faucet or meter faucet

Performance Features

- Self-diagnostics
- Intelligent controls
- InfoCue - visible LED indicator
- SafeStart™ technology
- Mounts in any orientation
- Compact size
- Only one cold water line needed for installation
- No T&P relief valve needed (check local codes)
- Integral 3/8" compression fittings
- Control system activates heater only on demand
- Bare wire technology
- High temperature limit switch (ECO - automatic energy cut-off)
- Low activation flow starting at 0.25 GPM turn on (model dependent)
- Warranty, five (5) years limited on leaks, one (1) year parts

Benefits

- Endless hot water – no storage capacity to run out
- Fits almost anywhere; suitable for ADA compliant facilities
- Save water and time by installing unit at point-of-use to eliminate long pipe runs
- Reduces installation cost and materials
- Cut energy waste (no standby heat loss)
- No venting
- Purge technology engages upon start-up to avoid dry-fire occurrence
- Easy, flexible installation
- Ready out of the box
- Over temperature protection
- Real-time response to flow
- Operation feedback via an intuitive LED indicator
- Blinking patterns indicate system status

System Specifications

Dimensions:	10.5" H x 5.25" W x 3" D
Product Weight: (model dependent)	2.75 lb/3 lb
Cover:	ABS-UL 94 5VA
Color:	White
Minimum Operating Pressure:	30 PSI
Maximum Operating Pressure:	150 PSI
Element:	Replaceable nichrome cartridge insert
Fittings:	3/8" compression fittings

U.S. Patent Pending Technology

Water Heater in accordance with NSF/ANSI 372 Mnl46846

Assembled in USA

NO LEAD
The wetted surfaces of this product contacted by water contains less than 0.25% lead and meets ANSI/NSF 372

Note: For optimum performance, mounting location should be within 2 feet of fixture.

Special Design Service

Inquiries for units for unique applications are welcome.
Call our Technical Service department at **1-800-543-6163.**

Suggested Specification

Replace suggested spec text on PDF w/ the following:

Tankless water heater shall be an Eemax model number SPEX_____.

Unit shall have ABS UL 94 5VA rated cover. Unit shall allow mounting in any orientation. Element shall be replaceable cartridge insert. Element shall be iron-free, nickel-chrome material. Unit shall have replaceable filter in the inlet connector. Unit shall include an integrated flow meter to ensure accurate turn-on / turn-off flow rate. Heater shall be fitted with 3/8" compression fittings to eliminate the need for soldering. Maximum operating pressure of 150 PSI. Diagnostic features to include LED error/fault indicator. Heater shall employ technology that engages upon start-up to avoid dry-fire occurrence. Hot water storage tanks prohibited. Unit shall be Eemax or approved equal.

NOTE: Refer to rating chart for product information.

Eemax® Hot Water Solutions Made Easy

Eemax, 400 Captain Neville Drive, Waterbury, CT 06705
(800) 543-6163 | info@eemaxinc.com | **www.eemax.com**

Information and product specifications contained in this document are subject to change without notice.

FlowCo™

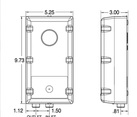
Point-of-use non-thermostatic heater- Ideal for handwashing and fixed-flow applications

Specifications
Electric Tankless Water Heater

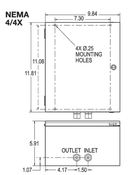
	MODEL NUMBER	kW	AMPS	RECOMMENDED WIRE SIZE (75° C/CU.)	TURN ON GPM	TEMPERATURE RISE °F 0.3 GPM	0.5 GPM	0.75 GPM	1.0 GPM	1.5 GPM	2.0 GPM
	VOLTS 120										
C	**SPEX1012**	1.8	15	14 AWG	0.2	41°	25°	16°	12°	8°	6°
C	**SPEX1012CA** (Canadian model)	1.8	15	14 AWG	0.2	41°	25°	16°	12°	8°	6°
C	**SPEX2412**	2.4	20	14 AWG	0.25	55°	33°	22°	16°	11°	8°
C	**SPEX2412CA** (Canadian model)	2.4	20	14 AWG	0.25	55°	33°	22°	16°	11°	8°
C	**SPEX3012**	3.0	25	12 AWG	0.25	68°	41°	27°	20°	14°	10°
C	**SPEX3012CA** (Canadian model)	3.0	25	12 AWG	0.25	68°	41°	27°	20°	14°	10°
C	**SPEX3512**	3.5	29	10 AWG	0.3	80°	48°	32°	24°	16°	12°
C	**SPEX3512CA** (Canadian model)	3.5	29	10 AWG	0.3	80°	48°	32°	24°	16°	12°
C	**VOLTS 208 Single Phase**										
C	**SPEX3208**	3.0	15	14 AWG	0.25	68°	41°	27°	20°	14°	10°
C	**SPEX3208CA** (Canadian model)	3.0	15	14 AWG	0.25	68°	41°	27°	20°	14°	10°
C	**SPEX4208**	4.1	20	14 AWG	0.4	–	56°	37°	28°	19°	14°
C	**SPEX4208CA** (Canadian model)	4.1	20	14 AWG	0.4	–	56°	37°	28°	19°	14°
C	**SPEX5208**	8.3	40	8 AWG	0.7	–	–	76°	57°	38°	29°
C	**SPEX5208CA** (Canadian model)	8.3	40	8 AWG	0.7	–	–	76°	57°	38°	29°
	VOLTS 240*										
C	**SPEX35**	3.5	15	14 AWG	0.3	80°	48°	32°	24°	16°	12°
	SPEX35 (derated 208V performance)	2.6	13	14 AWG	0.3	59°	36°	24°	18°	12°	9°
C	**SPEX35CA** (Canadian model)	3.5	15	14 AWG	0.3	80°	48°	32°	24°	16°	12°
C	**SPEX48**	4.8	20	14 AWG	0.4	–	66°	44°	33°	22°	16°
	SPEX48 (derated 208V performance)	3.6	17	14 AWG	0.4	–	49°	33°	25°	16°	12°
C	**SPEX48CA** (Canadian model)	4.8	20	14 AWG	0.4	–	66°	44°	33°	22°	16°
C	**SPEX55**	5.5	23	12 AWG	0.5	–	75°	50°	38°	25°	19°
	SPEX55 (derated 208V performance)	4.1	20	12 AWG	0.5	–	56°	37°	28°	19°	14°
C	**SPEX55CA** (Canadian model)	5.5	23	12 AWG	0.5	–	75°	50°	38°	25°	19°
C	**SPEX65**	6.5	27	10 AWG	0.7	–	–	59°	44°	30°	22°
	SPEX65 (derated 208V performance)	4.8	23	10 AWG	0.7	–	–	44°	33°	22°	16°
C	**SPEX65CA** (Canadian model)	6.5	27	10 AWG	0.7	–	–	59°	44°	30°	22°
C	**SPEX75**	7.5	32	10 AWG	0.7	–	–	68°	51°	34°	26°
	SPEX75 (derated 208V performance)	5.6	27	10 AWG	0.7	–	–	51°	38°	25°	19°
C	**SPEX75CA** (Canadian model)	7.5	32	10 AWG	0.7	–	–	68°	51°	34°	26°
C	**SPEX95**	9.5	40	8 AWG	0.8	–	–	–	65°	43°	32°
	SPEX95 (derated 208V performance)	5.6	34	8 AWG	0.8	–	–	–	38°	25°	19°
C	**SPEX95CA** (Canadian model)	9.5	40	8 AWG	0.8	–	–	–	65°	43°	32°
	VOLTS 277 Single Phase										
	SPEX100	10.0	36	8 AWG	0.8	–	–	–	68°	46°	34°
C	**SPEX100CA** (Canadian model)	10.0	36	8 AWG	0.8	–	–	–	68°	46°	34°
	SPEX3277	3.0	11	14 AWG	0.25	68°	41°	27°	20°	14°	10°
C	**SPEX3277CA** (Canadian model)	3.0	11	14 AWG	0.25	68°	41°	27°	20°	14°	10°
	SPEX4277	4.1	15	14 AWG	0.4	–	56°	37°	28°	19°	14°
C	**SPEX4277CA** (Canadian model)	4.1	15	14 AWG	0.4	–	56°	37°	28°	19°	14°
	SPEX60	6.0	22	12 AWG	0.7	–	–	55°	41°	27°	20°
C	**SPEX60CA** (Canadian model)	6.0	22	12 AWG	0.7	–	–	55°	41°	27°	20°
	SPEX80	8.0	29	10 AWG	0.7	–	–	73°	55°	36°	27°
C	**SPEX80CA** (Canadian model)	8.0	29	10 AWG	0.7	–	–	73°	55°	36°	27°
	SPEX90	9.0	33	10 AWG	0.7	–	–	82°	61°	41°	31°
C	**SPEX90CA** (Canadian model)	9.0	33	10 AWG	0.7	–	–	82°	61°	41°	31°

* 240V units can be used on 208V single phase with 20% reduced temperature output. Please note per UL standards the rating plate and installation instructions will all be according to a 240V applied voltage. Check with local officials prior to derating the electrical infrastructure.

*C*Indicates evaluation and compliance to either Underwriters Laboratories (UL) or Intertek (ETL) under CAN/CSA-C22.2 No. 64/No. 88.



NEMA 4/4X



Eemax® Hot Water Solutions Made Easy

Eemax, 400 Captain Neville Drive, Waterbury, CT 06705
(800) 543-6163 | info@eemaxinc.com | **www.eemax.com**

Information and product specifications contained in this document are subject to change without notice.
© 2018 Eemax, Inc. All Rights Reserved. 2018-09-25

THIS SHEET FOR REFERENCE ONLY

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Design Unit

THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED

REGISTERED PROFESSIONAL ENGINEER
ROBERT D. GETTER
No. M 30752
Exp. 09-30-22
STATE OF CHANGE
11/17/2021

BUREAU OF ENGINEERING

VERTICAL CONTROL:
HORIZONTAL CONTROL:

SHEET TITLE: WATER HEATER CUT SHEETS

PROJECT: RESEDA SKATE FACILITY

ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

CITY OF LOS ANGELES
DEPARTMENT OF PUBLIC WORKS

NO.	REVISIONS:	DATE:	BY:

INDEX NO.

CIP NO.

CITY ENGINEER
GARY LEE MOORE, P.E., ENV SP
DESIGN GROUP

DATE:

ENGINEER:	RGETTER	
DESIGNED BY:	XX	
DRAWN BY:	JCHIN	
CHECKED BY:	RHUBATCH	
APPROVED BY:	XX	

WORK ORDER NO.
E170121B

SHEET NAME
M-14
SHEET X OF X SHEETS

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

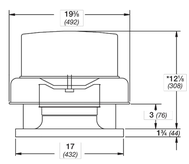
REVISION DATES
(RESERVED FOR USER ONLY)

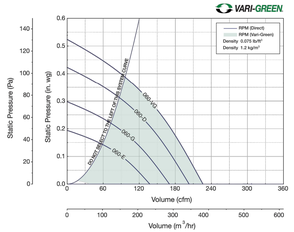
Sheet Version 4.0

Q:\PROJECTS\CITY OF LA_BROOKSSCARPA\PROJECTLINE DRAWINGS\CAD\M-14.DWG 12/7/2021 1:48 PM

Roof Downblast Exhaust
Size-060: G

GREENHECK
Building Value in Air.





Damper Size = 8 x 8 *(203 x 203)*
Roof Opening = 10½ x 10½ *(267 x 267)*
Shroud Thickness = 0.064 *(1.6)*
Motor Cover Thickness = 0.040 *(1.0)*
Curb Cap Thickness = 0.064 *(1.6)*
^Approximate Unit Weight = 15 lbs. *(7 kg)*

All dimensions in inches *(millimeters)*. *May be greater depending on motor.
^Weight shown is largest cataloged Open Drip-Proof motor.

Direct Drive RPM

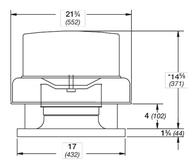
E-1050 RPM	G-1300 RPM	D-1550 RPM	VG-1725 RPM

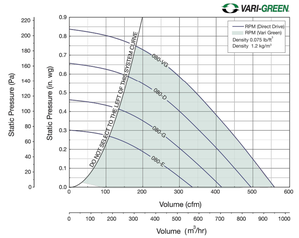
Direct Drive	Motor HP	Fan RPM		Static Pressure in Inches wg										
				0	0.05	0.1	0.125	0.15	0.2	0.25	0.3	0.375	0.4	
060														
VG-1/10	E-1/200	1050	CFM	138	116	90	73	53						
			BHP	0.00	0.00	0.01	0.01	0.01						
			Sones	1.7	1.7	1.7	1.7	1.7						
VARI-GREEN	G-1/100	1300	CFM	170	153	135	125	113	85					
			BHP	0.01	0.01	0.01	0.01	0.01	0.01					
			Sones	2.9	2.8	2.8	2.7	2.7	2.6					
	D-1/60	1550	CFM	203	188	173	166	158	140	120	92			
			BHP	0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.02			
			Sones	4.3	3.9	3.8	3.8	3.8	3.7	3.7	3.6			
			CFM	226	213	199	193	186	173	155	137	101	89	
		1725	BHP	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	
			Sones	5.4	4.9	4.9	4.8	4.8	4.8	4.7	4.6	4.5	4.4	

Performance certified is for installation type A: Free inlet, Free outlet. Power rating (BHP) does not include transmission losses. Performance ratings include the effects of a birdscreen. The sound ratings shown are loudness values in hemispherical sones at 5 ft. (1.5 m) in a hemispherical free field calculated per AMCA Standard 301. Values shown are for installation type A: free inlet hemispherical sone levels.

Roof Downblast Exhaust
Size-080: G

GREENHECK
Building Value in Air.





Damper Size = 10 x 10 *(254 x 254)*
Roof Opening = 12⅛ x 12⅛ *(318 x 318)*
Shroud Thickness = 0.064 *(1.6)*
Motor Cover Thickness = 0.040 *(1.0)*
Curb Cap Thickness = 0.064 *(1.6)*
^Approximate Unit Weight = 19 lbs. *(9 kg)*

All dimensions in inches *(millimeters)*. *May be greater depending on motor.
^Weight shown is largest cataloged Open Drip-Proof motor.

Direct Drive RPM

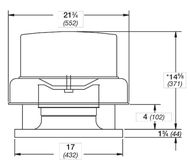
E-1050 RPM	G-1300 RPM	D-1550 RPM	VG-1725 RPM

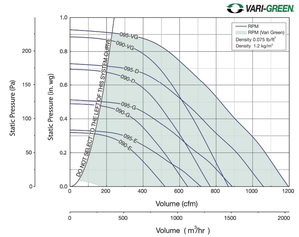
Direct Drive	Motor HP	Fan RPM		Static Pressure in Inches wg									
				0	0.1	0.125	0.15	0.2	0.25	0.3	0.375	0.5	0.625
080													
VG-1/10	E-1/140	1050	CFM	335	268	249	230	189	134				
			BHP	0.01	0.02	0.02	0.02	0.02	0.02				
			Sones	3.8	3.7	3.6	3.7	3.9	4.2				
VARI-GREEN	G-1/30	1300	CFM	415	361	348	333	303	272	239	174		
			BHP	0.02	0.03	0.03	0.03	0.03	0.03	0.03	0.03		
			Sones	5.4	5.4	5.4	5.4	5.4	5.5	5.6	5.9		
	D-1/20	1550	CFM	495	450	439	427	404	379	354	314	237	
			BHP	0.04	0.04	0.04	0.05	0.05	0.05	0.05	0.06	0.06	
			Sones	7.3	7.3	7.3	7.3	7.3	7.2	7.3	7.3	7.6	
			CFM	551	511	501	490	469	449	426	392	332	260
		1725	BHP	0.05	0.06	0.06	0.06	0.06	0.07	0.07	0.07	0.08	0.08
			Sones	9.1	9.1	9.1	9.1	9	8.9	8.9	8.9	9.1	9.4

Performance certified is for installation type A: Free inlet, Free outlet. Power rating (BHP) does not include transmission losses. Performance ratings include the effects of a birdscreen. The sound ratings shown are loudness values in hemispherical sones at 5 ft. (1.5 m) in a hemispherical free field calculated per AMCA Standard 301. Values shown are for installation type A: free inlet hemispherical sone levels.

Roof Downblast Exhaust
Sizes-090 • 095: G

GREENHECK
Building Value in Air.





Damper Size = 10 x 10 *(254 x 254)*
Roof Opening = 12⅛ x 12⅛ *(318 x 318)*
Shroud Thickness = 0.064 *(1.6)*
Motor Cover Thickness = 0.040 *(1.0)*
Curb Cap Thickness = 0.064 *(1.6)*
^Approximate Unit Weight = 22 lbs. *(10 kg)*

All dimensions in inches *(millimeters)*. *May be greater depending on motor.
^Weight shown is largest cataloged Open Drip-Proof motor.

Direct Drive RPM

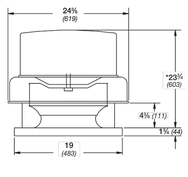
E-1050 RPM	G-1300 RPM	D-1550 RPM	VG-1725 RPM

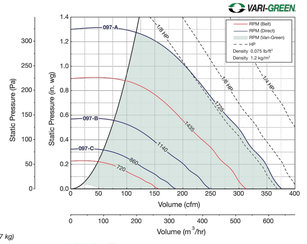
Direct Drive	Motor HP	Fan RPM		Static Pressure in Inches wg									
				0	0.1	0.125	0.15	0.2	0.25	0.3	0.375	0.5	0.625
090													
VG-1/10	E-1/40	1050	CFM	520	441	420	398	351	293				
			BHP	0.01	0.02	0.02	0.02	0.02	0.02				
			Sones	4	3.9	3.9	4	4.1	4.2				
VARI-GREEN	G-1/25	1300	CFM	644	580	565	549	515	478	440	373		
			BHP	0.03	0.03	0.04	0.04	0.04	0.04	0.04	0.05		
			Sones	5.4	5.4	5.4	5.4	5.4	5.5	5.5	5.6		
	D-1/15	1550	CFM	768	714	701	688	662	633	605	557	473	338
			BHP	0.05	0.05	0.06	0.06	0.06	0.06	0.07	0.07	0.08	0.07
			Sones	7.6	7.5	7.5	7.5	7.5	7.4	7.4	7.4	7.4	7.8
			CFM	855	806	794	762	759	735	709	671	600	522
		1725	BHP	0.06	0.07	0.07	0.08	0.08	0.08	0.09	0.09	0.10	0.11
			Sones	9.7	9.5	9.5	9.5	9.5	9.4	9.4	9.2	9.1	9.1
095													
VG-1/6	E-1/30	1050	CFM	717	606	570	534	468	389	290			
			BHP	0.03	0.03	0.04	0.04	0.04	0.04	0.03			
			Sones	5.4	4.5	4.5	4.5	4.4	4.5	4.6			
VARI-GREEN	G-1/12	1300	CFM	888	802	780	754	695	640	586	493	184	
			BHP	0.06	0.06	0.06	0.06	0.07	0.07	0.07	0.07	0.05	
			Sones	7.6	6.8	6.7	6.6	6.5	6.4	6.4	6.4	6.8	
	D-1/8	1550	CFM	1059	987	969	950	912	863	814	745	623	474
			BHP	0.10	0.10	0.10	0.11	0.11	0.11	0.11	0.12	0.12	0.11
			Sones	9.6	9.4	9.3	9.2	9	8.8	8.7	8.7	8.7	8.7
			CFM	1179	1114	1098	1081	1048	1013	969	903	800	688
		1725	BHP	0.13	0.14	0.14	0.14	0.15	0.15	0.15	0.16	0.16	0.16
			Sones	11.4	11.4	11.4	11.5	11.4	11.2	11	10.9	11.3	11.3

Performance certified is for installation type A: Free inlet, Free outlet. Power rating (BHP) does not include transmission losses. Performance ratings include the effects of a birdscreen. The sound ratings shown are loudness values in hemispherical sones at 5 ft. (1.5 m) in a hemispherical free field calculated per AMCA Standard 301. Values shown are for installation type A: free inlet hemispherical sone levels.

Roof Downblast Exhaust
Size-097: GB • G
Previously Size- GB-071

GREENHECK
Building Value in Air.





Damper Size = 12 x 12 *(305 x 305)*
Roof Opening = 14½ x 14½ *(368 x 368)*
Shroud Thickness = 0.051 *(1.3)*
Motor Cover Thickness = 0.040 *(1.0)*
Curb Cap Thickness = 0.064 *(1.6)*
^Approximate Unit Weight G/GB = 54/60 lbs. *(24/27 kg)*

All dimensions in inches *(millimeters)*. *May be greater depending on motor. *Weight shown is largest cataloged Open Drip-Proof motor.

Direct Drive RPM

C-860 RPM	B-1140 RPM	A-1725 RPM	VG-1725 RPM

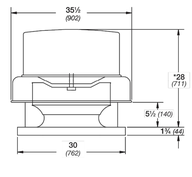
Motor HP		Fan RPM		Static Pressure in Inches wg									
Belt	Direct			0	0.125	0.25	0.375	0.5	0.625	0.75	0.875	1	1.125
097													
1/6 or 1/8 VARI-GREEN	VG-1/4	720	CFM	157	107								
			BHP	0.01	0.01								
			Sones	1.8	2.0								
		790	CFM	172	128	70							
			BHP	0.01	0.01	0.01							
			Sones	2.3	2.3	2.2							
	C-1/8	860	CFM	187	148	101							
			BHP	0.02	0.02	0.02							
			Sones	2.8	2.7	2.7							
		930	CFM	203	166	124							
			BHP	0.02	0.02	0.02							
			Sones	3.3	3.4	3.2							
		1000	CFM	218	184	146	100						
			BHP	0.03	0.03	0.03	0.02						
			Sones	3.9	4.0	3.9	3.6						
		1070	CFM	233	202	167	130						
			BHP	0.03	0.03	0.03	0.03						
			Sones	4.6	4.7	4.5	4.2						
	B-1/6	1140	CFM	248	220	187	152	109					
			BHP	0.04	0.04	0.04	0.04	0.03					
			Sones	5.3	5.4	5.1	4.9	4.7					
		1285	CFM	280	255	228	197	166	127				
			BHP	0.06	0.06	0.06	0.05	0.05	0.05				
			Sones	6.8	6.7	6.6	6.3	6.0	5.9				
		1435	CFM	313	292	265	240	212	185	151			
			BHP	0.08	0.08	0.08	0.08	0.08	0.07	0.07			
			Sones	8.0	8.0	7.9	7.6	7.3	7.1	6.9			
		1580	CFM	344	324	302	281	255	230	205	177	140	
			BHP	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.09	0.09	
			Sones	9.5	9.5	9.4	9.1	8.8	8.5	8.3	8.1	7.9	
	A-1/4	1725	CFM	376	356	339	316	297	273	250	227	205	171
			BHP	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.12	0.12
			Sones	11.3	11.2	11.2	10.8	10.5	10.2	9.9	9.7	9.5	9.3

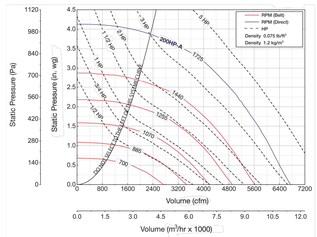
MAXIMUM BHP AT A GIVEN RPM = (RPM/3371)³
MAXIMUM RPM = 1725
TIP SPEED (ft/min) = RPM x 2.929
MAXIMUM MOTOR FRAME SIZE = 56

Performance certified is for installation type A: Free inlet, Free outlet. Power rating (BHP) does not include transmission losses. Performance ratings include the effects of a birdscreen. The sound ratings shown are loudness values in hemispherical sones at 5 ft. (1.5 m) in a hemispherical free field calculated per AMCA Standard 301. Values shown are for installation type A: free inlet hemispherical sone levels.

Roof Downblast Exhaust
Size-200HP: GB • G

GREENHECK
Building Value in Air.





Damper Size = 18 x 18 *(457 x 457)*
Roof Opening = 20⅛ x 20⅛ *(521 x 521)*
Shroud Thickness = 0.064 *(1.6)*
Motor Cover Thickness = 0.040 *(1.0)*
Curb Cap Thickness = 0.064 *(1.6)*
^Approximate Unit Weight = 166 lbs. *(75 kg)*

All dimensions in inches *(millimeters)*. *May be greater depending on motor. *Weight shown is largest cataloged Open Drip-Proof motor.

Motor HP		Fan RPM		Static Pressure in Inches wg									
Belt	Direct			0.5	0.75	1	1.25	1.5	2	2.5	2.75	3	3.25
200HP													
1/2		740	CFM	1961									
			BHP	0.30									
			Sones	8.7									
		895	CFM	2809	2331	1424							
			BHP	0.52	0.53	0.45							
			Sones	11.4	10.9	10.3							
3/4		958	CFM	3116	2715	2153							
			BHP	0.63	0.65	0.63							
			Sones	12.8	12.1	11.6							
		1020	CFM	3409	3050	2602	1857						
			BHP	0.75	0.77	0.78	0.71						
			Sones	14.1	13.6	13.1	12.6						
1		1125	CFM	3885	3584	3243	2804	2136					
			BHP	0.99	1.02	1.04	1.04	0.97					
			Sones	16.9	16.4	15.5	15.3	15.2					
1½	B-1½	1140	CFM	3950	3657	3323	2906	2294					
			BHP	1.02	1.06	1.08	1.09	1.03					
			Sones	17.4	16.9	15.9	15.6	15.3					
		1285	CFM	4569	4343	4070	3770	3416	2278				
			BHP	1.43	1.49	1.52	1.55	1.57	1.40				
			Sones	21	20	19.1	18.1	17.8	18.9				
2		1350	CFM	4843	4638	4384	4109	3811	2996				
			BHP	1.65	1.71	1.75	1.78	1.81	1.76				
			Sones	23	22	21	19.8	19.3	19.1				
		1415	CFM	5114	4919	4692	4442	4169	3492	2250			
			BHP	1.88	1.95	2.00	2.04	2.07	2.07	1.78			
			Sones	24	24	23	22	21	19.7	23			
3		1625	CFM	5982	5812	5642	5448	5233	4767	4196	3859	3377	2725
			BHP	2.80	2.88	2.95	3.02	3.06	3.13	3.16	3.12	3.01	2.76
			Sones	32	31	31	29	28	27	25	24	23	22
	A-5	1725	CFM	6394	6230	6070	5910	5709	5287	4812	4534	4222	3861
			BHP	3.32	3.41	3.49	3.57	3.63	3.71	3.77	3.79	3.75	3.68
			Sones	40	30	29	34	32	31	30	28	27	25

MAXIMUM BHP AT A GIVEN RPM = (RPM/1106)³
MAXIMUM RPM = 1625
TIP SPEED (ft/min) = RPM x 5.596
MAXIMUM MOTOR FRAME SIZE = 184T

Performance certified is for installation type A: Free inlet, Free outlet. Power rating (BHP) does not include transmission losses. Performance ratings include the effects of a birdscreen. The sound ratings shown are loudness values in hemispherical sones at 5 ft. (1.5 m) in a hemispherical free field calculated per AMCA Standard 301. Values shown are for installation type A: free inlet hemispherical sone levels.

THIS SHEET FOR REFERENCE ONLY

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

REGISTERED PROFESSIONAL ENGINEER
ROBERT D. GETTER
No. M 30752
Exp. 09-30-22
STATE OF CALIFORNIA
11/17/2021

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED •

DEPARTMENT OF PUBLIC WORKS
BUREAU OF ENGINEERING
VERTICAL CONTROL:
HORIZONTAL CONTROL:
SHEET TITLE: ROOF EXHAUST FAN CUT SHEETS
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

NO.	REVISIONS:	BY:	DATE:

CIP NO.
INDEX NO.

