DOCUMENT 00 9113

ADDENDA NO. 1

GENERAL

1.01 The following sets forth the format for issued Addenda.

w/ Specs & Plans

ADDENDUM NO. 1, dated June 29, 2026.
This addendum is to the RFQ dated April 23, 2026

RE: ACCESSIBILITY ENHANCEMENT PROJECT (ADA BARRIER REMOVAL)
DSA A# 03-125451 DSA File #19-63
OWNER PROJECT NO.: 10373689
AT
Utah Street Span School
located at 255 Gabriel Garcia Marquez St., Los Angeles CA 90033

FROM: OWNER: LOS ANGELES UNIFIED SCHOOL DISTRICT
FACILITIES CONSTRUCTION CONTRACTS
333 S. Beaudry Ave., 28th Fl.
Los Angeles, CA 90017

Architect/Engineer Stamp & Signature

TO: ALL PROSPECTIVE BIDDERS:

This Addendum forms a part of the Contract Documents and modifies the Bidding Documents dated April, 2025, as noted below. Acknowledge receipt of the Addendum in the space provided on Document 00 4100 - Bid and Acceptance Form. Failure to do so may result in the bid being deemed non-responsive.

The Addendum document 00 9113 consists of 4 pages plus 205 pages of specs, and the attached 11 drawings, Sheet Nos. A-6.31, A-7.00, A-7.03, S-0.1, S-0.2, S-4.1, S-5.1 with revised date of 06/15/2026 and Sheet Nos. E-0.1, E-2.11, E-2.21, E-2.22 clouded per responses to questions #7 and #8.

"The DSA review of this addendum is not expected to result in a material change to the contract"

OAR Name	Signature	Date
Maria Lachica	Digitally signed by Maria Lachica DN: cn=Maria Lachica, o=Los Angeles Unified School District, ou=PEX, email=marialourdes.lachica@lausd.net, c=US Date: 2026.06.29 11:45:46 -07'00'	06/29/2026

Regional Director Name	Signature	Date
Steve Boehm	Digitally signed by Steve Boehm Deputy Director DN: cn=Steve Boehm Deputy Director, o, ou=PEX, email=steve.boehm@lausd.net, c=US Date: 2026.06.29 12:38:11 -07'00'	

A. CHANGES TO BIDDING DOCUMENTS: Add Document 00 9113 Addednum No. 1 (4 pages).

B. CHANGES TO SPECIFICATIONS:

1. Replace Specification Section 00 0110 Table of Contents, 5 pages, in its entirety with Specification Section 00 0110 Table of Contents, 5 pages.

2. Replace Specification Section 00 1116 Invitation To Bid, 5 pages, in its entirety with Specification Section 00 1116 Invitation To Bid, 5 pages.

3. Replace Specification Section 00 1100 Summary of Work, 9 pages and Appendix A, 112 pages, in its entirety with Specification Section 00 1100 Summary of Work, 9 pages and Appendix A, 112 pages

4. Add Specification Section 07 1800 Traffic Coating, 4 pages.

5. Add Specification Section 08 7100 Door Hardware, 38 pages.

6. Add Specification Section 28 1000 Access Control Systems, 7 pages.

7. Add Specification Section 32 1236 Seal for Bituminous Surfacing, 3 pages.

8. Add Specification Section 32 1723 Pavement Markings, 2 pages.

9. Add Specification Section 32 1726 Detectable Warning Surfacing, 7 pages.

C. CHANGES TO DRAWINGS:

1. Replace Sheet A-6.31 MAIN CLASSROOM INTERIOR ELEVATIONS (DSA Back Check 02/09/2026) in its entirety and replace with Sheet A-6.31 MAIN CLASSROOM INTERIOR ELEVATIONS (Bid-RFC 005 06/25/2026)

2. Replace Sheet A-7.00 DOOR SCHEDULE (DSA Back Check 02/09/2026) in its entirety and replace with Sheet A-7.00 DOOR SCHEDULE (Addendum 1 06/15/2026)

3. Replace Sheet A-7.03 FINISH SCHEDULE (DSA Back Check 02/09/2026) in its entirety and replace with Sheet A-7.03 FINISH SCHEDULE (Bid RFC 12, 13, 14, 15 dated 06/25/2026)

4. Replace Sheet S-0.1 GENERAL NOTES (DSA Back Check 02/09/2026) in its entirety and replace with Sheet S-0.1 GENERAL NOTES (Addendum 1 06/15/2026)

5. Replace Sheet S-0.2 GENERAL NOTES (DSA Back Check 02/09/2026) in its entirety and replace with Sheet S-0.2 GENERAL NOTES (Addendum 1 06/15/2026)

6. Replace Sheet S-4.1 FOUNDATION DETAILS (DSA Back Check 02/09/2026) in its entirety and replace with Sheet S-4.1 FOUNDATION DETAILS (Addendum 1 06/15/2026)

7. Replace Sheet S-5.1 FRAMING DETAILS (DSA Back Check 02/09/2026) in its entirety and replace with Sheet S-5.1 FRAMING DETAILS (Addendum 1 06/15/2026)

8. Replace Sheet E-0.1 ELECTRICAL GENERAL NOTES, SYMBOLS, LEGENDS & SHEET INDEX (DSA Back Check 02/09/2026) in its entirety and replace with Sheet E-0.1 ELECTRICAL GENERAL NOTES, SYMBOLS, LEGENDS & SHEET INDEX (Clouded per responses to Question #7 and #8)

9. Replace Sheet E-2.11 ELECTRICAL AUDITORIUM BUILDING FLOOR PLAN (DSA Back Check 02/09/2026) in its entirety and replace with Sheet E-2.11 ELECTRICAL AUDITORIUM BUILDING FLOOR PLAN (Clouded per response to Question #7)

10. Replace Sheet E-2.21 ELECTRICAL MAIN CLASSROOM REMODELED 1ST FLOOR PLAN (DSA Back Check 02/09/2026) in its entirety and replace with Sheet E-2.21 ELECTRICAL MAIN CLASSROOM REMODELED 1ST FLOOR (Clouded per response to Question #8)

11. Replace Sheet E-2.22 ELECTRICAL MAIN CLASSROOM REMODELED 2ND FLOOR PLAN (DSA Back Check 02/09/2026) in its entirety and replace with Sheet E-2.22 ELECTRICAL MAIN CLASSROOM REMODELED 2ND FLOOR PLAN (Clouded per response to Question #8)

D. OTHER CHANGES AS SET FORTH: N/A

E. Clarification or any other notice of a change in the Bidding Documents will be issued only by the OWNER office of Facilities Construction Contracts and only in the form of a written Addendum, transmitted by fax or e-mail to all who are known by the issuing office to have received a complete set of Bidding Documents. Any other purported Addenda are void and unenforceable.

1. ***Question**:* Please clarify whether Door #62834 is a brand-new door assembly or an existing door. The remarks state to install a privacy latch to an existing door.
   ***Response**:* Door 62834 is an existing door to remain with new hardware. Refer to attached door schedule and door hardware specifications.

2. ***Question:*** Details 4 & 6 on Drawing A-9.22 show the elevator hoist way wall condition at the entrances. It appears to be a custom double wall condition. California elevator code ASMA A17.1-2004 Section 8.3.4.1.2 Requires UL Labeled entrances. Is the wall design in compliance with UL 10B Fire Testing Standard?
   Response: Elevator shaft assembly is 1-hour rated. The plans have been approved by DSA FLS.

3. ***Question:*** Details 5 & 7 on Drawing A.9.22, It appears that there is insufficient clearance for front approach clearance for the elevator call button. 12" on each side is required, we believe. Will layout be reconfigured or should the hall call buttons be relocated? Opposite side has less clearance.
   Response: Relocate elevator call button per revised interior elevations 5&6/A-6.31.

4. ***Question:*** Detail 1 on Drawing S.2.1 calls out six (6) 3/8" screw anchors for the attachment to the concrete slab. The specified lift manufacturer recommends a minimum of four (4) stud anchors. Can 4 to 6 Hilti 1/2" KBTZ2 wedge anchors be used?
   Response: Noted. Substitution is accepted.

5. ***Question:*** Please provide the specifications of the existing deck coating located at the second floor balcony where the new elevator will be installed.
   Response: Refer to attached specification section 07 1800 Traffic Coating.

6. ***Question:*** Detail 1 & 2 on Drawing A.3.35 & Drawing VT-1.00 Detail 1 indicate hole-less style elevator jack layout. Elevator specifications call for in-ground jack unit. Are single-stage hole-less jack units acceptable?
   Response: Single stage hole-less non-telescoping hydraulic elevator meets the intent of the design and is an acceptable application.

7. ***Question:*** Detail A on Drawing E.2.11 shows the electrical layout for the wheelchair lift. The detail does not indicate an emergency light. Is there an emergency light that can illuminate the platform with 5 ftc?
   Response: Yes per code, an emergency light is required for means of egress and shall be provided by the wheelchair landing. Refer to revised electrical sheets E-0.1 and E-2.11 and the Attachment B for the lighting cut sheets.

8. ***Question:*** Detail B on Drawing E.2.21 shows lighting lumens at the entrance and in the machine room. The lighting in the machine room is insufficient. Code requires 19 ftc in the elevator machine room and 10 ftc in the elevator pit in all areas. Will the lighting be changed to meet these code requirements?
   Response: Refer to revised electrical sheets and the lighting cut sheets, E-0.1, E-2.21, and E-2.22. Reference Attachment A for lighting cut sheets.

9. ***Question:*** Per Geotech Report 6.1 please confirm if all concrete slab subgrade need to be removed and replace 2' or a geo-grid material need to be used.
   Response: According to the geotechnical recommendation, a 12-inch excavation, instead of 2-feet, is acceptable. Backfill requires at least 95% subgrade compaction; with an option to include geogrid reinforcement to improve the soil's design life.

10. ***Question:*** Please confirm ABL-1.1 to ABL-1.6 are for reference only.
    Response: ABL-1.1 through ABL-1.6 refer to barrier removal for project. The associated work is referenced in these sheets.

11. ***Question:*** Bid documents include wood flooring restoration, but no wood flooring restoration areas are clearly indicated on THE PLANS. Please clarify if this scope is required, and if so, provide locations and limits of work.
    Response: Refer to 4/A-3.12 for area of existing Auditorium stage to be resurfaced.

12. ***Question:*** Bid documents do not contain a specification for the door hardware. Please provide the specifications for the door hardware.
    Response: Refer to Addendum 01 for door hardware specification.

13. ***Question:*** Bid documents indicate several floor bases (B2, B3 and B4), but are not indicated on plans or the finish schedule. Please clarify if these floor bases are needed for the project. If so, please identify all areas where it is needed.
    Response: Refer to revised sheet A-7.03 FINSIH SCHEDULE for applicable wall bases.

14. ***Question:*** Bid documents indicate several paint finishes (PT1-PT8) but are not clearly indicated on plans or the finish schedule which paint code to use per room. Please identify all areas where the paint finishes are to be applied.
    Response: Refer to revised sheet A-7.03 FINSIH SCHEDULE for applicable paint colors.

15. ***Question:*** Bid documents indicate several Vinyl Composite Tiles (VT1-VT6) but are not clearly indicated on plans or the finish schedule which vinyl tile to use per room. Please identify all areas where the tiles are to be installed.
    Response: Refer to revised sheet A-7.03 FINSIH SCHEDULE for applicable vinyl composition floor tile.

16. ***Question:*** Bid documents indicate several Ceramic Floor Tiles (CT1-CT8) but are not clearly indicated on plans or the finish schedule which tile to use per room. Please identify all areas where the tiles are to be installed.
    Response: Refer to attached sheet A-7.03 FINSIH SCHEDULE for applicable floor tiles.

17. ***Question:*** Will the bid date be extended? Due to the timing of the release date of the final addendum and the extended holiday weekend that shortens the week before the bid is due. Plus the bid date immediately follows the extended holiday weekend.
    Response: The bid due date shall be Friday July 10, 2026, 2 p.m.

END OF ADDENDUM NO. 1

TABLE OF CONTENTS

DIVISION 23 - HEATING, VENTILATING, AND AIR CONDITIONING

DIVISION 26 - ELECTRICAL

DIVISION 28 – ELECTRONIC SAFETY AND SECURITY

DIVISION 31 – EARTHWORK

DIVISION 32 – EXTERIOR IMPROVEMENTS

SECTION 00 1116

INVITATION TO BID

Subject to all conditions prescribed by OWNER, sealed bids for a lump sum, fixed price contract are invited for the following Work:

UTAH STREET SPAN SCHOOL

Project # 10373689

SID 230594

LOS ANGELES UNIFIED SCHOOL DISTRICT AS OWNER

EAST – C2

DESCRIPTION OF WORK:

This project upgrades the following facilities to comply with the Americans with Disabilities Act (ADA) and improve program accessibility: paths of travel, restrooms, drinking fountains, concrete ramp, parking area, assembly seating areas, stage lift, new elevator, and other miscellaneous upgrades.

OWNER is committed to sustainable or "high performance" design and construction in all of its schools because high performance schools enhance student and teacher performance, reduce operating costs, and protect the environment. To implement this commitment, the Owner endorses the high performance school strategies defined in the Collaborative for High Performance School (CHPS) Best Practices Manuals (available at www.chps.net), and requires that all qualified projects achieve, at a minimum, a "CHPS School" rating. The Owner shall be responsible for monitoring compliance with the CHPS criteria necessary to achieve this objective.

The Los Angeles Unified School District's electronic bid submittal process has changed. Bidders are now required to utilize the Ariba Business (Supplier) Network to submit a bid package electronically.

Bidders will need their company's user ID and password to access the Ariba Business (Supplier) Network at: https://discovery.ariba.com/profile/AN01650823748. If an existing LAUSD vendor is unaware of the user ID and password associated with their Ariba Business (Supplier) Network account, they should contact the Vendor Services Unit for assistance via email at psg-vsu@lausd.net or via telephone at (562) 654-9404.

A bidder will need to access the Ariba Business (Supplier) Network and submit the bid package for the transaction number identified below by the Bid Due Date. Virtual drop-in sessions have been scheduled for Tuesdays and Thursdays, 11 am to 12 pm, to provide instructions on accessing and responding to LAUSD solicitations in the Ariba Business (Supplier) Network. You should join a session via the following link: https://teams.microsoft.com/l/meetup-join/19%3ameeting_ZmI4MjU3ZTYtZmYxNC00MjZhLTk0MGQtNDljNTg3YmNlMzQ4%40thread.v2/0?context=%7b%22Tid%22%3a%22042a40a1-b128-4ac4-8648-016ffa121487%22%2c%22Oid%22%3a%22ec989ceb-0c29-4836-86b7-03f004059bc2%22%7d. A job aid on accessing and responding to LAUSD solicitations in the system is attached to Section 00 2113 - Instructions to Bidders. If unsuccessful in

uploading the file, a bidder should e-mail Rosy Sanchez (rosy.sanchez@lausd.net) at least two (2) days prior to the Bid Due Date for assistance.

The vendor is solely responsible for ensuring timely submission of its electronic solicitation response. A vendor should allow itself adequate time for bid submittal and possible technical support as bids will not be accepted after the deadline.

The vendor must complete its bid entry and upload all required documents before the end of the bid submission period. The District is not responsible for contractor system problems/errors.

To ensure that your bid is submitted properly and on time, please submit well before the Bid Due Date/Time, at least two (2) days in advance as suggested above.

The applicable reference number for this project in the Ariba Business (Supplier) Network is Ariba Sourcing project #2610076.

Bidding Documents will be available to bidder after the first date of advertisement and can be obtained at:

CRISP IMAGING
Los Angeles Office (Downtown)
1829 S. Main Street
Los Angeles, CA 90015
Business Hours:
Monday through Friday
7:00 a.m. to 6:00 p.m.
Telephone: (213) 741-9560

Additional office locations are listed at www.crispimg.com.

Bidders may also view and order Bidding Documents through the website by clicking on the "Planroom" button, click "Public Jobs".

Bid will only be accepted from a pre-qualified and qualified bidder pursuant to the OWNER prequalification process and RFQ requirements.