CITY OF LOS ANGELES
GARY LEE MOORE, P.E., ENV SP
CITY ENGINEER
DESIGN GROUP
DATE:

ENGINEER: RGETTER
DESIGNED BY: XX
DRAWN BY: JCHN
CHECKED BY: RHUBATCH
APPROVED BY: XX

WORK ORDER NO.
E170121B

SHEET NAME
M-15
SHEET X OF X SHEETS

REVISION DATES (DESIGN STAGE ONLY)

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

Sheet Version 4.0

Q:\PROJECTS\CITY OF LA_BROOKSSCARPA\PROJECTLINE DRAWINGS\CAD\M-15.DWG 12/7/2021 1:48 PM

PLUMBING GENERAL NOTES:

1. PRIOR TO THE BID THE CONTRACTOR SHALL VERIFY THE EXACT LOCATIONS, ELEVATIONS, POINTS OF CONNECTIONS AND CHARACTERISTICS OF ALL UTILITY PIPING AND SHALL IMMEDIATELY NOTIFY THE ARCHITECT OF ANY DISCREPANCIES.
2. EXACT LOCATION AND MOUNTING HEIGHTS OF PLUMBING FIXTURES SHALL BE OBTAINED FROM ARCHITECTURAL DRAWINGS.
3. SEE ARCHITECTURAL DRAWINGS FOR ALL DISABLED ACCESS FIXTURE LOCATIONS AND MOUNTING HEIGHTS. INSULATE ALL EXPOSED EDGES, INCLUDING WATER SUPPLY PIPING, LOOSE KEY STOPS AND DRAIN PIPING BELOW DISABLED ACCESS FIXTURES. ALL DESIGNATED FIXTURES SHALL BE ACCESSIBLE TO INDIVIDUALS WITH DISABILITIES IN ACCORDANCE WITH THE "AMERICANS WITH DISABILITIES ACT FIXTURES AND THEIR INSTALLATION ANSI A117.1"
4. ALL PLUMBING WORK SHALL BE INSTALLED SO AS TO AVOID INTERFERENCE WITH OTHER TRADES.
5. CLEANOUTS SHALL BE PROVIDED AS REQUIRED BY CODE AND SHALL BE READILY ACCESSIBLE. THE CONTRACTOR SHALL COORDINATE ALL LOCATIONS WITH EQUIPMENT, CABINETS, ETC., WITH THE ARCHITECT PRIOR TO ANY INSTALLATION. ALL CLEANOUTS SHALL BE SIZED PER CODE.
6. EQUIPMENT ANCHORAGE: ANCHORAGE DETAILS FOR EQUIPMENT ARE SUBJECT TO APPROVAL OF THE STRUCTURAL ENGINEER PRIOR TO INSTALLATION AND INSPECTION, UNLESS SPECIFICALLY SHOWN ON THESE PLANS. NO STRUCTURAL MEMBERS SHALL BE CUT OR DRILLED WITHOUT PRIOR WRITTEN AUTHORIZATION FROM STRUCTURAL OR ENGINEER.
7. ALL PLUMBING FIXTURES, EQUIPMENT, TRIM AND FITTINGS SHALL COMPLY WITH LOCAL, STATE, AND FEDERAL REGULATIONS AND CODES, INCLUDING, BUT NOT LIMITED TO WATER AND ENERGY CONSERVATION CODES. THE SCHEDULED AND/OR SPECIFIED PLUMBING FIXTURES AND EQUIPMENT REPRESENT THE MINIMUM CRITERIA.
8. ALL WASTE PIPING SHALL SLOPE AT 1% MIN. UNLESS OTHERWISE INDICATED OR REQUIRED DUE TO STRUCTURAL CONDITIONS.
9. PROVIDE DIELECTRIC ISOLATION FITTINGS AT POINT OF CONNECTION OF ALL COPPER TUBING AND ANY DISSIMILAR METALS.
10. ALL NEW PIPING, INCLUDING WATER, WASTE, ROOF DRAINS SHALL BE TESTED IN ACCORDANCE WITH THE CALIFORNIA PLUMBING CODE.
11. ALL HOT WATER PIPING SHALL BE INSULATED WITH MINIMUM THERMAL RESISTANCE OF R=4.0 PER INCH. THE INSULATION SHALL HAVE A FLAME SPREAD RATING OF NOT MORE THAN 25 AND SMOKE DEVELOPED RATING OF NOT MORE THAN 50, TYPE AND THICKNESS PER SPECIFICATIONS.
12. PROVIDE LOOSE CHROME PLATED KEY STOPS AT ALL FIXTURES.
13. EACH PLUMBING VENT SHALL TERMINATE NOT LESS THAN TEN (10) FEET FROM TO THREE (3) FEET ABOVE ANY WINDOW, DOOR, AIR INTAKE, OR VENT SHAFT, AND SHALL HAVE A VANDAL RESISTANT VENT CAP.
14. ALL HOSE BIBBS SHALL HAVE A NON-REMOVABLE VACUUM BREAKER.
15. CONTRACTOR SHALL PAY ALL FEES REQUIRED TO COMPLETELY INSTALL ALL EQUIPMENT, MATERIALS AND PIPING INDICATED IN CONTRACT DRAWINGS.
16. PROVIDE TRAPS AND AUTOMATIC TRAP PRIMERS FOR ALL FLOOR DRAINS.
17. PROVIDE WATER HAMMER ARRESTORS, THREADED OR SOLDERED, UPSTREAM OF LAST FIXTURE WATER SUPPLY PIPING, PER PDI & TD WH-201.
18. ALL BURRED ENDS OF WATER PIPING AND TUBING SHALL BE REAMED TO THE FULL BORE OF THE PIPE OR TUBE AND ALL CHIPS SHALL BE REMOVED (SEE CALIFORNIA PLUMBING CODE, 2016 EDITION, SECTION 310.3). ADDITIONALLY, TOOLS USED IN CUTTING OR REAMING SHALL BE KEPT FREE FROM OIL OR GREASE AND WHERE SUCH CONTAMINATION HAS OCCURRED, THE ITEMS AFFECTED SHALL BE REWORKED AND RINSED.
19. FOR PIPE PENETRATIONS THROUGH FIRE RATED FLOOR, WALL AND PARTITIONS, PROVIDE FIRE STOP DEVICES AND PACKING IN COMPLIANCE WITH U.L. FIRE RESISTANCE DIRECTORY FOR THROUGH-PENETRATION FIRE STOPS DEVICES (XHCR), SYSTEMS WL1001, WL1002, WL5001, WL5002 OR CAJ1001, CAJ5001, CAJ5002, CAJ5003 AS APPLICABLE.
20. SEAL ALL PENETRATIONS THROUGH FIRE RESISTIVE CONSTRUCTION WITH APPROVED MATERIALS PER SECTION 714, CBC.
21. PER CODE ALL SINKS AND URINALS SHALL HAVE WALL CLEAN-OUTS.
22. CONTRACTOR SHALL COMPLY WITH LOW-LEAD ORDINANCE AB-1953.
23. COORDINATE ACCESS PANEL LOCATIONS WITH ARCHITECTURAL SHEETS.
24. ALL PLUMBING FIXTURES & PLUMBING FITTINGS SHALL COMPLY WITH MAXIMUM FLOW RATE VALUES OF SECTION 5.303.2. AND SECTION 5.303.3. OF CALIFORNIA GREEN BUILDING CODE.
25. NEW OR REPAIRED POTABLE WATER SYSTEM SHALL BE DISINFECTED PRIOR TO USE ACCORDING TO METHOD SET IN SECTION 609.9 OF CALIFORNIA PLUMBING CODE.
26. ALL FIXTURES, EQUIPMENT, PIPING, AND MATERIALS SHALL BE LISTED. (LAPC103.2.1;LAPC3012)
27. ALL PLUMBING FIXTURES SHALL MEET THE FLOW REQUIREMENTS SPECIFIED IN THE LOS ANGELES PLUMBING CODE. (LAPC401.3)
28. ALL FAUCETS IN PUBLIC RESTROOMS SHALL BE SELF-CLOSING OR SELF-CLOSING METERING FAUCETS. (LAPC407.2.2)
29. PUBLIC LAVATORIES SHALL HAVE CONTROLS TO LIMIT THE WATER TEMPERATURE TO 100°F. (TITLE 24, PART 6 110.3(c)3)
30. WATER PIPE AND FITTINGS WITH A LEAD CONTENT WHICH EXCEED 0.25% SHALL BE PROHIBITED IN SYSTEMS CONVEYING POTABLE WATER. (LAPC604.2; HEALTH & SAFETY CODE 116875)
31. PROVIDE REDUCED-PRESSURE BACK FLOW PRVENTERS FOR ALL DOMESTIC WATER CONNECTIONS TO MECHANICAL EQUIPMENT, WATTS SERIES 009, OR EQUAL.

APPLICABLE CODES - REFER TO LATEST APPLICABLE EDITIONS
CALIFORNIA BUILDING STANDARDS ADMINISTRATIVE CODE, PART 1, TITLE 24 C.C.R.
CALIFORNIA BUILDING CODE, PART2, TITLE 24 C.C.R. (2009 INTERNATIONAL BUILDING CODE).
CALIFORNIA ELECTRICAL CODE, PART 3, TITLE 24 C.C.R. (2008 NATIONAL ELECTRICAL CODE).
CALIFORNIA MECHNAICAL CODE, PART 4, TITEL 24 C.C.R. (2009 UNIFORM MECHANICAL CODE).
CALIFORNIA PLUMBING CODE, PART 5, TITLE 24 C.C.R. (2009 UNIFORM PLUMBING CODE).
CALIFORNIA ENERGY CODE, PART 6, TITLE 24 C.C.R.
CALIFORNIA FIRE CODE, PART 9, TITLE 24 C.C.R. (2009 INTERNATIONAL FIRE CODE).
CALIFORNIA GREEN BUILDING STANDARD CODE, TITLE 24, PART II C.C.R.
CALIFORNIA REFERENCE STANDARDS CODE, PART 12, TITLE 24 C.C.R.

SEISMIC BRACING OF PLUMBING SYSTEMS	
1	GENERAL CONTRACTOR SHALL ENGINEER, PROVIDE AND INSTALL GRAVITY SUPPORTS (HANGERS, STANDS, ETC.) AND SEISMIC RESTRAINTS (CABLE BRACING, ANGLE BRACING, ETC.) INCLUDING THEIR CONNECTIONS TO THE STRUCTURE, FOR ALL EQUIPMENT AND DISTRIBUTION SYSTEMS (PIPING, DUCTWORK, CONDUIT, ETC.) GRAVITY SUPPORTS AND SEISMIC RESTRAINTS SHALL MEET THE REQUIREMENTS SET FORTH IN THE CALIFORNIA BUILDING CODE, IT'S REFERENCE STANDARD ASCE 7-10 (CHAPTER 13), AND ALL OTHER APPLICABLE CODES.
2	GENERAL CONTRACTOR SHALL SUBMIT THE ENGINEERED DESIGN OF THE SEISMIC RESTRAINTS, STAMPED AND SIGNED BY CALIFORNIA LICENSED CIVIL OR STRUCTURAL ENGINEER, TO THE AHJ REPRESENTATIVE FOR REVIEW AND APPROVAL PRIOR TO INSTALLATION.
3	SEISMIC BRACING SHALL CONSISTS OF ENGINEERED SYSTEMS (SUCH AS ISAT, TOLCO, OR ERICO) CARRYING AN OSHPD OPM CERTIFICATION UNDER THE 2013-CBC OR 2016-CBC.
4	GRAVITY SUPPORTS AND SEISMIC RESTRAINTS SHALL BE LAID OUT AS TO AVOID INDUCING TORSION ON STRUCTURAL STEEL MEMBERS.

PIPE MATERIAL		
UTILITY	ABOVE GRADE	BELOW GRADE
SANITARY SOIL, WASTE, VENT, STORM & OVERFLOW DRAIN	NO-HUB CAST IRON & COUPLINGS W/ STAINLESS STEEL BAND FITTINGS	NO-HUB CAST IRON W/M.G. COUPLINGS. WRAP ALL BURIED PIPING W/8 MIL. THICK LAYER OF POLYETHYLENE PLASTIC WHERE IN CONTACT WITH CORROSIVE SOIL.
DOMESTIC & INDUSTRIAL WATER	TYPE"L' COPPER W/WROUGHT COPPER SOLDERED JOINT FITTINGS. PROVIDE FIBERGLASS INSULATION ON HW PIPING	TYPE "K" COPPER W/WROUGHT COPPER BRAZED JOINT FITTINGS. PROVIDE FIBERGLASS INSULATION ON HW PIPING
CONDENSATE DRAIN	TYPE "M" COPPER W/WROUGHT COPPER SOLDERED JOINT FITTINGS. PROVIDE ARMAFLEX 1" THICK INSULATION	N/A
FIRE WATER/ SPRINKLER	SCHEDULE 40 BLACK STEEL ASTM A53 GRADE B WITH ASME B16.9 STEEL BUTT WELD FITTINGS OR LIGHT WALL AS LISTED IN NFPA 13, 2016 EDITION	DUCTILE IRON, CEMENT LINED AWWA C151 W/AWWA C110 DUCTILE IRON FITTINGS, AWWA C111 RUBBER GASKET, MECHANICAL JOINTS W/ ROD.
ACID WASTE	CPVC CHEM DRAIN, SCHEDULE 40 PIPING	CPVC CHEM DRAIN, SCHEDULE 40 PIPING

PLUMBING ABBREVIATIONS

&	AND
(E)	EXISTING
@	AT
ABV	ABOVE
AD	AREA DRAIN
ADA	AMERICAN WITH DISABILITY ACT
AFF	ABOVE FINISH FLOOR
AHU	AIR HANDLING UNIT
AP	ACCESS PANEL
ARCH	ARCHITECT/ARCHITECTURAL
BEH	BEHIND
BEL	BELOW
BLDG	BUILDING
CO	CLEANOUT
CFH	CUBIC FEET PER HOUR
CFM	CUBIC FEET PER MINUTE
CLG	CEILING
CONC	CONCRETE
CONN	CONNECT/CONNECTION
CONT	CONTINUED/CONTINUATION
CP	CIRCULATING PUMP
DCW	DOMESTIC COLD WATER
DF	DRINKING FOUNTAIN
DIA	DIAMETER
DN	DOWN
DS	DOWNSPOUT
DW	DOMESTIC WATER (POTABLE WATER)
DWG(S)	DRAWINGS(S)
EA	EACH
EWH	ELECTRIC WATER HEATER
EQUIP	EQUIPMENT
FC	FAN COIL UNIT
FD	FLOOR DRAIN
FDC	FIRE DEPARTMENT CONNECTION
FFE	FINISH FLOOR ELEVATION
FIN	FINISH
FLR	FLOOR
FP	FIRE PROTECTION WATER
FR	FROM
FS	FLOOR SINK
FTG(S)	FITTINGS
GAL	GALLONS
GPF	GALLONS PER FLUSH
GPH	GALLONS PER HOUR
GPM	GALLONS PER MINUTE
GRD	GRADE
HB	HOSE BIBB
HDR	HEADER
HP	HORSE POWER
HTR	HEATER
HW	HOT WATER
HWC	CIRCULATING HOT WATER
HWCP	HOT WATER RECIRCULATION PUMP
IE	INVERT ELEVATION
IWR	INDIRECT WASTE RECEPTOR
L	LAVATORY
MAX	MAXIMUM
MECH	MECHANICAL
MIN	MINIMUM
OD	OVERFLOW DRAIN
PP	POLYPROPYLENE
PRESS	PRESSURE
PRV	PRESSURE REDUCING VALVE
PSI	POUNDS PER SQUARE INCH
PVC	POLYVINYL CHLORIDE
R	REFRIGERATOR
RD	ROOF DRAIN
RED	REDUCER
RI & C	ROUGH-IN AND CONNECT
RL	RAIN LEADER
SD	STORM DRAIN
SH	SHOWER
SS	SANITARY SEWER
SHT	SHEET
T	TANK
TEMP	TERMPERATURE
THRU	THROUGH
TP	TRAP PRIMER
TYP	TYPICAL
UL	UNDERWRITERS LABORATORY
UR	URINAL
VTR	VENT THRU ROOF
W/	WITH
WC	WATER CLOSET
WH	WATER HEATER

PIPING LEGEND		
SYMBOL	ABBREV	DESCRIPTION
— · S/W · —	S OR W	SEWER OR WASTE BEL.FLR. OR GRD.
—— S/W ——	S OR W	SEWER OR WASTE BEL.FLR. OR GRD.
— — V — —	V	VENT LINE
—— CD ——	CD	CONDENSATE DRAIN
—— PCD ——	PCD	PUMPED CONDENSATE DRAIN
—— DCW ——	DCW	DOMESTIC COLD WATER
—— HW ——	HW	HOT WATER
—— HWC ——	HWC	CIRCULATION HOT WATER
—— SD ——	SD	STORM DRAIN ABOVE GRADE
—— OD ——	OD	OVERFLOW DRAIN ABOVE GRADE
—— GW ——	GW	GRAY WATER
—— ICW ——	ICW	INDUSTRIAL COLD WATER
—— TP ——	TP	TRAP PRIMER LINE
	FD	FLOOR DRAIN
	RD	ROOF DRAIN
	FS	FLOOR SINK
	FCO	FLOOR CLEANOUT
	COYB	CLEANOUT IN YARD BOX
	WCO	WALL CLEANOUT BEHIND ACCESS PANEL
	IWR	INDIRECT WASTE RECEPTOR
	CO	CLEANOUT
	TP	TRAP PRIMER LINE
	SOVYB	SHUT-OFF VALVE IN YARD BOX (BALL TYPE)
	SOV	SHUT-OFF VALVE (BALL TYPE)
	SOV	SHUT-OFF VALVE (BUTTERFLY TYPE)
	HB	HOSE BIBB
	-	UNION
	CV	CHECK VALVE
	PG	PRESSURE GAUGE
	TH	THERMO METER
	-	DIRECTION OF FLOW IN LINE
	-	CAP OR PLUG
	WHA	WATER HAMMER ARRESTOR
#	-	KEYNOTE
# / #		DETAIL NUMBER / DRAWING NUMBER WHERE DRAWN
	POC	POINT OF CONNECTION BETWEEN NEW & EXISTING WORK

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

REGISTERED PROFESSIONAL ENGINEER
ROBERT D. GETTER
No. M 30752
Exp. 09-30-22
MECHANICAL
STATE OF CALIFORNIA
11/17/2021

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED •

BUREAU OF ENGINEERING
VERTICAL CONTROL:
HORIZONTAL CONTROL:
SHEET TITLE: PLUMBING GENERAL NOTES AND LEGEND
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

DEPARTMENT OF PUBLIC WORKS
CITY OF LOS ANGELES
GARY LEE MOORE, P.E., ENV SP
CITY ENGINEER
DATE:
DESIGN GROUP
ENGINEER: ROBERT GETTER
DESIGNED BY: JUSTIN CHIN
DRAWN BY: JUSTIN CHIN
CHECKED BY: ROBERT GETTER
APPROVED BY: XXX

NO. | REVISIONS: | BY: | DATE:

CIP NO.

INDEX NO.

WORK ORDER NO.
E170121B

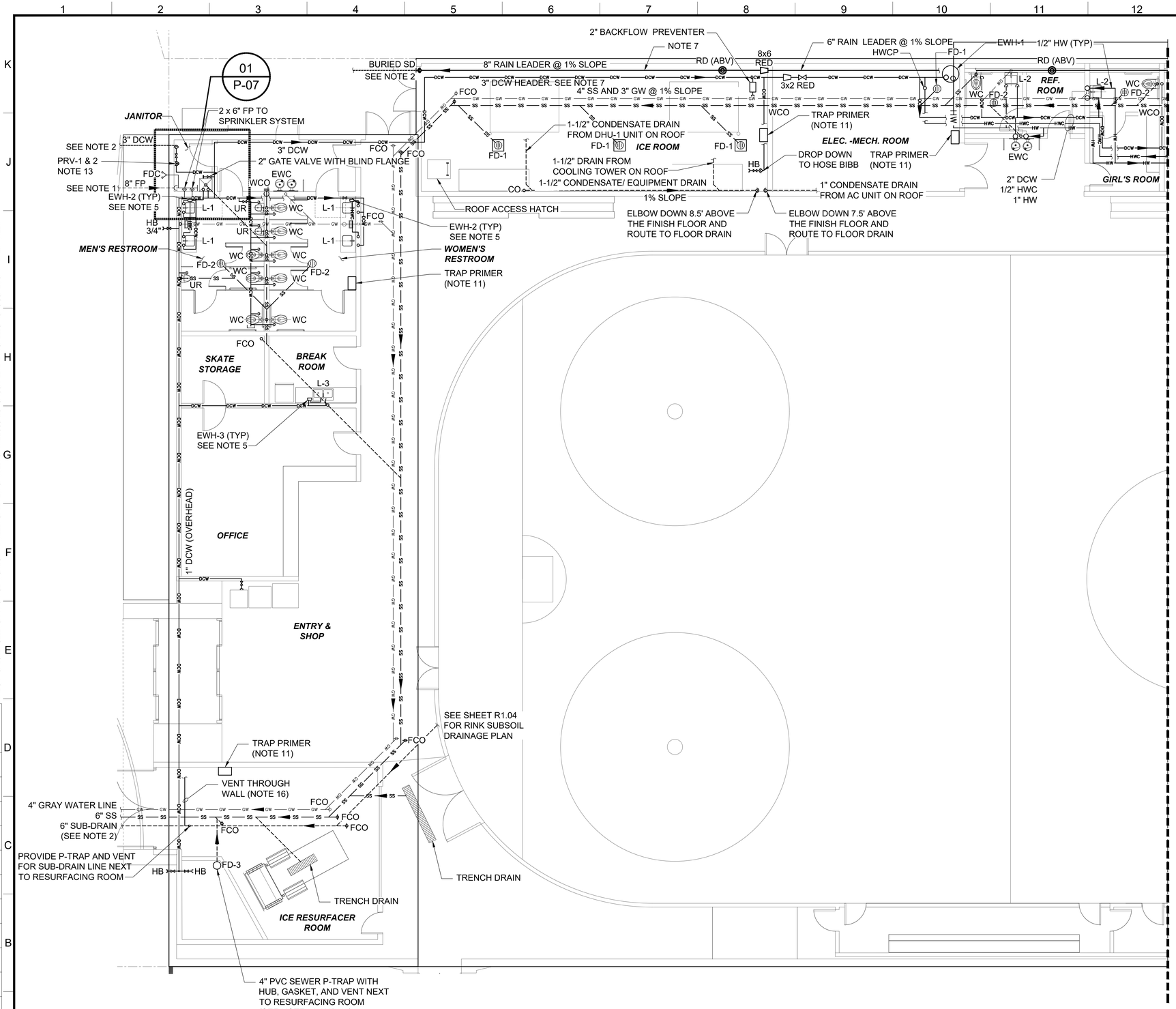
SHEET NAME
P-01
SHEET X OF X SHEETS

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REVISION DATES: (DESIGN STAGE ONLY)

Sheet Version 4.0

D:\PROJECT\CITY OF LA_BROOKSSCARPA_RESEDA SKATE FACILITY\PROJECTLINE DRAWINGS\P-01.DWG 11/19/2021 2:26 PM



PLUMBING FLOOR PLAN

REF: REFERENCE

1

SCALE: 5/32"=1'

N

NOTES:

1. FIRE PROTECTION SEE DRAWINGS FP-02 AND FP-05 FOR DETAIL.
2. FOR LOCATION AND CONNECTION OF STORM DRAIN, FIRE PROTECTION, DOMESTIC WATER AND SANITARY SEWER, REFER TO CIVIL DRAWINGS. ELEVATIONS TO MATCH WITH CIVIL PLAN FOR CONNECTION:
   - DCW (TO PIPE CENTER) @ 2 FEET BELOW FINISH FLOOR
   - SS (TO PIPE INVERT) @ 6.25 FEET BELOW FINISH FLOOR
   - SD (TO PIPE INVERT) @ 4 FEET BELOW FINISH FLOOR
   - SUB-DRAIN (TO PIPE INVERT) @6 FEET BELOW FINISH FLOOR
   - GW (TO PIPE INVERT) @ 5.25 FEET BELOW FINISH FLOOR
3. FOR WASTE VENT CONNECTION, SEE TYPICAL DRAIN AND VENT DETAIL ON DRAWING P-04.
4. REFER TO DRAWING P-05 FOR FIXTURE SCHEDULE.
5. PROVIDE ONE TANK-LESS ELECTRIC WATER HEATER IN EACH OF THE TWO PUBLIC RESTROOMS, WITH EEMAX MODEL SPEX75 OR EQUAL AND FOR SINK IN BREAK ROOM WITH EEMAX MODEL SPEX3208 OR EQUAL.
6. PROVIDE 1/2" HW AND 1/2" DCW TO All SHOWERS AND LAVATORIES.
7. PIPING LOCATIONS ARE SHOWN SCHEMATICALLY. LOCATE DCW, HWC, HW, AND RAIN LEADER PIPING IN PIPE CHASE ALONG EAST WALL. COORDINATE WITH OTHER DISCIPLINES. PREPARE AND SUBMIT COORDINATION DRAWINGS FOR CITY REVIEW PRIOR TO CONSTRUCTION.
8. UNFIRED STORAGE TANK INSULATION SHALL HAVE INTERNAL + EXTERNAL ≥ R-16 OR EXTERNAL ≥ R-12. LABEL REQUIRED PER §110.3(C)3.
9. CONSTRUCTION DOCUMENTS REQUIRE MANUFACTURER CERTIFICATION THAT SERVICE WATER-HEATING SYSTEMS ARE EQUIPPED WITH AUTOMATIC TEMPERATURE CONTROLS CAPABLE OF ADJUSTING TEMPERATURE SETTINGS PER §110.3(A).
10. CONTROLS FOR CIRCULATING PUMPS PROVIDE CAPABLE OF AUTOMATICALLY TURNING OFF THE SYSTEM PER §110.3(C)2.
11. PROVIDE ELECTRONIC TRAP PRIMERS BY PRECISION PLUMBING PRODUCTS, MINI-PRIME, OR EQUAL. INSTALL PER MFG. RECOMMENDATIONS AT ALL FLOOR DRAINS.
12. PROVIDE TWO WATER HAMMER ARRESTORS, WATTS MODEL LF15M2-C OR EQUAL. LOCATE ONE IN ICE ROOM.
13. CONTRACTOR SHALL VERIFY PRV-1 AND 2 OUTLET PRESSURE OVER RANGE OF OPERATING CONDITIONS 0-100 GPM. ARRANGE VALVES VERTICALLY ALONG WALL. SUPPORT PIPES INDEPENDENTLY FROM WALL USING 3/4" STAINLESS STEEL UNISTRUT.
14. SUPPORT PIPING FROM WALLS, FLOORS AND CEILINGS USING 1" STAINLESS STEEL UNISTRUT, TYPICAL.
15. FOR LOW-ROOF AREAS SANITARY DRAWINGS, ROUTE VENTS THROUGH ROOF. FOR SPRUNG STRUCTURE AREAS, ROUTE VENTS THROUGH WALLS. CONTRACTOR TO FIELD ROUTE VENTS AS REQUIRED BY PLUMBING CODE.
16. VENT THROUGH WALL TO BE COORDINATED WITH MEMBRANE SUPPLIER. PROVIDE FLASHING AND SEALING FOR WALL PENETRATION.
17. PLUMBING CONTRACTOR SHALL INSTALL WITH REMOVABLE 4" DUCTILE IRON PIPE RISER AND SUPPORT BRACKET PER DETAIL ON DRAWING R5.04.

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Design Collaborative

REGISTERED PROFESSIONAL ENGINEER
ROBERT D. GETTER
No. M 30752
Exp. 09-30-22
MECHANICAL
STATE OF CALIFORNIA
11/17/2021

THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED

BUREAU OF ENGINEERING
VERTICAL CONTROL:
HORIZONTAL CONTROL:
SHEET TITLE: PLUMBING FLOOR LAYOUT PLAN 1 OF 2
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

DEPARTMENT OF PUBLIC WORKS
NO. | REVISIONS: | DATE: | BY:
CIP NO.
INDEX NO.

CITY OF LOS ANGELES
GARY LEE MOORE, P.E., ENV SP
CITY ENGINEER
DATE:

	DESIGN GROUP
ENGINEER:	ROBERT GETTER
DESIGNED BY:	JUSTIN CHIN
DRAWN BY:	JUSTIN CHIN
CHECKED BY:	ROBERT GETTER
APPROVED BY:	XXX

WORK ORDER NO.
E170121B

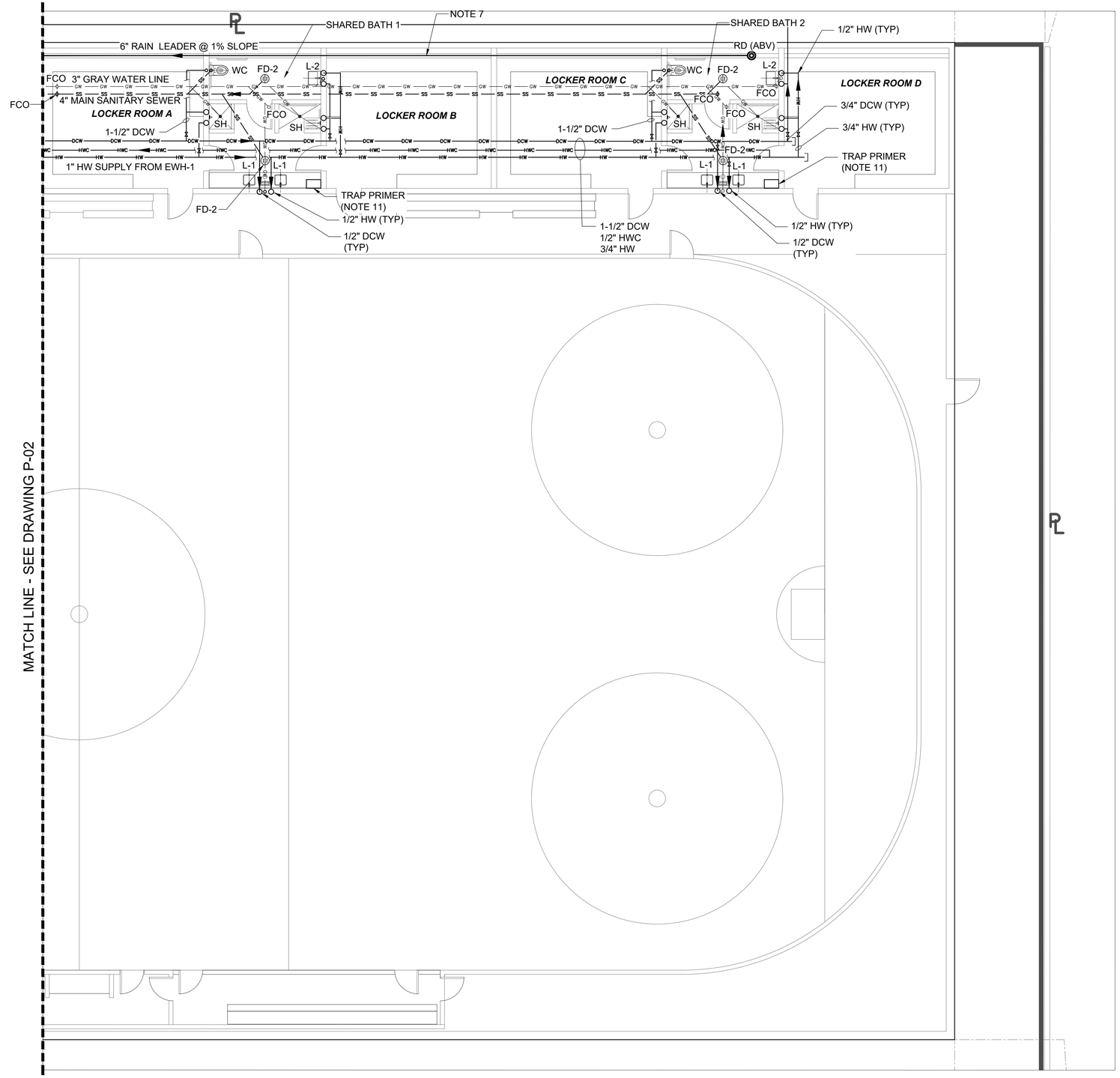
SHEET NAME
P-02
SHEET X OF X SHEETS

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REVISION DATES
(DESIGN STAGE ONLY)

Sheet Version 4.0

D:\PROJECT\CITY OF LA_BROOKSSCARPA_RESEDA SKATE FACILITY\PROJECTLINE DRAWINGS\P-02 & P-03.DWG 11/19/2021 2:26 PM



PLUMBING FLOOR PLAN

REFERENCE 1

SCALE: 5/32"=1'

N

NOTES:

1. FIRE PROTECTION SEE DRAWINGS FP-02 AND FP-05 FOR DETAIL.
2. FOR LOCATION AND CONNECTION OF STORM DRAIN, FIRE PROTECTION, DOMESTIC WATER AND SANITARY SEWER, REFER TO CIVIL DRAWINGS. ELEVATIONS TO MATCH WITH CIVIL PLAN FOR CONNECTION:
   - DCW (TO PIPE CENTER) @ 2 FEET BELOW FINISH FLOOR
   - SS (TO PIPE INVERT) @ 6.25 FEET BELOW FINISH FLOOR
   - SD (TO PIPE INVERT) @ 4 FEET BELOW FINISH FLOOR
   - SUB-DRAIN (TO PIPE INVERT) @6 FEET BELOW FINISH FLOOR
   - GW (TO PIPE INVERT) @ 5.25 FEET BELOW FINISH FLOOR
3. FOR WASTE VENT CONNECTION, SEE TYPICAL DRAIN AND VENT DETAIL ON DRAWING P-04.
4. REFER TO DRAWING P-05 FOR FIXTURE SCHEDULE.
5. PROVIDE ONE TANK-LESS ELECTRIC WATER HEATER IN EACH OF THE TWO PUBLIC RESTROOMS, WITH EEMAX MODEL SPEX75 OR EQUAL AND FOR SINK IN BREAK ROOM WITH EEMAX MODEL SPEX3208 OR EQUAL.
6. PROVIDE 1/2" HW AND 1/2" DCW TO All SHOWERS AND LAVATORIES.
7. PIPING LOCATIONS ARE SHOWN SCHEMATICALLY. LOCATE DCW, HWC, HW, AND RAIN LEADER PIPING IN PIPE CHASE ALONG EAST WALL. COORDINATE WITH OTHER DISCIPLINES. PREPARE AND SUBMIT COORDINATION DRAWINGS FOR CITY REVIEW PRIOR TO CONSTRUCTION.
8. UNFIRED STORAGE TANK INSULATION SHALL HAVE INTERNAL + EXTERNAL ≥ R-16 OR EXTERNAL ≥ R-12. LABEL REQUIRED PER §110.3(C)3.
9. CONSTRUCTION DOCUMENTS REQUIRE MANUFACTURER CERTIFICATION THAT SERVICE WATER-HEATING SYSTEMS ARE EQUIPPED WITH AUTOMATIC TEMPERATURE CONTROLS CAPABLE OF ADJUSTING TEMPERATURE SETTINGS PER §110.3(A).
10. CONTROLS FOR CIRCULATING PUMPS PROVIDE CAPABLE OF AUTOMATICALLY TURNING OFF THE SYSTEM PER §110.3(C)2.
11. PROVIDE ELECTRONIC TRAP PRIMERS BY PRECISION PLUMBING PRODUCTS, MINI-PRIME, OR EQUAL. INSTALL PER MFG. RECOMMENDATIONS AT ALL FLOOR DRAINS.
12. PROVIDE TWO WATER HAMMER ARRESTORS, WATTS MODEL LF15M2-C OR EQUAL. LOCATE ONE IN ICE ROOM.
13. CONTRACTOR SHALL VERIFY PRV-1 AND 2 OUTLET PRESSURE OVER RANGE OF OPERATING CONDITIONS 0-100 GPM. ARRANGE VALVES VERTICALLY ALONG WALL. SUPPORT PIPES INDEPENDENTLY FROM WALL USING 3/4" STAINLESS STEEL UNISTRUT.
14. SUPPORT PIPING FROM WALLS, FLOORS AND CEILINGS USING 1" STAINLESS STEEL UNISTRUT, TYPICAL.
15. FOR LOW-ROOF AREAS SANITARY DRAWINGS, ROUTE VENTS THROUGH ROOF. FOR SPRUNG STRUCTURE AREAS, ROUTE VENTS THROUGH WALLS. CONTRACTOR TO FIELD ROUTE VENTS AS REQUIRED BY PLUMBING CODE.
16. VENT THROUGH WALL TO BE COORDINATED WITH MEMBRANE SUPPLIER. PROVIDE FLASHING AND SEALING FOR WALL PENETRATION.
17. PLUMBING CONTRACTOR SHALL INSTALL WITH REMOVABLE 4" DUCTILE IRON PIPE RISER AND SUPPORT BRACKET PER DETAIL ON DRAWING R5.04.

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Design Collaborative

REGISTERED PROFESSIONAL ENGINEER
ROBERT D. GETTER
No. M 30758
Exp. 09-30-22
MECHANICAL
STATE OF CALIFORNIA
11/17/2021

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED •

BUREAU OF ENGINEERING
VERTICAL CONTROL:
HORIZONTAL CONTROL:
SHEET TITLE: PLUMBING FLOOR LAYOUT PLAN 2 OF 2
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

DEPARTMENT OF PUBLIC WORKS
NO. | REVISIONS: | DATE: | BY:
CIP NO.
INDEX NO.

CITY OF LOS ANGELES
GARY LEE MOORE, P.E., ENV SP
CITY ENGINEER
DATE:

	DESIGN GROUP
ENGINEER:	ROBERT GETTER
DESIGNED BY:	JUSTIN CHIN
DRAWN BY:	JUSTIN CHIN
CHECKED BY:	ROBERT GETTER
APPROVED BY:	XXX

WORK ORDER NO.
E170121B

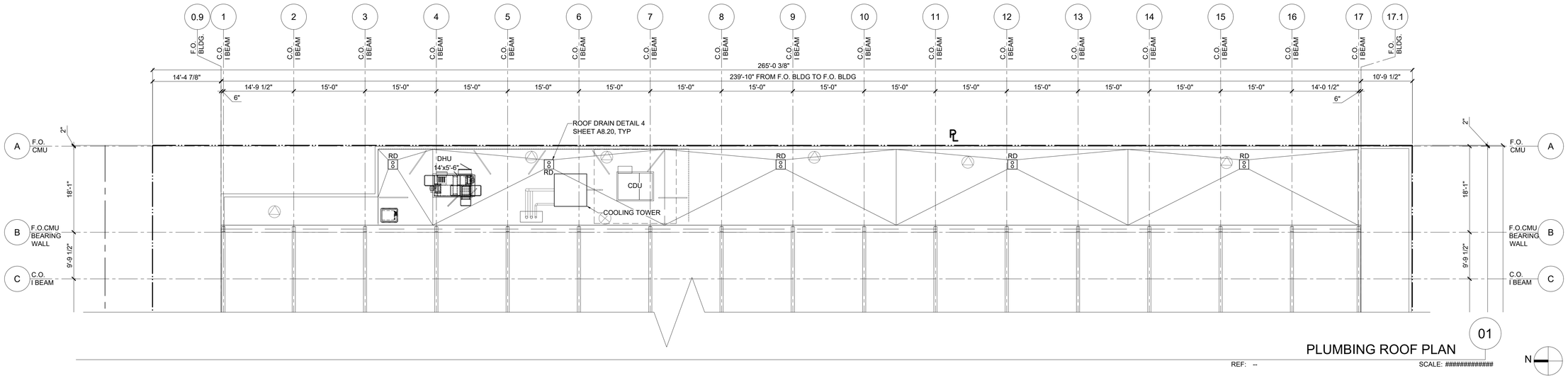
SHEET NAME
P-03
SHEET X OF X SHEETS

REVISION DATES:
(DESIGN STAGE ONLY)

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

Sheet Version 4.0

D:\PROJECT\CITY OF LA_BROOKSSCARPA_RESEDA SKATE FACILITY\PROJECTLINE DRAWINGS\P-02 & P-03.DWG 11/19/2021 2:26 PM



01

PLUMBING ROOF PLAN

REF: --

SCALE: ##############

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REVISION DATES (DESIGN STAGE ONLY)

Sheet Version 4.0

D:\PROJECT\CITY OF LA_BROOKSSCARPA_RESEDA SKATE FACILITY\PROJECTLINE DRAWINGS\P-04.DWG 11/19/2021 2:26 PM

ENGINEERING

CITY OF LOS ANGELES

Environmental Engineering Design Division

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED •

REGISTERED PROFESSIONAL ENGINEER
ROBERT D. GETTER
No. M 30758
Exp. 09-30-22
MECHANICAL
STATE OF CALIFORNIA
11/17/2021

BUREAU OF ENGINEERING

VERTICAL CONTROL:
HORIZONTAL CONTROL:

SHEET TITLE: PLUMBING ROOF LAYOUT PLAN

PROJECT: RESEDA SKATE FACILITY

ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

DEPARTMENT OF PUBLIC WORKS

NO.	REVISIONS:	DATE:	BY:

CIP NO.

INDEX NO.

CITY OF LOS ANGELES

GARY LEE MOORE, P.E., ENV SP
CITY ENGINEER
DATE:

DESIGN GROUP

ENGINEER:	ROBERT GETTER	
DESIGNED BY:	JUSTIN CHIN	
DRAWN BY:	JUSTIN CHIN	
CHECKED BY:	ROBERT GETTER	
APPROVED BY:	XXX	

WORK ORDER NO.
E170121B

SHEET NAME
P-04

SHEET X OF X SHEETS

PLUMBING FIXTURE SCHEDULE

FD-1 FLOOR DRAIN
ZURN MODEL NO. ZN415B DURA-COATED CAST IRON DRAIN WITH BOTTOM OUTLET, COMBINATION NO HUB INVERTABLE MEMBRANE CLAMP AND ADJUSTABLE COLLAR WITH SEEPAGE SLOTS, "TYPE B" POLISHED NICKEL BRONZE LIGHT-DUTY STRAINER.

FD-2 FLOOR DRAIN WITH RUBBER FLOORING
ZURN MODEL NO. Z415H, STRAINER CLAMPING DEVICE, DRAIN BODY IS SECURED TO THE PIPE WITH FOUR CONNECTIONS, THREADED, NO HUB CONNECTOR, LEAD CAULK OR ZURN NEO-LOC GASKET.

FS-1 FLOOR SINK AND SERVICE FAUCET
ADVANCE TABCO MODEL 9-OP-40F, 18.5"X25"X16" STAINLESS STEEL FLOOR MOUNTED MOP SINK WITH SERVICE FAUCET MODEL K-240.

TD-1 TRENCH DRAIN (12" WIDE x 8' LONG)
ZURN, NO. ZN-665-Y D.C. SUMP BODY WITH BOTTOM OUTLET, INTEGRAL SEEPAGE PAN D.C. SEDIMENT BUCKET AND 12"x 96" NICKEL BRONZE LOOSE SLOTTED GRATE.

TD-2 TRENCH DRAIN (12" WIDE x 4' LONG)
ZURN, NO. ZN-665-Y D.C. SUMP BODY WITH BOTTOM OUTLET, INTEGRAL SEEPAGE PAN D.C. SEDIMENT BUCKET AND 12"x 48" NICKEL BRONZE LOOSE SLOTTED GRATE.

HB HOSE BIBB - LOOSE KEY
PRIER "SKU NO. C-255CP-75" ANTI-SIPHON BACKFLOW CHECK VALVE, CAST BRASS WITH POLISHED CHROME FINISH, LOOSE KEY ON LANYARD, FULL-FLOW INLINE VACUUM BREAKER AND HOSE THREAD OUTLET, AND WALL FLANGE

FCO CLEANOUT - FLOOR
ZURN MODEL NO. ZN1400-BP WITH NICKEL BRONZE TOP AND BRONZE PLUG, PROVIDE -CM CARPET CLEANOUT MARKER WHERE ON CARPET

BFP-1 BACKFLOW PREVENTER
3" WATTS NO. LF909-S-QT-FDA REDUCED PRESSURE ZONE BACKFLOW PREVENTER WITH EPOXY COATED STRAINER AND QUARTER TURN BALL VALVES, UNIT SHALL MEET AND BE LABELED WITH ASSE 1013 AND FCCCHR OR USC STANDARDS AND SPECIFICATIONS, PROVIDE AIR GAP WATTS 909AG-C

BFP-2 BACKFLOW PREVENTER
2" WATTS NO. LF909M1QT-S REDUCED PRESSURE ZONE BACKFLOW PREVENTER WITH EPOXY COATED STRAINER AND QUARTER TURN BALL VALVES, UNIT SHALL MEET AND BE LABELED WITH ASSE 1013 AND FCCCHR OR USC STANDARDS AND SPECIFICATIONS, PROVIDE AIR GAP WATTS 909AG-F

MV-1 MIXING VALVE
BRADLEY MODEL NO. S59-3130 THERMOSTATIC MIXING VALVE, CAST BRASS BODY, CHECK STRAINERS ON INLETS, ROUGH CHROME FINISH WITH 1-1/4" INLETS AND 1-1/2" OUTLET. PROVIDE QUARTER-TURN BALL VALVES ON INLETS AND OUTLET, PROVIDE TEMPERATURE GAUGE ON OUTLET

RD ROOF DRAIN
JAY R. SMITH DRAWING FIGURE NUMBER 1800, DUCO CAST IRON BODIES WITH COMBINED FLASHING CLAMP AND GRAVEL STOP FOR ROOF DRAIN, COMBINED FLASHING CLAMP, GRAVEL STOP WITH HIGH INTERNAL WATER DAM STANDPIPE FOR OVERFLOW DRAIN WIH VANDAL PROOF DOME.

WC WATER CLOSET (ACCESSIBLE)
AMERICAN STANDARD, MADERA MODEL NO. 3461528.020, COMPLETE HIGH EFFICIENCY TOILET SYSTEM WITH FLOOR MOUNTED, BOTTOM OUTLET, TOP SPUD, VITREOUS CHINA, HIGH EFFICIENCY TOILET WITH ELONGATED BOWL, 1.28 GPF FLUSHOMETER TOILET SYSTEM (SELECTRONIC MODEL NO. 6063.101.002), ADA COMPLIANT. AMERICAN STANDARD #5905.100 EXTRA HEAVY DUTY OPEN FRONT LESS COVER.

L-1 LAVATORY (SHARE BATH 1& 2)
HI-MACS, SINGLE SINK, MODEL NO. 1715, WALL HUNG, 17"W X 15"L X 5"D LAVATORY, ARCTIC WHITE, WITH FAUCET (MOMENTS MODEL NO. 250B.105, CHROME COLOR FINISH, HARDWIRED AC, ADA COMPLIANT.

L-2 LAVATORY
AMERICAN STANDARD, DECORUM MODEL NO. 9024.011EC, WALL HUNG, 20"W x 18-1/4"L x 5"D LAVATORY, WHITE COLOR, WITH FAUCET (MOMENTS MODEL NO. 250B.105, CHROME COLOR FINISH, HARDWIRED AC, ADA COMPLIANT.

L-3 KITCHEN SINK
SINK MANUFACTURER KOHLER, MODEL VAULT K-3996-1, SINK FAUCET MANUFACTURER DELTA, B1310LF WITH CHROME FINISH.

SH SHOWER
BRADLEY MODEL NO. WS-1WCA-ADA-TTPA WITH TWO 1.5 GPM SHOWER HEADS WITH VANDAL-PROOF LOCKABLE SPRAY ADJUSTMENT AND CAST BRASS HEAVY DUTY INSTITUTIONAL TYPE HEAD BRACKET FOR VANDAL-RESISTANT RIGIDITY, A DIVERTER VALVE, AND A PUSH-BUTTON ACTUATOR WITH AUTOMATIC SHUT-OFF. VALVE SHALL HAVE COMPLETE WORKING PARTS ENCLOSED WITHIN THE CARTRIDGE AND AN INTEGERAL STOP WITH VOLUME CONTROL ADJUSTED TO MAXIMUM FLOW LENGTH (APPX. ONE MINUTE). ALL PARTS SHALL BE MOUNTED ON/WITHIN A STAINLESS STEEL PIPE COVER WITH INTEGRAL SOAP DISH. MOUNT USING VANDAL-PROOF SCREWS. PROVIDE ADDITIONAL VERTICAL STAINLESS STEEL PIPE COVER AS NEEDED TO COVER EXPOSED PIPING TO FLOOR.

EWC ELECTRIC WATER COOLER (ACCESSIBLE)
OASIS MODEL NO. PGF8EBFSL, LEAD & BARRIER-FREE SPLIT-LEVEL COOLER W/ TOP MOUNTED VERSAFILLER SPORTS BOTTLE FILLER WITH INDEPENDENT ACTIVATION. COOLER SHALL HAVE SOFT-TOUCH, SELF-CLOSING, VANDAL RESISTANT PUSH-BUTTON AND STAINLESS STEEL ANTI-SPLASH TOP DESIGN, UNIT SHALL HAVE OPTIONAL CHROM-PLATED BRASS, TAMPER-RESISTANT BUBBLER. BOTTLE FILLER SHALL HAVE STAINLESS STEEL ANTIMICROBIAL FINISH. PROVIDE OPTIONAL APRON FOR UPPER BOWL OF UNIT. PROVIDE JAY R. SMITH CARRIER NO. 0834 TO SUIT INSTALLATION. WHERE CARRIER CANNOT BE USED, SECURE FIXTURE RIGIDLY TO THE WALL WITH TOGGLE BOLTS OR RAM-SET ON BLOCK WALLS, OR PROVIDE WOOD OR STEEL BLOCKING IN GYPSUM BOARD WALLS. PROVIDE McGUIRE NO.8912C P-TRAP AND BALL VALVE IN COLD WATER LINE WITHIN CABINET. PROVIDE TWO (2) SPARE FILTERS FOR OWNER'S STOCK

EWH-1 HEAT PUMP WATER HEATER
HUBBELL, MODEL NO. PBX120SL. THE ENTIRE TANK IS TO BE INSULATED WITH A MINIMUM OF 3" THICK CFC FREE POLYURETHANE FOAM INSULATION THAT EXCEEDS THE LATEST ASHRAE STANDARD FOR STAND-BY HEAT LOSS. HEATER TO BE SET AT 110°F. TACO MODEL WATER CIRCULATION PUMP (MODEL 006-IFC), FLOW RANGE: 0-9 GPM, HEAD RANGE: 0-8.5 FEET, 120/1/60, 1/40 HP, 1/2",3/4" STAINLESS STEEL WITH UNION CONNECTIONS WITH SMART PLUG INSTANT HOT WATER CONTROL MODEL SP115-1.

EWH-2 TANKLESS WATER HEATER
EEMAX, MODEL NO. SPEX75. HIGH TEMPERATURE LIMIT SWITCH WITH AUTOMATIC RESET, FLOW RESTRICTING AERATOR, COMPLIANT WITH ADA PHYSICAL INSTALLATION.

EWH-3 TANKLESS WATER HEATER
EEMAX, MODEL NO. SPEX75. HIGH TEMPERATURE LIMIT SWITCH WITH AUTOMATIC RESET, FLOW RESTRICTING AERATOR, COMPLIANT WITH ADA PHYSICAL INSTALLATION.

SEE ARCHITECTURAL SHEET A-700 FOR OTHER FIXTURES AND ACCESSORY SCHEDULE.

DOMESTIC WATER PIPE SIZING:

- WATER PRESSURE 83-93 PSI PER LADWP WEST VALLEY (213-367-1250)
- PRV-1 OUTLET OF 50 PSI, WATTS MODEL LFN223-2.5"
- PRV-2 OUTLET OF 55 PSI, WATTS MODEL LF223-2".
- BACKFLOW PREVENTOR: WATTS LF90905Y.

PIPC 2014-009

SIMPLE SIZING FORM FOR DOMESTIC WATER SYSTEMS
This is a very simplified form and should not be used for complex design as design by branches, systems with booster pumps, down-feed systems, etc.

JOB ADDRESS

WATER INFORMATION FROM DWP: MAX PRESS. 91 psi MIN PRESS. 83 psi at 739 ft a.s.l.
GIVEN BY LADWP West Valley DATE 11/15/2021
METER SIZE 3 in
143 F. U. 79 g.p.m. DEVELOPED LENGTH 240 ft
25% OF DEVELOPED LENGTH 60 ft
EQUIVALENT LENGTH (Developed length + 25%) 300 ft

WATER CLOSETS AND URINALS

	With Tank	W/Flush Valve	MAKE	MODEL
WC1		X	American Standard	Madera Model 3461528.020/1.28 gpf
WC2				
WC3				
WC4				
UR1		X	American Standard	Allbrook Model 6550001.020/ 1.0 gpf
UR2				

SYSTEM COMPONENTS

PIPING MATERIAL COPPER TYPE K_____ L X M_____ GALVANIZED IRON_____ OTHER (specify)
PRESSURE REDUCING VALVE SIZE 2" & 2.5" MAKE Watts MODEL LFN223-2.5"/LF223-2"
BACKFLOW PREVENTION DEVICE SIZE 3" MAKE Watts MODEL LF909

HYDRAULIC CALCULATIONS

A.	MINIMUM PRESSURE AT CITY MAIN	83	psi
B.	SET PRESSURE AT PRESSURE REDUCING VALVE	70	psi
C.	PRESSURE LOSS THROUGH 3 inch METER	1	psi
D.	PRESSURE LOSS THROUGH 3 inch REDUCED PRESSURE BACKFLOW PREVENTER	12	psi
E.	PRESSURE LOSS THROUGH 2 inch PRESSURE REDUCING VALVE	20	psi
F.	PRESSURE LOSS THROUGH SOFTENER OR OTHER MISCELLANEOUS EQUIPMENT		psi
G.	PRESSURE LOSS DUE TO ELEVATION 8 ftX0.43=	3.4	psi
H.	RESIDUAL PRESSURE	25	psi
I.	TOTAL PRESSURE LOSSES	46.6	psi
J.	PRESSURE AVAILABLE FOR FRICTION LOSS IN THE SYSTEM	21.6	psi
K.	**PRESSURE/100ft (J/EQUIVALENT LENGTH X100)**	7.2	**psi/100ft**

As a covered entity under Title II of the Americans with Disabilities Act, the City of Los Angeles does not discriminate on the basis of disability and, upon request, will provide reasonable accommodation to ensure equal access to its programs, services and activities. For efficient handling of information internally and in the internet, conversion to this new format of code related and administrative information bulletins including MGD and RGA that were previously issued will also allow flexibility and timely distribution of information to the public.

PIPC 2014-009

FIXTURE UNIT COUNT				PIPE SIZE SCHEDULE			
FIXTURE UNIT TYPE	F. U. Value	Quantity	TOTAL	PIPE MAT. COPPER TYPE L			
Kitchen Sinks	1.5	1	1.5	PRESS. LOSS psi/100ft	6 PSI/ 100 ft		
Dishwashers	1.5				ALLOWED F. U.		
Bar Sinks					Flush Tank		Flush Valve
Mop or Service Sinks	3	1	3	Size (in.)	Hot Water	Cold Water	Cold Water
Clothes Washers	4				(5ft/s)	(8ft/s)	(8ft/s)
Lavatories	1	12	12	½	2	2	0
Bathtub	4			¾	8	8	0
Bathtub 3/4 inch fill	10			1	16	20	0
Showers	2	4	8	1 ¼	28	42	8
Water Closets				1 ½	46	83	26
Water Closets with Flushometer Valve	8	12	96	2	119	254	132
Urinals with Flushometer Valve	5	3	15	2 ½	245	455	329
First Hose Bibb	2.5	1	2.5	3			
Additional Hose Bibbs	1	4	4	3 ½			
Drinking Fountain	0.25	4	1	4			
				5			
				6			
TOTAL FIXTURE UNITS			143	= 79			g.p.m.
Additional Flow				= 100			g.p.m.
TOTAL FLOW				= 179			g.p.m.

Addional flow of approximately 100 gpm will be required for filling ice rink, however, this will be an infrequent process water demand, which will occur when facility is not in use, so this has not been included in above hydraulic calculations.

As a covered entity under Title II of the Americans with Disabilities Act, the City of Los Angeles does not discriminate on the basis of disability and, upon request, will provide reasonable accommodation to ensure equal access to its programs, services and activities. For efficient handling of information internally and in the internet, conversion to this new format of code related and administrative information bulletins including MGD and RGA that were previously issued will also allow flexibility and timely distribution of information to the public.

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REVISION DATES (DESIGN STAGE ONLY)

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Design Collaborative

REGISTERED PROFESSIONAL ENGINEER
ROBERT D. GETTER
No. M 30752
Exp. 09-30-22
MECHANICAL
STATE OF CALIFORNIA
11/17/2021

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED •

BUREAU OF ENGINEERING
VERTICAL CONTROL:
HORIZONTAL CONTROL:
SHEET TITLE: PLUMBING FIXTURE SCHEDULE
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

DEPARTMENT OF PUBLIC WORKS
CIP NO.
INDEX NO.
NO. | REVISIONS: | BY: | DATE:

CITY OF LOS ANGELES
GARY LEE MOORE, P.E., ENV SP
CITY ENGINEER
DATE:

DESIGN GROUP	
ENGINEER:	ROBERT GETTER
DESIGNED BY:	JUSTIN CHIN
DRAWN BY:	JUSTIN CHIN
CHECKED BY:	ROBERT GETTER
APPROVED BY:	XXX

WORK ORDER NO.
E170121B

SHEET NAME
P-05
SHEET X OF X SHEETS

Sheet Version 4.0

D:\PROJECT\CITY OF LA_BROOKSSCARPA_RESEDA SKATE FACILITY\PROJECTLINE DRAWINGS\P-05.DWG 11/23/2021 3:48 PM

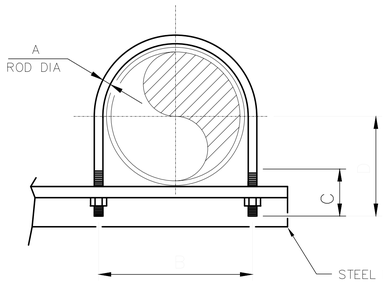


FIG 1
ANCHOR

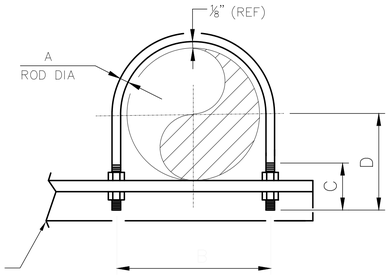


FIG 2
GUIDE

PIPE SIZE (IN)	½	¾	1	1½	2	2½	3	4	6	8	10	12	14	16	18
"A" ROD DIA (IN)	¼	⅜	⅜	⅜	⅜	½	½	½	⅝	⅝	¾	⅞	⅞	⅞	1
"B" (IN)	1 3/16	1½	1¾	2⅜	2 13/16	3 7/16	4 1/16	5 1/16	7⅜	9⅜	11⅝	13¾	15	17	19⅛
"C" THRD (IN)	2⅜	2⅜	2⅜	2½	2½	2 5/16	3	3	3¾	3¾	4	4¼	4¼	4¼	4¾
"D" TANG. (IN)	2¾	2¾	2¾	3	3¼	3¾	4	4½	6⅛	7⅛	8⅜	9⅝	10¼	11¼	12⅝
# OF SUPPORTS	32	10	10	5	197	–	–	64	70	35	54	–	–	–	–

"U" BOLT W/HEX NUTS

PIPE SUPPORT TYPE A DETAIL (A)
SCALE: N.T.S.

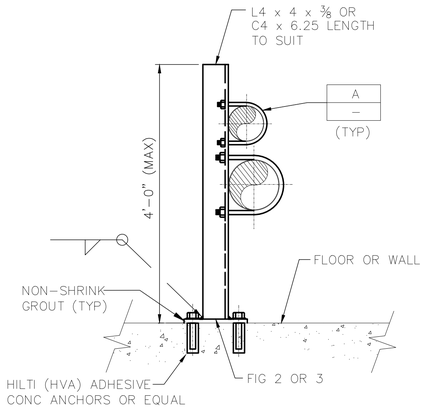


FIG 1
FLOOR OR OVERHEAD MOUNTED

SCHEDULE

L6 x 4 x ⅜ FOR PIPES 14" – 18"
L5 x 3½ x 5/16 FOR PIPES 8" – 12"
L4 x 4 x ⅜ FOR PIPES 6" & BELOW

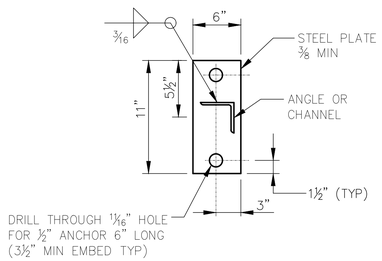


FIG 2
BOLTED

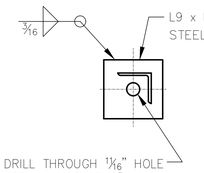


FIG 3
BOLTED

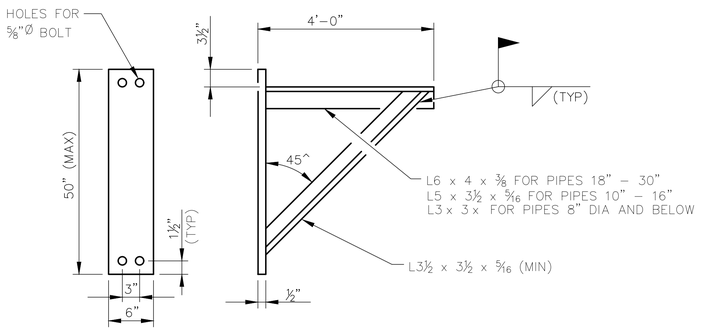
USE FOR PIPE SIZE BELOW 4"

PSG1:

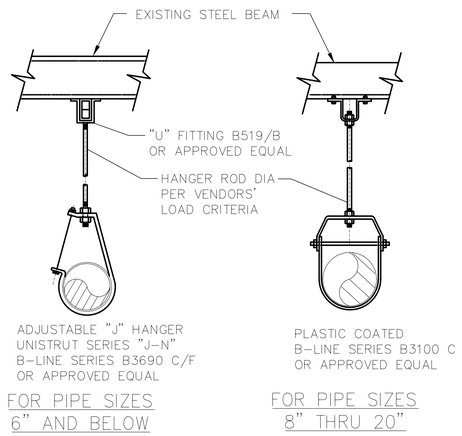
BOLT SUPPORT TO EXISTING STRUCTURAL STEEL FRAME. DRILL 11/16" HOLES IN STEEL FRAME AND PROVIDE NUTS AND BOLTS FOR ATTACHMENT.

PIPE SIZE (IN)	0.5	1	1.5	2	3	4
# OF PSG SUPPORTS	10	20	12	72	15	18
OVERALL LENGTH OF SUPPORTS (FT)	40	50	30	200	60	70
# OF PSG1 SUPPORTS	30	20	4	40	–	4
OVERALL LENGTH OF SUPPORTS (FT)	90	60	12	100	–	12

PIPE SUPPORT TYPE B DETAIL (B)
SCALE: N.T.S.