Bidders should note that the OWNER's prequalification requirements include mechanical, electrical, and plumbing contractors (i.e., contractors licensed pursuant to Sections 7056–7059 of the Business and Professions Code, specifically holding A, B, C-4, C-7, C-10, C-16, C-20, C-34, C-36, C-38, C-42, C-43, or C-46 licenses pursuant to regulations of the Contractors' State License Board) that contract directly with a bidder to perform any such component work on the Project ("MEP subcontractors"). Bidders that intend to contract with any MEP subcontractors to perform any such component work on the Project shall only select MEP subcontractors that have been prequalified by the OWNER at least five (5) business days before the date fixed for the public opening of bids. Non-MEP subcontractors do not need to be prequalified to perform non-MEP component work on the Project. Bidders and MEP subcontractors shall not be eligible to bid or perform work on the Project if they (a) have not submitted completed prequalification questionnaires and financial statements to the OWNER at least ten (10) business days before the date fixed for the public opening of bids, and (b) have not been prequalified by the OWNER at least five (5) business days before the date fixed for the public opening of bids. The OWNER's list of prequalified contractors can be found online at https://www.laschools.org/new-site/prequalification/additional-resources by clicking on "Safety PQ Program Approved List." The list is updated on an ongoing basis. If an MEP subcontractor does not appear on the list, bidder should verify with the subcontractor to determine if subcontractor has received a notice from OWNER that confirms its prequalification by the above deadline. Unless prohibited by the OWNER, bidders licensed pursuant to Section 7057 of the Business and Professions Code, specifically holding general building contractor B licenses pursuant to regulations of the Contractors' State License Board, may self-perform any work on the Project to the extent permitted by law. Bids that fail to adhere to these requirements will be deemed non-responsive by the OWNER.

Bidder should note the disclaimer in Section 00 2113, 1.09 E, concerning the use of District prequalified subcontractors.

Bidder is advised that no contractor or subcontractor may be listed on a bid proposal for a public works project (submitted on or after March 1, 2015) unless registered with the Department of Industrial Relation pursuant to Labor Code section 1725.5 [with limited exceptions from this requirement for bid purposes only under Labor Code section 1771.1(a)].

No contractor or subcontractor may be awarded a contract for public work on a public works project (awarded on or after April 1, 2015) unless registered with the Department of Industrial Relations pursuant to Labor Code section 1725.5.

This project is subject to compliance monitoring and enforcement by the Department of Industrial Relations (DIR) and the Los Angeles Unified School District's DIR-approved Labor Compliance Program.

BID DUE DATE: Bid will only be accepted before **2:00 P.M., JULY, 10, 2026**

Deadline for MEP subcontractors to be prequalified by the OWNER: **JULY, 02, 2026**. Bidder must only list MEP subcontractors that are prequalified by the OWNER as of this date. OWNER will attempt to ensure that all prequalified MEP subcontractors are placed on the OWNER's List of Prequalified MEP Subcontractors in a timely manner. However, if an MEP subcontractor does not appear on the list, bidder should verify with the subcontractor to determine if subcontractor has received a notice from OWNER that confirms its prequalification by the deadline. Bids that fail to adhere to this requirement will be deemed non-responsive by the OWNER.

Bidder is responsible for the cost of bid package. Cost for bid package is non-refundable. Bid package is non-returnable.

Bid security in the amount of ten (10) percent of the lump sum base bid, excluding bid items, as set forth in Section 01 2300, shall accompany each bid. Surety issuing the bid bond shall meet the requirements set forth in Article 5.17 of the General Conditions. A mandatory pre-bid meeting and pre-bid job walk will be held in accordance with Section 00 2513. The bidder is responsible for ensuring that they have complete Bidding Documents including all Addenda provided by the OWNER, prior to the bid due date.

Pursuant to Labor Code Section 1771.7, this Project will be subject to the Owner approved Labor Compliance Program (Final Approval, December 7, 1996). For questions or assistance concerning the Labor Compliance Program, contact the Labor Compliance Department at (213) 241-4665 or lcp@lausd.net, or go to www.laschools.org/new-site/labor-compliance/ on the internet. Any Contractor to whom a contract for the Work is awarded by the Owner shall comply with the provisions of the California Labor Code, as well as the Owner Labor Compliance Program for the Project, including, without limitation, the obligation to pay the general prevailing rates of wages in the locality in which the Work is to be performed in accordance with, without limitation, Sections 1771, 1773.1, 1774, 1775 and 1776 of the California Labor Code and the obligation to comply with Section 1777.5 of the California Labor Code governing employment of apprentices. Copies of the prevailing rates of per diem wages are available to any interested party at www.laschools.org//new-site/labor-compliance/dir or www.dir.ca.gov/oprl.

The successful bidder will be required to pay prevailing wages in accordance with law and is required to have the following State of California Contractor license current at the time of bid submission:

In accordance with the provisions of Public Contract Code section 3300, OWNER has determined that the CONTRACTOR performing this project must hold the following license as the prime contractor: **B – General Building Contractor**. A prime CONTRACTOR self-performing any of the following specialty trades must also hold the required specialty license:

C-11 – Elevator and Chairlift

To perform abatement and demolition work, including removal of roofing materials, bidders must select a subcontractor from the Owner's List of Asbestos Abatement Subcontractors as per Section 00 3126. The only license required to perform abatement and demolition work, including removal of roofing materials, is C-22. A dual license of C-22 and C-39 is not a requirement.

Bidder is required to participate in an OWNER Controlled Insurance Program (OCIP) as set forth in Section 00 7316 and Article 5 of the General Conditions.

Bidder is subject to the Small Business Enterprises participation requirements as set forth in Section 00 7339.

It is the responsibility of the Prime contractor to ensure that its subcontractors/suppliers register to become LAUSD certified prior to award. Please have all subcontractors/suppliers utilize the following link to access the online registration: http://www.laschools.org/new-site/small-business/sbe-certification.

WORKER CERTIFICATION - Only Workers skilled in the various trades required on this Contract shall be employed upon the Work. In addition to all other requirements stated in the Bidding Documents, all craftsmen must adhere to the following requirement(s): Journeyman plumbers must possess a plumbing certificate issued by the Los Angeles County and City of Los Angeles, Building and Safety Divisions. All HVAC technicians must possess an EPA-608 Certification. Electricians working for a contractor with a C-10 license must possess a California State Electrician certification. Electricians that are certified can be verified via the State database at www.dir.ca.gov/DAS/ElectricalTrade.htm. Elevator companies must possess a Certified Qualified Conveyance Company License (CQCC). Journeymen will be required to have their Certified Competent Conveyance Mechanics License (CCCM) from the State of California and Journeymen working within the City limits of Los Angeles will be required to have their Journeymen Elevator Mechanic's License. The State of California (Elevator, Ride and Tram Unit) will inspect all County Elevator Modernizations and Alterations.

Bidder is subject to the Project Stabilization Agreement (PSA) as set forth in Document 00 4500 and Section 00 7349.

Bidder shall engage a licensed Structural Engineer (hereafter called the Shoring Engineer) who will be responsible for the design, implementation, and continuous monitoring of all shoring and bracing. The installation of shoring and excavations shall be performed under the continuous inspection and approval of the geotechnical engineer.

Bidder is to coordinate, sequence and schedule work activities in conjunction with a Separate Work Contract (multiple projects at site) as set forth in Article 7.4.1 of the General Conditions.

The District's contract bond estimate is **$4,027,360**.

The Contract Time is **577** calendar days.

CONTRACTOR should consult the General Conditions, Supplementary Conditions, and General Requirements regarding Milestones and Liquidated Damages. CONTRACTOR has those options regarding retention as set forth in Public Contract Code Section 22300.

CONTRACTOR is advised that fraud is investigated by the Office of the Inspector General. The Inspector General of the Los Angeles Unified School District has statutory authority to audit and investigate persons and companies that do business with the District. Identified criminal acts including fraud, kickbacks, theft, and conspiracy are pursued to the greatest extent of the law, in conjunction with Federal, State, and Local law enforcement partner agencies.

Examples of offenses and corresponding maximum sentences are:

- 15 U.S.C. §1 Conspiracy to Restrain Trade - 10 years
- 18 U.S.C. §1341 Mail Fraud - 20 years
- 18 U.S.C. §1344 Bank Fraud - 30 years

- 18 U.S.C. §1349 Conspiracy to Commit Wire Fraud - 20 years
- 18 U.S.C. §1956 Money Laundering - 20 years
- California Penal Code §487 Grand Theft – 3 years

Offenses carry potential fines of up to $1,000,000.

Call the OIG Hotline at **(213) 241-7778** or visit **http://achieve.lausd.net/oig**

END OF SECTION

SECTION 01 1100

SUMMARY OF WORK

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. The furnishing of all labor, materials, equipment, services, and incidentals necessary for Work of the **Accessibility Enhancement Project (Voluntary Barrier Removal)**, at **Utah Street Span School** located at **255 Gabriel Garcia Marquez St., Los Angeles,** California **90033,** as set forth in the Construction Documents which include, but are not limited to, the Drawings, Addenda and Specifications.

B. Project Scope of Work: Refer to Division 00 1116 “Invitation to Bid”.

C. **Other Inclusions as noted below.**

1. **Perform complete scanning of all areas of construction (restrooms, ramps, asphalt, landings, drinking fountains, etc.) using ground penetrating radar to determine locations of existing rebar, reinforcing steel, electrical and communication conduits, water lines, fiber optic cables, voids in concrete, underground utilities, etc. Request dig alert and perform pot holing prior to any excavation, trenching, digging, etc. Mark the site/areas of work. Include scanning reports of the area of construction in shop drawings for records.**

2. **CONTRACTOR shall provide all necessary temporary shoring, bracing, and protection to maintain stability of the existing structure and adjacent improvements during construction of the elevator. Submit a sequencing and engineered shoring plan for review prior to commencement of work. Reference contract documents, including the Report of Geotechnical Investigation prepared by WSP USA, dated February 12, 2024, 112 pages A full copy of this report (112 pages) is provided in Appendix A of this section.**

3. **Temporary Office Set-up and Restoration – One classroom in the Classroom Building will be designated as the field office.**

   a) **Documentation & Protection: Prior to relocating any items, CONTRACTOR shall photograph and document the existing layout of all furnishings to ensure accurate restoration. CONTRACTOR shall then install Ram Board, or an approved equivalent, to protect existing classroom flooring in all affected areas.**

b) Relocation & Partitioning: CONTRACTOR shall relocate existing furnishings as directed by the Owner's Authorized Representative (OAR) to create temporary office space.

c) Space Division: CONTRACTOR shall install temporary partitions to divide the area into two primary rooms. Within the designated office room, partitions shall be installed to create distinct workspaces for the OAR, APE, and IOR, as well as a shared conference room area and a separate "break room" area.

d) All partitions must be free-standing or secured in a manner that ensures no damage to existing floors, walls, or ceilings.

e) Restoration & Cleaning: Upon completion of the work, CONTRACTOR shall remove all temporary partitions and floor protection. All furnishings shall be returned to their original documented locations. Following restoration, CONTRACTOR shall professionally clean the classroom to return it to its pre-construction condition.

4. Contractor-Led Relocation

a) Relocation of Owner Property: The CONTRACTOR shall relocate any furniture or equipment not moved by the Owner as required to perform the scope of work. This relocation shall be at the CONTRACTOR's expense and performed at the direction of the OAR. Relocated items include, but are not limited to:

- **Interior: Office, restroom, and classroom furniture; educational materials; musical instruments; and contents of cabinets/drawers.**
- **Exterior/Common: Lunch shelter tables and chairs; playground materials and equipment.**

Upon completion of the work in each area, the CONTRACTOR shall return all items to their original locations and configurations.

Prior to any movement of furnishings or equipment, the CONTRACTOR and the OAR shall conduct a joint inspection to document the existing condition of all items. Any damage to furniture, equipment, educational materials, musical instruments, or building finishes resulting from the CONTRACTOR's operations shall be repaired or replaced to "like-new" condition at the CONTRACTOR's sole expense.

1.02 RELATED REQUIREMENTS:

1. Division 00 1116: Invitation to Bid
2. Section 01 1216: Phasing of the Work.
3. Section 01 2300: Alternates (Bid Items).
4. Section 01 3113: Project Coordination.
5. Section 01 3229: Project Forms.
6. Section 01 3213: Construction Schedule.
7. Section 01 4523: Testing and Inspection
8. Section 01 4525: Testing, Adjusting, and Balancing for HVAC.
9. Section 01 5000: Construction Facilities and Temporary Controls.
10. Section 01 7123: Field Engineering.

1.03 REGULATORY REQUIREMENTS

A. Refer to Regulatory Requirements as defined by Specification Section 01 4523 “Testing and Inspection” and requirements of each Specification Section as noted.

PART 2 - PRODUCTS (Not used)

PART 3 - EXECUTION

3.01 USE OF PREMISES

A. CONTRACTOR shall coordinate Work of all trades, Subcontractors, utility service providers, with OWNER and/or Separate Work Contract. CONTRACTOR shall sequence, coordinate, and perform the Work to impose minimum hardship on the operation and use of the existing facilities and/or Project site. CONTRACTOR shall install all necessary protection for existing improvements, Project site, property, and new Work against dust, dirt, weather, damage, vandalism, and maintain and relocate all protection to accommodate progression of the Work.

B. CONTRACTOR shall confine entrance and exiting to the Project site and/or facilities to routes designated by the OAR.

C. Within existing facilities, OWNER will remove portable equipment, furniture, and supplies from Work areas prior to the start of Work. CONTRACTOR shall cover and protect remaining items in areas of the Work.

D. CONTRACTOR is advised school may be in session during performance of the Work. CONTRACTOR shall utilize all available means to prevent generation of unnecessary noise and maintain noise levels to a minimum. When required by the OAR, CONTRACTOR shall immediately discontinue noise-generating activities and/or provide alternative methods to minimize noise generation. CONTRACTOR shall install and maintain air compressors, tractors, cranes, hoists, vehicles, and other internal combustion engine equipment with mufflers, including unloading cycle of compressors. CONTRACTOR shall discontinue operation of equipment producing objectionable noise as required by the OAR.

E. CONTRACTOR shall furnish, install, and maintain adequate supports, shoring, and bracing to preserve structural integrity and prevent collapse of existing improvements and/or Work modified and/or altered as part of the Work.

F. CONTRACTOR shall secure building entrances, exits, and Work areas with locking devices as required by the OAR.

G. CONTRACTOR assumes custody and control of OWNER property, both fixed and portable, remaining in existing facilities vacated during the Work.

H CONTRACTOR shall cover and protect surfaces of rooms and spaces in existing facilities turned over for the Work, including OWNER property remaining within as required to prevent soiling or damage from dust, dirt, water, and/or fumes. CONTRACTOR shall protect areas adjacent to the Work in a similar manner. Prior to OWNER occupancy, CONTRACTOR shall clean all surfaces including OWNER property.

I. CONTRACTOR shall not use or allow anyone other than OWNER employees to use facility telephones and/or other equipment, except in an emergency. CONTRACTOR shall reimburse OWNER for telephone toll charges originating from the facility except those arising from emergencies or use by OWNER employees.

J. CONTRACTOR shall protect all surfaces, coverings, materials, and finished Work from damage. Mobile equipment shall be provided with pneumatic tires.

K. CONTRACTOR is advised OWNER will award Separate Work Contracts at this Project site.

L. CONTRACTOR shall not permit the use of portable and/or fixed radios or other types of sound producing devices including walkmans and similar devices.

3.02 PROPERTY INVENTORY

A. Property, OWNER intends to remove; will be removed by OWNER before a room or space is vacated for the Work. Before performing Work in each room or space, OAR and CONTRACTOR shall prepare a detailed initial written inventory of OWNER property remaining within, including equipment and telephone instruments and the condition thereof. OAR and CONTRACTOR shall retain a signed copy of the inventory dated and signed by both parties. Prior to subsequent OWNER occupancy of each such room or space, OAR and CONTRACTOR shall perform a final inventory of OWNER property and all discrepancies between the initial inventory and final inventory shall be the responsibility of CONTRACTOR.

3.03 FURNITURE, FIXTURES AND EQUIPMENT (MATERIALS) OWNER FURNISHED CONTRACTOR INSTALLED (OFCI)

A. Certain materials identified in the Contract Documents as OWNER Furnished CONTRACTOR Installed, OFCI, will be delivered to the Project site by the OWNER.

B. If designated in the Contract Documents to be OWNER furnished CONTRACTOR installed, (OFCI), CONTRACTOR shall unload, store, uncrate, assemble, install, and connect OWNER supplied materials.

C. One-Hundred and Twenty days before the date the CONTRACTOR needs to have the OFCI materials on site, CONTRACTOR shall notify OWNER of the scheduled date for needed OFCI materials. Upon delivery to Project site, CONTRACTOR shall store OFCI materials inside rooms and/or protected spaces and will be responsible for security of OFCI materials until Substantial Completion. OAR will sign receipt or bill of lading as applicable.

D. CONTRACTOR shall, within ten days after delivery, uncrate and/or unpack OFCI materials in presence of OWNER who shall inspect delivered items. OWNER shall prepare an inspection report listing damaged or missing parts and accessories. OWNER shall transmit one copy of the report to CONTRACTOR. OWNER will procure and/or replace missing and or damaged OFCI materials, as indicated in inspection report.

E. CONTRACTOR shall install OFCI materials in the locations and orientation as indicated in the Contract Documents. CONTRACTOR shall verify exact locations with OAR before final installation of OFCI materials.

F. If required, OAR will furnish setting and or placement drawings for OFCI materials.

G. CONTRACTOR shall install OFCI materials by proper means and methods to ensure an installation as recommended by the manufacturer. CONTRACTOR shall furnish and install all necessary fasteners and required blocking to properly install OFCI materials.

H. CONTRACTOR shall install OFCI materials with manufacturer recommended fasteners for the type of construction to which the OFCI materials are being fastened and/or anchored.

I. CONTRACTOR shall provide final connections of any electrical, signal, gas, water, waste, venting and/or similar items to OFCI materials. CONTRACTOR shall, prior to final connection, verify the operating characteristics of OFCI materials are consistent with the designated supply.

3.04 FURNITURE, FIXTURES AND EQUIPMENT (Materials) - OWNER furnished, OWNER installed (OFOI)

A. Certain materials are identified in the Contract Documents as OWNER Furnished, OWNER Installed (OFOI)

B. On dates and during times designated by OWNER, CONTRACTOR shall provide clear off-loading, receiving, protected storage, and OWNER'S dumpster space areas for the use of OWNER or OWNER'S third party OFOI installation contractors. At such times, CONTRACTOR shall also make clear routes and access available to all rooms and spaces to receive OFOI materials.

C. On dates and during times designated by OWNER, CONTRACTOR shall provide access to the elevators for use of OWNER or OWNER'S third party OFOI installation contractors.

D. CONTRACTOR shall cooperate fully with OWNER or OWNER'S third part OFOI installation contractors.

E. CONTRACTOR may be requested by OWNER to provide supplemental labor and equipment to support OFOI activities. Such requests must be submitted in accordance with the change order clauses of Contract.

F. Immediately prior to mobilization of OWNER or OWNER'S third party OFOI installation contractors, OWNER shall document the condition of the Work in areas to be utilized for OFOI activities.

G. CONTRACTOR shall not be responsible for damage caused by OWNER or OWNER'S forces. OWNER shall document the condition of the Work and report to CONTRACTOR any damage in areas utilized for OFOI activities.

3.05 OTHER REQUIREMENTS

A. **The CONTRACTOR is responsible for the restoration of all disturbed finishes. Walls and ceilings shall be patched and painted corner-to-corner and floor to ceiling to ensure a seamless match with existing conditions. Any work impacting existing doors requires full patching and repair, followed by a complete repaint of the entire door jamb and door surface.**

B. **Elevation Adjustments: If the CONTRACTOR's work on the exterior Path of Travel (POT) or landings results in a change to the finished grade or elevation, the CONTRACTOR shall be responsible for all resulting impacts to adjacent vertical surfaces. Where wall surfaces (e.g., stucco, masonry, or siding) are exposed, damaged, or left unfinished due to raising or lowering elevations, the CONTRACTOR shall patch, repair, and refinish the affected areas. All repairs must be feathered into the existing surface to create a seamless transition. The final finish, texture, and paint color must match the existing surrounding conditions.**

C. **CONTRACTOR shall submit daily reports to the OAR no later than 12:00 PM the following business day. Reports must include clear progress photos capturing the work performed during that shift. Reports must provide a full inventory of equipment onsite and include copies of the daily sign-in sheets for all personnel. Each report must explicitly identify, and segregate work performed under the Base Contract versus work performed under an approved or pending Change Order.**

D. **Contractor shall maintain full compliance with all local laws and residential ordinances. Given the site's density, strict adherence to noise control and public right-of-way parking regulations are required. The Contractor is responsible for securing any necessary permits or variances for activities conducted outside standard allowable hours.**

E. **CONTRACTOR shall be completely responsible for, and shall provide all means, methods and materials to fully protect and/or otherwise prevent damage to the owner's property and work until Substantial Completion.**

F. **CONTRACTOR shall perform a comprehensive review of the As-Built plans and verify all dimensions, utilities, and structural elements against actual existing site conditions. CONTRACTOR must identify and document any discrepancies or potential conflicts between the As-Built records and the field conditions that may impact the new construction. Any identified conflicts must be submitted to the**

OAR in writing via Request for Clarification (RFC) before proceeding with the affected work.

G. **All service shutdowns—including gas, water, and power—must be coordinated with the OAR and school administration. Work must be scheduled to avoid impacting school operations and may only occur after all students and personnel, including those in after-school programs, have vacated the premises.**

H. **Schedule fire alarm testing after school hours to avoid impacting campus operations. All testing must remain compliant with city noise ordinances regarding after-hours disturbance.**

I. **CONTRACTOR is responsible for the relocation of temporary facilities and materials to facilitate work by others. This includes moving offices, staging, and stockpiles at no additional cost to the District when necessitated by separate project schedules.**

J. **To safeguard pedestrians during the elevator build, the CONTRACTOR shall provide full-height debris netting and rigid barriers along the Main Building arcade to separate foot traffic from construction equipment and falling debris, ensuring all school path of travel requirements are maintained. Include dust-mitigation seals.**

K. **Within 14 days of NTP, the CONTRACTOR and its electrical subcontractor, as applicable, shall field-verify the existing panel to confirm it has adequate capacity for the elevator power requirements per the Contract Documents. The Contractor shall immediately issue an RFC to address any identified discrepancies or capacity issues before proceeding.**

L. **CONTRACTOR is responsible for site protection during inclement weather. Contractor to coordinate proactive measures (tenting, coverings, etc.) at project start-up to mitigate potential schedule impacts and damage to the work.**

M. **The Contractor shall provide composite shop drawings for the elevator shaft, pit, and machine room, illustrating the coordinated routing of all conduit, piping, and wiring (Power, Fire Alarm, Lighting, and Controls) in relation to structural walls and slabs. No equipment, piping, or wiring foreign to the operation of the elevator shall be permitted within the elevator shaft or machine room. The Contractor (GC) is responsible for resolving all trade conflicts during the submittal phase. To facilitate this, the GC shall lead a mandatory coordination meeting—including the elevator, electrical, and fire alarm subcontractors—to finalize the layout of the hydraulic pump, elevator controller, shunt trip, and all associated devices prior to rough-in. Invitees should include District and Design representations.**

N. CONTRACTOR shall conduct a site meeting prior to installation and include ACU representative, General Contractor, lift installer, electrical contractor, electrical inspector, and the senior project manager to review lift placement and to spot electrical equipment locations.

O. CONTRACTOR shall furnish and install a temporary covered walkway extending from the west entrance of the Main Classroom Building to the Lunch Shelter. This walkway must remain in place and be maintained in a safe, clean condition for the duration of the south entrance closure necessitated by the elevator construction. The structure must provide overhead protection from the elements, maintain a clear Path of Travel (POT) compliant with safety standards, and be secured to prevent wind uplift without damaging existing site finishes.

END OF SECTION

01 1000 Summary of Work
APPENDIX A
(For Reference Only)

REPORT OF GEOTECHNICAL INVESTIGATION

UTAH STREET SPAN SCHOOL

PREPARED FOR
LOS ANGELES UNIFIED SCHOOL DISTRICT

PROJECT NO.: 4953-23-0441
DATE: FEBRUARY 12, 2024

WSP USA
6001 RICKENBACKER ROAD
LOS ANGELES, CALIFORNIA

T: +1 323-889-5300

WSP.COM

February 12, 2024

Mr. Peyman Soroosh Moghadam
Supervising Structural Engineer
Los Angeles Unified School District
333 South Beaudry Avenue, 22nd Floor
Los Angeles, California 90017

Subject: Letter of Transmittal
Report of Geotechnical Investigation
Proposed Elevator
Utah Street Span School
255 Gabriel Garcia Marquez Street
Los Angeles, California

Dear Mr. Moghadam:

We (WSP USA Environment & Infrastructure Inc., WSP) are pleased to submit the results of our geotechnical investigation for the proposed exterior elevator to be constructed on the campus of Utah Street Span School in Los Angeles, California. This investigation was conducted in general accordance with our proposal dated October 26, 2023, which was authorized under Task Order 069, dated November 2, 2023, under Professional Services Agreement for Geotechnical Engineering Services (Contract No. 2090025/4400008131) between the Los Angeles Unified School District and our firm.

The scope of our services was planned with Ms. Cristina Cho, of your office, who provided us with a description of the project and a site plan depicting the project location.

It has been a pleasure to be of professional service to you. Please contact us if you have any questions or if we can be of further assistance.

Yours sincerely,

Mark A. Murphy
Principal Geotechnical Engineer
Project Manager

WI/mm
WSP ref.: *X:\US\USCRC100-LAX\project$\projects\4953 Geotech\2023-proj\230441 LAUSD Utah Street ES Elevator\03 DocCtrl\4953-23-0441r01.docx*

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QUALITY MANAGEMENT

ISSUE/REVISION	FIRST ISSUE	REVISION 1	REVISION 2	REVISION 3
Remarks				
Date	2/12/2024			
Prepared by	WI/PER			
Signature	WI/PER			
Checked by	LH			
Signature	LH			
Authorised by	MM			
Signature	MM			
Project number	4953-23-0441			
Report number	r01			
File reference				

SIGNATURES

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MARK ANDREW MURPHY
No. 2777
GEOTECHNICAL
STATE OF CALIFORNIA

Mark A. Murphy
Principal Geotechnical Engineer/Project Manager

WSP prepared this report solely for the use of the intended recipient, Los Angeles Unified School District, in accordance with the terms and conditions attached to our proposal. The intended recipient is solely responsible for the disclosure of any information contained in this report. The content and opinions contained in the present report are based on the observations and/or information available to WSP at the time of preparation. If a third part makes use of, relies on, or makes decisions in accordance with this report, said third party is solely responsible for such use, reliance or decisions. WSP does not accept responsibility for damages, if any, suffered by any third party as a result of decisions made or actions taken by said third party based on this report. This limitations statement is considered an integral part of this report.

[1] Approval of this document is an administrative function indicating readiness for release and does not impart legal liability on to the Approver for any technical content contained herein. Technical accuracy and fit-for-purpose of this content is obtained through the review process. The Approver shall ensure the applicable review process has occurred prior to signing the document.

TABLES

FIGURE

APPENDICES

EXECUTIVE SUMMARY

We have completed our geotechnical investigation for the proposed elevator at Utah Street Span School in Los Angeles, California. Our subsurface explorations, engineering analyses and geotechnical recommendations are summarized below.

The proposed project is to consist of the construction of a new elevator immediately adjacent to the existing exterior stairs of the main classroom building. The elevator will be a two-story prefabricated structure with a possible attached walkway structure. It is anticipated that the elevator pit will extend approximately 5 feet below grade. Some minor site work may also be included as part of the project.

We explored the site by drilling one boring at the site; fill soils, 5½ feet thick, were encountered in our boring. Our nearby prior borings encountered fill soils, which range from 3 to 14 feet in thickness. As encountered in some of our prior borings, it is possible that portions of the floor slab and foundations of a pre-existing building that was demolished may be present beneath the location of the proposed elevator. The natural alluvial soils underlying the fill soils consist predominantly of coarse-grained materials, such as poorly graded sand and well-graded sand with varying amounts of gravel. Thin layers of silty sand were encountered, ranging from several inches to approximately 3 feet in thickness in the current boring. The sands are generally loose to medium dense to the depth of approximately 30 feet bgs. Below approximately 30 feet bgs, the sands become dense to very dense. Groundwater was not encountered in our current exploratory boring, nor was it encountered in any of the prior borings drilled within the subject school campus. Our corrosion tests indicate that the upper on-site soils are moderately corrosive to ferrous metals, non-aggressive to copper, and that the potential for sulfate attack on portland cement concrete is considered negligible.

The potential for surface rupture due to fault plane displacement propagating to the surface at the project site during the design life of the building is considered low. Hazards associated with strong ground shaking in the event of an earthquake is common in Southern California, the effects of these hazards can be mitigated by proper engineering design and construction in conformance with current building codes and engineering practices. The potential for methane gas migrating to the surface at the project site is considered to be low. The potential for other geologic hazards such as slope stability, liquefaction, subsidence, flooding, tsunamis, inundation, seiches, radon, volcanic hazards, or other geologic hazards affecting the project site is considered low. We estimate that the seismically-induced settlement will be on the order of 1 inch beneath the project site in the event of the Maximum Considered Earthquake.

Fill soils, 5½ feet thick, were encountered in our current boring. Our prior boring drilled at the location of the proposed elevator encountered fill soils to approximately 4½ feet bgs, or approximately 5½ feet below the finished floor elevation at the southwest entrance to the auditorium building. Our other prior borings in the vicinity of the elevator site, many of which were drilled within the footprints of demolished pre-existing buildings, encountered fill soils to depths as deep as 14 feet bgs. Since records are not available documenting the placement and compaction of any of the existing fill soils, their thickness and lateral extent are uncertain, and these fill soils are not considered suitable for supporting new foundations, floor slabs, paving, and other exterior concrete walks or slabs on grade.

The existing fill soils are anticipated to be automatically removed by the excavation for the proposed elevator pit; nevertheless, all existing fill, if any, beneath the proposed elevator should be removed and replaced as properly compacted fill soils. All existing fill soils should also be excavated and replaced as properly compacted fill for support of floor slabs.

If the recommended removal and replacement of the existing fill as described herein and the recommendations on subgrade preparation presented in the grading section of this report are implemented, the proposed elevator equipment and the elevator pit walls below grade may be supported on a mat-type foundation or conventional spread/continuous footings established in undisturbed natural soils or properly compacted fill.

To provide proper support of pavement and other exterior concrete walks and slabs on grade, all existing fill soils should be removed and replaced as properly compacted fill to a maximum depth of 2 feet below the pavement section. In areas where existing pavement is to be replaced, provided that the performance of the existing pavement has been acceptable over its design life, the removal of existing fill may be limited to the upper 12 inches beneath the new pavement. To further improve the design life of the new pavement and reduce (but not eliminate) possible maintenance costs that may be associated with the above-described limited improvement, a layer of geogrid material (Tensar BX-1200 or equivalent) could be placed immediately beneath the 12-inch layer of properly compacted fill and below the base course layer.

All removals should extend horizontally beyond the foundation limits a distance equal to the depth of removal beneath the foundation; the excavations for floor slabs, pavement, and other exterior concrete walks and slabs on grade need not extend laterally beyond the slab/pavement limits.

The on-site soils, less any debris or organic matter, may be used in any required fill. After the recommended excavation, the exposed subgrade should be carefully observed by a representative of our firm to identify any soft or loose areas that may require additional excavation and compaction.

1 SCOPE

This report provides the results of our geotechnical investigation for the proposed exterior elevator at Utah Street Span School located at 255 Gabriel Garcia Marquez Street in Los Angeles, California. The location of the project site is shown on Figure 1, Site Vicinity Map. The locations of the proposed new elevator, our current and relevant prior explorations in relation to the locations of the existing structures and other features at the site are shown on Figure 2, Plot Plan.

Our predecessor firm, LeRoy Crandall and Associates, previously performed a geotechnical investigation for various existing structures at the subject school site, which includes the main classroom building immediately adjacent to the site of the proposed elevator. The results of our relevant prior investigation were submitted in a report dated November 29, 1967 (our Project No. A-67272).

The recommendations presented in this report were developed in part using the geotechnical information from the above-referenced previous investigation. We acknowledge that we have reviewed the referenced report, and we concur with the data and findings contained therein.

This investigation was authorized to evaluate the physical characteristics of the soils at the site of the proposed new elevator, and to provide recommendations for design of foundations and elevator pit walls below grade, for temporary shoring, for floor slab and paving support, and for earthwork. More specifically, the scope of this investigation included the following:

- Review of prior data at and in the vicinity of the site;
- Perform subsurface explorations and laboratory testing, and provide a description of the soil and groundwater conditions encountered;
- Perform surface wave measurements;
- Perform a geologic-seismic hazards evaluation in general conformance with Title 24 of the California Code of Regulations and with the California Geological Survey (CGS) Checklist for Review of Geologic-Seismic Reports for California Public Schools, Hospitals, and Essential Services Buildings (CGS Note 48);
- Provide recommendations for design of foundations for the proposed elevator pit, together with the necessary design parameters, including frictional resistance, passive resistance, and the anticipated total and differential settlement due to expected structural loading;
- Perform a site-specific ground motion hazard analysis to generate site-specific response spectra in accordance with the requirements of ASCE 7-16 and provide seismic design parameters based on the current California Building Code (CBC);
- Provide recommendations for design of temporary shoring;
- Provide recommendations for design of elevator pit walls below grade;
- Provide recommendations for subgrade preparation and floor slab support;
- Provide recommendations for design of asphalt and portland cement concrete paving; and
- Provide recommendations for grading, including site preparation, the placing of compacted fill, and quality control measures relating to earthwork.