PIPE SUPPORT TYPE C DETAIL (C)
SCALE: N.T.S.



FOR PIPE SIZES
6" AND BELOW

FOR PIPE SIZES
8" THRU 20"

PIPE SUPPORT TYPE D DETAIL (D)
SCALE: N.T.S.

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Design Unit

REGISTERED PROFESSIONAL ENGINEER
ROBERT D. GETTER
No. M 30752
Exp. 09-30-22
MECHANICAL
STATE OF CALIFORNIA
11/17/2021

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED •

BUREAU OF ENGINEERING
VERTICAL CONTROL:
HORIZONTAL CONTROL:
SHEET TITLE: PIPE SUPPORT DETAILS
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

DEPARTMENT OF PUBLIC WORKS
CITY OF LOS ANGELES
GARY LEE MOORE, P.E., ENV SP
CITY ENGINEER
DATE:
DESIGN GROUP
ENGINEER: ROBERT GETTER
DESIGNED BY: JUSTIN CHIN
DRAWN BY: JUSTIN CHIN
CHECKED BY: ROBERT GETTER
APPROVED BY: XXX

NO. | REVISIONS: | DATE: | BY:

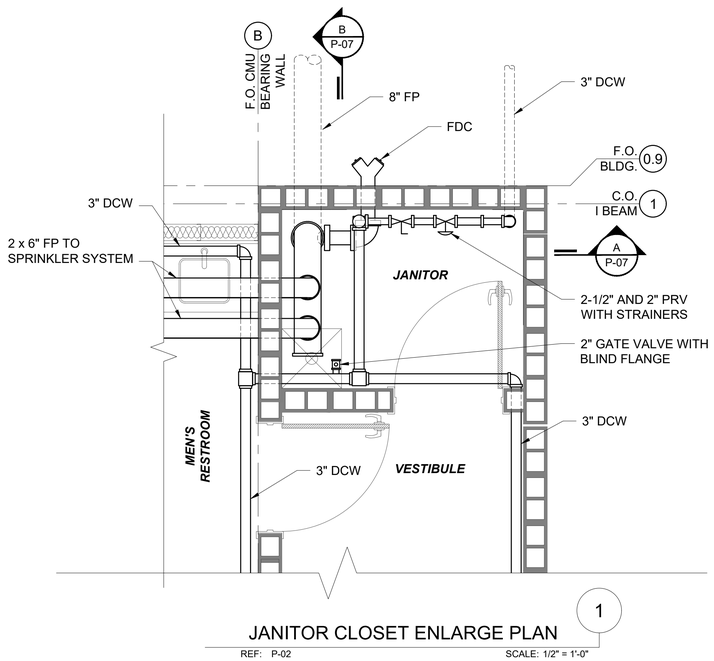
CIP NO.
INDEX NO.
WORK ORDER NO. E170121B
SHEET NAME P-06
SHEET X OF X SHEETS

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REVISION DATES (DESIGN STAGE ONLY)

Sheet Version 4.0

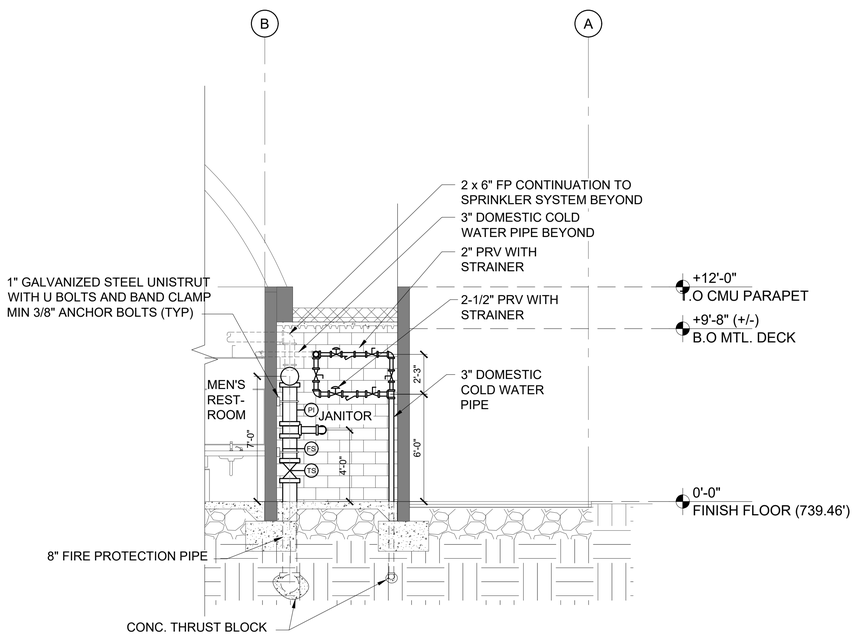
D:\PROJECT\CITY OF LA_BROOKSSCARPA_RESEDA SKATE FACILITY\PROJECTLINE DRAWINGS\P-06.DWG 11/19/2021 2:26 PM



JANITOR CLOSET ENLARGE PLAN

1

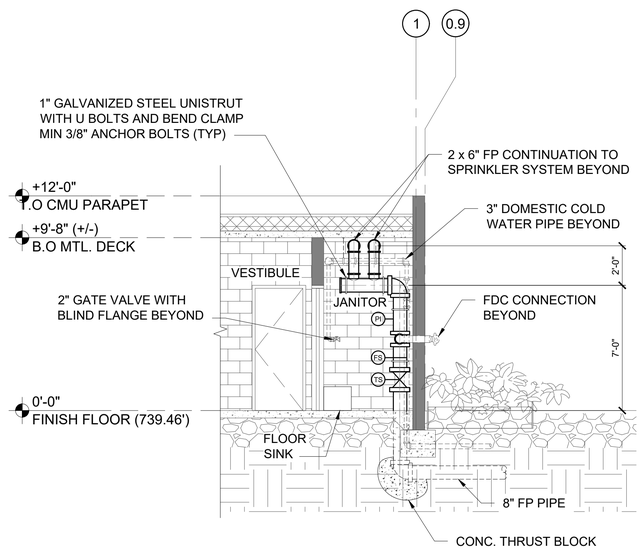
REF: P-02 SCALE: 1/2" = 1'-0"



SECTION @ JANITOR NORTH WALL

A

REF: P-02 SCALE: 1/4" = 1'-0"



SECTION @ JANITOR WEST WALL

B

REF: P-02 SCALE: 1/4" = 1'-0"

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REVISION DATES (DESIGN STAGES ONLY)

Sheet Version 4.0

D:\PROJECT\CITY OF LA_BROOKSSCARPA_RESEDA SKATE FACILITY\PROJECTLINE DRAWINGS\P-07.DWG 11/19/2021 2:26 PM

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

REGISTERED PROFESSIONAL ENGINEER
ROBERT D. GETTER
No. M 30758
Exp. 09-30-22
MECHANICAL
STATE OF CALIFORNIA
11/17/2021

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED •

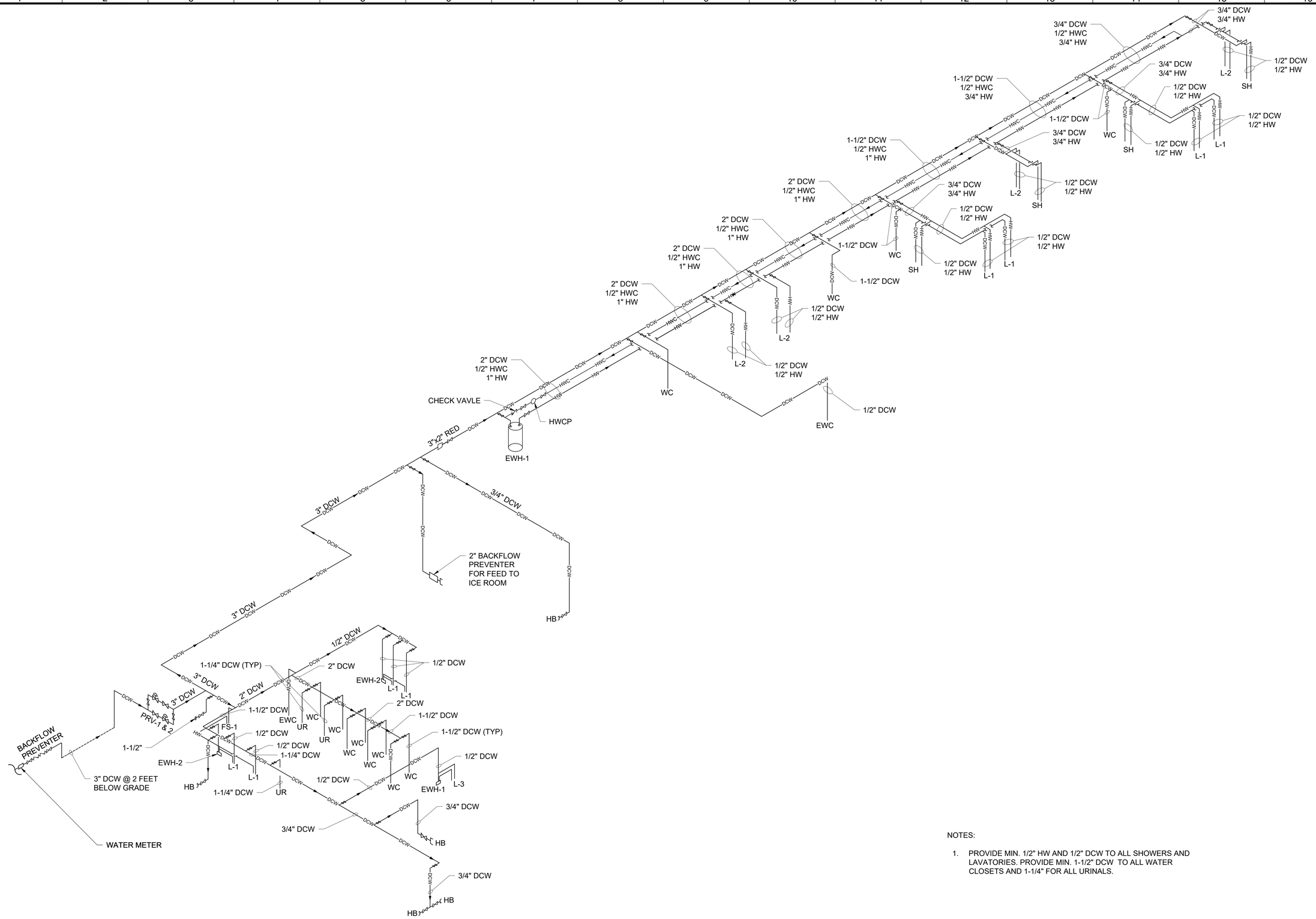
BUREAU OF ENGINEERING
VERTICAL CONTROL:
HORIZONTAL CONTROL:
SHEET TITLE: PIPING DETAIL PLAN AND SECTIONS
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

DEPARTMENT OF PUBLIC WORKS
NO. REVISIONS: DATE: BY:
CIP NO.
INDEX NO.

CITY OF LOS ANGELES
CITY ENGINEER
GARY LEE MOORE, P.E., ENV SP
DATE:
DESIGN GROUP
ENGINEER: ROBERT GETTER
DESIGNED BY: JUSTIN CHIN
DRAWN BY: JUSTIN CHIN
CHECKED BY: ROBERT GETTER
APPROVED BY: XXX

WORK ORDER NO.
E170121B

SHEET NAME
P-07
SHEET X OF X SHEETS



NOTES:

1. PROVIDE MIN. 1/2" HW AND 1/2" DCW TO ALL SHOWERS AND LAVATORIES. PROVIDE MIN. 1-1/2" DCW TO ALL WATER CLOSETS AND 1-1/4" FOR ALL URINALS.

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Design Standards

REGISTERED PROFESSIONAL ENGINEER
ROBERT D. GETTER
No. M 30752
Exp. 09-30-22
MECHANICAL
STATE OF CALIFORNIA
11/17/2021

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED •

BUREAU OF ENGINEERING

VERTICAL CONTROL:
HORIZONTAL CONTROL:

SHEET TITLE: WATER SUPPLY PLUMBING DIAGRAM

PROJECT: RESEDA SKATE FACILITY

ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

DEPARTMENT OF PUBLIC WORKS

NO.	REVISIONS:	DATE:	BY:

CIP NO.

INDEX NO.

CITY OF LOS ANGELES

CITY ENGINEER

GARY LEE MOORE, P.E., ENV SP

DATE:

DESIGN GROUP	
ENGINEER:	ROBERT GETTER
DESIGNED BY:	JUSTIN CHIN
DRAWN BY:	JUSTIN CHIN
CHECKED BY:	ROBERT GETTER
APPROVED BY:	XXX

WORK ORDER NO.
E170121B

SHEET NAME
P-08
SHEET X OF X SHEETS

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

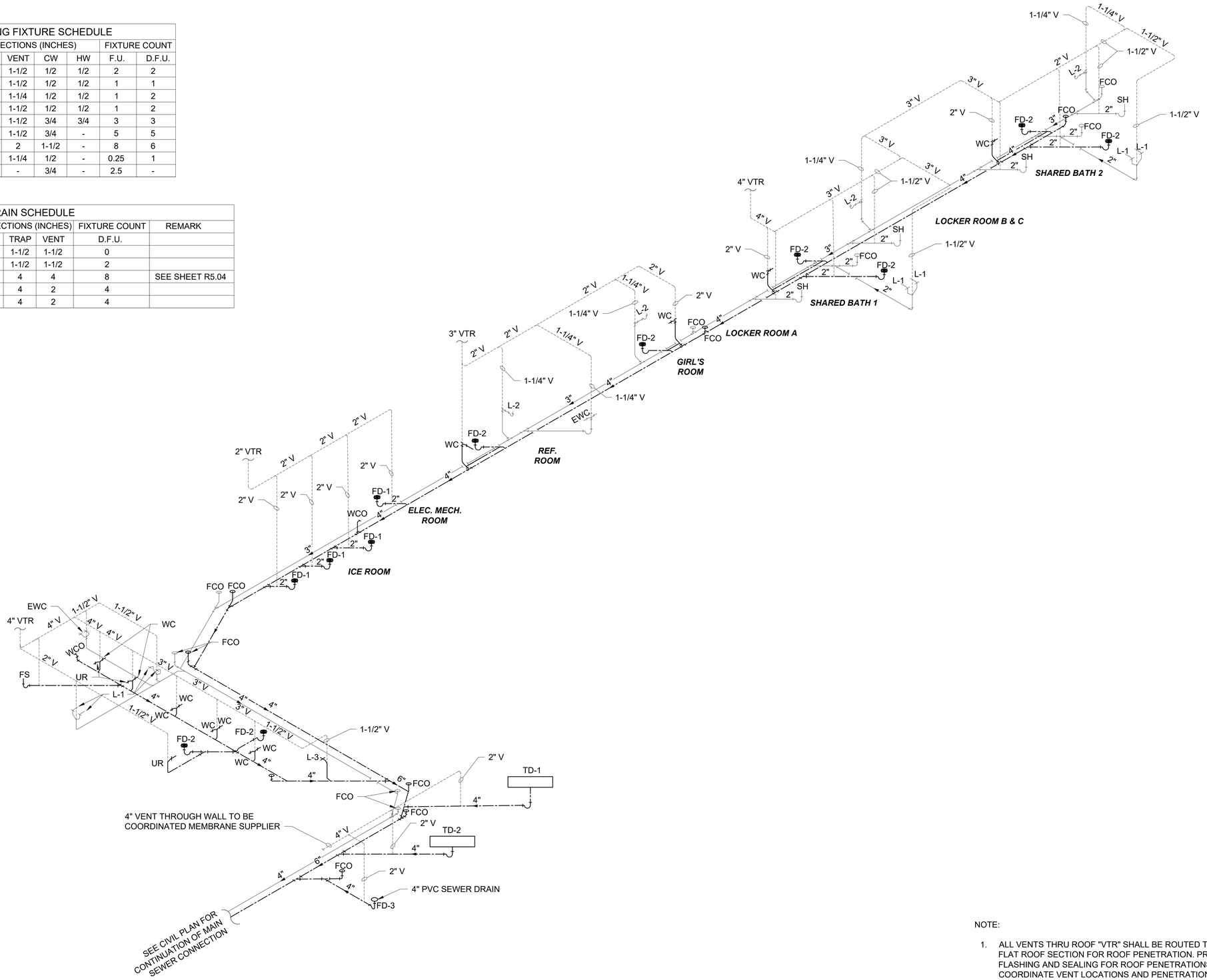
REVISION DATES
DESIGN STAGE ONLY)

Sheet Version 4.0

D:\PROJECT\CITY OF LA_BROOKSSCARPA_RESEDA SKATE FACILITY\PROJECTLINE DRAWINGS\RISER_DIAGRAM.DWG 11/23/2021 3:46 PM

PLUMBING FIXTURE SCHEDULE							
		CONNECTIONS (INCHES)				FIXTURE COUNT	
MARK	DESCRIPTION	WASTE	VENT	CW	HW	F.U.	D.F.U.
SH	SHOWER	2	1-1/2	1/2	1/2	2	2
L-1	LAVATORY	2	1-1/2	1/2	1/2	1	1
L-2	LAVATORY	1-1/2	1-1/4	1/2	1/2	1	2
L-3	KITCHEN SINK	2	1-1/2	1/2	1/2	1	2
FS-1	FLOOR SINK	2	1-1/2	3/4	3/4	3	3
UR	URINAL	2	1-1/2	3/4	-	5	5
WC	WATER CLOSET	3	2	1-1/2	-	8	6
EWC	WATER COOLER	1-1/4	1-1/4	1/2	-	0.25	1
HB	HOSE BIBB	-	-	3/4	-	2.5	-

FLOOR DRAIN SCHEDULE						
		CONNECTIONS (INCHES)			FIXTURE COUNT	REMARK
MARK	DESCRIPTION	WASTE	TRAP	VENT	D.F.U.	
FD-1	FLOOR DRAIN	2	1-1/2	1-1/2	0	
FD-2	FLOOR DRAIN	2	1-1/2	1-1/2	2	
FD-3	FLOOR DRAIN	4	4	4	8	SEE SHEET R5.04
TD-1	TRENCH DRAIN	4	4	2	4	
TD-2	TRENCH DRAIN	4	4	2	4	



NOTE:

1. ALL VENTS THRU ROOF "VTR" SHALL BE ROUTED TO LOW FLAT ROOF SECTION FOR ROOF PENETRATION. PROVIDE FLASHING AND SEALING FOR ROOF PENETRATIONS. COORDINATE VENT LOCATIONS AND PENETRATION DETAILS WITH GENERAL CONTRACTOR AND ROOFING SUBCONTRACTOR

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

REGISTERED PROFESSIONAL ENGINEER
ROBERT D. GETTER
No. M 30758
Exp. 09-30-22
MECHANICAL
STATE OF CALIFORNIA
11/17/2021

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED •

DEPARTMENT OF PUBLIC WORKS
BUREAU OF ENGINEERING

VERTICAL CONTROL:
HORIZONTAL CONTROL:

SHEET TITLE: WASTE AND VENT PLUMBING DIAGRAM

PROJECT: RESEDA SKATE FACILITY

ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

NO.	REVISIONS:	DATE:	BY:

CIP NO.

INDEX NO.

CITY OF LOS ANGELES
CITY ENGINEER
DATE:
GARY LEE MOORE, P.E., ENV SP

DESIGN GROUP	
ENGINEER:	ROBERT GETTER
DESIGNED BY:	JUSTIN CHIN
DRAWN BY:	JUSTIN CHIN
CHECKED BY:	ROBERT GETTER
APPROVED BY:	XXX

WORK ORDER NO.
E170121B

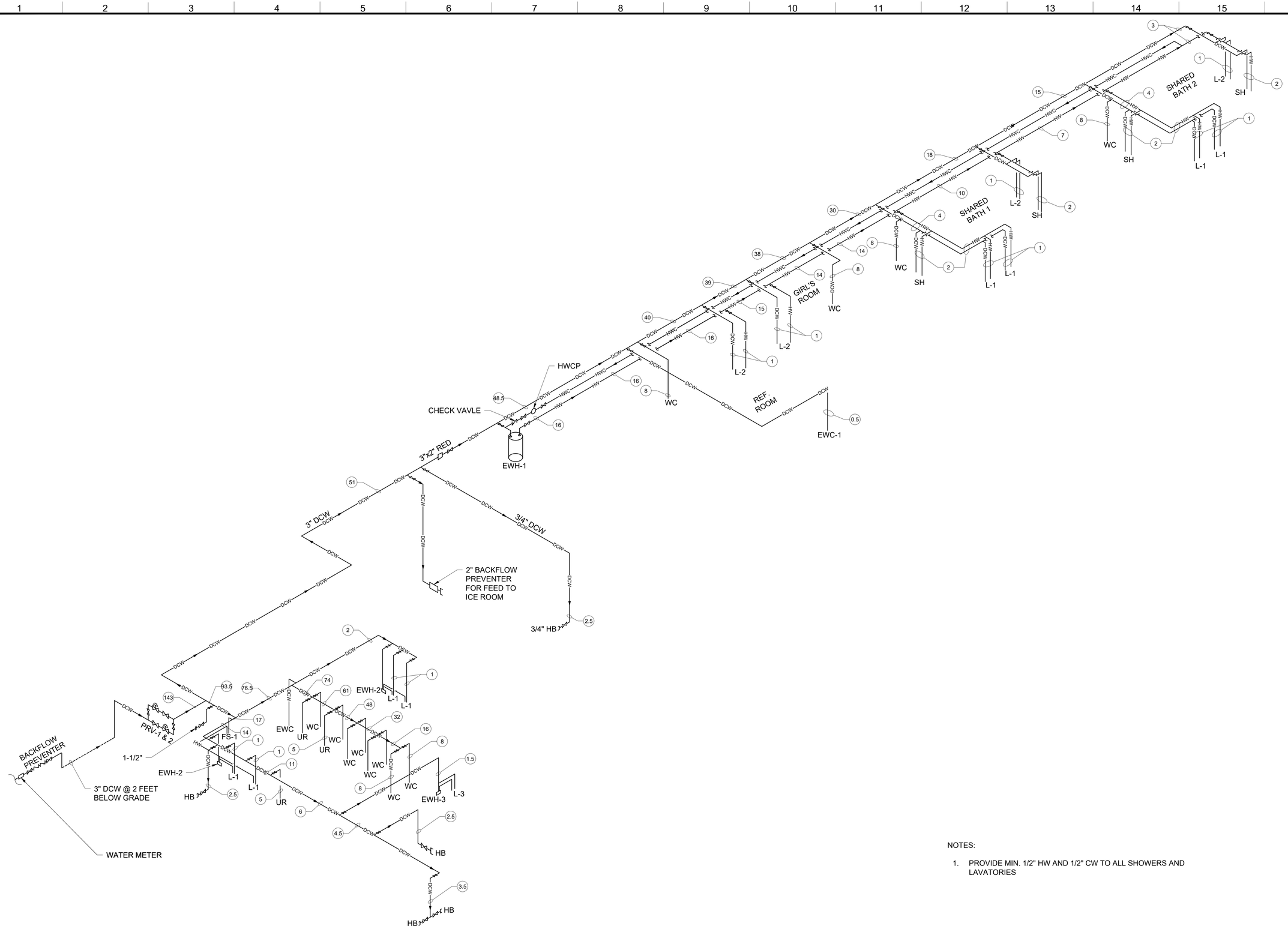
SHEET NAME
P-09
SHEET X OF X SHEETS

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REVISION DATES
(DESIGN STAGE ONLY)

Sheet Version 4.0

D:\PROJECT\CITY OF LA_BROOKSSCARPA_RESEDA SKATE FACILITY\PROJECTLINE DRAWINGS\RISER_DIAGRAM.DWG 11/19/2021 2:26 PM



NOTES:

1. PROVIDE MIN. 1/2" HW AND 1/2" CW TO ALL SHOWERS AND LAVATORIES

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

REGISTERED PROFESSIONAL ENGINEER
ROBERT D. GETTER
No. M 30750
Exp. 09-30-22
MECHANICAL
STATE OF CALIFORNIA
11/17/2021

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED •

BUREAU OF ENGINEERING

VERTICAL CONTROL:
HORIZONTAL CONTROL:

SHEET TITLE: WATER SUPPLY FIXTURE COUNT DIAGRAM

PROJECT: RESEDA SKATE FACILITY

ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

DEPARTMENT OF PUBLIC WORKS

NO.	REVISIONS:	DATE:	BY:

CIP NO.

INDEX NO.

CITY OF LOS ANGELES
GARY LEE MOORE, P.E., ENV SP
CITY ENGINEER

DESIGN GROUP | DATE:

ENGINEER:	ROBERT GETTER
DESIGNED BY:	JUSTIN CHIN
DRAWN BY:	JUSTIN CHIN
CHECKED BY:	ROBERT GETTER
APPROVED BY:	XXX

WORK ORDER NO.
E170121B

SHEET NAME
P-10
SHEET X OF X SHEETS

REVISION DATES
(DESIGN STAGE ONLY)

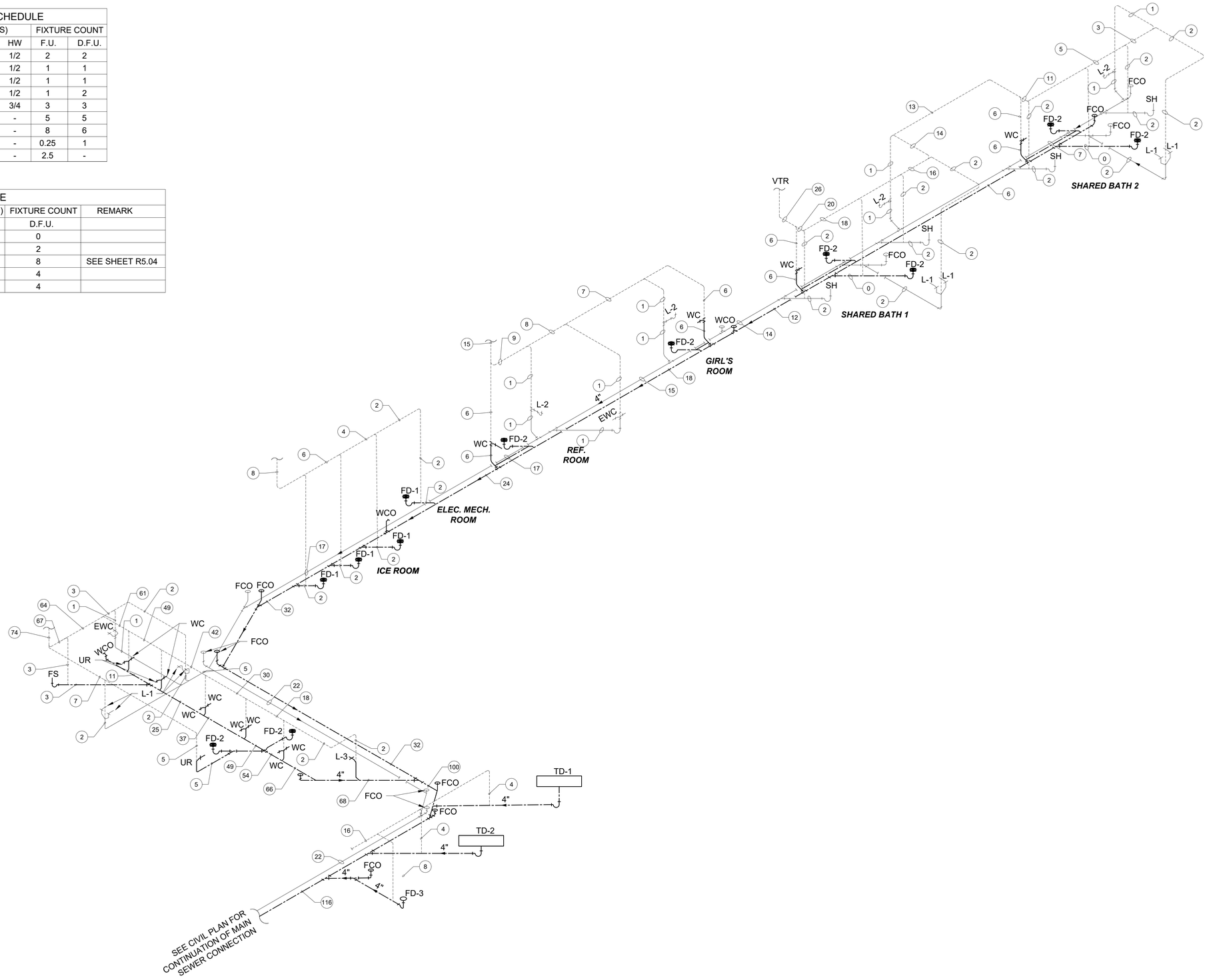
THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

Sheet Version 4.0

D:\PROJECT\CITY OF LA_BROOKSSCARPA_RESEDA SKATE FACILITY\PROJECTLINE DRAWINGS\RISER_DIAGRAM.DWG 11/19/2021 2:27 PM

PLUMBING FIXTURE SCHEDULE							
		CONNECTIONS (INCHES)				FIXTURE COUNT	
MARK	DESCRIPTION	WASTE	VENT	CW	HW	F.U.	D.F.U.
SH	SHOWER	2	1-1/2	1/2	1/2	2	2
L-1	LAVATORY	1-1/2	1-1/4	1/2	1/2	1	1
L-2	LAVATORY	1-1/2	1-1/4	1/2	1/2	1	1
L-3	KITCHEN SINK	2	1-1/2	1/2	1/2	1	2
FS-1	FLOOR SINK	2	1-1/2	3/4	3/4	3	3
UR	URINAL	2	1-1/2	3/4	-	5	5
WC	WATER CLOSET	3	2	1-1/2	-	8	6
EWC	WATER COOLER	1-1/4	1-1/4	1/2	-	0.25	1
HB	HOSE BIBB	-	-	3/4	-	2.5	-

FLOOR DRAIN SCHEDULE						
		CONNECTIONS (INCHES)			FIXTURE COUNT	REMARK
MARK	DESCRIPTION	WASTE	TRAP	VENT	D.F.U.	
FD-1	FLOOR DRAIN	2	1-1/2	1-1/2	0	
FD-2	FLOOR DRAIN	2	1-1/2	1-1/2	2	
FD-3	FLOOR DRAIN	4	4	4	8	SEE SHEET R5.04
TD-1	TRENCH DRAIN	4	4	2	4	
TD-2	TRENCH DRAIN	4	4	2	4	



THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REVISION DATES
(DESIGN STAGE ONLY)

Sheet Version 4.0

D:\PROJECT\CITY OF LA_BROOKSSCARPA_RESEDA SKATE FACILITY\PROJECTLINE DRAWINGS\RISER_DIAGRAM.DWG 11/19/2021 2:27 PM

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

REGISTERED PROFESSIONAL ENGINEER
ROBERT D. GETTER
No. M 30752
Exp. 09-30-22
MECHANICAL
STATE OF CALIFORNIA
11/17/2021

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED •

DEPARTMENT OF PUBLIC WORKS
BUREAU OF ENGINEERING

VERTICAL CONTROL:
HORIZONTAL CONTROL:

SHEET TITLE: WASTE AND VENT FIXTURE COUNT DIAGRAM

PROJECT: RESEDA SKATE FACILITY

ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

NO.	REVISIONS:	DATE:	BY:

CIP NO.