The scope of this investigation did not include the assessment of general site environmental conditions for the presence of contaminants in the soils and groundwater of the site.

Our recommendations are based on the results of our current and prior applicable field explorations, laboratory tests, and appropriate engineering analyses. The results of the current field exploration and laboratory tests, which, together with the relevant data obtained from our previous investigation, form the basis of our recommendations, are presented in Appendix A. The results of our relevant prior field explorations and laboratory tests are presented in Appendix B. The results of the current surface wave measurements performed by our subcontractor, GEO*Vision,* are presented in Appendix C.

Our professional services have been performed using that degree of care and skill ordinarily exercised, under similar circumstances, by reputable geotechnical consultants practicing in this or similar localities. No other warranty, express or implied, is made as to the professional advice included in this report. This report has been prepared for the Los Angeles Unified School District and their design consultants to be used solely in support of the proposed elevator at Utah Street Span School in Los Angeles, California. This report has not been prepared for use by other parties, and may not contain sufficient information for purpose of other parties or other uses.

2 SITE CONDITIONS AND PROJECT DESCRIPTION

The proposed new exterior elevator is to be constructed immediately adjacent to the existing exterior stairs of the main classroom building on the subject school campus. The location of the proposed new elevator is shown on Figure 2. The campus is currently occupied by numerous school structures including classrooms, administration buildings, auditorium/cafeteria buildings, playground structures, and sports facilities. The site topography slopes gently from roughly Elevation 270 at the northwest edge of campus down to Elevation 266 at the southeast edge.

The elevator will be a two-story prefabricated structure with a possible attached walkway structure; the structural loading information and detailed structural features are not available at this time. For the purposes of our analysis, it is assumed that the proposed elevator will be supported on shallow spread/mat-type foundation and impose a relatively light load. It is anticipated that the elevator pit will extend approximately 5 feet below grade. Some minor site work may also be included as part of the project.

3 EXPLORATIONS AND LABORATORY TESTS

To supplement our relatively shallow existing geotechnical data at the site, the subsurface conditions beneath the site of the proposed elevator were further explored by drilling one exploratory boring nearby to a depth of approximately 37 feet below the existing ground surface (bgs) Our prior borings drilled in the vicinity of the proposed elevator site extended to a maximum depth of 25 feet bgs. The locations of our current and relevant prior borings are shown on Figure 2. The drilling of the current boring was terminated at a depth shallower than the planned depth of 50 feet due to refusal on a layer of cobbles/boulders. Details of our explorations and the log of our current boring are presented in Appendix A. The logs of our relevant prior borings are presented in Appendix B. In addition, surface wave measurements were performed immediately adjacent to the site of the proposed elevator as a part of our current investigation; the results are presented in Appendix C.

Laboratory tests were performed on selected samples obtained from our current boring to aid in the classification of the soils and to determine the pertinent engineering properties of the foundation soils. The following tests were performed:

- Moisture content and dry density determinations.
- Direct Shear.
- Compaction.
- Hydrocollapse.
- Compaction.
- Corrosion.

All testing was performed in general accordance with applicable ASTM specifications at the time of testing. Details of our current laboratory testing program and the test results are presented in Appendix A. The results for our prior laboratory testing are presented in Appendix B.

4 SOIL CONDITIONS

Fill soils, 5½ feet thick, were encountered in our current boring. Our nearby prior borings encountered fill soils, which range from 3 to 14 feet in thickness. Our prior boring (Boring 5) at the location of the proposed elevator encountered fill soils to approximately 4½ feet bgs, or approximately 5½ feet below the finished floor elevation (FFE) at the southwest entrance to the auditorium building (the FFE of the auditorium building was used as a benchmark for determining the surface elevations at our borings in 1967). Several of the prior borings were drilled within the footprints of previously demolished structures. The outlines of the previously demolished structures are presented on Figure 2. The fill soils encountered in these prior borings were likely placed during the construction of the pre-existing buildings and after the demolition of these structures that pre-dated the currently existing main classroom building.

The encountered fill soils in the current and prior borings generally consisted of silty sand with various amount of brick, concrete, and wood debris. Deeper fill could occur between the current and prior borings and unexplored areas, particularly near underground utilities and foundations. Records are not available documenting the placement and compaction of the fill soils encountered in our current and prior borings. Furthermore, since grading records for the existing main classroom building and the surrounding area are not available, it is possible that portions of the floor slab and foundations of the pre-existing building that was demolished may be present beneath the location of the proposed elevator. Our prior boring (Boring 5) at the location of the proposed elevator encountered the pre-existing building floor slab at approximately 2½ feet bgs, or approximately 3½ feet below the FFE at the southwest entrance to the auditorium building.

The natural alluvial soils underlying the fill soils consist predominantly of coarse-grained materials, such as poorly graded sand and well-graded sand with varying amounts of gravel. Thin layers of silty sand were encountered, ranging from several inches to approximately 3 feet in thickness in the current boring. The sands are generally loose to medium dense to the depth of approximately 30 feet bgs. Below approximately 30 feet bgs, the sands become dense to very dense based on the blowcounts in our boring; the results of our surface wave measurements also indicate an increase in density below depths between 25 and 40 feet bgs.

Groundwater was not encountered in our current exploratory boring, nor was it encountered in any of the prior borings drilled within the subject school campus. As reported by the California Geological Survey, the historic-high groundwater level at the site is approximately 40 feet bgs.

Our corrosion tests indicate that the upper on-site soils are moderately corrosive to ferrous metals, non-aggressive to copper, and that the potential for sulfate attack on portland cement concrete is considered negligible.

5 GEOLOGY

5.1 GEOLOGIC SETTING

The project site is located in the northern portion of the Los Angeles Basin. This basin is a major elongated northwest-trending structural depression that has been filled with sediments up to 13,000 feet thick since middle Miocene time (Yerkes et al, 1965). On a regional scale, the project site lies within the northernmost portion of the Peninsular Ranges Geomorphic Province near its boundary with the Transverse Ranges Geomorphic Province. The southern boundary of the Transverse Ranges province is marked by the Malibu Coast, Santa Monica, Hollywood, Raymond, Sierra Madre, and Cucamonga faults. The Hollywood and Raymond faults are approximately 5 miles north of the project site. The Peninsular Ranges province is characterized by northwest/southeast trending alignments of mountains and hills and intervening basins, reflecting the influence of northwest trending major faults and folds controlling the general geologic structural fabric of the region. The Los Angeles Basin is the northernmost part of the Peninsular Ranges province. The Whittier section of the Elsinore fault and Newport-Inglewood fault are parts of a major northwest-trending structural zone expressed at the surface by a series of low hills and mountain ranges. The Whittier and Newport-Inglewood faults are located approximately 10 miles east-southeast and 7.9 miles west of the project site, respectively.

Locally, the project site is situated approximately 1½ miles south of the Elysian Hills and within the historic Los Angeles River floodplain. The Elysian Hills comprise the low-lying hills west of the current Los Angeles River path and southeast of the eastern end of the Santa Monica Mountains. Bedrock underlying the Elysian Hills are comprised largely of Miocene age sedimentary rocks with Pliocene age rocks flanking the southeastern edge of the hills (Lamar, 1970). The approximate mean elevation at the project site is 270 feet above mean sea level (AMSL) (NAVD 88).

The project site in relation to topographic features is depicted in Figure 1, Site Vicinity Map. The relationship of the project site to the local geologic conditions is depicted in Figure 3, Local Geology Map. Figure 4, Regional Geology Map, presents the geology of the region. The location of major faults and earthquake epicenters in Southern California are shown on the Regional Fault and Seismicity Map, Figure 5. The project site in relation to liquefaction zones is shown on Figure 6, Liquefaction Map.

5.2 GEOLOGIC MATERIALS

According to published reports and geologic maps, the project site is underlain by late Holocene age alluvial deposits associated with the Los Angeles River (Campbell et al., 2016; Lamar, 1970). The alluvium is underlain at depth by the Pliocene-age Fernando Formation. Local geologic conditions are depicted in Figure 3, Local Geology Map. Regional geologic conditions are shown in Figure 4, Regional Geology Map.

Within our current geotechnical exploration excavated at the project site, fill materials were encountered to a depth of 5½ feet. The fill soils consist primarily of silty sand with brick fragments with diameters between 10 and 12 inches. Deeper fill may be encountered at the project site from prior construction, grading, or utility excavations. Underlying the fill, the alluvial soils are composed primarily of poorly- to well-graded deposits of unconsolidated to semi-consolidated sand with gravel and cobbles. Large cobbles and boulders were encountered at approximately 35 feet below ground surface (bgs). Occasional silty sand layers were observed.

5.3 GROUNDWATER

According to the California Department of Water Resources (DWR), the project site is located within the Central Subbasin of the Coastal Plain of Los Angeles groundwater basin (DWR, 2003). According to the California Geological Survey (CGS), the historic-high groundwater level at the project site is approximately 40 feet bgs (CDMG, 1998). Groundwater was not encountered in our exploratory boring drilled to the maximum depth of 37 feet bgs. Similarly, prior borings drilled by our legacy company in 1967 did not encounter groundwater to the maximum depth of 25 feet bgs (LeRoy Crandall and Associates, 1967). Although groundwater was not encountered in our current or prior borings, seasonal groundwater may manifest as seepage or perched water.

5.4 FAULTS

Numerous faults in Southern California have been previously characterized as active or potentially active. The criteria for these major groups were based on criteria developed by the CGS, for the Alquist-Priolo (A-P) Earthquake Fault Zoning Program (Bryant and Hart, 2007; CGS, 2018a). According to Bryant and Hart, an active fault is one with surface displacement within Holocene time (about the last 11,700 years); and a potentially active fault is a fault that has demonstrated surface displacement of Quaternary age deposits (last 1.6 million years) (Jennings and Bryant, 2010, Bryant and Hart, 2007). More recently the CGS has revised fault activity designations for the purpose of the A-P Earthquake Fault Zoning Program (CGS, 2018a). A Holocene-active fault is one that has had surface displacement within Holocene time (about the last 11,700 years). A pre-Holocene fault is a fault that has been demonstrated to not have Holocene surface displacement. An age-undetermined fault is one where the recency of fault movement has not been determined. A list of selected Holocene and late Quaternary faults is shown on Table 1.

Many fault systems in Southern California are considered to be active with Holocene activity (Field et al., 2013; USGS-CGS, 2020) but are not included in an A-P Zone. Many late Quaternary faults are also included in Field et al. 2013 and USGS-CGS 2020. The faults in the vicinity of the project site are shown in Figure 5, Regional Fault and Seismicity Map.

MAJOR HOLOCENE AND LATE QUATERNARY FAULTS

Raymond Fault

The active Raymond fault is located approximately 5 miles north of the project site. The fault is primarily a left-lateral strike-slip fault with a minor component of high-angle reverse offset, placing basement rocks north of the fault over alluvial sediments south of the fault (Hernandez, 2017). The Raymond fault has long been recognized as a groundwater barrier in the Pasadena/San Marino area and numerous geomorphic features along its entire length (such as fault scarps, sag ponds, springs, and pressure ridges) attest to the fault's activity during the Holocene epoch (last 11,700 years) (Hernandez and Olson, 2015). Within the last 36,000 to 41,000 years, five to eight separate earthquake events have been recognized along the Raymond fault (Crook et al., 1987, Weaver and Dolan, 2000). The most recent fault movement, based on radiocarbon ages from materials collected in an excavation exposing the fault, occurred sometime between 2,160 ± 105 and 1,630 ± 100 years before present (LeRoy Crandall and Associates, 1978; Crook et al., 1987; Weaver and Dolan, 2000). An average slip rate of 2.0 millimeters per year and a maximum moment magnitude of 6.5 are estimated by the CGS (Cao et al., 2003; Field et al., 2013) for the Raymond fault.

Hollywood Fault
The active Hollywood fault, located miles north of the project site, trends approximately east-west near the base of the Santa Monica Mountains from the West Hollywood-Beverly Hills area (Dolan and Sieh, 1992) to the Los Feliz area of Los Angeles. The fault is a groundwater barrier within Holocene sediments (Converse et al., 1981). Studies by many investigators (Dolan et al., 2000a; Dolan et al., 1997; Dolan and Sieh, 1992; and Crook and Proctor, 1992) have indicated that the fault is active, based on geomorphic evidence, stratigraphic correlation between exploratory borings, and fault trenching studies. The Hollywood fault zone is included in an A-P Earthquake Fault Zone within the Hollywood 7.5-minute quadrangle by the CGS (CGS, 2017a).

Until recently, the approximately 15-kilometer-long Hollywood fault zone was considered to be expressed as a series of linear scarps and faceted south-facing ridges along the south margin of the eastern Santa Monica Mountains and the Hollywood Hills. Multiple recent fault rupture hazard investigations have shown that the active Hollywood fault zone is located south of the faceted ridges and bedrock outcrops along Sunset Boulevard (Harza, 1998, William Lettis & Associates, 1998a and 1998b). Active deposition of numerous small alluvial fans at the mountain front and a lack of fan incision suggests late Quaternary uplift of the Santa Monica Mountains along the Hollywood fault zone (Dolan et al., 2000a, Dolan et al., 1997, Crook et al., 1992 and 1987). The fault dips steeply to the north and has juxtaposed Tertiary and Cretaceous age rocks over young sedimentary deposits of the northern Los Angeles basin (Hernandez and Treiman, 2014a and 2014b, Hernandez, 2017; Hernandez and Olson, 2015). The Hollywood fault zone has not produced any damaging earthquakes during the historical period and has had relatively minor micro-seismic activity. An average slip rate of 0.9 millimeters per year and a maximum moment magnitude of 6.4 are estimated by the CGS (Cao et al., 2003; Field et al., 2013) for the Hollywood fault.

Verdugo Fault
The active Verdugo fault zone, located approximately 6.4 miles north of the project site, is composed of several reverse oblique faults including the Verdugo fault, the San Rafael fault, and the Eagle Rock fault. The most recent documented activity along this fault is in the Holocene age alluvial deposits along the western flank of the Verdugo Mountains in the Burbank area (County of Los Angeles, 1990a). Additionally, this portion of the fault is considered active by the State (Jennings and Bryant, 2010) although an Alquist-Priolo Earthquake Fault Zone has not currently been established for the Verdugo fault. According to the CGS (Cao et al., 2003; Field et al., 2013), the Verdugo fault is capable of a moment magnitude 6.9 earthquake and has a slip rate of 0.4 millimeters per year.

Newport-Inglewood Fault Zone
The active South Los Angeles Basin section of the Newport-Inglewood fault zone is located approximately 7.9 miles west-southwest of the project site. The Newport-Inglewood fault zone is composed of a series of discontinuous northwest-trending en echelon faults extending from the Ballona Gap south-eastward past the Santa Ana River in Newport Beach, where it extends off-shore. This zone is reflected at the surface by a line of geomorphically young anticlinal hills and mesas formed by the folding and faulting of a thick sequence of Pleistocene-age sediments and Tertiary-age sedimentary rocks (Bryant, 1985; Barrows, 1974). Fault-plane solutions for 39 small earthquakes (between 1977 and 1985) show mostly strike-slip faulting with some reverse faulting along the north section (north of Dominguez Hills) and some normal faulting along the south section (south of Dominguez Hills to Newport Beach) (Treiman, 1993: Hauksson, 1987). Prior fault investigations by Law/Crandall (1993) in the Huntington Beach area indicate that the on-shore South Los Angeles Basin section of the Newport-Inglewood fault zone offsets Holocene age alluvial deposits in the vicinity of the Santa Ana River. An average slip rate of

1.0 millimeters per year and a maximum moment magnitude of 7.1 are estimated by the CGS (Cao et al., 2003; Field et al., 2013) for the Newport-Inglewood fault.

Santa Monica Fault

The active Santa Monica fault, a left lateral, reverse oblique slip fault, is located approximately 9.9 miles west-northwest of the project site. The Santa Monica and Hollywood fault zones form a portion of the Transverse Ranges Southern Boundary fault system. The Transverse Ranges Southern Boundary fault system also includes the Malibu Coast-Anacapa-Dume faults to the west of the Santa Monica fault and the Raymond and Cucamonga faults to the east of the Hollywood fault (Dolan et al., 2000b). The Santa Monica fault zone is the western segment of the Santa Monica-Hollywood fault zone. The fault zone trends east-west from the Santa Monica coastline on the west to the Hollywood area on the east. Urbanization and development within the greater Los Angeles area has resulted in a poor understanding of the lateral extent, location, and rupture history of the Santa Monica fault zone. However, the surface expression of the Santa Monica fault zone includes fault-related geomorphic features, offset stratigraphy, and ground water barriers within late Quaternary deposits (Hill et al., 1979, and Dolan et al., 2000b).

The Santa Monica fault zone is included in an Alquist-Priolo Earthquake Fault Zone within the Beverly Hills 7.5-minute quadrangle by the CGS (CGS, 2018b). An average slip rate of 1.0 millimeters per year and a maximum moment magnitude of 6.6 are estimated by the CGS (Cao et al., 2003; Field et al., 2013) for the Santa Monica fault.

Whittier Fault

The active Whittier fault is located approximately 10 miles southeast of the project site. The northwest-trending Whittier fault extends along the south flank of the Puente Hills from the Santa Ana River on the southeast to Whittier Narrows on the northwest. According to Yeats, 2004 and Treiman, 1991, the Whittier fault extends northwesterly becoming the East Montebello fault beneath the Whittier Narrows towards the Alhambra Wash. The East Montebello fault is approximately 5.7 miles west-southwest of the project site. The main Whittier fault trace is a high-angle reverse fault, with the north side uplifted over the south side at an angle of approximately 70 degrees, although late Quaternary movement has been nearly pure strike slip and total right separation may be around 5 to 5.5 miles (Yeats, 2004). In the Brea-Olinda Oil Field, the Whittier fault displaces Pleistocene age alluvium, and Carbon Canyon Creek is offset in a right lateral sense by the Whittier fault. The CGS considers the Whittier fault to be capable of a Magnitude 6.8 earthquake and estimates an annual slip rate of 2.5 millimeters per year (Cao et al. 2003; Field et al. 2013).

Sierra Madre Fault Zone

The active Sierra Madre fault is located 12 miles northeast of the project site. This fault zone borders the southern front of the San Gabriel Mountains and consists of a series of discontinuous reverse faults that separate pre-Tertiary crystalline rocks on the north from Tertiary and Quaternary sedimentary deposits on the south. The various faults exhibit northerly dips from 15 degrees to vertical, with the crystalline rocks thrust upward toward the south over sediments as young as upper-Pleistocene age. The Sierra Madre fault zone extends approximately 80 kilometers along the southern flank of the San Gabriel Mountains from Big Tujunga Canyon on the west to Cajon Pass on the east. The fault zone, which includes the active Cucamonga fault, consists of a series of reverse fault segments that are believed to have been active at different times in the geologic past (Crook et al., 1987). The moderate magnitude 5.8 1991 Sierra Madre earthquake is believed to be a result of movement on a small portion of the Sierra Madre fault zone. Recent paleoseismic investigations in Altadena (Rubin et al., 1998) have shown that the Sierra Madre fault fails in large, infrequent earthquakes. The past two ruptures in Altadena produced about 4.5 to 5 m of slip at the ground surface and occurred within the past ~18,000 years. Farther east in San Dimas, Tucker and Dolan (2001) documented the occurrence of two large-slip earthquakes during the period between ~8,000 and ~24,000 years ago. The most recent event on the eastern portion of the Sierra Madre fault zone occurred prior to ~8,000 years ago and a minimum slip rate of 0.6 to 0.9 millimeters per year was estimated (Tucker and Dolan, 2001). The CGS considers the Sierra Madre fault to be capable of a moment magnitude 7.2 earthquake and estimates an annual slip rate of 2 millimeters per year (Cao et al. 2003; Field et al. 2013).

San Andreas Fault Zone

The active Mojave section of the San Andreas fault zone is located about 35 miles northeast of the project site. This fault zone is California's most prominent structural feature, trending in a general northwest direction for almost the entire length of the state. The southern section of the San Andreas fault is approximately 450 kilometers long and extends from the Transverse Ranges west of Tejon Pass on the north to the Mexican border and beyond on the south. The last major earthquake along the San Andreas fault zone in Southern California was the 1857 Magnitude 8.3 Fort Tejon earthquake (SCEDC, 2024). The CGS considers the Mojave section to be capable of a moment magnitude 7.5 earthquake and estimates an annual slip rate of 19 millimeters per year (Cao et al., 2003; Field et al., 2013).

BLIND THRUST FAULT ZONES

Several buried thrust faults, commonly referred to as blind thrusts; underlie the Los Angeles Basin at depth. These faults are not exposed at the ground surface and are typically identified at depths greater than 3 kilometers. These faults do not present a potential surface fault rupture hazard. However, the following described blind thrust faults are considered active and potential sources for future earthquakes.

Upper Elysian Park Thrust

The Upper Elysian Park fault is a blind thrust fault that overlies the Los Angeles and Santa Fe Springs sections of the Puente Hills Thrust (Oskin et al., 2000 and Shaw et al., 2002). The eastern edge of the Upper Elysian Park fault is defined by the northwest-trending Whittier fault zone. The vertical surface projection of the Upper Elysian Park fault upper limb is approximately 0.3 miles north of the project site (USGS-CGS, 2020). Like other blind thrust faults in the Los Angeles area, the Upper Elysian Park fault is not exposed at the surface and does not present a potential surface rupture hazard; however, the Upper Elysian Park fault should be considered an active feature capable of generating future earthquakes. An average slip rate of 1.9 millimeters per year and a maximum moment magnitude of 6.4 are estimated by Cao et al. (2003) and Field et al. (2013) for the Upper Elysian Park fault.

Puente Hills Blind Thrust

The active Puente Hills Blind Thrust (PHBT) is defined based on seismic reflection profiles, petroleum well data, and precisely located seismicity (Dolan et al., 2003; Shaw et al., 2002). The project site is approximately 6 miles southwest of the surface projection of the Puente Hills Blind Thrust upper limb (USGS-CGS, 2020). This blind thrust extends eastward from downtown Los Angeles to Brea in northern Orange County. The PHBT includes three north-dipping segments, named from east to west the Coyote Hills segment, the Santa Fe Springs segment, and the Los Angeles segment. These segments are overlain by folds expressed at the surface as the Coyote Hills, Santa Fe Springs Anticline, and the Montebello Hills. The Santa Fe Springs segment of the PHBT was the causative fault of the October 1, 1987, Whittier Narrows (Shaw et al., 2002) and March 29, 2014, La Habra earthquakes. The PHBT is not exposed at the ground surface and does not present a potential for surface fault rupture. However, based on deformation of late Quaternary age sediments above this fault system and the occurrence of the Whittier Narrows earthquake, the PHBT is considered an active fault capable of generating future earthquakes beneath the Los Angeles Basin. An average slip rate of 0.9 millimeters per year and a moment magnitude of 7.1 are estimated by the CGS (Cao et al., 2003; Field et al., 2013), for a multiple segment fault rupture of the

Puente Hills Blind Thrust; a single segment fault rupture may produce an earthquake of moment magnitude 6.5 to 6.6.

Northridge Thrust
The Northridge Thrust is located beneath the majority of the San Fernando Valley and is the causative fault of the January 17, 1994, maximum moment magnitude 6.7 Northridge earthquake (SCEDC, 2024). This thrust fault is not exposed at the surface and does not present a potential surface fault rupture hazard. However, the Northridge Thrust is an active feature that can generate future earthquakes. The vertical surface projection of the Northridge thrust upper limb is approximately 20 miles north-northwest of the project site (USGS-CGS, 2020). An average slip rate of 1.5 millimeters per year and a maximum moment magnitude of 7.0 are estimated by Cao et al. (2003) and Field et al. (2013) for the Northridge Thrust.

Compton Thrust
The Compton blind thrust has been defined from seismic reflection profiles and borehole data (Leon et al., 2009) as a northeast-dipping structure. The vertical surface projection of the Compton thrust upper limb is approximately 8.4 miles southwest of the project site. This blind thrust fault system extends approximately 28 miles from southwest Los Angeles County to northern Orange County in a southeastern direction. Leon et al. (2009) has correlated blind faulting at depth to near-surface folding. Several uplift events have been observed by investigating deformed Holocene layers along buried fold scarps. The cumulative uplift from the observed events ranged from 2 to 6 feet or approximately 4 to 14 feet of thrust displacement (Leon et al., 2009). Although the CGS (Cao et al., 2003) estimates a moment magnitude 7.6 earthquake, Leon et al. (2009) estimates moment magnitudes of 7.0 to 7.4 (Leon et al., 2009). Slip rate is estimated to be 0.9 millimeters per year (Field et al., 2013). Like other blind thrust faults in the Los Angeles area, the Compton blind thrust is not exposed at the surface and does not present a potential surface rupture hazard; however, the Compton thrust should be considered an active feature capable of generating future earthquakes.

5.5 GEOLOGIC-SEISMIC HAZARDS

SURFACE FAULT RUPTURE

The project site is not within a currently established Alquist-Priolo Earthquake Fault Zone (A-P Zone) for surface fault rupture hazard (CGS 2024a, 2017b, 2002). An A-P Zone is an area which requires investigation to evaluate whether the potential for surface fault rupture is present near an active fault (CGS, 2018a; Bryant and Hart, 2007). An active fault is defined as a fault with surface displacement within the last 11,700 years (Holocene). The closest active faults, and established Earthquake Fault Zones, are the Hollywood and Raymond faults, both located 5 miles north of the project site (CGS, 2024a and 2017b; USGS-CGS, 2020).

The project site is located above the buried fault plane of the active Puente Hills Blind Thrust. Blind thrust faults are not exposed at the ground surface and are typically identified at depths greater than 3 kilometers. Therefore, these faults do not present a potential surface fault rupture hazard.

Faults with the potential for surface rupture are not known to be located directly beneath or projecting toward the project site. In our opinion, the potential for surface rupture at the project site due to fault plane displacement propagating to the ground surface during the design life of the project is considered low.

SEISMICITY AND GROUND SHAKING

Earthquake Catalog Data

The seismicity of the region surrounding the project site was determined from research of a digital catalog of seismic data compiled by the Southern California Earthquake Data Center (SCEDC, 2024). This database includes earthquake data compiled by the California Institute of Technology for 1932 to 2024. We have also utilized data from 1769 to 1931 compiled by the CGS (CDMG, 2001). The search for earthquakes that have occurred within 100 kilometers (62.1 miles) of the project site indicates that 326 earthquakes of Magnitude 4.0 and greater occurred between 1932 and 2023; 10 earthquakes of Magnitude 6.0 or greater occurred between 1769 and 1931. Faults and epicenters of earthquakes greater than Magnitude 5 in the greater Los Angeles area are shown in Figure 5, Regional Fault and Seismicity Map.

A number of earthquakes of moderate to major magnitude have occurred in the Southern California area within about the last 90 years. A partial list of these earthquakes is included in the following table.

EARTHQUAKE (OLDEST TO YOUNGEST)	DATE OF EARTHQUAKE	MAGNITUDE	DISTANCE TO EPICENTER (MI)	DIRECTION TO EPICENTER
Long Beach	March 11, 1933	6.4	31	SSE
Tehachapi	July 21, 1952	7.5	77	NW
San Fernando	February 9, 1971	6.6	27	NNW
Whittier Narrows	October 1, 1987	5.9	8.4	E
Sierra Madre	June 28, 1991	5.8	20	NE
Landers	June 28, 1992	7.3	103	E
Big Bear	June 28, 1992	6.3	81	ENE
Northridge	January 17, 1994	6.7	21	NW
Hector Mine	October 16, 1999	7.1	118	NE
Sierra El Mayor	April 4, 2010	7.2	209	SE
La Habra	March 29, 2014	5.1	19	SE
Borrego Springs	June 10, 2016	5.2	111	SE
Ridgecrest	July 6, 2019	7.1	124	NNE
Ventura	August 20, 2023	5.1	61	NE

The proximity of the project site relative to known active faults indicates the project site could be subjected to significant ground shaking caused by earthquakes. This hazard is common in Southern California and the effects of ground shaking can be mitigated by proper engineering design and construction in conformance with current building codes and engineering practices.

LIQUEFACTION AND SEISMICALLY-INDUCED SETTLEMENT

Liquefaction potential is greatest where the groundwater level is shallow, and submerged loose, fine sands occur within a depth of about 50 feet or less. Liquefaction potential decreases as grain size and clay and gravel content increase. As ground acceleration and shaking duration increase during an earthquake, liquefaction potential increases.

According to Los Angeles County Enterprise Geographic Information Systems (GIS) data (LACEGIS, 2024a) and the CGS (2017b), the project site is within an area identified as having a potential for liquefaction, as shown on Figure 6. The alluvium beneath the project site consists primarily of loose to medium dense sands with minor layers of silty sand to the depth of approximately 30 feet bgs. Below the depth of approximately 30 feet bgs, the sands become dense to very dense. The historic-high groundwater level is approximately 40 feet bgs based on data from the CGS; groundwater was not encountered in our current and prior exploratory borings drilled to a maximum depth of 37 feet bgs. Since the soil deposits below the historic-high groundwater level at the site are dense to very dense, these soils are not considered to be susceptible to liquefaction and associated ground deformation.

Seismically-induced settlement is often caused by loose to medium-dense granular soils becoming denser during ground shaking. We estimate that the seismically induced settlement will be on the order of 1 inch beneath the project site in the event of the Maximum Considered Earthquake. This settlement is anticipated to be relatively uniform across the project site.

SLOPE STABILITY

Topographically, the project site is located on the Los Angeles River floodplain south of the Elysian Hills. According to the County of Los Angeles (2024b) and the CGS (2017b), the project site is not within a mapped landslide hazard zone. Additionally, there are no known landslides near the project site (CGS, 2017b, 2024b and 2024c). Therefore, the potential for seismic slope instability is considered low.

TSUNAMIS, INUNDATION, SEICHES, FLOODING AND SUBSIDENCE

The project site is not in a coastal area and situated at elevations greater than 270 feet amsl. Therefore, tsunamis (seismic sea waves) are not considered a hazard at the project site.

According to the County of Los Angeles (1990b), the California Office of Emergency of Services (CalOES, 2007), and the State of California Department of Water Resources' Division of Safety of Dams (DSOD, 2024), the project site is not within an inundation path of a dam or reservoir. Furthermore, there are no other large bodies of water near the project site that could adversely affect the project site in the event of earthquake-induced seiches (wave oscillations in an enclosed or semi-enclosed body of water).

The project site is in an area of minimal flooding potential (Zone X). Zone X, as defined by the Federal Emergency Management Agency (FEMA, 2024), is an area outside of the 0.2% annual chance flood. Therefore, the potential for flooding at the project site is considered low.

The project site is not within an area of known subsidence associated with fluid withdrawal (groundwater or petroleum), peat oxidation, or hydrocompaction.

OIL WELLS AND METHANE GAS

Oil and gas wells are potential concerns when they seep oil or gas, are not abandoned to current regulations, or have associated surface contamination. Oil wells and oil fields are also associated with methane hazards. The project site is not located within the administrative limits of an oil field according to the California Geologic Energy Management Division [CalGEM, 2024, previously the California Division of Oil, Gas, and Geothermal Resources (DOGGR)]. The closest known oil production well is 0.2-mile to the south-southeast. It is classified as a "plugged core hole." There is a remote possibility that undocumented wells could be encountered during any grading and construction at the project site. Any well encountered would need to be properly abandoned in accordance with the current requirements of CalGEM.

Although the project site is not within the administrative boundaries of an active or abandoned oil field, the project site is within 0.4-mile of the abandoned Union Station and

Boyle Heights Oil Fields (CalGEM, 2024). Additionally, City of Los Angeles Methane Buffer Zones surround the school property (City of Los Angeles, 2024). Therefore, the potential exists for methane and other volatile gases to occur beneath the project site.

RADON

The project site is in a Low Potential for Indoor Radon Levels above 4.0 Picocuries per Liter zone, defined as all areas that are not designated as High Potential or Moderate Potential (CGS, 2024c).

5.6 GEOLOGIC CONCLUSIONS

Based on the available geologic data, active faults with the potential for surface fault rupture are not known to be located directly beneath or projecting toward the project site. Therefore, the potential for surface rupture due to fault plane displacement propagating to the surface at the project site during the design life of the building is considered low.

Although the project site could be subjected to strong ground shaking in the event of an earthquake, this hazard is common in Southern California and the effects of ground shaking can be mitigated by proper engineering design and construction in conformance with current building codes and engineering practices.