INDEX NO.

CITY OF LOS ANGELES
GARY LEE MOORE, P.E., ENV SP
CITY ENGINEER

DESIGN GROUP | DATE:

ENGINEER:	ROBERT GETTER
DESIGNED BY:	JUSTIN CHIN
DRAWN BY:	JUSTIN CHIN
CHECKED BY:	ROBERT GETTER
APPROVED BY:	XXX

WORK ORDER NO.
E170121B

SHEET NAME
P-11
SHEET X OF X SHEETS

RESEDA SKATE FACILITY - RINK DRAWINGS

SHEET INDEX:

R0.01	RINK COVER SHEET
R1.01	RINK LAYOUT
R1.02	RINK EQUIPMENT ROOM
R1.03	RINK ROOF-TOP CONDENSOR
R1.04	RINK SUBSOIL DRAINAGE PLAN
R1.05	RINK SUBSOIL & SNOWMELT HEATING PLAN
R5.01	RINK DETAILS
R5.02	RINK DETAILS
R5.03	RINK DETAILS
R5.04	RINK DETAILS
R6.01	RINK DETAILS
R6.02	RINK DETAILS
R6.03	RINK DETAILS

Summary of Reseda Ice Skating Facility Ice Systems

General

Basis of design

Refrigeration System for the ice-skating rink provides a total of 140 tons of cooling to the ice rink floor through two Trane RTHD 120 chiller packages. Each chiller provides 70 tons of cooling from twin screw compressors using refrigerant R513A as the primary refrigerant and a 40% ethylene glycol fluid for the secondary refrigerant. Secondary refrigerant circulates through the rink floor cooling pipe using primary and secondary (100% backup) Grunfoss cold floor pumps. A waste heat recovery system captures refrigerant waste heat with a waste heat condenser and circulates a solution of 40% ethylene glycol warmed from waste heat to both warm the subsoils beneath the rink and provide heating for the snowmelt pit. The subsoils require heating to prevent frost from developing under the rink floor due to continuous operation of the refrigerated ice rink and the snowmelt pit requires heating to melt ice shavings generated from the ice grooming operation of the ice resurfacer. A Korytko, Model KDI-0606A-7.5-1, cooling tower is located on the roof of the ice refrigeration mechanical room for condensing the hot gasses and exhausting any excess heat from the refrigeration cooling process. All refrigeration equipment and pumps are identified on the Refrigeration Equipment Schedule located on Sheet R-603 of the Refrigeration Drawings.

The refrigeration floor is detailed on the drawings and includes a subsoil drainage piping system located beneath the cooling floor and at the base of the granular fill that provides a frost-free base to the cooling floor. The drainage system evacuates any stray water from the ice resurfacing equipment, surface and subsurface rainwater that may migrate into the rink floor subsoils preventing any accidental freezing of these soils that could cause the ice floor to heave. Additional freeze protection is provided under the rink floor from the subsoil waste heat system described above which is located just beneath the ice rink insulation layer located immediately below the ice rink refrigerated floor. All these systems are designed to protect the rink floor subsoils from freezing which would heave the rink floor upward causing damage to the ice rink floor.

The ice rink contractor will be responsible for coordinating and installing all the ice rink floor systems shown on the R (Rink) drawings.

Ice Rink Floor Systems include:

1. Subsoil drainage piping under the rink floor.
2. Granular fill under the rink floor.
3. Subsoil heat headers and piping under the rink floor.
4. Insulation and vapor barriers under the rink floor.
5. The refrigeration floor which includes rink floor headers and cooling pipe, granular sand fill surrounding and covering the rink floor cooling pipe, and the rink perimeter expansion joint.
6. Insulated refrigeration floor transmission pipe to and from the refrigeration room and ice rink floor.
7. Subsoil heating transmission pipe to and from the refrigeration room and ice rink floor subsoil heating headers and piping.
8. Transmission piping for the snowmelt pit to and from the ice refrigeration room and the snowmelt pit.
9. The snowmelt pit and drain will be constructed by the building contractor, but the snowmelt pit heating coil will be provided and installed by the ice rink contractor.

Other rink systems shown on the R (Rink) drawings, coordinated, and installed by the ice rink contractor include:

1. The refrigeration plant, including all equipment, piping, pumping, valves, wiring, and controls.
2. The refrigeration plant motor control panel.
3. The refrigeration leak detection system, including all wiring, sensors, controls, sound/strobe light alarms, emergency shutdowns and required fire department monitoring panelboards and signage.
4. All equipment, pumps, piping, wiring and controls for the condensing system.
5. All equipment, pumps, piping, wiring, and controls for the waste heat reclamation system.
6. All dasher boards and boxes including spectator shielding, team box rubber floor, benches, gates, and safety netting and accessories.

The ice rink contractor will have a project manager on site during all critical construction associated around the installation of the ice rink systems outlined above and will coordinate their systems installation with the general building systems construction.

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REVISION DATES (DESIGN STAGE ONLY)

Sheet Version 4.0

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

Stantec

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED •

BUREAU OF ENGINEERING
DEPARTMENT OF PUBLIC WORKS
CITY OF LOS ANGELES

VERTICAL CONTROL:
HORIZONTAL CONTROL:

SHEET TITLE: RINK COVER SHEET
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

NO.	REVISIONS:	DATE:	BY:

CIP NO.

INDEX NO.

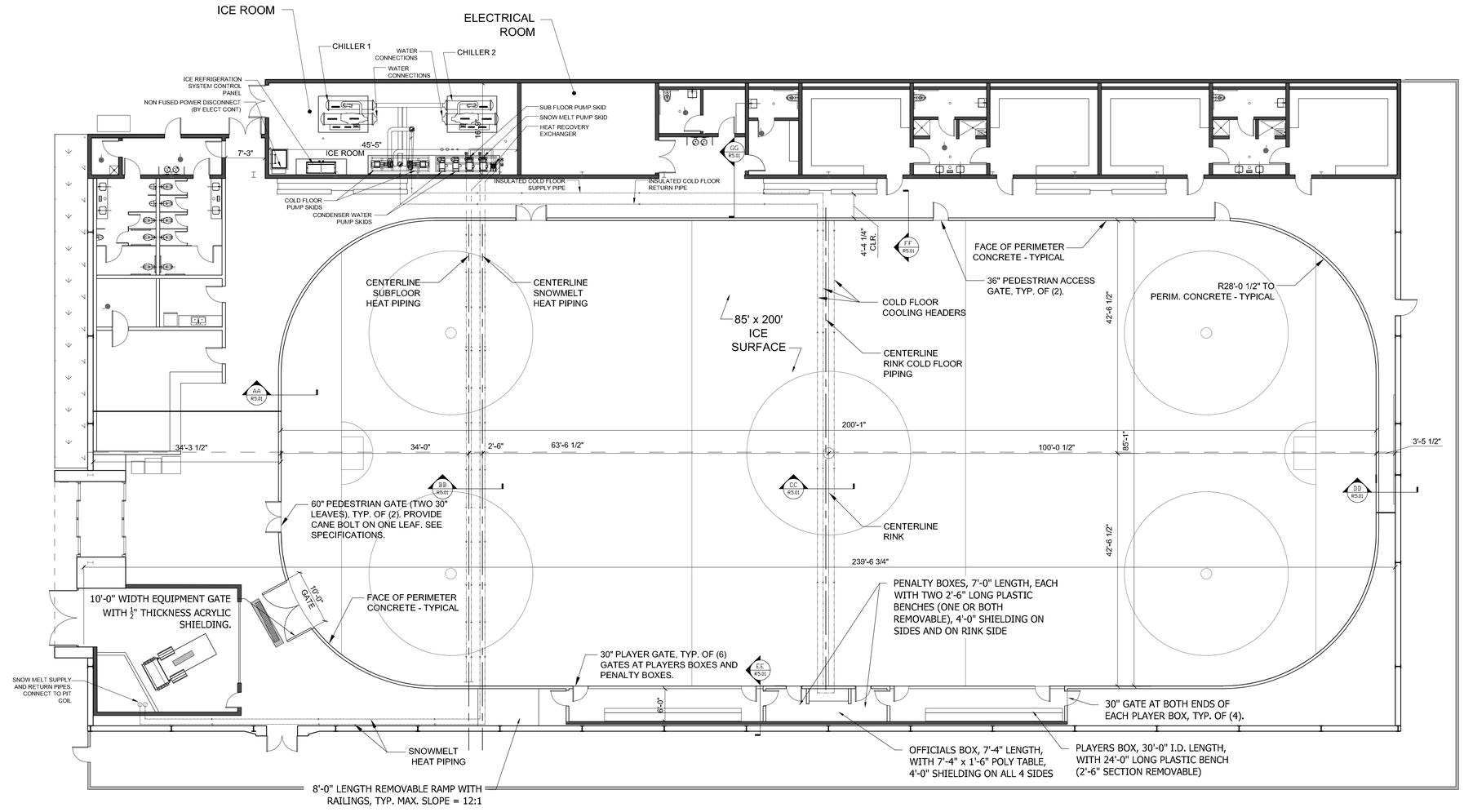
CITY ENGINEER
GARY LEE MOORE, P.E., ENV SP
DATE:

	DESIGN GROUP
ENGINEER:	JAMES R. MALAND
DESIGNED BY:	JAMES R. MALAND
DRAWN BY:	S. DUNLEAVY
CHECKED BY:	JAMES R. MALAND
APPROVED BY:	JAMES R. MALAND

WORK ORDER NO.
E170121B

SHEET NAME
R0.01
SHEET X OF X SHEETS

W:\1938\ACTIVE\193804962\CAD\DWG\193804962_R001.DWG 11/9/2021 9:57 AM



DASHER BOARD NOTES:

1. PROVIDE SUPPORTLESS-STYLE 1/2" THICKNESS TEMPERED GLASS SHIELDING ON SIDES OF RINK. HEIGHT SHALL BE 6'-0" ABOVE POLY CAP RAIL. SHIELDING PANELS SHALL INCLUDE ADDITIONAL HEIGHT EQUAL TO SUPPORTLESS CHANNEL DEPTH.
2. PROVIDE 5/8" THICKNESS TEMPERED GLASS SHIELDING WITH CLEAR ANODIZED ALUMINUM POSTS AT 4'-0" NOMINAL SPACING ON ENDS AND RADIUSSES OF RINK. HEIGHT SHALL BE 6'-0" ABOVE POLY CAP RAIL.
3. BLACK NYLON NETTING SHALL BE INSTALLED ON THE SPECTATOR SIDES, BOTH ENDS, AND ALL 4 RADIUSSES OF EACH RINK. NO NETTING IS REQUIRED ON THE BOX SIDES. NETTING HEIGHT SHALL BE 14'-0", OF WHICH 13'-6" SHALL EXTEND ABOVE THE TOP OF SHIELDING.
4. PROVIDE PORTABLE THRESHOLD RAMPS AT ALL 3'-4" WIDTH GATES. SEE SPECIFICATIONS FOR RAMP DIMENSIONS.

ICE RINK FLOOR PLAN

01

3/32" = 1'-0"

N

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REVISION DATES (DESIGN STAGE ONLY)

Sheet Version 4.0

W:\1938\ACTIVE\193804962\CAD\DWG\193804962_R101.DWG 11/9/2021 1:24 PM

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

Stantec

THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED

BUREAU OF ENGINEERING
VERTICAL CONTROL:
HORIZONTAL CONTROL:
SHEET TITLE: RINK LAYOUT
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

DEPARTMENT OF PUBLIC WORKS
CITY OF LOS ANGELES

NO.	REVISIONS:	DATE:	BY:

CIP NO.

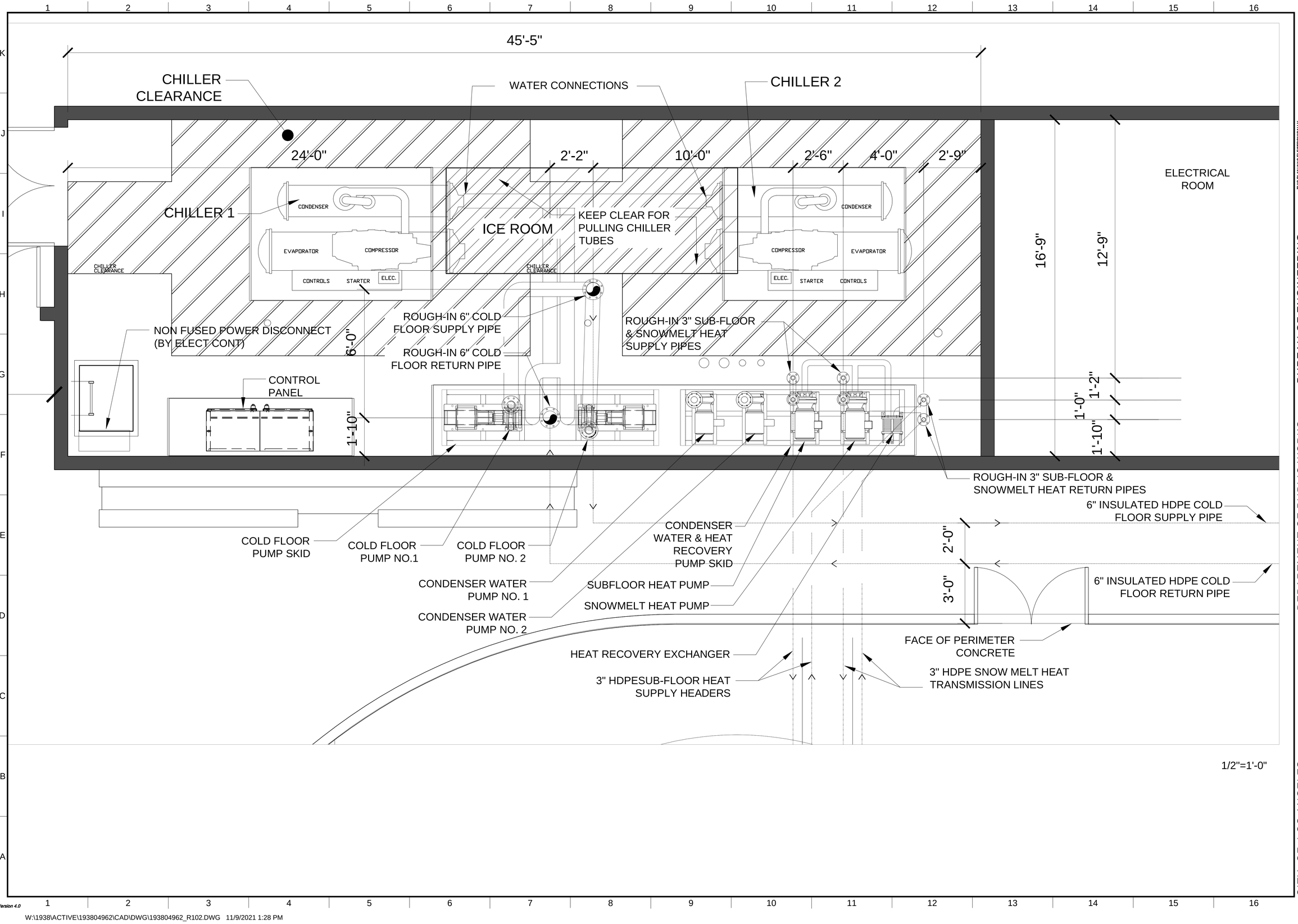
INDEX NO.

CITY ENGINEER: GARY LEE MOORE, P.E., ENV SP — DATE:

DESIGN GROUP	
ENGINEER:	JAMES R. MALAND
DESIGNED BY:	JAMES R. MALAND
DRAWN BY:	S. DUNLEAVY
CHECKED BY:	JAMES R. MALAND
APPROVED BY:	JAMES R. MALAND

WORK ORDER NO.
E170121B

SHEET NAME
R1.01
SHEET X OF X SHEETS



1/2"=1'-0"

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REVISION DATES (DESIGN STAGE ONLY)

Sheet Version 4.0

W:\1938\ACTIVE\193804962\CAD\DWG\193804962_R102.DWG 11/9/2021 1:28 PM

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Design

Stantec

THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED

DEPARTMENT OF PUBLIC WORKS
CITY OF LOS ANGELES
BUREAU OF ENGINEERING

VERTICAL CONTROL:
HORIZONTAL CONTROL:

SHEET TITLE: RINK EQUIPMENT ROOM
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

NO.	REVISIONS:	DATE:	BY:

CIP NO.

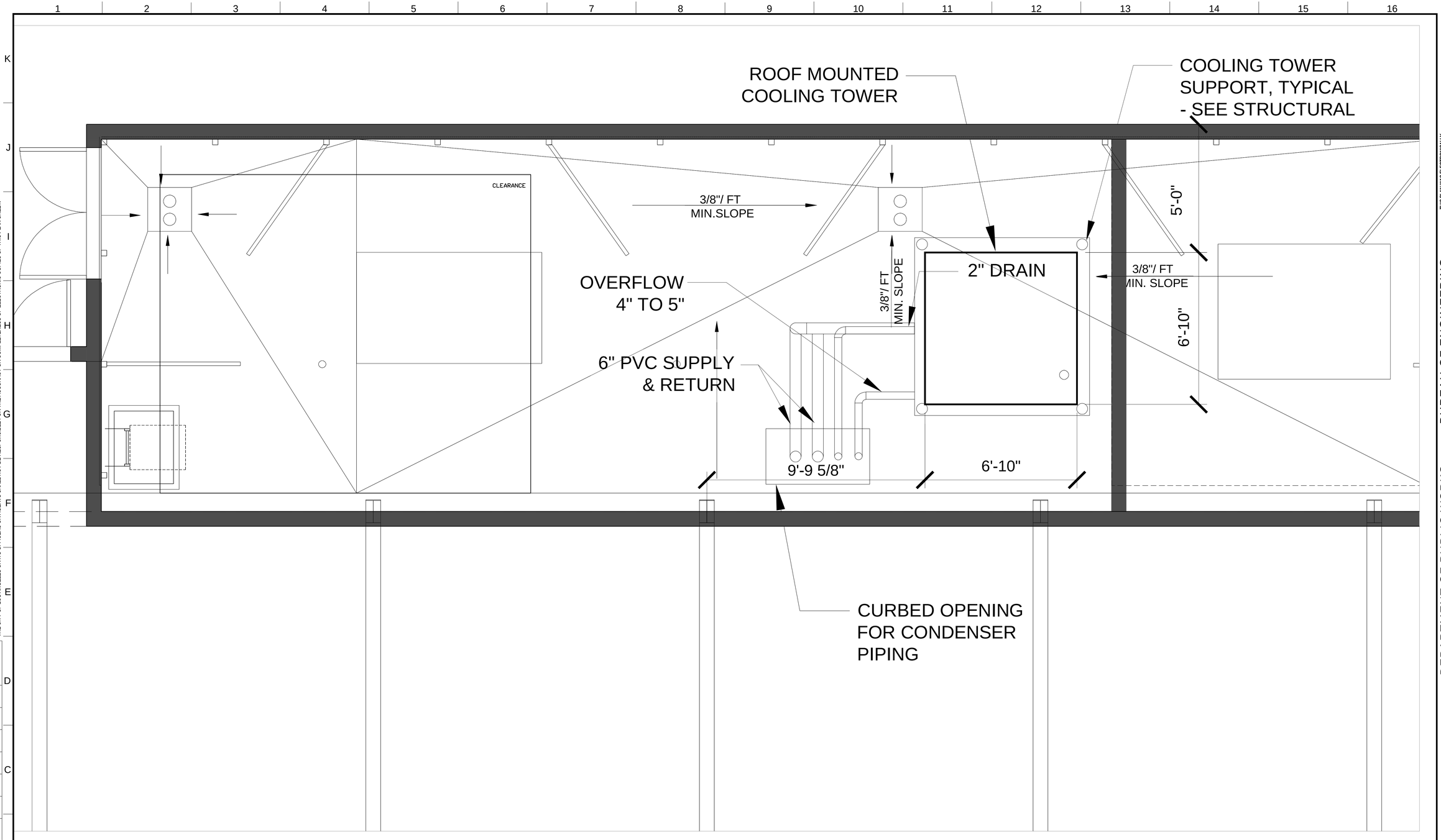
INDEX NO.

CITY ENGINEER: GARY LEE MOORE, P.E., ENV SP — DATE:

DESIGN GROUP	
ENGINEER:	JAMES R. MALAND
DESIGNED BY:	JAMES R. MALAND
DRAWN BY:	S. DUNLEAVY
CHECKED BY:	JAMES R. MALAND
APPROVED BY:	JAMES R. MALAND

WORK ORDER NO.
E170121B

SHEET NAME
R1.02
SHEET X OF X SHEETS



THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REVISION DATES
(DESIGN STAGE ONLY)

Sheet Version 4.0

W:\1938\ACTIVE\193804962\CAD\DWG\193804962_R103.DWG 11/9/2021 1:26 PM

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

Stantec

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED •

DEPARTMENT OF PUBLIC WORKS
BUREAU OF ENGINEERING
CITY OF LOS ANGELES

VERTICAL CONTROL:
HORIZONTAL CONTROL:

SHEET TITLE: RINK ROOF-TOP CONDENSER

PROJECT: RESEDA SKATE FACILITY

ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

NO.	REVISIONS:	DATE:	BY:

CIP NO.

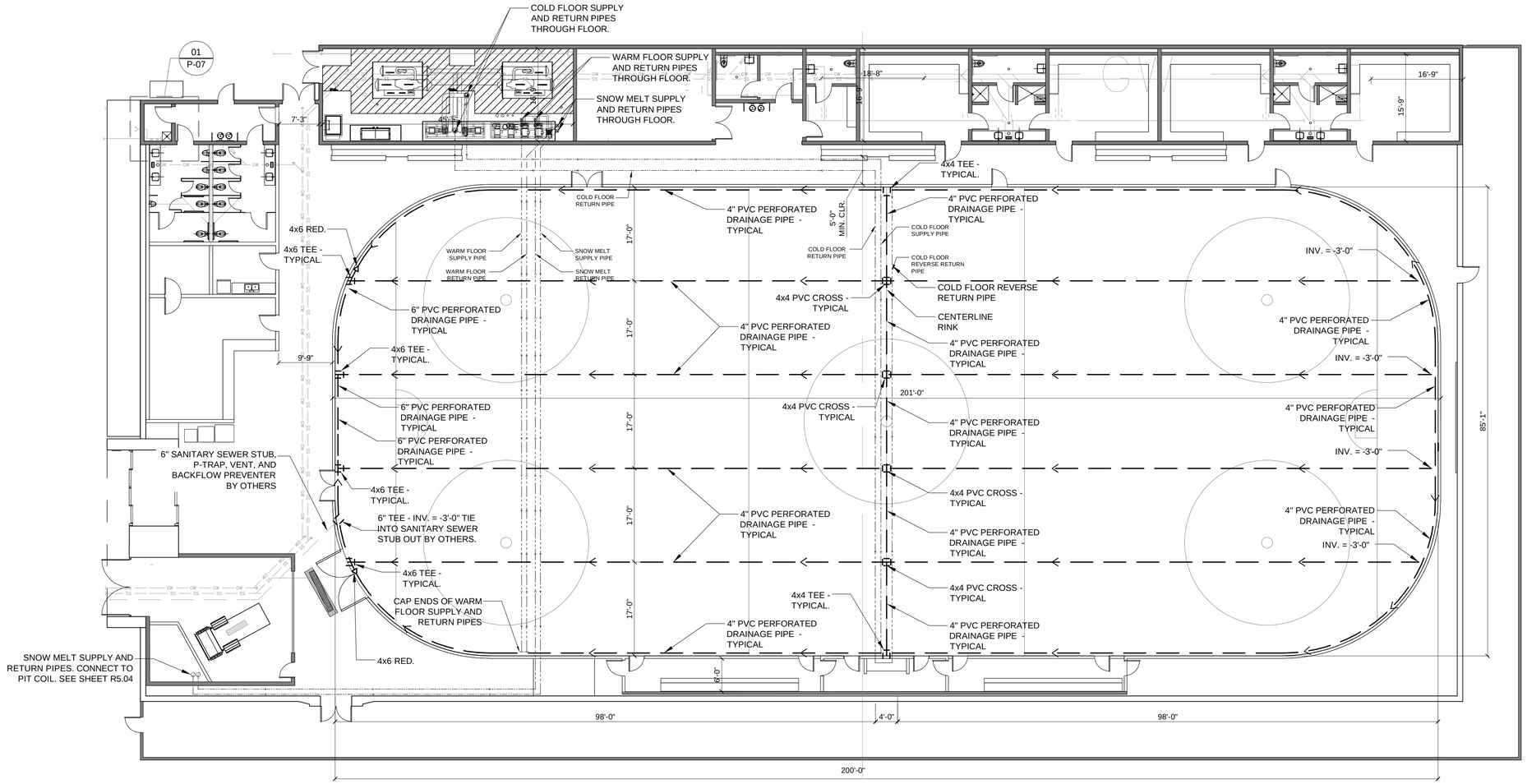
INDEX NO.

CITY ENGINEER: GARY LEE MOORE, P.E., ENV SP
DATE:

	DESIGN GROUP
ENGINEER:	JAMES R. MALAND
DESIGNED BY:	JAMES R. MALAND
DRAWN BY:	S. DUNLEAVY
CHECKED BY:	JAMES R. MALAND
APPROVED BY:	JAMES R. MALAND

WORK ORDER NO.
E170121B

SHEET NAME
R1.03
SHEET X OF X SHEETS



NOTES:

1. RINK FLOOR DRAINAGE PIPE TO BE 4" PERFORATED PIPE - TYPICAL EXCEPT AS SHOWN.
2. DRAINAGE TRANSMISSION PIPE TO BE 8" SCHEDULE 40. BED DRAINAGE PIPING IN CLEAN SAND, AND COMPACT - TYPICAL.
3. SEE SECTIONS E-E AND F-F ON SHEET R5.01.
4. ALL PERFORATED PIPE TO BE INSTALLED WITH INVERT EQUAL TO -3'-0".
5. RESEDA SKATING FACILITY FLOOR ELEVATION = 0'-0"

RINK SUBSOIL DRAINAGE PLAN

01

REF: --

SCALE: 3/32" = 1'-0"

N

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REVISION DATES (DESIGN STAGE ONLY)

Sheet Version 4.0

W:\1938\ACTIVE\193804962\CAD\DWG\193804962_R104.DWG 11/19/2021 1:57 PM

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

Stantec

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED •

DEPARTMENT OF PUBLIC WORKS
BUREAU OF ENGINEERING

VERTICAL CONTROL:
HORIZONTAL CONTROL:

SHEET TITLE: RINK SUBSOIL DRAINAGE PLAN
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

NO.	REVISIONS:	DATE:	BY:

CIP NO.

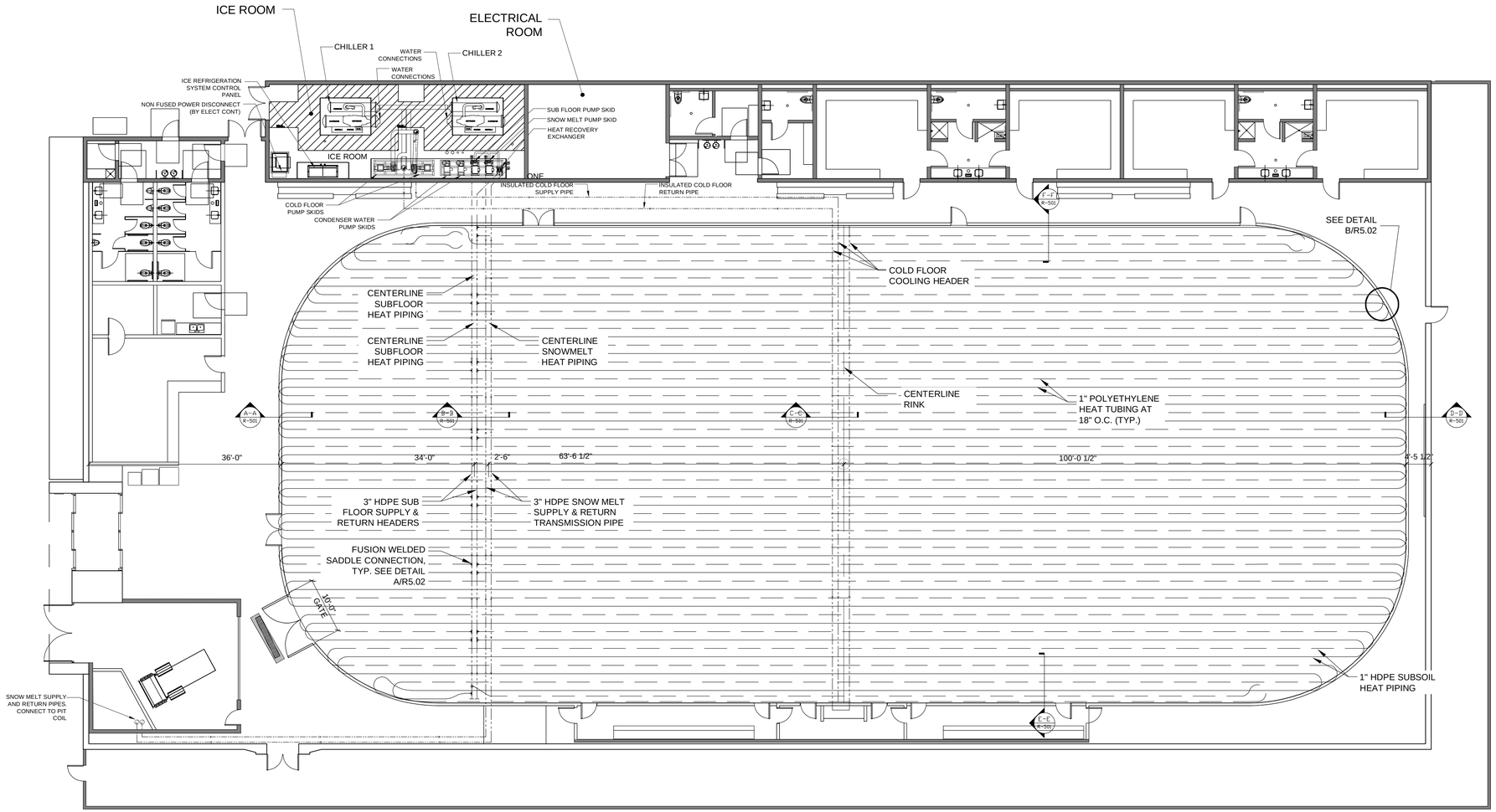
INDEX NO.