Although the project site is not within the limits of a City of Los Angeles Methane or Methane Buffer Zone, methane migrating to the surface is a potential hazard due to its location near the abandoned Union Station and Boyle Heights Oil Fields. However, we consider the potential for methane gas migrating to the surface at the project site to be low.

The project site is relatively level and the potential for slope stability hazards is considered low. The potential for other geologic hazards such as liquefaction, subsidence, flooding, tsunamis, inundation, seiches, radon, volcanic hazards, or other geologic hazards affecting the project site is considered low. The loose to medium-dense near-surface granular soils are susceptible to seismically-induced dry settlement. We estimate that the seismically-induced settlement will be on the order of 1 inch beneath the project site in the event of the Maximum Considered Earthquake.

6 RECOMMENDATIONS

6.1 GENERAL

Fill soils, 5½ feet thick, were encountered in our current boring. Our prior boring (Boring 5) drilled at the location of the proposed elevator encountered fill soils to approximately 4½ feet bgs, or approximately 5½ feet below the FFE at the southwest entrance to the auditorium building. Our other prior borings in the vicinity of the elevator site, many of which were drilled within the footprints of demolished pre-existing buildings, encountered fill soils to depths as deep as 14 feet bgs. Since records are not available documenting the placement and compaction of any of the existing fill soils, their thickness and lateral extent are uncertain, and these fill soils are not considered suitable for supporting new foundations, floor slabs, paving, and other exterior concrete walks or slabs on grade.

The existing fill soils are anticipated to be automatically removed by the excavation for the proposed elevator pit; nevertheless, all existing fill, if any, beneath the proposed elevator should be removed and replaced as properly compacted fill soils. All existing fill soils should also be excavated and replaced as properly compacted fill for support of floor slabs. If the recommended removal and replacement of the existing fill as described herein and the recommendations on subgrade preparation presented in the grading section of this report are implemented, the proposed elevator equipment and the elevator pit walls below grade may be supported on a mat-type foundation or conventional spread/continuous footings established in undisturbed natural soils or properly compacted fill.

To provide proper support of pavement and other exterior concrete walks and slabs on grade, all existing fill soils should be removed and replaced as properly compacted fill to a maximum depth of 2 feet below the pavement section. In areas where existing pavement is to be replaced, provided that the performance of the existing pavement has been acceptable over its design life, the removal of existing fill may be limited to the upper 12 inches beneath the new pavement. To further improve the design life of the new pavement and reduce (but not eliminate) possible maintenance costs that may be associated with the above-described limited improvement, a layer of geogrid material (Tensar BX-1200 or equivalent) could be placed immediately beneath the 12-inch layer of properly compacted fill and below the base course layer.

All removals should extend horizontally beyond the foundation limits a distance equal to the depth of removal beneath the foundation; the excavations for floor slabs, pavement, and other exterior concrete walks and slabs on grade need not extend laterally beyond the slab/pavement limits.

The on-site soils, less any debris or organic matter, may be used in any required fill. After the recommended excavation, the exposed subgrade should be carefully observed by a representative of our firm to identify any soft or loose areas that may require additional excavation and compaction.

6.2 FOUNDATIONS

6.2.1 SHALLOW FOUNDATIONS

6.2.1.1 BEARING VALUE

Conventional spread/continuous footings or a mat-type foundation, underlain by properly compacted fill and/or undisturbed natural soils, may be designed to impose a net dead-plus-live load pressure of 3,000 pounds per square foot. These foundations should be at least 2 feet wide and carried at least 2 feet below the lowest adjacent grade and at least 12 inches below the level of elevator pit bottom. The excavations should be deepened as necessary to extend into satisfactory soils.

A one-third increase may be used for wind or seismic loads. The recommended bearing value is a net value, and the weight of concrete in the foundation may be taken as 50 pounds per cubic foot; the weight of any soil backfill may be neglected when determining the downward loads.

6.2.1.2 SETTLEMENT

We estimate that the static settlement of the proposed elevator supported on a mat-type foundation or conventional spread/continuous footings in the manner recommended above, will be on the order of ½ inch or less. The differential settlement across the elevator footprint is expected to be ¼ inch or less. In addition to the static settlement, the seismically-induced settlement discussed in Section 5.5 should also be considered.

6.2.1.3 LATERAL RESISTANCE

Lateral loads may be resisted by soil friction and by the passive resistance of the soils. A coefficient of friction of 0.35 may be used between the footings and the floor slab and the supporting soils. The passive resistance of the soils may be assumed to be equal to the pressure developed by a fluid with a density of 250 pounds per cubic foot. A one-third increase in the passive value may be used for wind or seismic loads. The frictional resistance and the passive resistance of the soils may be combined without reduction in determining the total lateral resistance.

6.2.1.4 FOUNDATION OBSERVATION

To verify the presence of satisfactory soils at the design elevations, the bottoms of the foundations should be observed by personnel of our firm. Foundations should be deepened as necessary to reach satisfactory supporting soils, as discussed above. The exposed soils should be inspected to confirm that the bottom of the excavation is free of loose soil and other unsuitable materials before footing construction.

Inspection of the foundation excavations may also be required by the appropriate reviewing governmental agencies. The contractor should be familiar with the inspection requirements of the reviewing agencies.

6.2.2 POLE-TYPE FOUNDATIONS

6.2.2.1 GENERAL

Short drilled-in-place concrete piles or pole-type foundations may be designed to support new pole-type structures. Pole-type foundations may be designed using the simplified approach given in Section 1807.3A of the 2022 CBC (Pole Formula). Design parameters for the Pole Formula are presented below.

6.2.2.2 AXIAL CAPACITIES
Based on an assumed embedment depth of at least 6 feet, the downward capacity of short drilled cast-in-place concrete piles supporting pole-type structures may be estimated assuming a uniform friction value of 150 pounds per square foot for the portion of the pile extending into natural soil or properly compacted fill and a uniform friction value of 100 pounds per square foot may be used for the portion of the pile extending into the existing fill. For upward capacity, a uniform friction value of 75 pounds per square foot may be used for the portion of the pile extending into natural soil or properly compacted fill and a uniform friction value of 50 pounds per square foot may be used for the portion of the pile extending into the existing fill.

A one-third increase in the friction values may be used for support of wind or seismic loads. The uniform friction values above should be ignored within 2 feet of the ground surface surrounding the pile, unless the surrounding area is paved with asphalt or concrete.

6.2.2.3 SETTLEMENT
We estimate that the static settlement of pole-type structures, supported in the manner recommended, would be about ¼ inch or less.

6.2.2.4 LATERAL RESISTANCE
For computing the lateral resistance of the drilled piles, the pole formula in the current CBC may be used. When using the pole formula, the lateral resistance of the natural soils or properly compacted fill may be assumed to be equal to the pressure developed by a fluid with a density of 500 pounds per cubic foot, up to a maximum of 5,000 pounds per square foot. The lateral resistance of the existing fill soils may be assumed to be equal to the pressure developed by a fluid with a density of 200 pounds per cubic foot, up to a maximum of 2,000 pounds per square foot.

A one-third increase in the lateral resistance may be used when considering wind or seismic loads. The lateral resistance within 2 feet of the ground surface surrounding the pile should be ignored unless the surrounding area is paved with asphalt or concrete.

All backfill soils and additional fill soils placed at the locations of the poles should be properly compacted in accordance with the recommendations in the Grading Section of this report.

6.2.2.5 POLE-TYPE FOUNDATION INSTALLATION
Sandy deposits are likely to be encountered and caving may occur in such soils during the construction of pole-type foundations. The need for the use of special methods to prevent the caving of the shaft sidewalls, such as slow drilling speed or casing/drilling mud should be anticipated. Piles spaced less than 8 feet on centers should be drilled and filled alternately, with the concrete permitted to set at least eight hours before drilling an adjacent hole. Pile foundation excavations should be filled with concrete as soon after drilling and inspection as possible; the holes should not be left open overnight. The concrete should be placed with special equipment so that the concrete is not allowed to fall freely more than 5 feet and to prevent concrete from striking the walls of the excavations.

Only competent drilling contractors with experience in the installation of pile foundations in similar soil conditions should be considered for the pile construction.

The drilling of the pile foundation excavations and the placing of the concrete should be observed continuously by our personnel to verify that the desired diameter and depth are achieved.

6.2.3 ULTIMATE DESIGN FACTORS

The recommended design values above are for use with loadings determined by a conventional working stress design. When considering an ultimate design approach, the allowable values provided in the previous sections may be multiplied by the factors shown in the table below:

Design Item	Ultimate Design Factor
Footing Bearing Value	3.0
Axial Capacity (Pole-Type Foundations)	2.0
Passive Resistance	1.5
Coefficient of Friction	1.5

In no event, however, should foundation sizes be less than those required to support dead-plus-live loads when using the working stress design method.

6.3 DYNAMIC SITE CHARACTERISTICS

6.3.1 SEISMIC DESIGN PARAMETERS

We have determined the mapped seismic design parameters in accordance with the 2022 CBC and ASCE 7-16 Standard (ASCE, 2017) using the USGS Seismic Design Map Tool. The CBC Site Class was determined to be Site Class "D" based on the results of our surface wave measurements, our explorations, and on a review of the local soil and geologic conditions. The mapped seismic parameters may be taken as presented in Table 2.

It should be noted that, based on the project Site Class and the S_1 value, per Section 11.4.8 of ASCE 7-16, a site-specific ground motion hazard analysis is required unless the exception under Section 11.4.8 of ASCE 7-16 (as modified in Supplement 3), is utilized, which requires that the values of the parameters S_{M1} and S_{D1} are increased by 50% for all applications of S_{M1} and S_{D1}. The results of our site-specific ground motion hazard analysis are presented in the following subsections.

6.3.2 SITE-SPECIFIC RESPONSE SPECTRA

6.3.2.1 GENERAL

In addition to the mapped seismic design parameters presented in the previous section, we have performed a site-specific ground motion hazard analysis in accordance with Chapter 21 of ASCE 7-16 to obtain site-specific seismic design acceleration parameters, the Risk-Targeted Maximum Considered Earthquake (MCE_R) response spectrum, and design earthquake response spectrum. The results are presented in the following sections.

6.3.2.2 SITE CONDITIONS

The average shear wave velocity within the upper 30 meters (V_{S30}) beneath the site was estimated to be approximately 350 meters per second (1,147 feet per second), based on the surface wave measurements at the site; a report of the geophysical studies conducted is presented in Appendix C. Additional site information necessary for the analysis includes the depth to a shear wave velocity of 1,000 meters per second ($Z_{1.0}$) and 2,500 meters per second ($Z_{2.5}$), which were estimated as 350 meters and 2.25 kilometers, respectively, based on the Southern California Earthquake Center's Community Velocity Model Version 4.26 (SCEC-CVM-S4.26) (Graves and Pitarka, 2014).

6.3.2.3 GROUND MOTION MODELS (GMMS)

The ergodic ground motion models (GMMs) selected for use in this analysis are those developed for the Pacific Earthquake Engineering Research Center (PEER) Next Generation Attenuation (NGA) West 2 project. Four of the five GMMs – Abrahamson et al. (2014), Boore et al. (2014), Campbell and Bozorgnia (2014), and Chiou and Youngs (2014) were used; an equal weighting of 0.25 was used for each of these GMMs. The fifth NGA West 2 GMM (Idriss, 2014) was not used because the model is only based on data from "quasi-linear sites" where V_{S30} is greater than 450 meters per second and, therefore, is not applicable at this site because the V_{S30} is less than 450 meters per second. The GMMs provide ergodic median component ground motion (RotD50) estimates as a function of the V_{S30}, $Z_{1.0}$ and $Z_{2.5}$.

6.3.2.4 GROUND MOTION HAZARD ANALYSIS

We have performed a Probabilistic Seismic Hazard Analysis (PSHA) using the computer program OpenSHA (Field et al. 2003) and a Deterministic Seismic Hazard Analysis (DSHA) using the NGA West 2 GMPE Excel spreadsheet together with fault data published as part of the Second Uniform California Earthquake Rupture Forecast (UCERF2) in order to develop site-specific response spectra (RS) in accordance with ASCE 7-16 for the site.

The site-specific probabilistic RS were developed using the OpenSHA program. An average of Fault Models 3.1 and 3.2 from the Third Uniform California Earthquake Rupture Forecast (UCERF3) was used as the earthquake rupture forecast model for the PSHA (Field et al., 2013). In addition to known fault sources, background seismicity was also included in the PSHA. For the DSHA, a composite deterministic RS was compiled from the maximum of the 84th percentile spectral ordinates computed for known nearby faults using the USGS 2008 and 2014 California fault models. The deterministic spectrum is controlled by the Upper Elysian Park Thrust fault, for oscillator periods between PGA and 5 seconds. The deterministic spectrum is controlled by the Compton Thrust fault for periods above 5 seconds and up to 10 seconds.

The computed 5%-damped probabilistic and deterministic geomean ground motions were converted to maximum response direction ground motions (RotD100) using the scaling factors recommended in the Shahi-Baker (Shahi and Baker, 2014) method as presented in Table 3.

In accordance with Section 21.2.1 of ASCE 7-16, the probabilistic risk-targeted response spectrum (MCE_R) was taken as the maximum direction response spectrum with a 2% probability of being exceeded in 50 years multiplied by the risk coefficients C_{RS} and C_{R1} to achieve a 1% probability of collapse within a 50-year period. In accordance with Section 21.2.2 of Chapter 21 of ASCE 7-16, the deterministic MCE response spectrum was taken as the largest of the maximum direction response spectrum of the compiled 84th percentile deterministic events and the deterministic lower limit at each spectral period as shown in Table 4 and on Figure 7. The risk-targeted probabilistic response spectrum is presented in Table 5 and on Figure 7. The risk-targeted coefficients, C_{RS} and C_{R1}, were taken from Figures 22-18 and 22-19 in ASCE 7-16. The C_{RS} and C_{R1} values were both computed as 0.897 for the site.

In accordance with Section 21.2.3 of Chapter 21 of ASCE 7-16, the site-specific MCE_R response spectrum was taken as the minimum of the deterministic MCE_R and probabilistic MCE_R response spectra and as never less than 80% of the code-based MCE_R using the mapped parameters at each spectral period, as shown in Table 6.

In accordance with Chapter 21.3 of ASCE 7-16, the site-specific design earthquake response spectrum is taken as the lesser of two-thirds of the site-specific MCE_R and 80% of the design response spectrum computed per Section 11.4.6 of ASCE 7-16, as presented in Table 7 and on Figure 7. The final site-specific MCE_R and design earthquake response spectra are presented on Figure 7.

The site-specific design acceleration parameters were determined in accordance with Chapter 21.4 of ASCE 7-16. The parameter S_{DS} is taken as 90% of the maximum spectral acceleration obtained from the site-specific spectrum within the oscillator period range 0.2 to 5 seconds. S_{D1} is taken as the maximum value of the product of the oscillator period and the spectra acceleration for oscillator periods from 1 to 5 seconds. S_{MS} and S_{M1} are taken as 1.5 times S_{DS} and S_{D1}, respectively. The site-specific design acceleration parameters are presented in Table 2.

6.4 FLOOR SLAB SUPPORT

The subgrade for the floor slab on grade should be prepared in accordance with the recommendations in Section 6.9, Grading.

Floor slab thicknesses and reinforcing details should be determined by the structural engineer. However, we suggest, at a minimum, the floor slab on grade should consist of a 4-inch-thick slab reinforced with No. 3 reinforcing bars spaced at 16 inches on center each way.

Construction activities and exposure to the environment can cause deterioration of the prepared subgrade. Therefore, we recommend that our field representative observe the condition of the final subgrade soils immediately prior to slab-on-grade construction, and, if necessary, perform further density and moisture content tests to determine the suitability of the final prepared subgrade.

Where vinyl or other moisture-sensitive floor covering is planned, we recommend that the floor slab in those areas be underlain by a capillary break consisting of a vapor-retarding membrane over a 4-inch-thick layer of gravel. A 2-inch-thick layer of sand should be placed between the gravel and membrane to decrease the possibility of damage to the membrane. We suggest the following gradation for the gravel:

Sieve	Percent Passing
¾”	90-100
No. 4	0-10
No. 100	0-3

Measures to reduce concrete shrinkage, such as the use of a low-slump concrete (i.e. less than 2 inches), should be implemented in order to minimize possible curling of the slab. A 2-inch-thick layer of coarse sand (having a Sand Equivalent of at least 30) should be placed over the vapor retarding membrane to reduce slab curling. If this sand bedding is sued, care should be taken during the placement of the concrete to prevent displacement of the sand. The concrete slab should be allowed to cure properly before placing vinyl or other moisture-sensitive floor covering. The vapor retarding membrane should meet the requirements of ASTM E-1745 (Class A, B, or C), as stated in ACI 302.1R, regardless of thickness.