CITY OF LOS ANGELES
GARY LEE MOORE, P.E., ENV SP
CITY ENGINEER

DESIGN GROUP	DATE:
ENGINEER: JAMES R. MALAND	
DESIGNED BY: JAMES R. MALAND	
DRAWN BY: S. DUNLEAVY	
CHECKED BY: JAMES R. MALAND	
APPROVED BY: JAMES R. MALAND	

WORK ORDER NO.
E170121B

SHEET NAME
R1.04
SHEET X OF X SHEETS



RINK SUBSOIL & SNOWMELT HEATING PLAN

REF: --

SCALE: 3/32" = 1'-0"

01

NOTES:
1. SUBSOIL HEATING PIPING JOINTS SHALL BE FUSION WELDED. JOINTS IN THE 1" HEAT PIPING SHALL OCCUR ONLY AT CONNECTIONS TO HEADERS.
2. PRESSURE TESTING OF SUBSOIL HEATING PIPING SHALL BE COMPLETED PRIOR TO BACKFILLING WITH CLEAN SAND.
3. PROVIDE SUBSOIL TEMPERATURE SENSOR. SEE DETAIL C/R5-02

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REVISION DATES (DESIGN STAGE ONLY)

Sheet Version 4.0

W:\1938\ACTIVE\193804962\CAD\DWG\193804962_R105.DWG 11/9/2021 1:29 PM

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

Stantec

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED •

DEPARTMENT OF PUBLIC WORKS
BUREAU OF ENGINEERING

VERTICAL CONTROL:
HORIZONTAL CONTROL:

SHEET TITLE: RINK SUBSOIL & SNOWMELT HEATING PLAN
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

NO.	REVISIONS:	DATE:	BY:

CIP NO.

INDEX NO.

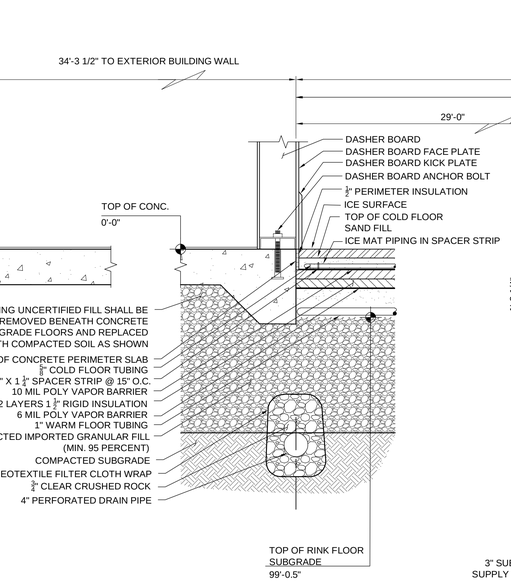
CITY OF LOS ANGELES
DEPARTMENT OF PUBLIC WORKS

CITY ENGINEER: GARY LEE MOORE, P.E., ENV SP — DATE:

	DESIGN GROUP
ENGINEER:	JAMES R. MALAND
DESIGNED BY:	JAMES R. MALAND
DRAWN BY:	S. DUNLEAVY
CHECKED BY:	JAMES R. MALAND
APPROVED BY:	JAMES R. MALAND

WORK ORDER NO.
E170121B

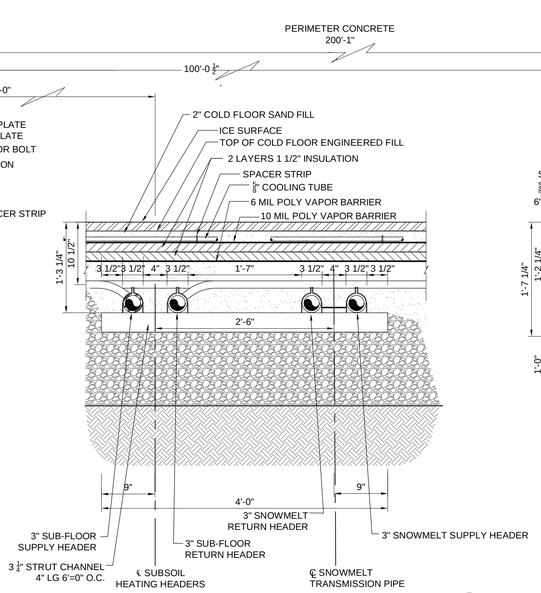
SHEET NAME
R1.05
SHEET X OF X SHEETS



A-A

RINK EDGE DETAIL

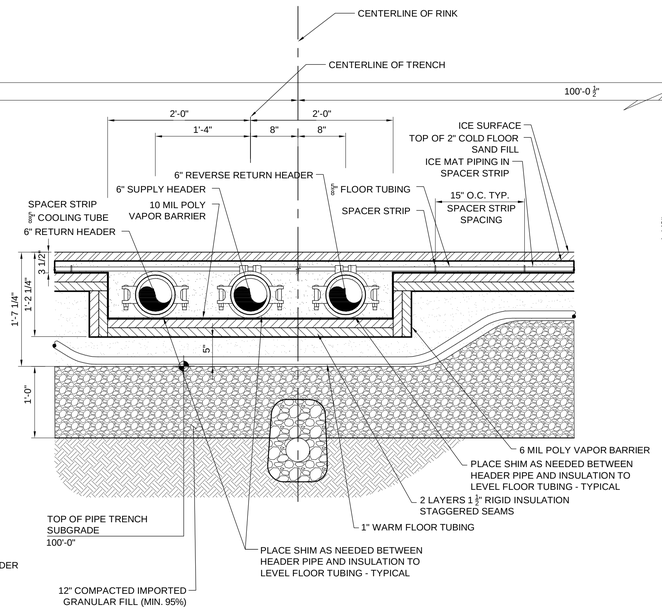
REF: XXX SCALE: 1" = 1'-0"



B-B

SUBSOIL/SNOW MELT HEAT DETAIL

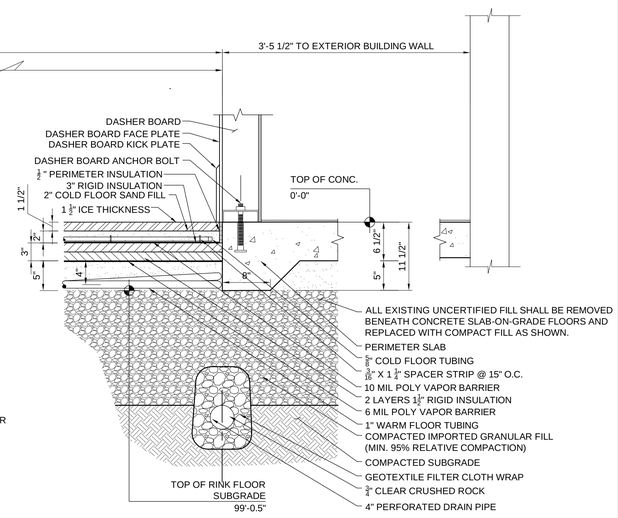
REF: XXX SCALE: 1" = 1'-0"



C-C

COOLING HEADER DETAIL

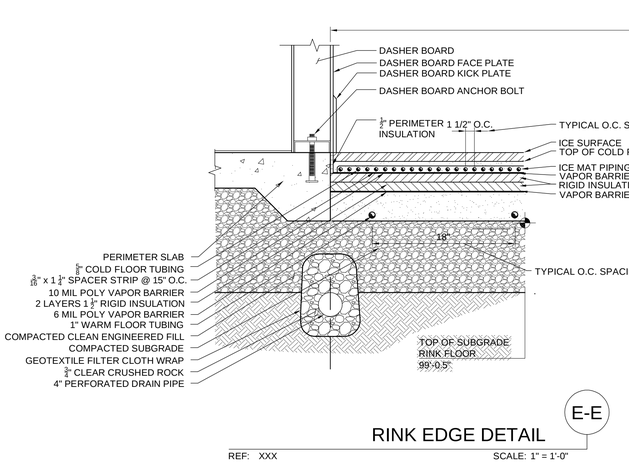
REF: XXX SCALE: 1" = 1'-0"



D-D

RINK EDGE DETAIL

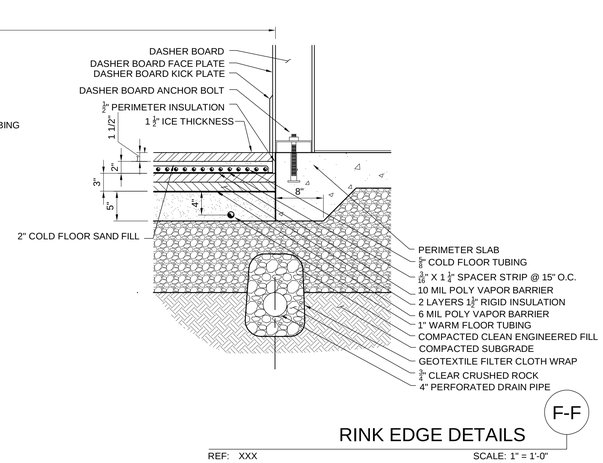
REF: XXX SCALE: 1" = 1'-0"



E-E

RINK EDGE DETAIL

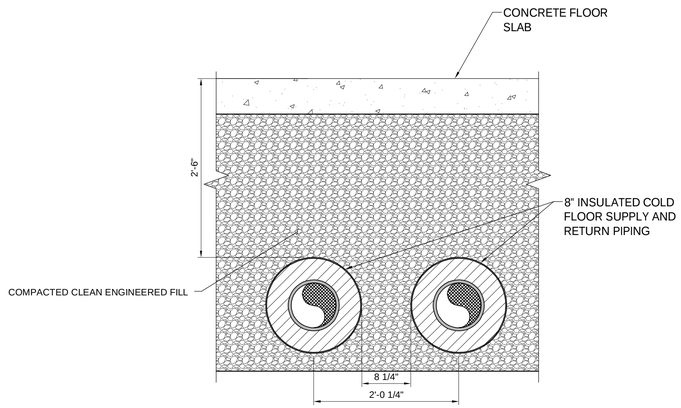
REF: XXX SCALE: 1" = 1'-0"



F-F

RINK EDGE DETAILS

REF: XXX SCALE: 1" = 1'-0"



G-G

COLD FLOOR TRANSMISSION PIPE TRENCH

REF: XXX SCALE: 1" = 1'-0"

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REVISION DATES (DESIGN STAGES ONLY)

Sheet Version 4.0

W:\1938\ACTIVE\193804962\CAD\DWG\193804962_R501.DWG 11/10/2021 8:12 PM

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

Stantec

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED •

BUREAU OF ENGINEERING
VERTICAL CONTROL:
HORIZONTAL CONTROL:
SHEET TITLE: RINK DETAILS
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

DEPARTMENT OF PUBLIC WORKS
CITY OF LOS ANGELES

NO.	REVISIONS:	BY:	DATE:

CIP NO.

INDEX NO.

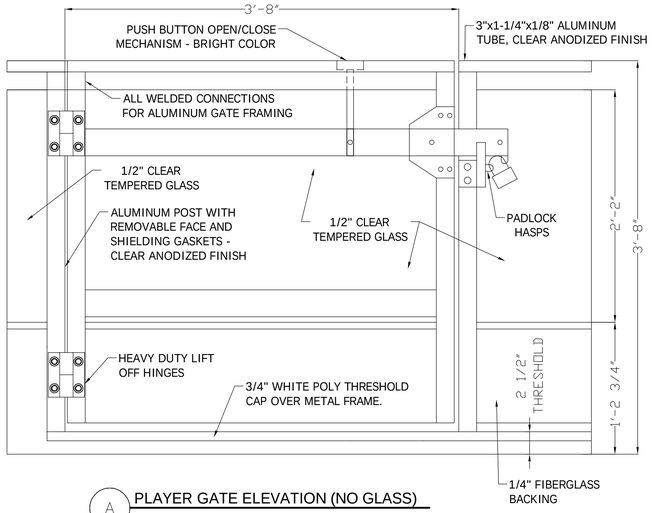
CITY ENGINEER
DATE:

GARY LEE MOORE, P.E., ENV SP
DESIGN GROUP

ENGINEER:	JAMES R. MALAND
DESIGNED BY:	JAMES R. MALAND
DRAWN BY:	S. DUNLEAVY
CHECKED BY:	JAMES R. MALAND
APPROVED BY:	JAMES R. MALAND

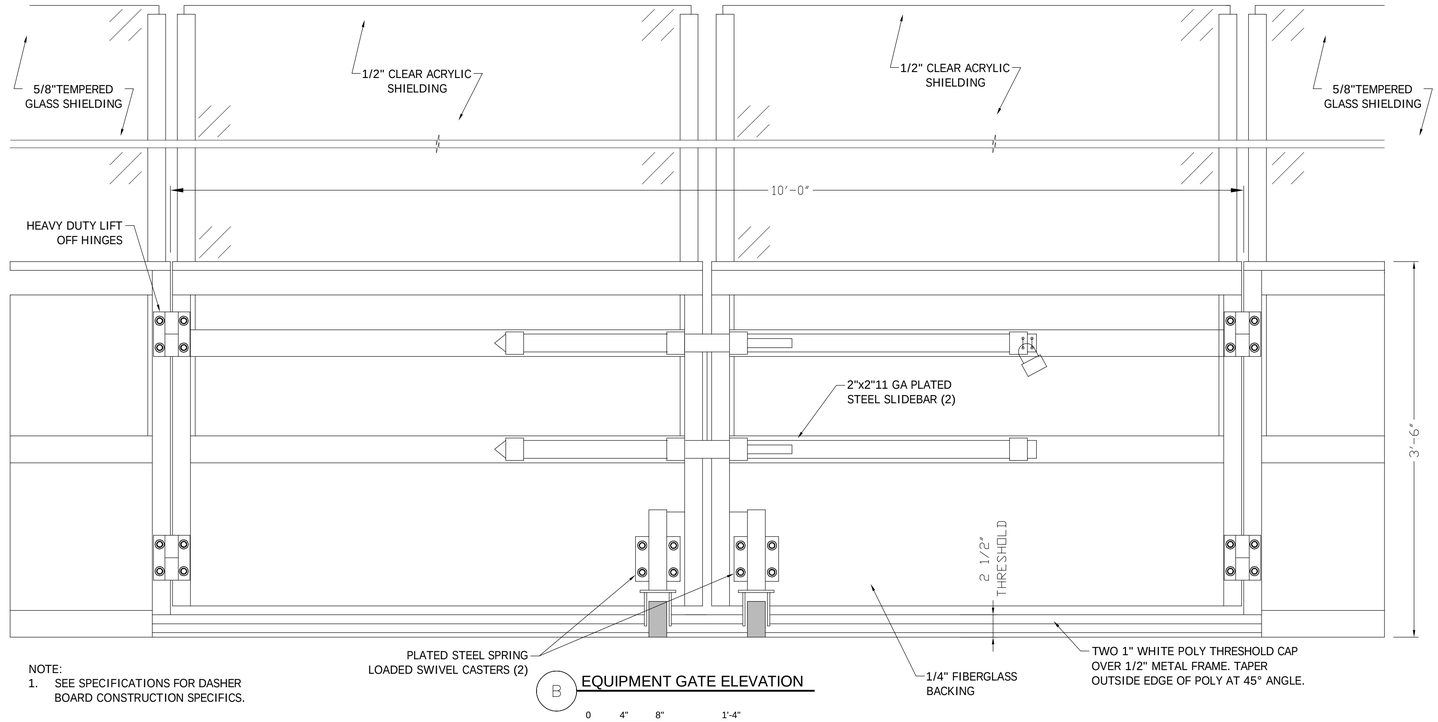
WORK ORDER NO.
E170121B

SHEET NAME
R5.01
SHEET X OF X SHEETS



A PLAYER GATE ELEVATION (NO GLASS)

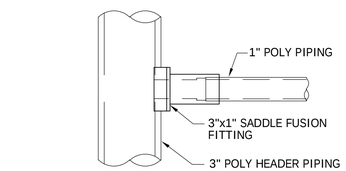
0 4" 8" 1'-4"



NOTE:
1. SEE SPECIFICATIONS FOR DASHER BOARD CONSTRUCTION SPECIFICS.

B EQUIPMENT GATE ELEVATION

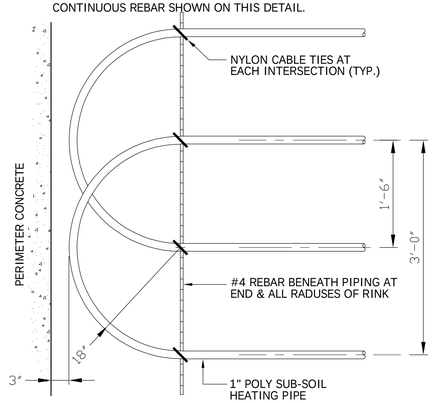
0 4" 8" 1'-4"



C SADDLE FUSION FITTING

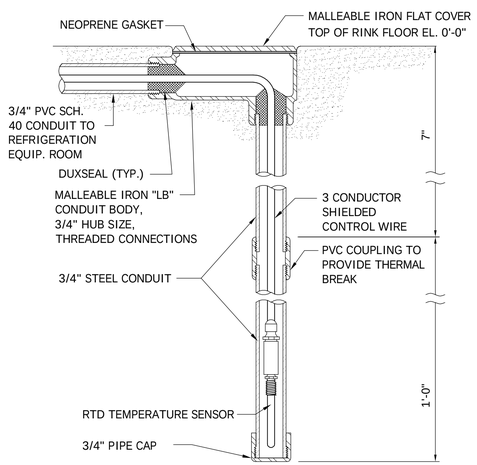
0 2" 4" 8"

NOTE:
AT CONTRACTOR'S OPTION, INDIVIDUAL PIPING ANCHORS MAY BE PLACED AT EACH RETURN BEND LOCATION IN PLACE OF THE CONTINUOUS REBAR SHOWN ON THIS DETAIL.



D DETAIL

0 6" 1' 2'



E SUB-SOIL TEMPERATURE SENSOR
NO SCALE

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REVISION DATES: (DESIGN STAGES ONLY)

Sheet Version 4.0

W:\1938\ACTIVE\193804962\CAD\DWG\193804962_R501.DWG 11/10/2021 7:21 PM

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

Stantec

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED •

BUREAU OF ENGINEERING
VERTICAL CONTROL:
HORIZONTAL CONTROL:
SHEET TITLE: RINK DETAILS
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

DEPARTMENT OF PUBLIC WORKS
CITY OF LOS ANGELES

NO.	REVISIONS:	DATE:	BY:

CIP NO.

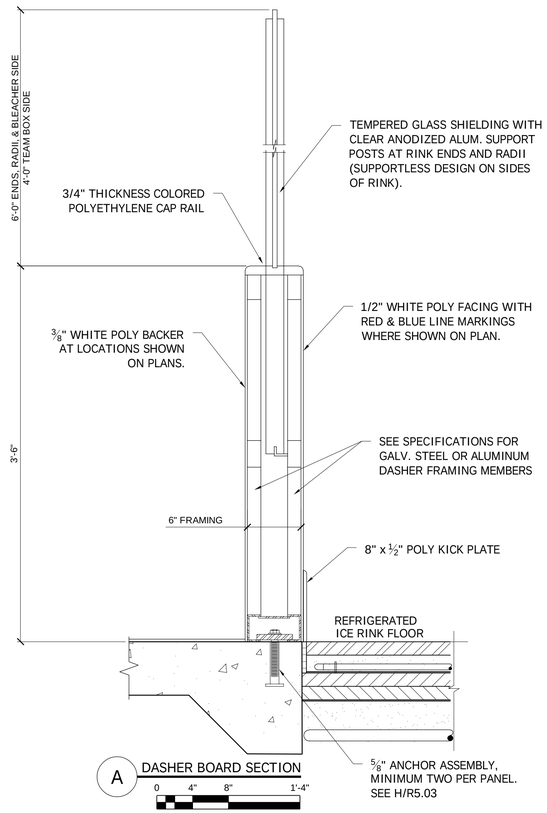
INDEX NO.

CITY ENGINEER
GARY LEE MOORE, P.E., ENV SP
DATE:

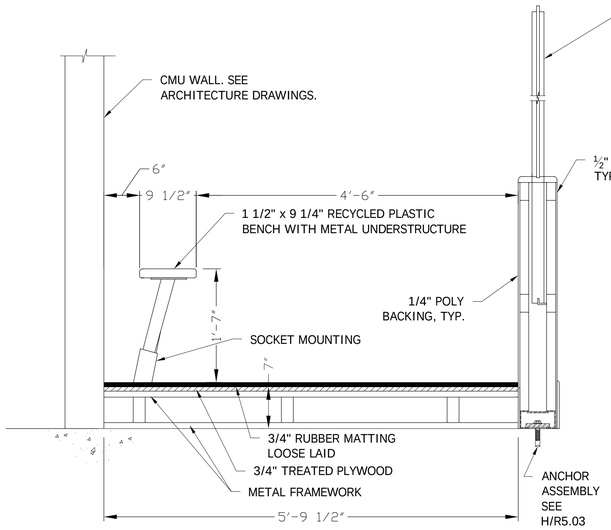
	DESIGN GROUP
ENGINEER:	JAMES R. MALAND
DESIGNED BY:	JAMES R. MALAND
DRAWN BY:	S. DUNLEAVY
CHECKED BY:	JAMES R. MALAND
APPROVED BY:	JAMES R. MALAND

WORK ORDER NO.
E170121B

SHEET NAME
R5.02
SHEET X OF X SHEETS

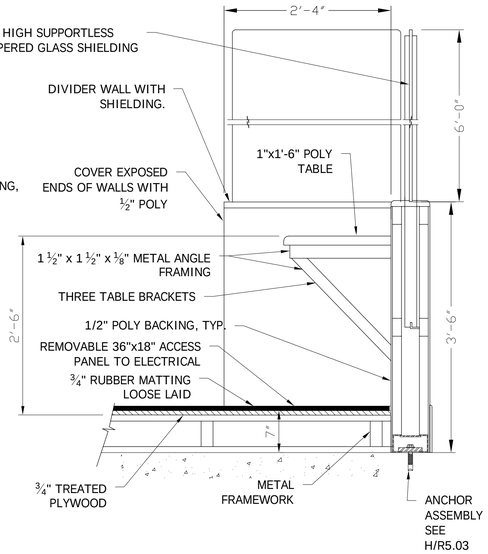


A DASHER BOARD SECTION



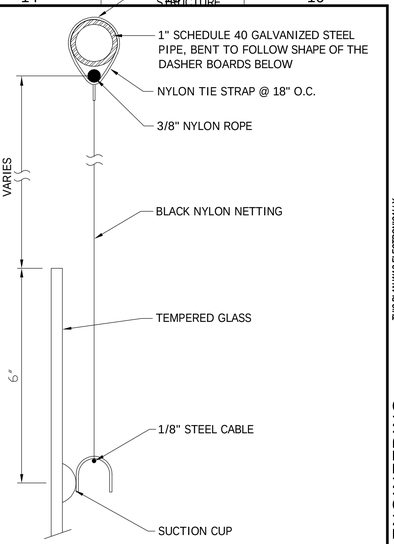
B PENALTY BOX SECTION

0 6" 1' 2'



C OFFICIALS BOX SECTION

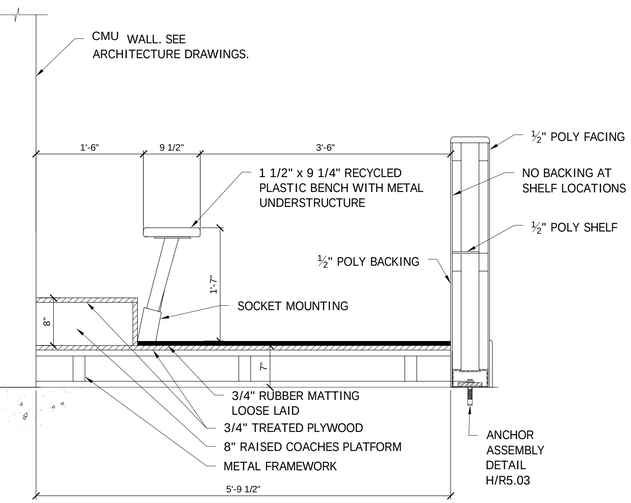
0 6" 1' 2'



NOTES:
1. NETTING TO BE INSTALLED AT LOCATIONS SHOWN ON DRAWINGS.
2. CONNECT NETTING SUPPORT TUBE TO CEILING STRUCTURE WITH 3/16" GALV. STEEL CABLES AT MAX. 8 FT. SPACING.

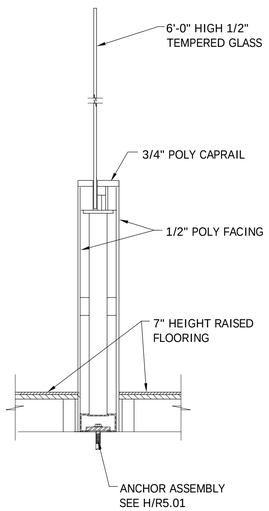
D NETTING SUPPORT DETAIL

0 1" 2" 4"



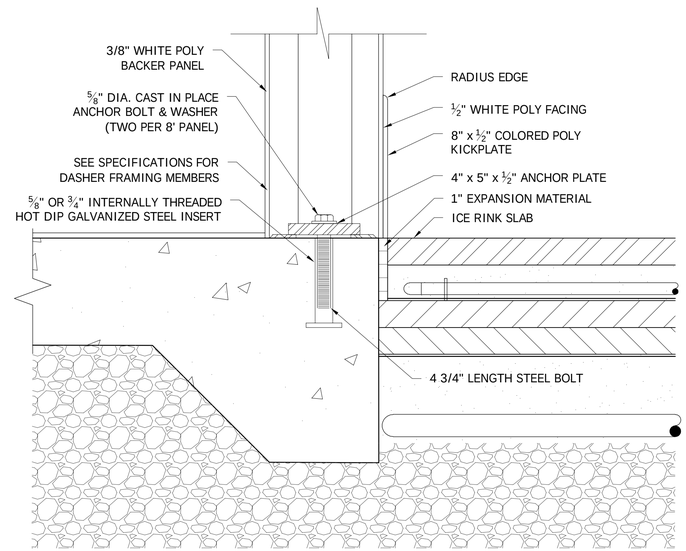
E PLAYERS BOX SECTION

0 6" 1' 2'



F SECTION

0 6" 1' 2'



H DASHER ANCHOR DETAIL

0 2" 4" 8"

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

Stantec

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED •

CITY OF LOS ANGELES
DEPARTMENT OF PUBLIC WORKS
BUREAU OF ENGINEERING

VERTICAL CONTROL:
HORIZONTAL CONTROL:

SHEET TITLE: RINK DETAILS
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

NO.	REVISIONS:	DATE:	BY:

CIP NO.

INDEX NO.

CITY OF LOS ANGELES
CITY ENGINEER
GARY LEE MOORE, P.E., ENV SP
DATE:

	DESIGN GROUP
ENGINEER:	JAMES R. MALAND
DESIGNED BY:	JAMES R. MALAND
DRAWN BY:	S. DUNLEAVY
CHECKED BY:	JAMES R. MALAND
APPROVED BY:	JAMES R. MALAND

WORK ORDER NO.
E170121B

SHEET NAME
R5.03
SHEET X OF X SHEETS

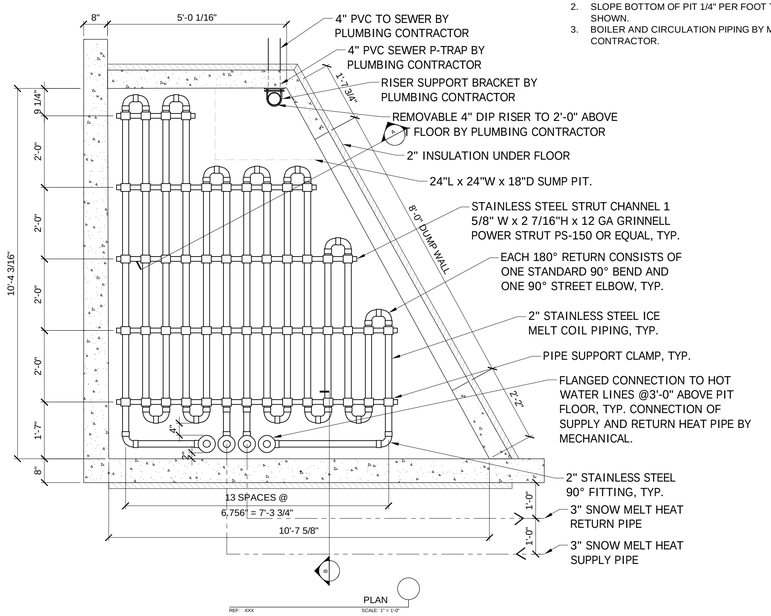
THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

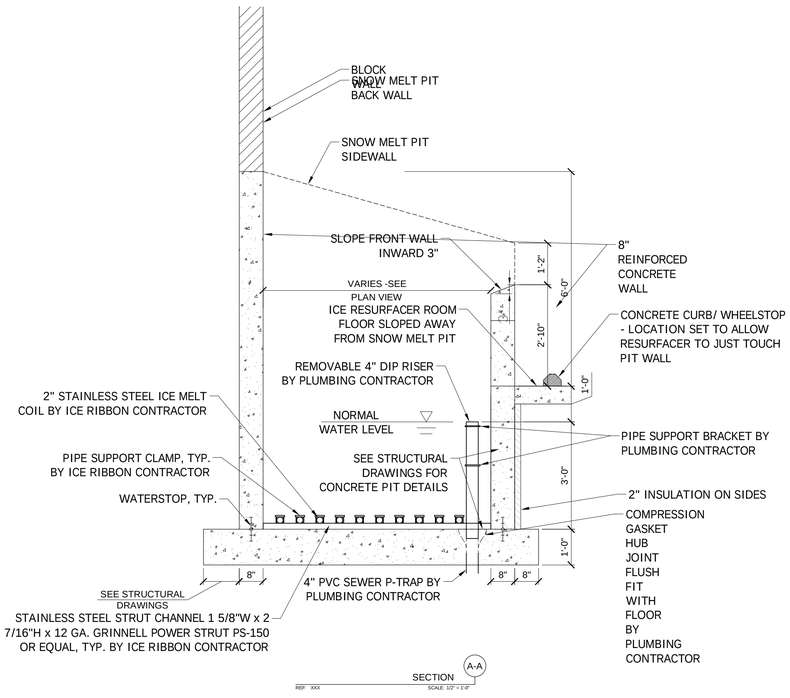
REVISION DATES: (DESIGN STAGE ONLY)

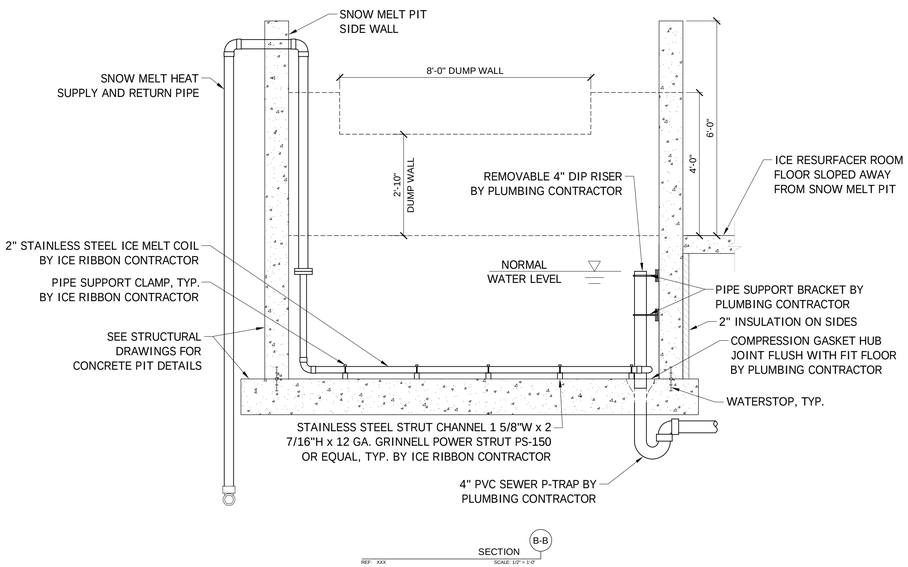
Sheet Version 4.0

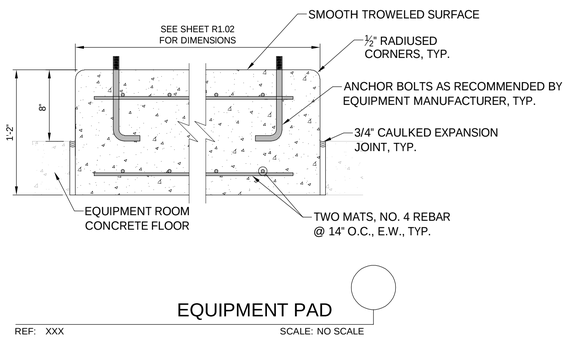
W:\1938\ACTIVE\193804962\CAD\DWG\193804962_R501.DWG 11/9/2021 1:33 PM

NOTES:
1. SERPENTINE HEATING COIL BY ICE RIBBON CONTRACTOR.
2. SLOPE BOTTOM OF PIT 1/4" PER FOOT TOWARDS DRAIN AS SHOWN.
3. BOILER AND CIRCULATION PIPING BY MECHANICAL CONTRACTOR.









THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REVISION DATES (DESIGN STAGE ONLY)

Sheet Version 4.0

W:\1938\ACTIVE\193804962\CAD\DWG\193804962_R501.DWG 11/9/2021 1:38 PM

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

Stantec

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED •

BUREAU OF ENGINEERING
VERTICAL CONTROL:
HORIZONTAL CONTROL:
SHEET TITLE: RINK DETAILS
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

DEPARTMENT OF PUBLIC WORKS
NO. | REVISIONS: | DATE: | BY:

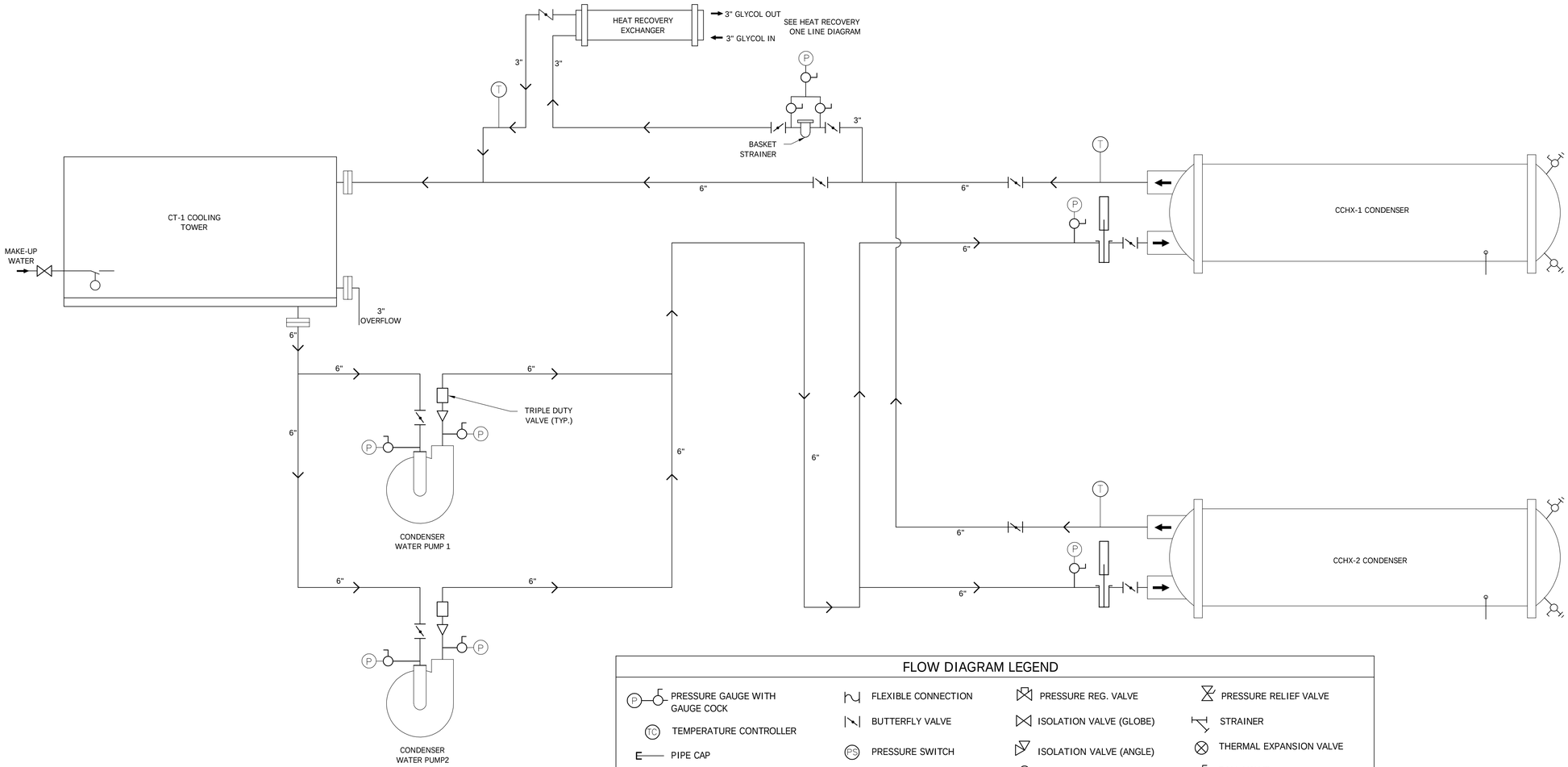
CIP NO.

INDEX NO.

CITY OF LOS ANGELES
GARY LEE MOORE, P.E., ENV SP
CITY ENGINEER
DATE:
DESIGN GROUP
ENGINEER: JAMES R. MALAND
DESIGNED BY: JAMES R. MALAND
DRAWN BY: S. DUNLEAVY
CHECKED BY: JAMES R. MALAND
APPROVED BY: JAMES R. MALAND

WORK ORDER NO.
E170121B

SHEET NAME
R5.04
SHEET X OF X SHEETS



A CONDENSER ONE LINE DIAGRAM

FLOW DIAGRAM LEGEND

- PRESSURE GAUGE WITH GAUGE COCK
- TEMPERATURE CONTROLLER
- PIPE CAP
- HEATER
- THREE-WAY VALVE
- F.M. FLOW METER
- FLEXIBLE CONNECTION
- BUTTERFLY VALVE
- PRESSURE SWITCH
- FLOW SWITCH
- THERMOMETER AND TEMP. WELL
- AIR RELIEF VALVE
- PRESSURE REG. VALVE
- ISOLATION VALVE (GLOBE)
- ISOLATION VALVE (ANGLE)
- SOLENOID VALVE
- CHECK VALVE
- TEMPERATURE SENSOR
- PRESSURE RELIEF VALVE
- STRAINER
- THERMAL EXPANSION VALVE
- BALL VALVE
- CONTROL VALVE CV1
- SERVICE/RECOVERY VALVE

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REVISION DATES (DESIGN STAGE ONLY)

Sheet Version 4.0

W:\1938\ACTIVE\193804962\CAD\DWG\193804962_R601.DWG 11/9/2021 1:39 PM

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

Stantec

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED •

DEPARTMENT OF PUBLIC WORKS
BUREAU OF ENGINEERING

VERTICAL CONTROL:
HORIZONTAL CONTROL:

SHEET TITLE: RINK DETAILS
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

NO.	REVISIONS:	DATE:	BY:

CIP NO.

INDEX NO.

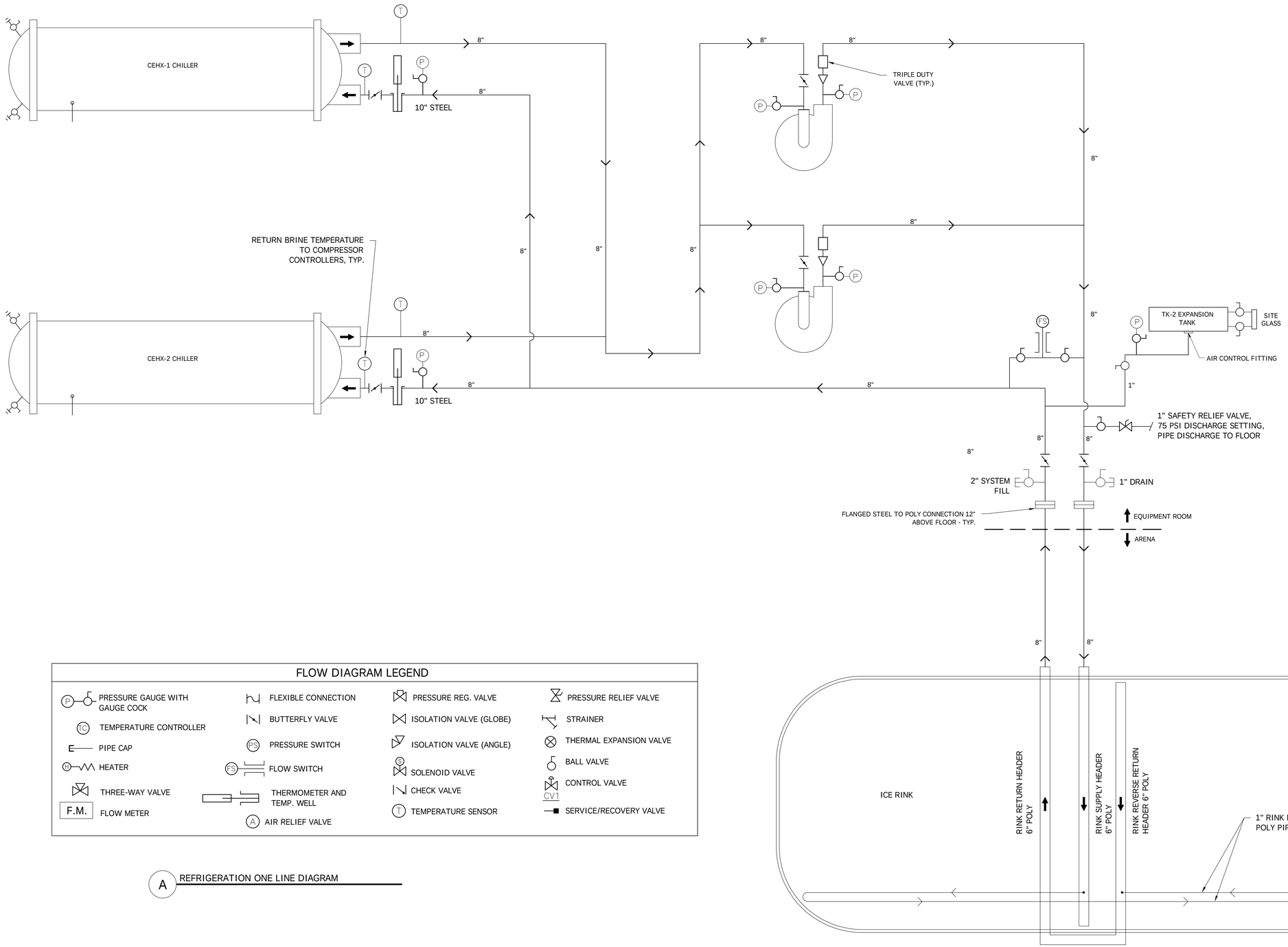
CITY OF LOS ANGELES
CITY ENGINEER: GARY LEE MOORE, P.E., ENV SP
DATE:

	DESIGN GROUP
ENGINEER:	JAMES R. MALAND
DESIGNED BY:	JAMES R. MALAND
DRAWN BY:	S. DUNLEAVY
CHECKED BY:	JAMES R. MALAND
APPROVED BY:	JAMES R. MALAND

WORK ORDER NO.
E170121B

SHEET NAME
R6.01
SHEET X OF X SHEETS

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.



FLOW DIAGRAM LEGEND

- PRESSURE GAUGE WITH GAUGE COCK
- TEMPERATURE CONTROLLER
- PIPE CAP
- HEATER
- THREE-WAY VALVE
- FLOW METER
- FLEXIBLE CONNECTION
- BUTTERFLY VALVE
- PRESSURE SWITCH
- FLOW SWITCH
- THERMOMETER AND TEMP. WELL
- AIR RELIEF VALVE
- PRESSURE REG. VALVE
- ISOLATION VALVE (GLOBE)
- ISOLATION VALVE (ANGLE)
- SOLENOID VALVE
- CHECK VALVE
- TEMPERATURE SENSOR
- PRESSURE RELIEF VALVE
- STRAINER
- THERMAL EXPANSION VALVE
- BALL VALVE
- CONTROL VALVE
- SERVICE/RECOVERY VALVE

A REFRIGERATION ONE LINE DIAGRAM

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

Stantec

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED •

BUREAU OF ENGINEERING
DEPARTMENT OF PUBLIC WORKS
CITY OF LOS ANGELES

VERTICAL CONTROL:
HORIZONTAL CONTROL:
SHEET TITLE: RINK DETAILS
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

NO. | REVISIONS: | DATE: | BY:

CIP NO.
INDEX NO.

CITY ENGINEER
DATE:
GARY LEE MOORE, P.E., ENV SP
DESIGN GROUP
ENGINEER: JAMES R. MALAND
DESIGNED BY: JAMES R. MALAND
DRAWN BY: S. DUNLEAVY
CHECKED BY: JAMES R. MALAND
APPROVED BY: JAMES R. MALAND

WORK ORDER NO.
E170121B

SHEET NAME
R6.02
SHEET X OF X SHEETS

REVISION DATES (DESIGN STAGE ONLY)

Sheet Version 4.0

W:\1938\ACTIVE\193804962\CAD\DWG\193804962_R601.DWG 11/9/2021 1:40 PM

ICE SYSTEM PUMPS

NO.	DESCRIPTION	MANUFACTURER	MODEL	GPM	TDH (FT)	MOTOR	RPM	VOLT/PH/FREQ.	FLUID	COMMENTS
P1	COLD FLOOR PUMP	GRUNDFOSS	LF-40707 5"x4"	1283	83	40 HP	3550	460/3/60	40% ETHYLENE GLYCOL	VAR. SPEED
P2	COLD FLOOR PUMP	GRUNDFOSS	LF-40707 5"x4"	1283	83	40 HP	3550	460/3/60	40% ETHYLENE GLYCOL	VAR. SPEED
P3	CONDENSER WATER PUMP	GRUNDFOSS	LC-40707 5"x4"	464	40	7.5 HP	1755	460/3/60	WATER	VAR. SPEED
P4	CONDENSER WATER PUMP	GRUNDFOSS	LC-40707 5"x4"	464	40	7.5 HP	1755	460/3/60	WATER	VAR. SPEED
P5	WARM FLOOR PUMP	GRUNDFOSS PACO	IO-20709-130008-1562P 2.5"x2"	150	35	2 HP	1800	460/3/60	40% ETHYLENE GLYCOL	
P6	SNOW MELT PUMP	GRUNDFOSS	LC-12709 1.5"x1.25"	90	35	1.5 HP	1765	460/3/60	40% ETHYLENE GLYCOL	

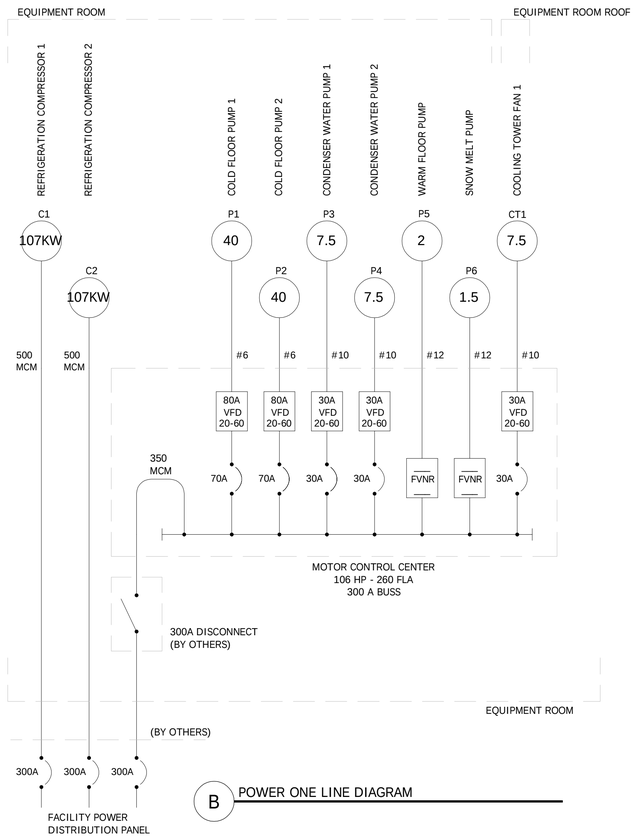
PACKAGED CHILLERS

NO.	TYPE	MANUFACTURER	MODEL	NUMBER OF CIRCUITS	REFRIGERANT	CAPACITY TONS	EVAPORATOR LEAVING TEMP	EVAPORATOR ENTERING TEMP	EVAPORATOR FLOW (GPM)	CONDENSER LEAVING TEMP	CONDENSER ENTERING TEMP	CONDENSER FLOW (GPM)	VOLT/PH/FREQ.	ELECTRICAL MCA -MOCP AMPERAGE
C1	SCREW	TRANE	RTHD 120	1	R513A	70	15 °F	18 °F	641.5	95 °F	240 °F	641.5	460/3/60	183-300
C2	SCREW	TRANE	RTHD 120	1	R513A	70	15 °F	18 °F	641.5	95 °F	240 °F	641.5	460/3/60	183-300

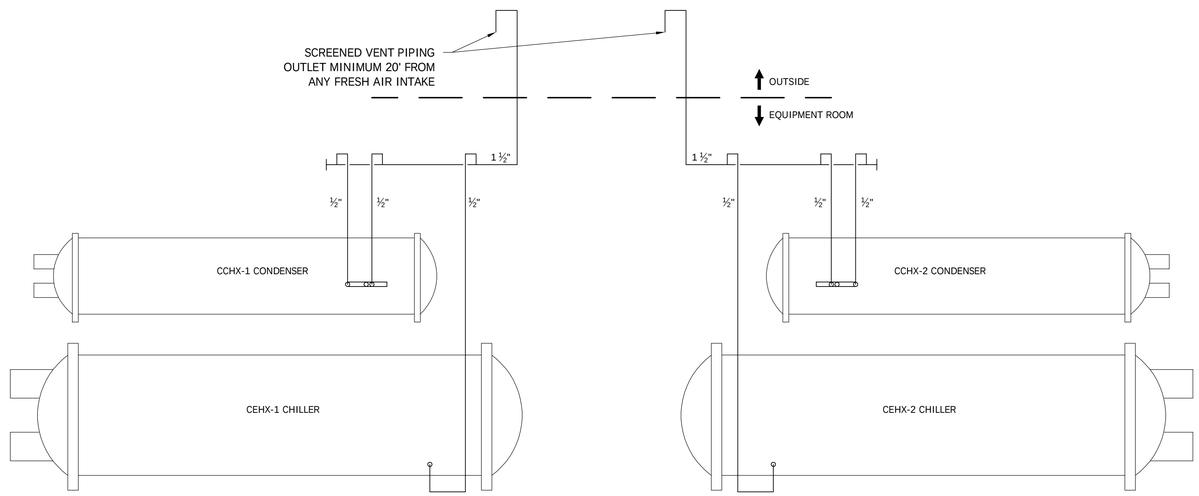
COOLING TOWER

NO.	MANUFACTURER	MODEL	EWT	LWT	WET BULB	SPRAY WATER FLOW	FAN MOTOR	VFD	AIR FLOW	COMMENTS
CT1	KORYTKO	KDI-0606A-7.5-1	95.0 °F	85.0 °F	72.0 °F	464 GPM	7.5HP	YES	25,200 CFM	

A REFRIGERATION EQUIPMENT SCHEDULE



B POWER ONE LINE DIAGRAM



C SAFETY RELIEF ONE LINE DIAGRAM

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REVISION DATES (DESIGN STAGE ONLY)

Sheet Version 4.0

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

Stantec

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED •

BUREAU OF ENGINEERING
DEPARTMENT OF PUBLIC WORKS
CITY OF LOS ANGELES

VERTICAL CONTROL:
HORIZONTAL CONTROL:

SHEET TITLE: RINK DETAILS
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

NO.	REVISIONS:	DATE:	BY:

CIP NO.

INDEX NO.

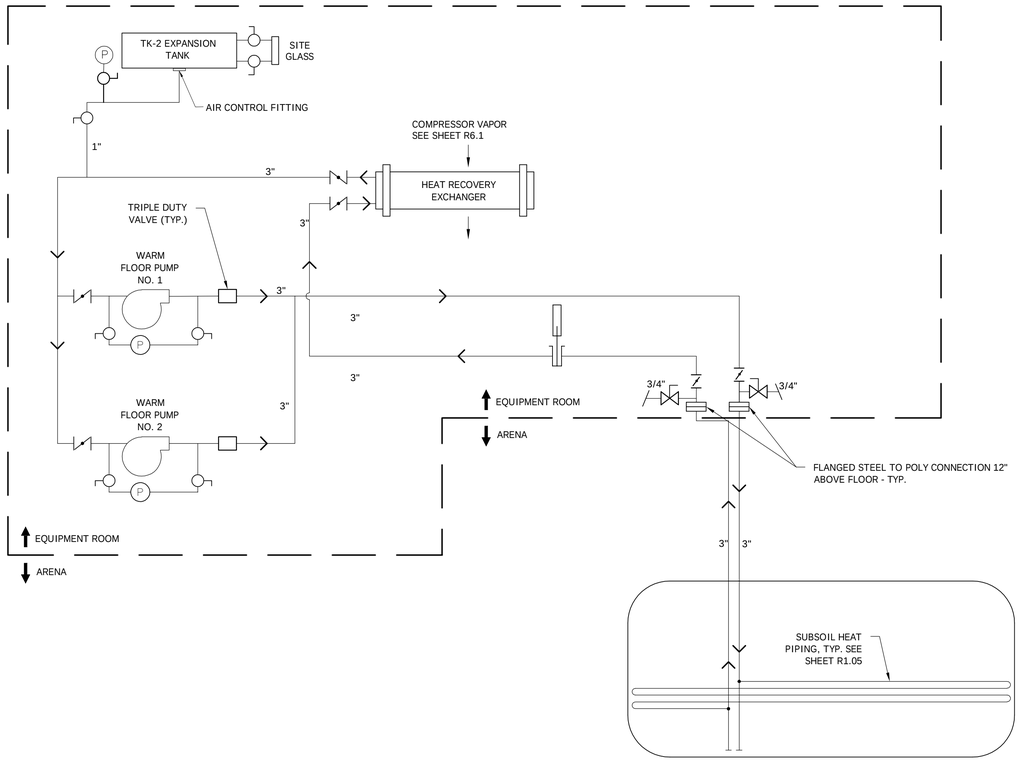
CITY ENGINEER
GARY LEE MOORE, P.E., ENV SP
DATE:

DESIGN GROUP
ENGINEER: JAMES R. MALAND
DESIGNED BY: JAMES R. MALAND
DRAWN BY: S. DUNLEAVY
CHECKED BY: JAMES R. MALAND
APPROVED BY: JAMES R. MALAND

WORK ORDER NO.
E170121B

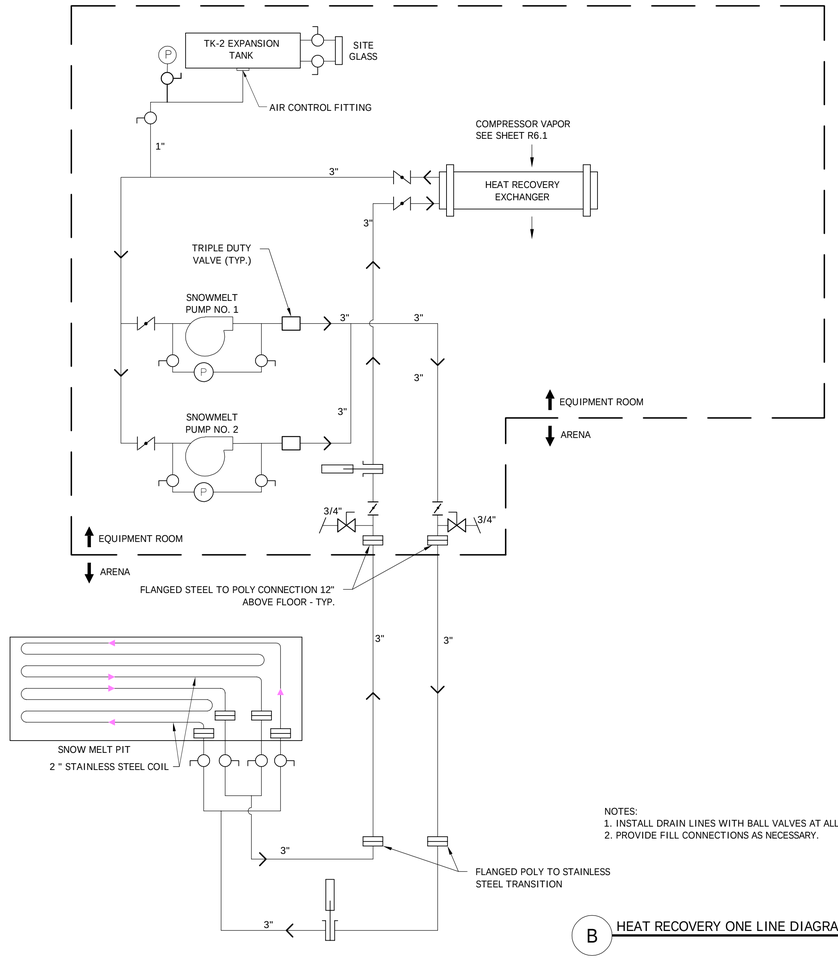
SHEET NAME
R6.03
SHEET X OF X SHEETS

W:\1938\ACTIVE\193804962\CAD\DWG\193804962_R601.DWG 11/10/2021 7:27 PM



NOTES:
1. INSTALL DRAIN LINES WITH BALL VALVES AT ALL LOW POINTS IN SYSTEM.
2. PROVIDE FILL CONNECTIONS AS NECESSARY.

A HEAT RECOVERY ONE LINE DIAGRAM (SUBSOIL HEAT)



NOTES:
1. INSTALL DRAIN LINES WITH BALL VALVES AT ALL LOW POINTS IN SYSTEM.
2. PROVIDE FILL CONNECTIONS AS NECESSARY.

B HEAT RECOVERY ONE LINE DIAGRAM (SNOW MELT)

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REVISION DATES
(DESIGN SHEETS ONLY)

Sheet Version 4.0

W:\1938\ACTIVE\193804962\CAD\DWG\193804962_R601.DWG 11/9/2021 1:39 PM

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

Stantec

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED •

BUREAU OF ENGINEERING
VERTICAL CONTROL:
HORIZONTAL CONTROL:
SHEET TITLE: RINK DETAILS
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

DEPARTMENT OF PUBLIC WORKS
CITY OF LOS ANGELES

NO.	REVISIONS:	DATE:	BY:

CIP NO.

INDEX NO.