6.5 EXCAVATION AND SLOPES

Where excavations are deeper than about 4 feet, and the necessary space is available, the sides of the excavations should be sloped back at 1:1 (horizontal to vertical) or shored for safety. It should be noted that, due to the sandy nature of the on-site soils, footing excavations may not stand vertically without caving and sloughing. Unshored excavations should not extend below a plane drawn at 2:1 (horizontal to vertical) extending downward from adjacent existing footings. Where space is not available, shoring will be required; data for design of shoring are presented in the following section. Where limited excavations adjacent to existing continuous footings are necessary, excavation in sections (slots) may be feasible. We can provide additional recommendations on this procedure when the foundation and excavation details are provided.

The excavations should be observed by personnel of our firm so that any necessary modifications based on variations in the soil conditions encountered can be made. All applicable safety requirements and regulations, including OSHA regulations, should be met.

Where sloped embankments are used, the top of the slopes should be barricaded to prevent vehicles and storage loads within 5 feet of the tops of the slopes. A greater setback may be necessary when considering heavy vehicles, such as concrete trucks and cranes; we should be advised of such heavy vehicle loadings so that specific setback requirements can be established. If the temporary construction embankments are to be maintained during the rainy season, berms are suggested along the tops of the slopes where necessary to prevent runoff water from entering the excavation and eroding the slope faces. The soils exposed in the cut slopes should be inspected during excavation by our personnel so that modifications of the slopes can be made if variations in the soil conditions occur or if possible adverse water seepage conditions are encountered.

To minimize potential water intrusion into the proposed elevator pit excavation during a rain event, the opening of the excavation may should be covered, such as with steel plates and plastic sheeting with sandbags or soil berms along the steel plate/sheeting edges.

6.6 TEMPORARY SHORING

6.6.1 GENERAL

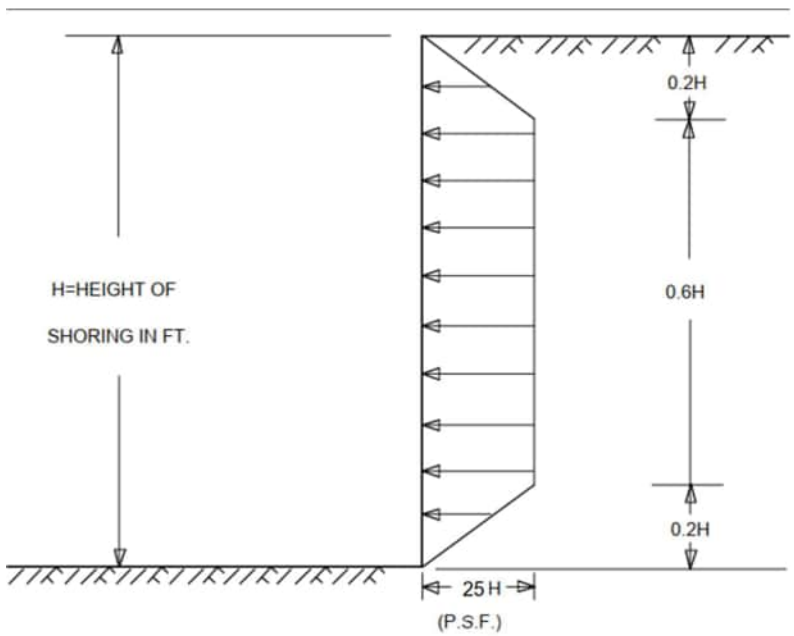
Where there is not sufficient space for sloped embankments, such as adjacent to the existing main classroom building, shoring will be required to support the faces of the elevator pit excavations. One method of shoring would consist of steel soldier piles placed in drilled holes and backfilled with concrete. Based on the anticipated depth of excavation, cantilevered soldier piles are anticipated to be sufficient.

The following information on the design and installation of the shoring is as complete as possible at this time. We can furnish any additional required data as the design progresses. Also, we suggest that our firm review the final shoring plans and specifications prior to bidding or negotiating with a shoring contractor.

6.6.2 LATERAL PRESSURES

For design of the cantilevered shoring, a triangular distribution of lateral earth pressure may be used. It may be assumed that the retained soils with a level surface behind the cantilevered shoring will exert a lateral pressure equal to that developed by a fluid with a density of 35 pounds per cubic foot.

Alternatively, braced hydraulic shoring could be used for the elevator pit excavation. The hydraulic shoring system should be capable of resisting a trapezoidal distribution of lateral earth pressure. The recommended trapezoidal distribution of lateral earth pressure of the case where the grade is level behind the shoring is illustrated in the following diagram, where the maximum lateral pressure will be 25H in pounds per square foot, where H is the shored height in feet.



In addition to the recommended earth pressure, the shoring adjacent to vehicular traffic areas should be designed to resist a uniform lateral pressure of 100 pounds per square foot, acting as a result of an assumed 300 pounds per square foot surcharge behind the shoring due to normal traffic. If the traffic is kept back at least 5 feet from the shoring, the traffic surcharge may be neglected. The shoring system should also be designed to support the lateral surcharge pressures imposed by the foundations of the adjacent structures, concrete trucks, other heavy construction equipment, or storage loads placed near the shoring system. We can provide additional recommendations when the geometry/layout for the adjacent foundations/loads are provided to us.

6.6.3 DESIGN OF SOLDIER PILES

For the design of soldier piles spaced at least two diameters on centers, the allowable lateral bearing value (passive value) of the soils below the level of the excavation may be assumed to be 500 pounds per square foot per foot of depth at the excavated surface, up to a maximum of 5,000 pounds per square foot. To develop the full lateral value, provisions should be taken to assure firm contact between the soldier piles and the undisturbed soils. The concrete placed in the soldier pile excavations maybe a lean-mix concrete. However, the concrete used in that portion of the soldier pile which is below the planned excavated level should be of sufficient strength to adequately transfer the imposed loads to the surrounding soils.

6.6.4 LAGGING

Continuous lagging will be required between the soldier piles and the lagging should be designed for the full anticipated lateral pressure.

6.6.5 DEFLECTION

The deflection of a cantilevered shoring system may be estimated by the shoring engineer. If greater than the estimated deflection occurs during construction, additional bracing may be necessary to minimize settlement of adjacent structures. If desired to reduce the deflection of the shoring, a greater active pressure could be used in the shoring design.

6.6.6 MONITORING

Some means of monitoring the performance of the shoring system is recommended. The monitoring should consist of periodic surveying of the lateral and vertical locations of the tops of all the soldier piles. Initial survey should be taken prior to the excavation so that an accurate baseline may be established. We will be pleased to discuss this further with you and the design consultants when the design of the shoring system has been finalized.

6.7 ELEVATOR PIT WALLS BELOW GRADE

6.7.1 GENERAL

Detailed plans depicting proposed elevator pit walls below grade are not currently available; however, we have assumed that the planned walls below grade will be minor (extending to less than 5 feet bgs) Foundations supporting the elevator pit walls below grade should be designed in accordance with the recommendations for foundations provided in Section 6.2 of this report.

6.7.2 LATERAL PRESSURES

The current CBC requires that at-rest earth pressures be considered for the design of walls below grade. As such, where the surface of the backfill is level, it may be assumed that drained soils behind the proposed elevator pit walls will exert a lateral pressure equal to that developed by fluid with a density of 60 pounds per cubic foot.

If drainage behind the elevator pit walls below grade, as discussed in the following subsection is not planned, the walls below grade should be designed to resist hydrostatic pressure in addition to the earth pressure recommended above. It may be assumed that the additional increment of hydrostatic pressure would be equal to 32 pounds per cubic foot.

In addition to the recommended earth pressures and hydrostatic pressures, walls adjacent to areas subject to vehicular traffic should be designed to resist a uniform lateral pressure of 100 pounds per square foot, acting as a result of an assumed 300 pounds per square foot surcharge behind the walls due to normal vehicular traffic. If the traffic is kept back a horizontal distance at least equal to the retained height of the wall, the traffic surcharge may be neglected. The walls should also be designed to support the lateral surcharge pressures imposed by the foundations of the adjacent structures. We can provide additional recommendations when the geometry/layout for the adjacent foundations/loads are provided to us.

6.7.3 DRAINAGE

The proposed elevator pit walls below grade should be provided with waterproofing and designed to resist hydrostatic pressures as discussed above or be provided with a drainage system to relieve the possible buildup of hydrostatic pressures. The drainage could consist of a 4-inch-diameter perforated pipe placed with perforations down at the base of the wall. The pipe should be sloped at least 2 inches in 100 feet and surrounded by ¾-inch crushed rock or gravel separated from the on-site soils by an appropriate filter fabric. The crushed rock or gravel should have less than 5% passing a No. 200 sieve. In any event, the retaining walls should be waterproofed.

6.8 PAVING

6.8.1 GENERAL

To provide support for paving, the subgrade soils should be prepared as recommended in the following section on grading. Compaction of the subgrade, including trench backfills, to at least 95%, and achieving a firm, hard, and unyielding surface will be important for paving support. The preparation of the paving area subgrade should be performed immediately prior to placement of the base course. Proper drainage of the paved areas should be provided since this will reduce moisture infiltration into the subgrade and increase the life of the paving.

The paving thicknesses are based on our observations of the on-site soil conditions. An R-value of 40 was assumed for design. The R-value should be confirmed during grading.

6.8.2 ASPHALT CONCRETE PAVEMENT

The required paving and base thicknesses will depend on the expected wheel loads and volume of traffic (Traffic Index or TI). Assuming that the paving subgrade will consist of the on-site or comparable soils compacted to at least 90% as recommended, the minimum recommended paving thicknesses are presented in the following table.

ASSUMED TRAFFIC INDEX	ASPHALT CONCRETE (INCHES)	BASE COURSE (INCHES)
4 and 5 (Automobile Parking and Driveways with Light Truck Traffic)	3	4
6 (Driveways with Heavy Truck Traffic)	4	4

The asphalt paving sections were determined using the Caltrans design method. We can determine the recommended paving and base course thicknesses for other Traffic Indices if required. Careful inspection is recommended to verify that the recommended thicknesses or greater are achieved, and that proper construction procedures are followed.

6.8.3 PORTLAND CEMENT CONCRETE PAVEMENT

Portland cement concrete paving sections were determined in accordance with procedures developed by the Portland Cement Association. Concrete paving sections for a range of Traffic Indices are presented in the following table. We have assumed that the portland cement concrete will have a compressive strength of at least 3,000 pounds per square inch and that the paving subgrade will consist of the on-site or comparable soils compacted to at least 90% as recommended.

ASSUMED TRAFFIC INDEX	ASPHALT CONCRETE (INCHES)	BASE COURSE (INCHES)
4 and 5 (Automobile Parking and Driveways with Light Truck Traffic)	7	4
6 (Driveways with Heavy Truck Traffic)	7½	4

The paving should be provided with joints at regular intervals no more than 15 feet in each direction. Load transfer devices, such as dowels or keys, are recommended at joints in the paving to reduce possible offsets. The paving sections in the above table have been developed based on the strength of unreinforced concrete. Steel reinforcing may be added to the paving to reduce cracking and to prolong the life of the paving.

6.8.4 PLAYGROUND PAVEMENT AND PAVEMENT BETWEEN BUILDINGS

Playground pavement and pavement between buildings are to be designed essentially for foot traffic, with only occasional light vehicle loading, i.e., golf cart-type vehicles. We understand that the District's standard design for such pavements consists of 2 inches of asphalt concrete (AC) over 3 inches of Aggregate Base. The District's experience indicates this standard design generally provides satisfactory performance over the design life of the pavement for a wide range of subgrade conditions. However, to reduce potential damage during construction or the potential for distress caused by occasional heavy loads from maintenance equipment, we recommend that proposed pavements that are to be designed essentially for pedestrian traffic consist of 3 inches of AC over 4 inches of aggregate base.

6.8.5 NON-VEHICULAR EXTERIOR SLABS

Exterior slabs should be supported by compacted fill prepared as recommended in this report. Slabs should be designed to resist the anticipated loadings. We recommend that exterior slabs be at least 4 inches thick and reinforced with No. 3 steel reinforcing bars placed at maximum spacing of 18 inches on center in both horizontal directions. Crack control joints should be used on all exterior slabs, with a maximum spacing of 5-foot centers each way for sidewalks and 10-foot centers each way for slabs. Actual crack control joint spacing should be designed by the project structural engineer or architect in conformance with the requirements of the 2022 CBC.

6.8.6 BASE COURSE

The base course for both asphaltic and concrete paving should meet the specifications for crushed aggregate base as defined in Section 200-2.2 of the latest edition of the Standard Specifications for Public Works Construction. The base course should be compacted to at least 95% of the maximum dry density obtainable by the ASTM Designation D1557 method of compaction.

6.9 GRADING

6.9.1 SITE PREPARATION

After the site is cleared and the existing fill soils are excavated as recommended, the exposed soils should be carefully observed for the removal of all unsuitable deposits. Next, the exposed soils should be scarified to a depth of 6 inches, brought to near-optimum moisture content, and rolled with heavy compaction equipment. At least the upper 6 inches of the exposed soils should be compacted to at least 90% of the maximum dry density obtainable by the ASTM D1557 method of compaction.

Good drainage of surface water should be provided by adequately sloping all surfaces. Such drainage will be important to minimize infiltration of water beneath pavement.

6.9.2 COMPACTION

All required fill should be placed in loose lifts not more than 8-inches-thick and compacted. The fill should be compacted to at least 90% of the maximum density obtainable by the ASTM Designation D1557 method of compaction. The moisture content of the on-site sandy materials at the time of compaction should vary no more than 2% below or above optimum moisture content.

6.9.3 PIPE BEDDING AND PIPE ZONE BACKFILL

Unshaped bedding is typically used for utility support. Material for pipe bedding and pipe-zone backfill should consist of sand and gravelly sand, free from organic matter, loam, contaminants, or other deleterious substances. The material should meet the gradation requirements shown below when tested in accordance with ASTM D422 and have a minimum sand equivalent of 30 as determined by ASTM D2419.

SIEVE SIZE NO.	PERCENTAGE PASSING SIEVE (BY WEIGHT)
½"	100
4	70-100
16	50-90
50	10-40
200	0-10

To provide a uniform bearing conditions, we recommend a minimum 6-inch layer of bedding material be placed beneath utilities. Pipe zone backfill will be required all around proposed pipes and to a height of 12 inches above the top of pipes. The pipe bedding and pipe zone backfill materials should be vibrated in place using vibratory equipment, such as a vibratory plate compactor, or equivalent. Jetting and flooding should not be permitted.

Fill placement within the trench zone above the pipe backfill should be performed in accordance with the recommendations of this report. In backfill areas where mechanical compaction of soil backfill is impractical due to space constraints, the trench zone may be backfilled with 1½-sack sand-cement slurry.

We recommend that the backfill along the sides of the pipe be placed simultaneously and brought up to at least the top of the pipe in equal lifts and level heights during the backfill operation.

6.9.4 MATERIAL FOR FILL

The on-site silty sand soils, less any debris or organic matter, may be used in any required fills. Cobbles larger than 4 inches in diameter should not be used in the fill. Any required import material should consist of relatively non-expansive soils with an Expansion index of less than 35. The imported materials should contain sufficient fines (at least 15% passing the No. 200 sieve) so as to be relatively impermeable and result in a stable subgrade when compacted. All proposed import materials should be approved by personnel of our firm prior to being placed at the site.

6.10 GEOTECHNICAL OBSERVATION

The reworking of the upper soils and the compaction of any required fill should be observed and tested during placement by a representative of our firm. This representative should perform at least the following duties:

- Observe the clearing and grubbing operations for proper removal of all unsuitable materials, including the existing fill as required.
- Observe the exposed subgrade in any areas to receive fill and in areas where excavation has resulted in the desired finished subgrade. The representative should also observe proofrolling and delineation of areas requiring overexcavation.
- Evaluate the suitability of on-site and import soils for fill placement; collect and submit soil samples for required or recommended laboratory testing where necessary.
- Observe any fill and backfill for uniformity during placement.
- Test any backfill for field density and compaction to determine the percentage of compaction achieved during backfill placement.
- Observe and probe foundation materials to confirm that suitable bearing materials are present at the design foundation depths.
- Observe the installation of temporary shoring, if used.
- Observe the installation of short pile/pole-type foundations to confirm that the design diameters and depths are achieved.