CITY ENGINEER
GARY LEE MOORE, P.E., ENV SP
DESIGN GROUP | DATE:

ENGINEER:	JAMES R. MALAND	
DESIGNED BY:	JAMES R. MALAND	
DRAWN BY:	S. DUNLEAVY	
CHECKED BY:	JAMES R. MALAND	
APPROVED BY:	JAMES R. MALAND	

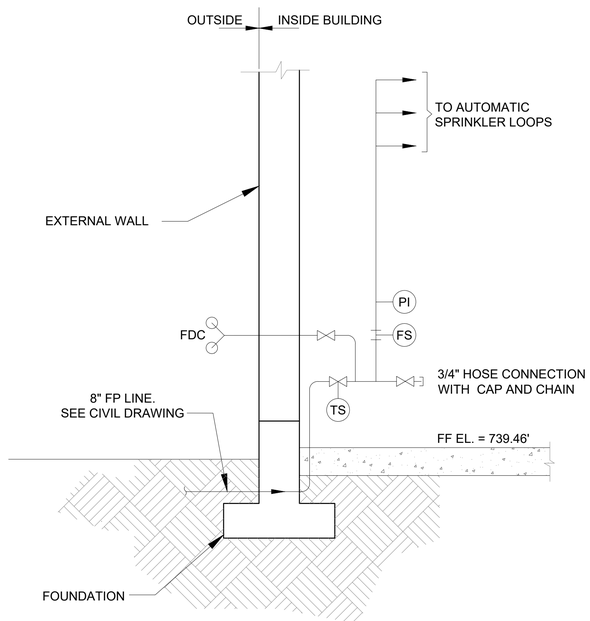
WORK ORDER NO.
E170121B

SHEET NAME
R6.04
SHEET X OF X SHEETS

FIRE PROTECTION NOTES:

- 1. PROVIDE FIRE WATER SERVICE, FIRE SPRINKLERS, INSTALLATION, TESTING AND RELATED DOCUMENTATION IN ACCORDANCE WITH THE LATEST APPLICABLE EDITION OF NFPA 13 AND STATE AND CITY OF LOS ANGELES REQUIREMENTS. PER NFPA TABLE B105.1 MINIMUM REQUIRED FIRE FLOW FOR 28,000 SF TYPE IIB CONSTRUCTION =
- ORDINARY HAZARD GROUP 1
  QO = 1945 SF x 0.14 GPM/SF
  =272 GPM
- LIGHT HAZARD
  QL = 26,055 SF x 0.075 GPM/SF
  =1954 GPM
  QT = 2226 GPM SPRINKLER FLOW

2. BUILDING SHALL BE FULLY SPRINKLERED. CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING CITY OF LOS ANGELES DEPARTMENT OF BUILDING AND SAFETY (DBS) APPROVAL AS A DEFERRED SUBMITTAL. CONTRACTOR SHALL SUBCONTRACT FIRE PROTECTION SYSTEM TO QUALIFIED FIRE PROTECTION SYSTEM SUBCONTRACTOR AND SUBMIT:
   a. SUBCONTRACTOR QUALIFICATIONS AND LICENSE, AND RESPONSIBLE INDIVIDUAL'S QUALIFICATIONS.
   b. DRAWINGS AND CALCULATIONS FOR SPRINKLER INSTALLATION, INCLUDING PIPE SUPPORTS, WALL AND CEILING PENETRATIONS, CONTROLS, ETC.
   c. DRAWINGS AND DETAILS FOR FIRE DEPARTMENT CONNECTION, INSPECTOR'S TEST VALVES, DRAINS, FLOW SWITCH, TAMPER SWITCHES, HOSE CONNECTIONS, ETC.
   d. CATALOG CUTS FOR ALL EQUIPMENT AND MATERIALS TO BE INSTALLED.
3. IT IS THE CONTRACTOR'S RESPONSIBILITY TO REVIEW THE CONTRACT DRAWINGS AND COORDINATE THE FIRE PROTECTION SYSTEM INSTALLATION WITH CIVIL, STRUCTURAL, MECHANICAL AND ELECTRICAL DESIGNS.
   a. COORDINATE LOCATION OF SPRINKLER HEADS AND PIPING WITH CEILING PLANS, ELECTRICAL, PLUMBING AND HVAC TO AVOID CONFLICTS (E.G. WITH LIGHTS AND VENTILATION SYSTEMS).
   b. COORDINATE WITH ELECTRICAL AND FIRE ALARM SUBCONTRACTORS FOR WIRING OF ALARM SIGNALS TO FIRE ALARM CONTROL PANEL.
   c. COORDINATE WITH BURIED UTILITIES FOR CONNECTION OF FIRE WATER SUPPLY PIPING AND TO AVOID BURIED UTILITY CONFLICTS.
   d. ALL SPRINKLER HEADS ABOVE AND ADJACENT TO THE ICE RINK SHALL BE INSTALLED A MINIMUM OF 20 FT ABOVE THE FINISHED FLOOR, AND INCLUDE HEAD GUARD CAGES.
   e. SPRINKLER WATER SUPPLY PIPING THROUGHOUT LOCKER ROOMS AND RESTROOMS SHALL BE ROUTED IN SHARED PIPE CHASE ALONG EAST EXTERIOR WALL.
   f. DRAINS SHALL BE ROUTED TO FLOOR DRAINS OR EXTERIOR OF BUILDING.
4. MINIMUM MATERIAL REQUIREMENTS:
   a. WET SPRINKLER SYSTEM PIPING SHALL BE BLACK STEEL PIPE, ASTM A53 SCHEDULE 40, WITH THREADED OR GROOVED JOINTS.
   b. SPRINKLER HEADS IN SHOWER AREAS, BATHROOMS, LOCKER ROOMS, ICE ROOM, AND MECHANICAL ROOM SHALL BE CORROSION RESISTANT TYPE.
   c. ALL SPRINKLER PIPING SERVING INDIVIDUAL SPRINKLER HEADS SHALL BE 1-INCH SCHEDULE 40 BLACK STEEL PIPE.
   d. COORDINATE WITH CIVIL FOR MATERIALS CONNECTING TO FIRE PROTECTION SUPPLY PIPING. PROVIDE DUCTILE IRON OR LINED STEEL FOR FIRE PROTECTION SUPPLY PIPING.



FIRE PROTECTION PIPING SCHEMATIC

SAFETY PLAN LEGEND:

FH	FIRE HYDRANT		ALARM STROBE
PIV	POST INDICATOR VALVE	ESTOP	EMERGENCY STOP PUSH BUTTON
TS	TAMPER SWITCH	FACP	FIRE ALARM CONTROL PANEL
FS	FLOW SWITCH	FDC	FIRE DEPARTMENT CONNECTION
	SPRINKLER AREA ORDINARY HAZARD	H	ALARM HORN
		FA	FIRE ALARM MANUAL PULL STATION
	SPRINKLER AREA LIGHT HAZARD		

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REVISION DATES (DESIGN STAGE ONLY)

Sheet Version 4.0

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

REGISTERED PROFESSIONAL ENGINEER
ROBERT D. GETTER
No. M 30758
Exp. 09-30-22
MECHANICAL
11/17/2021

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED •

BUREAU OF ENGINEERING
VERTICAL CONTROL:
HORIZONTAL CONTROL:
SHEET TITLE: FIRE PROTECTION NOTES, LEGEND, SINGLE LINE
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

DEPARTMENT OF PUBLIC WORKS
NO. | REVISIONS: | DATE: | BY:
CIP NO.
INDEX NO.

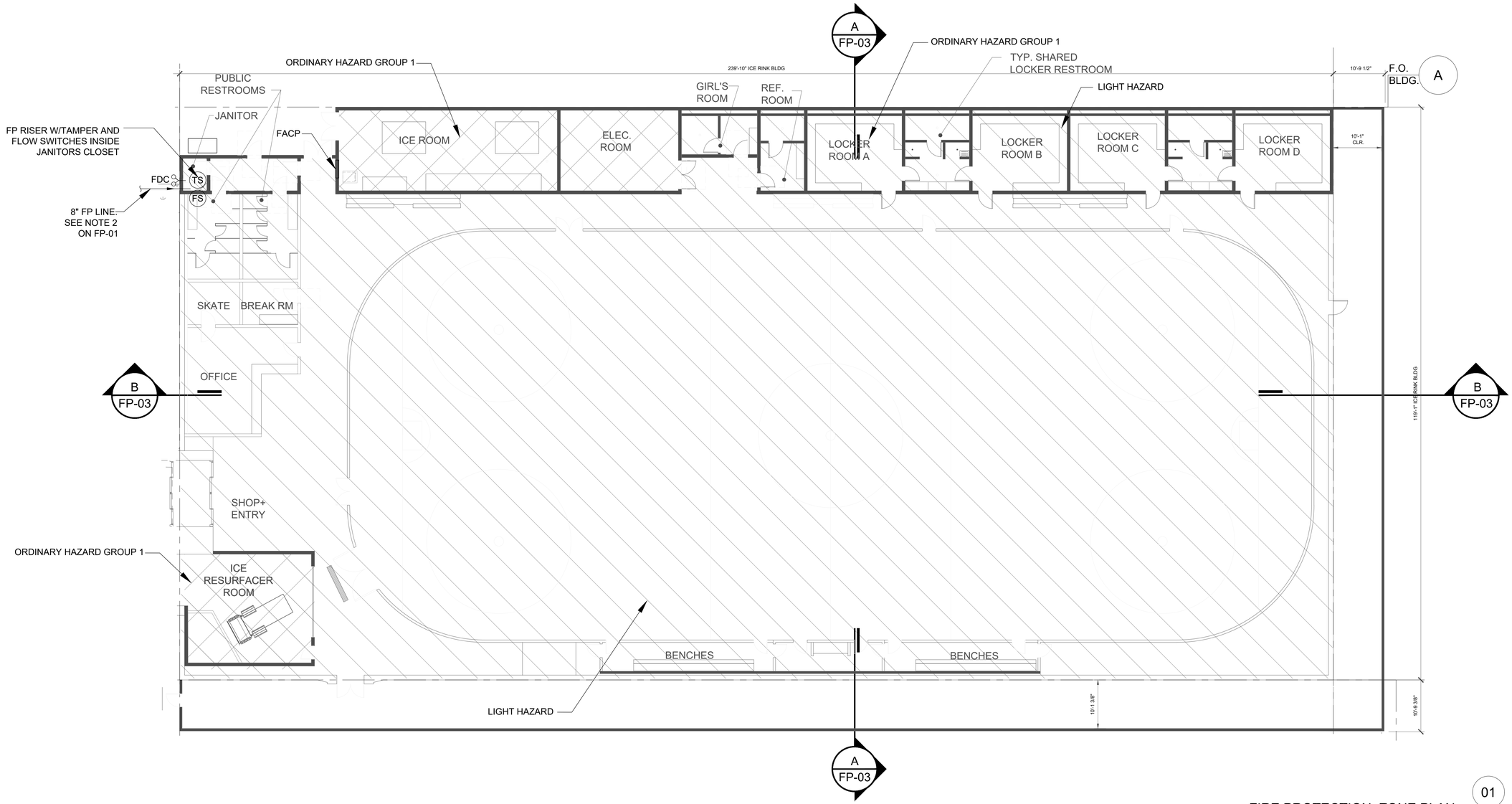
CITY OF LOS ANGELES
GARY LEE MOORE, P.E., ENV SP — CITY ENGINEER — DATE:

	DESIGN GROUP
ENGINEER:	ROBERT GETTER
DESIGNED BY:	JUSTIN CHIN
DRAWN BY:	JUSTIN CHIN
CHECKED BY:	ROBERT GETTER
APPROVED BY:	XXX

WORK ORDER NO.
E170121B

SHEET NAME
FP-01
SHEET X OF X SHEETS

D:\PROJECT\CITY OF LA_BROOKSSCARPA_RESEDA SKATE FACILITY\PROJECTLINE DRAWINGS\RICK DRAWING\FP-01.DWG 11/19/2021 4:34 PM



FIRE PROTECTION ZONE PLAN

01

REF: --

SCALE: 3/32"=1'-0"

N

NOTES:

1. FOR FIRE PROTECTION WATER NOTES AND LEGEND, SEE DRAWING FP- 01.

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

REGISTERED PROFESSIONAL ENGINEER
ROBERT D. GETTER
No. M 30752
Exp. 09-30-22
MECHANICAL
11/17/2021

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED •

BUREAU OF ENGINEERING
VERTICAL CONTROL:
HORIZONTAL CONTROL:
SHEET TITLE: FIRE PROTECTION WATER PLAN
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

DEPARTMENT OF PUBLIC WORKS
NO. REVISIONS: DATE: BY:
CIP NO.
INDEX NO.

CITY OF LOS ANGELES
GARY LEE MOORE, P.E., ENV SP
CITY ENGINEER
DATE:

	DESIGN GROUP
ENGINEER:	ROBERT GETTER
DESIGNED BY:	JUSTIN CHIN
DRAWN BY:	JUSTIN CHIN
CHECKED BY:	ROBERT GETTER
APPROVED BY:	XXX

WORK ORDER NO.
E170121B

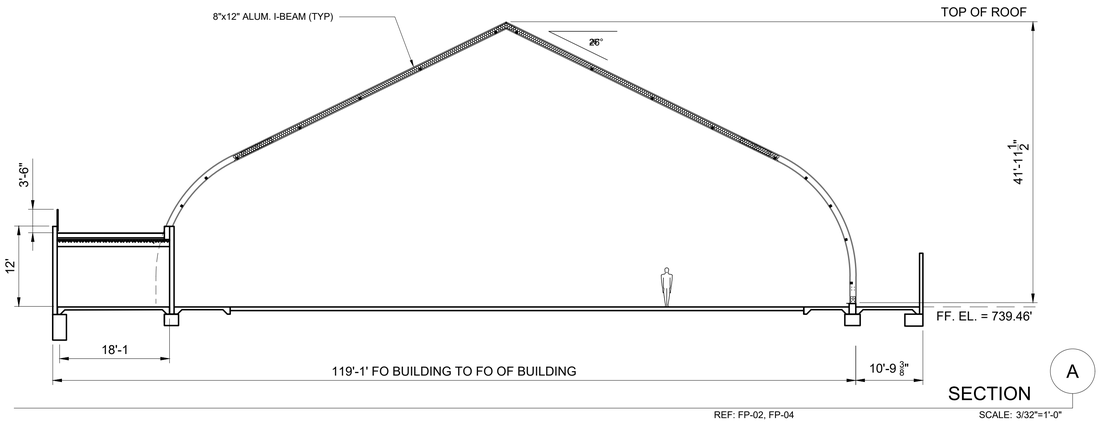
SHEET NAME
FP-02
SHEET X OF X SHEETS

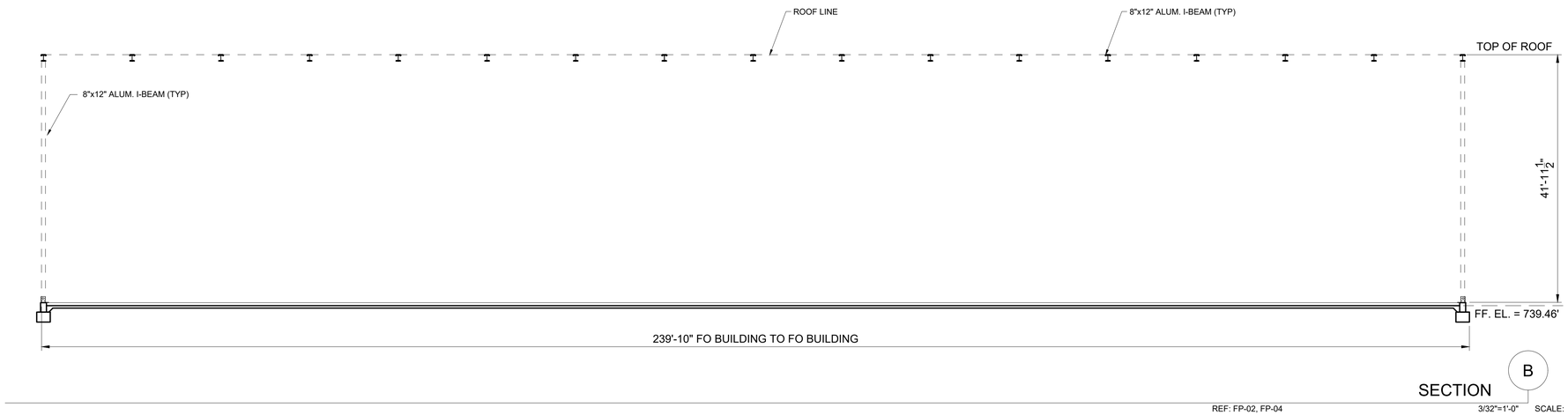
THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REVISION DATES (DESIGN STAGE ONLY)

Sheet Version 4.0

D:\PROJECT\CITY OF LA_BROOKSSCARPA_RESEDA SKATE FACILITY\PROJECTLINE DRAWINGS\RICK DRAWING\FP-02.DWG 11/19/2021 4:34 PM





NOTE:

1. FOR DETAILS ON ROOF, SEE STRUCTURAL DRAWINGS.

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Division

REGISTERED PROFESSIONAL ENGINEER
ROBERT D. GETTER
No. M 30758
Exp. 09-30-22
MECHANICAL
11/17/2021

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED •

DEPARTMENT OF PUBLIC WORKS
BUREAU OF ENGINEERING

VERTICAL CONTROL:
HORIZONTAL CONTROL:

SHEET TITLE: FIRE PROTECTION AND ALARM SECTIONS
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

NO.	REVISIONS:	DATE:	BY:

CIP NO.

INDEX NO.

CITY OF LOS ANGELES
GARY LEE MOORE, P.E., ENV SP
CITY ENGINEER

	DESIGN GROUP	DATE:
ENGINEER:	ROBERT GETTER	
DESIGNED BY:	JUSTIN CHIN	
DRAWN BY:	JUSTIN CHIN	
CHECKED BY:	ROBERT GETTER	
APPROVED BY:	XXX	

WORK ORDER NO.
E170121B

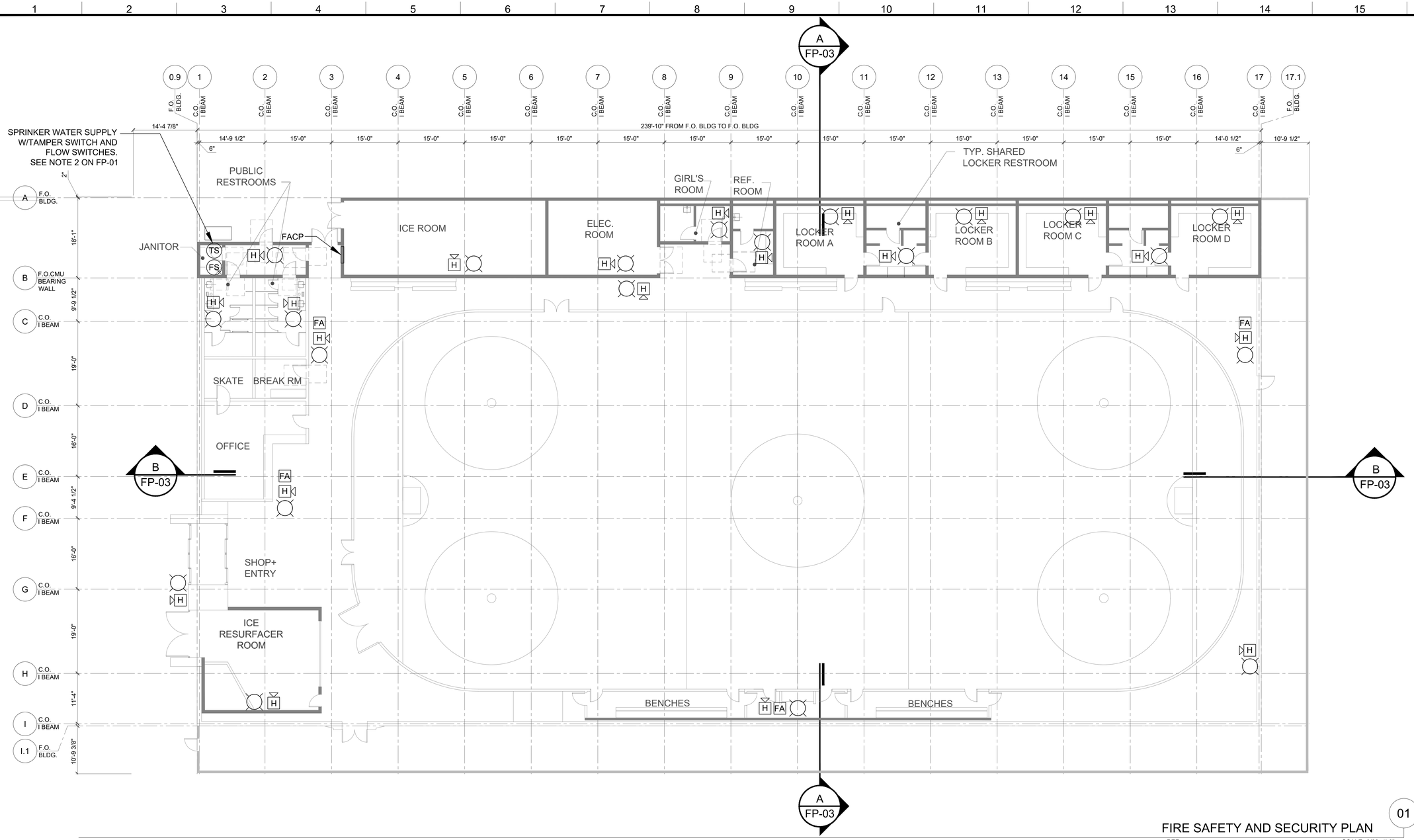
SHEET NAME
FP-03
SHEET X OF X SHEETS

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REVISION DATES
(DESIGN STAGE ONLY)

Sheet Version 4.0

D:\PROJECT\CITY OF LA_BROOKSSCARPA_RESEDA SKATE FACILITY\PROJECTLINE DRAWINGS\RICK DRAWING\FP-03.DWG 11/19/2021 4:34 PM



FIRE SAFETY AND SECURITY PLAN

REF: --

SCALE: 3/32"=1'-0"

01

N

FIRE ALARM AND SAFETY PLAN NOTES:

1. PROVIDE COMPLETE FIRE ALARM AND SAFETY SYSTEM INSTALLATION DRAWINGS FOR APPROVAL BY CITY OF LOS ANGELES DBS AS A DEFERRED SUBMITTAL. SYSTEMS SHALL BE PROVIDED IN ACCORDANCE WITH NFPA AND DBS REQUIREMENTS BY QUALIFIED INSTALLATION TECHNICIANS IN ACCORDANCE WITH EQUIPMENT MANUFACTURERS' RECOMMENDATIONS.
2. FIRE ALARM SYSTEMS SHALL INCLUDE, BUT NOT BE LIMITED TO, THE FOLLOWING:
   a. FACP (EDWARDS MODEL EST4 SERIES, OR EQUAL). FACP AND ALARM DEVICES SHALL BE POWERED FROM A DEDICATED CIRCUIT, AND PROVIDED WITH EMERGENCY BACKUP POWER. CIRCUIT BREAKER SHALL BE LOCKED IN ON POSITION WITH APPROVED MECHANICAL CLIP, AND SHALL BE IDENTIFIED AS “FIRE ALARM SYSTEM”.
   b. SMOKE DETECTION DEVICES THROUGHOUT THE FACILITY, AND RELAY CONTACTS FROM FACP FOR HVAC AND DHU SHUTDOWN. COORDINATE ALARM SIGNAL WIRING WITH HVAC AND DHU CONTROLS.
   c. FIRE ALARM AUDIBLE ALARMS. AUDIBLE ALARMS SHALL BE NOT LESS THAN 15 DBA ABOVE AMBIENT AND NOT LESS THAN 75 DBA THROUGHOUT THE FACILITY.
   d. FIRE ALARM STROBES. AREAS HAVING MORE THAN 2 STROBES IN FIELD OF VIEW SHALL BE SYNCHRONIZED. WALL-MOUNTED STROBES SHALL BE MOUNTED NOT LESS THAN 80 INCHES, AND NOT MORE THAN 96 INCHES, ABOVE FINISHED FLOOR.
   e. MANUAL FIRE ALARM PULL STATIONS THROUGHOUT THE FACILITY. MANUAL PULL STATIONS SHALL BE DUAL-ACTION TYPE.
   f. SPRINKLER SYSTEM FLOW AND TAMPER SWITCHES, COORDINATED WITH FIRE WATER SUPPLY AND SPRINKLER SYSTEM INSTALLATION.
   g. ELECTRICAL WIRING SUITABLE FOR THE LOCATIONS AND IN ACCORDANCE WITH NFPA. ALL WIRING SHALL BE PROVIDED IN CONDUIT AND/OR APPROVED CABLE.
3. PROVIDE WALL-MOUNTED EMERGENCY EVACUATION SIGNAGE INDICATING LOCATIONS AND DIRECTION TO EXITS. SIGNS SHALL BE PROVIDED NOT LESS THAN EVERY 75 FT AT PERIMETER OF THE ICE RINK.
4. PROVIDE TEN (10) CLASS A FIRE EXTINGUISHERS IN SECURE ENCLOSURES THROUGHOUT THE FACILITY, AND ONE (1) CLASS C FIRE EXTINGUISHER IN ELECTRICAL ROOM.
5. DEDICATED TELEPHONE LINES SHALL BE PROVIDED BY OWNER, WITH ONE LINE DEDICATED FOR FA MONITORING.
6. CO, CO2 AND NO2 AIR QUALITY MONITORING INSTRUMENTS WILL BE PROVIDED BY DEHUMIDIFIER EQUIPMENT PACKAGE. AIR QUALITY ALARMS WILL FORCE DHU AND HVAC SYSTEMS TO EVENT MODE, WITH 100% OUTSIDE AIR. FACP SHALL ACCEPT EVENT MODE ALARM SIGNAL FROM DEHUMIDIFIER CONTROL PANEL.
7. IT IS CONTRACTOR’S RESPONSIBILITY TO PREPARE AND SUBMIT DRAWINGS AND SPECIFICATIONS FOR FIRE DETECTION AND ALARM SYSTEMS TO LA DBS AS A DEFERRED PLAN CHECK SUBMITTAL. CONTRACTOR SHALL PREPARE PLAN CHECK SUBMITTAL IN ACCORDANCE WITH CONTRACT SPECIFICATIONS, CODE AND CITY DBS REQUIREMENTS, AND OBTAIN CITY FIRE MARSHALL APPROVAL. FIRE DETECTION AND ALARM SYSTEMS SHALL BE IN ACCORDANCE WITH THE LATEST APPLICABLE EDITION OF CCR PART 2, TITLE 24, CHAPTER 9, SECTION 907, CBC, AND SHALL CONFORM TO CCR PART 3, TITLE 24, ARTICLE 760, CEC. FIRE DETECTION AND ALARM SHOP DRAWINGS SHALL BE SUBMITTED TO THE ARCHITECT WITHIN 14 CALENDAR DAYS AFTER NOTICE TO PROCEED. FIRE ALARM AND DETECTION WORK SHALL NOT BE STARTED UNTIL SUBMITTALS HAVE BEEN APPROVED BY THE ARCHITECT, DBS, AND CITY FIRE MARSHALL. CONTRACTOR SUBMITTALS SHALL INCLUDE:
   1. TYPE OF FIRE ALARM AND DETECTION SYSTEMS PROPOSED.
   2. CATALOG DATA, CSFM LISTING NUMBERS, AND MODEL NUMBERS FOR ALL SYSTEM COMPONENTS.
   3. ELECTRICAL SINGLE LINE DIAGRAM, RISER DIAGRAMS, AND POINT-TO-POINT WIRING DIAGRAMS.
   4. EMERGENCY WARNING SYSTEMS WITH VISUAL STROBES DEVICES AS REQUIRED FOR HEARING IMPAIRED, CCR PART 9, TITLE 24, CHAPTER 9, SECTIONS 9907.6.2.3.1 THROUGH 907.6.2.3.5, CFC.
   5. CONDUIT SIZES, QUANTITY AND TYPE OF CONDUCTORS, AND WHETHER THE SYSTEM IS POWER LIMITED OR NON-POWER LIMITED.
   6. BATTERY CALCULATIONS FOR THE ENTIRE SYSTEM (24-HOUR STANDBY, 5 MINUTE ALARM TIME).
   7. FLOOR PLANS SHOWING LOCATIONS OF ALL FIRE ALARM EQUIPMENT, INTERCONNECTING WIRING, REMOTE POWER SUPPLIES, AND ANNUNCIATORS.
   8. VOLTAGE DROP CALCULATIONS FOR THE LONGEST RUN AND FOR CIRCUITS WITH THE LARGEST LOAD REQUIRED FOR BOTH INITIATION AND SIGNAL CIRCUITS.
   9. FIRE DETECTION AND ALARM DEVICES INDICATED AND SPECIFIED HEREIN ARE MINIMUM REQUIREMENTS, AND CONTRACTOR SHALL PROVIDE ADDITIONAL DEVICES, CONDUITS AND WIRING AS REQUIRED BY CODE, AND AT NO ADDED COST TO THE CITY.
   10. CONTRACTOR SHALL COORDINATE WITH CITY RAP AND BOE DEPARTMENTS FOR CONNECTION AND REPORTING OF ALARMS TO A SUPERVISED LOCATION AS REQUIRED BY CODE.

THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REVISION DATES (RESCHEDULE STROKES ONLY)

Sheet Version 4.0

ENGINEERING
CITY OF LOS ANGELES
Environmental Engineering Design Consultant

REGISTERED PROFESSIONAL ENGINEER ROBERT D. GETTER No. M 30752 Exp. 09-30-22 MECHANICAL 11/17/2021

• THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED •

DEPARTMENT OF PUBLIC WORKS
BUREAU OF ENGINEERING
VERTICAL CONTROL:
HORIZONTAL CONTROL:
SHEET TITLE: FIRE ALARM AND SAFETY PLAN
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

CITY OF LOS ANGELES
CITY ENGINEER: GARY LEE MOORE, P.E., ENV SP

	DESIGN GROUP	DATE:
ENGINEER:	ROBERT GETTER	
DESIGNED BY:	JUSTIN CHIN	
DRAWN BY:	JUSTIN CHIN	
CHECKED BY:	ROBERT GETTER	
APPROVED BY:	XXX	

NO.	REVISIONS:	BY:	DATE:

CIP NO.

INDEX NO.

WORK ORDER NO. E170121B

SHEET NAME FP-04

SHEET X OF X SHEETS

D:\PROJECT\CITY OF LA_BROOKSSCARPA_RESEDA SKATE FACILITY\PROJECTLINE DRAWINGS\RICK DRAWING\FP-04.DWG 11/19/2021 4:34 PM