The governmental agencies having jurisdiction over the project should be notified prior to commencement of grading so that the necessary grading permits can be obtained and arrangements can be made for required inspection(s). The contractor should be familiar with the inspection requirements of the reviewing agencies.

7 BASIS FOR RECOMMENDATIONS

The recommendations provided in this report are based upon our understanding of the described project information and on our interpretation of the data collected during our current and previous subsurface explorations. We have made our recommendations based upon experience with similar subsurface conditions under similar loading conditions. The recommendations apply to the specific project discussed in this report; therefore, any change in the structure configuration, loads, location, or the site grades should be provided to us so that we can review our conclusions and recommendations and make any necessary modifications.

The recommendations provided in this report are also based upon the assumption that the necessary geotechnical observations and testing during construction will be performed by representatives of our firm. The field observation services are considered a continuation of the geotechnical investigation and essential to verify that the actual soil conditions are as expected. This also provides for the procedure whereby the client can be advised of unexpected or changed conditions that would require modifications of our original recommendations. In addition, the presence of our representative at the site provides the client with an independent professional opinion regarding the geotechnically-related construction procedures. If another firm is retained for the geotechnical observation services, our professional responsibility and liability would be limited to the extent that we would not be the geotechnical engineer of record.

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TABLES

Table 1: Major Holocene and Late Quaternary Faults in Southern California

FAULT (IN INCREASING DISTANCE)	MAXIMUM MAGNITUDE (MW)	FAULT GEOMETRY	SLIP RATE (MM/YR.)	SOURCES		DISTANCE FROM SITE (MILES)	DIRECTION FROM SITE
Upper Elysian Park Thrust	6.4	BT	1.9	(a,b)		0.3*	N
Raymond	6.5	RO	2.0	(a,b)		5.0	N
Hollywood	6.4	RO	0.9	(a,b)		5.0	N
Puente Hills Blind Thrust	7.1	BT	0.9	(a,b)		6.0*	SW
Verdugo	6.9	RO	0.4	(a,b)		6.4	N
Newport-Inglewood	7.1	SS	1.0	(a,b)		7.9	WSW
Compton Thrust	7.6	BT	0.6	(a,b)		8.4*	SW
Santa Monica	6.6	RO	1.0	(a,b)		9.9	WNW
Whittier	6.8	RO	2.5	(a,b)		10	SE
Sierra Madre	7.2	RO	2.0	(a,b)		12	NE
Clamshell-Sawpit	6.5	RO	0.4	(a,b)		15	NE
San Gabriel	7.2	SS	0.4	(a,b)		16	N
San Fernando	6.7	RO	2.0	(a,b)		16	NNW
Palos Verdes (Palos Verdes Hills Section)	7.3	SS	3.0	(a,b)		19	SW
Northridge Thrust	7.0	BT	1.5	(a,b)		20*	NNW
San Joaquin Hills Thrust	6.6	BT	0.6	(a,b)		30*	SSE
Chino	6.7	SS	1.0	(a,b)		30	ESE
Cucamonga	6.9	RO	1.5	(a,b)		32	NE
San Andreas (Mojave S. Section)	7.4	SS	34	(a,b)		35	NE
Elsinore (Glen Ivy Section)	6.8	SS	5	(a,b)		36	SE

(a) Cao et al., 2003; Field et al., 2013
(b) Jennings and Bryant, 2010; USGS-CGS, 2020; CGS, 2024a
SS Strike Slip
NO Normal Oblique
RO Reverse Oblique
BT Blind Thrust
(*) Distance to surface projection of upper limb as plotted by USGS-CGS, 2020

Prepared by: PER 1/31/2024
Checked by: RM 2/6/2024

Table 2: Mapped and Site-Specific Seismic Design Acceleration Parameters

PARAMETER	MAPPED VALUE	SITE-SPECIFIC VALUE
S_S	1.96g	--
S_1	0.70g	--
Project Site Class	D	--
F_a	1.0	--
F_v	1.7*	--
$S_{MS} = F_a S_S$ (0.2 second period)	1.96g	2.28g
$S_{M1} = F_v S_1$ (1.0 second period)	1.19g*	1.39g
$S_{DS} = 2/3 \times S_{MS}$ (0.2 second period)	1.31g	1.52g
$S_{D1} = 2/3 \times S_{M1}$ (1.0 second period)	0.79g*	0.93g

*See discussion in Section 6.3.1

By: WI 1/29/2024
Checked: LH 2/6/2024

Table 3: 84th Percentile (median plus 1 standard deviation) Deterministic Response Spectra

PERIOD	UPPER ELYSIAN PARK THRUST	COMPTON THRUST	MAX	CONTROLLING
T (sec)	SA (g)	SA (g)	SA (g)	-
0.01	1.006	0.601	1.006	Upper Elysian Park Thrust
0.02	1.018	0.603	1.018	Upper Elysian Park Thrust
0.03	1.048	0.622	1.048	Upper Elysian Park Thrust
0.05	1.173	0.708	1.173	Upper Elysian Park Thrust
0.075	1.407	0.863	1.407	Upper Elysian Park Thrust
0.1	1.618	1.003	1.618	Upper Elysian Park Thrust
0.15	1.940	1.211	1.940	Upper Elysian Park Thrust
0.2	2.161	1.340	2.161	Upper Elysian Park Thrust
0.25	2.359	1.421	2.359	Upper Elysian Park Thrust
0.3	2.487	1.459	2.487	Upper Elysian Park Thrust
0.4	2.457	1.432	2.457	Upper Elysian Park Thrust
0.5	2.281	1.335	2.281	Upper Elysian Park Thrust
0.75	1.801	1.027	1.801	Upper Elysian Park Thrust
1	1.419	0.817	1.419	Upper Elysian Park Thrust
1.5	0.878	0.557	0.878	Upper Elysian Park Thrust
2	0.587	0.409	0.587	Upper Elysian Park Thrust
3	0.332	0.256	0.332	Upper Elysian Park Thrust
4	0.200	0.178	0.200	Upper Elysian Park Thrust
5	0.132	0.132	0.132	Upper Elysian Park Thrust
7.5	0.057	0.069	0.069	Compton Thrust
10	0.032	0.040	0.040	Compton Thrust

Table 4: Development of Probabilistic and Deterministic Max Component Spectra

PERIOD	84TH PERCENTILE DETERMINISTIC EVENT GEOMETRIC MEAN	PROBABILISTIC 2% IN 50-YEAR GEOMETRIC MEAN	MAX COMPONENT FACTOR (SHAHI-BAKER, 2014)	DETERMINISTIC EVENT MAX COMPONENT (SHAHI-BAKER)	PROBABILISTIC 2% IN 50-YEAR MAX COMPONENT (SHAHI-BAKER)
T (sec)	SA (g)	SA (g)	-	SA (g)	SA (g)
0.01	1.006	0.924	1.19	1.197	1.100
0.02	1.018	0.929	1.19	1.211	1.106
0.03	1.048	0.972	1.19	1.247	1.156
0.05	1.173	1.139	1.19	1.396	1.355
0.075	1.407	1.433	1.19	1.674	1.705
0.1	1.618	1.680	1.19	1.925	1.999
0.15	1.940	1.985	1.20	2.328	2.382
0.2	2.161	2.167	1.21	2.615	2.623
0.25	2.359	2.273	1.22	2.878	2.773
0.3	2.487	2.317	1.22	3.034	2.826
0.4	2.457	2.215	1.23	3.022	2.724
0.5	2.281	2.040	1.23	2.806	2.509
0.75	1.801	1.566	1.24	2.233	1.942
1	1.419	1.222	1.24	1.759	1.515
1.5	0.878	0.787	1.24	1.089	0.976
2	0.587	0.554	1.24	0.728	0.687
3	0.332	0.336	1.25	0.415	0.420
4	0.200	0.228	1.26	0.252	0.287
5	0.132	0.169	1.26	0.167	0.213
7.5	0.069	0.097	1.28	0.088	0.124
10	0.040	0.063	1.29	0.051	0.081

Table 5: Development of Probabilistic and Deterministic Risk-Targeted Maximum Considered Earthquake Spectra

PERIOD	DETERMINISTIC EVENT MAX COMPONENT	DETERMINISTIC LOWER LIMIT	DETERMINISTIC WITH LOWER LIMIT CONSIDERED	PROBABILISTIC 2% IN 50-YEAR MAX COMPONENT	RISK COEFFICIENT	PROBABILISTIC MCE_R
T (sec)	SA (g)	SA (g)	-	SA (g)	SA (g)	
0.01	1.197	1.197	1.197	1.100	0.897	0.986
0.02	1.211	1.211	1.211	1.106	0.897	0.992
0.03	1.247	1.247	1.247	1.156	0.897	1.037
0.05	1.396	1.396	1.396	1.355	0.897	1.216
0.075	1.674	1.674	1.674	1.705	0.897	1.529
0.1	1.925	1.925	1.925	1.999	0.897	1.793
0.15	2.328	2.328	2.328	2.382	0.897	2.137
0.2	2.615	2.615	2.615	2.623	0.897	2.352
0.25	2.878	2.878	2.878	2.773	0.897	2.488
0.3	3.034	3.034	3.034	2.826	0.897	2.535
0.4	3.022	3.022	3.022	2.724	0.897	2.444
0.5	2.806	2.806	2.806	2.509	0.897	2.250
0.75	2.233	2.233	2.233	1.942	0.897	1.742
1	1.759	1.759	1.759	1.515	0.897	1.359
1.5	1.089	1.089	1.089	0.976	0.897	0.876
2	0.728	0.728	0.728	0.687	0.897	0.616
3	0.415	0.415	0.415	0.420	0.897	0.376
4	0.252	0.252	0.252	0.287	0.897	0.258
5	0.167	0.167	0.167	0.213	0.897	0.192
7.5	0.088	0.088	0.088	0.124	0.897	0.111
10	0.051	0.051	0.051	0.081	0.897	0.072

Table 6: Development of Site-Specific Risk-Targeted Maximum Considered Earthquake Spectra

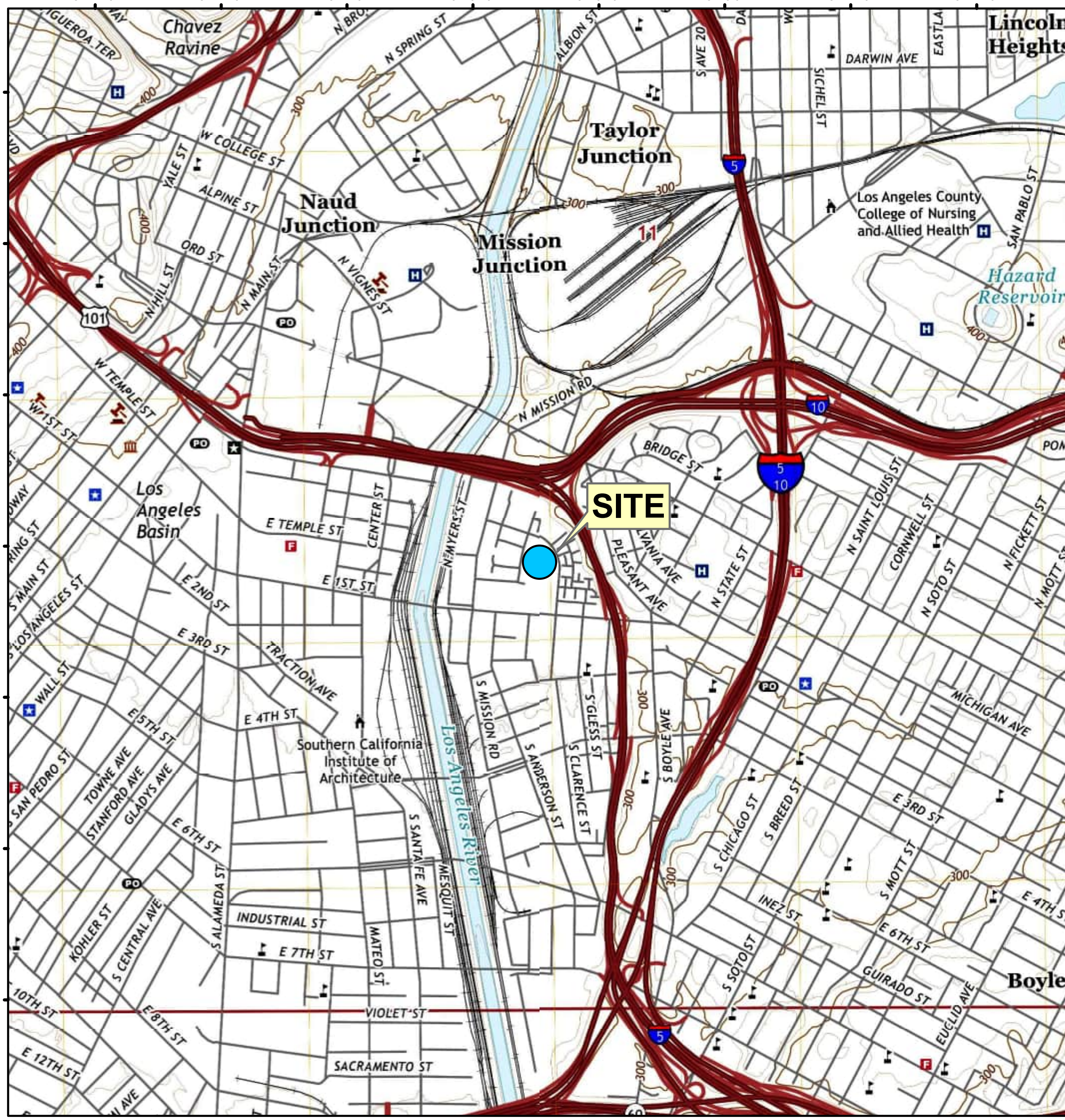
PERIOD	DETERMINISTIC WITH LOWER LIMIT CONSIDERED	PROBABILISTIC MCE_R	SITE-SPECIFIC MCE_R	80% CODE-BASED MCE_R	SITE-SPECIFIC MCE_R WITH 80% CODE-BASED CONSIDERED
T (sec)	SA (g)	SA (g)	-	SA (g)	SA (g)
0.01	1.197	0.986	0.986	0.677	0.986
0.02	1.211	0.992	0.992	0.730	0.992
0.03	1.247	1.037	1.037	0.783	1.037
0.05	1.396	1.216	1.216	0.888	1.216
0.075	1.674	1.529	1.529	1.019	1.529
0.1	1.925	1.793	1.793	1.150	1.793
0.15	2.328	2.137	2.137	1.413	2.137
0.2	2.615	2.352	2.352	1.562	2.352
0.25	2.878	2.488	2.488	1.562	2.488
0.3	3.034	2.535	2.535	1.562	2.535
0.4	3.022	2.444	2.444	1.562	2.444
0.5	2.806	2.250	2.250	1.562	2.250
0.75	2.233	1.742	1.742	1.562	1.742
1	1.759	1.359	1.359	1.394	1.394
1.5	1.089	0.876	0.876	0.929	0.929
2	0.728	0.616	0.616	0.697	0.697
3	0.415	0.376	0.376	0.465	0.465
4	0.252	0.258	0.252	0.349	0.349
5	0.167	0.192	0.167	0.279	0.279
7.5	0.088	0.111	0.088	0.186	0.186
10	0.051	0.072	0.051	0.112	0.112

Table 7: Site-Specific Design Earthquake

PERIOD	2/3 OF SITE-SPECIFIC MCE_R	80% CODE-BASED DESIGN RESPONSE SPECTRUM	DESIGN RESPONSE SPECTRUM
T (sec)	SA (g)	SA (g)	SA (g)
0.01	0.658	0.677	0.658
0.02	0.661	0.730	0.661
0.03	0.691	0.783	0.691
0.05	0.810	0.888	0.810
0.075	1.020	1.019	1.020
0.1	1.195	1.150	1.195
0.15	1.424	1.413	1.424
0.2	1.568	1.562	1.568
0.25	1.659	1.562	1.659
0.3	1.690	1.562	1.690
0.4	1.629	1.562	1.629
0.5	1.500	1.562	1.500
0.75	1.161	1.562	1.161
1	0.929	1.394	0.929
1.5	0.620	0.929	0.620
2	0.465	0.697	0.465
3	0.310	0.465	0.310
4	0.232	0.349	0.232
5	0.186	0.279	0.186
7.5	0.124	0.186	0.124
10	0.074	0.112	0.074

FIGURES

FIGURE 1 Site Vicinity Map



Base: USGS topographic map of the Los Angeles 7.5-minute Quadrangle, 2022.

0 1,000 2,000 4,000 Feet

0 0.2 0.4 0.8 Miles

N E S W

4953230441_Fig-1_site_vicinity_map

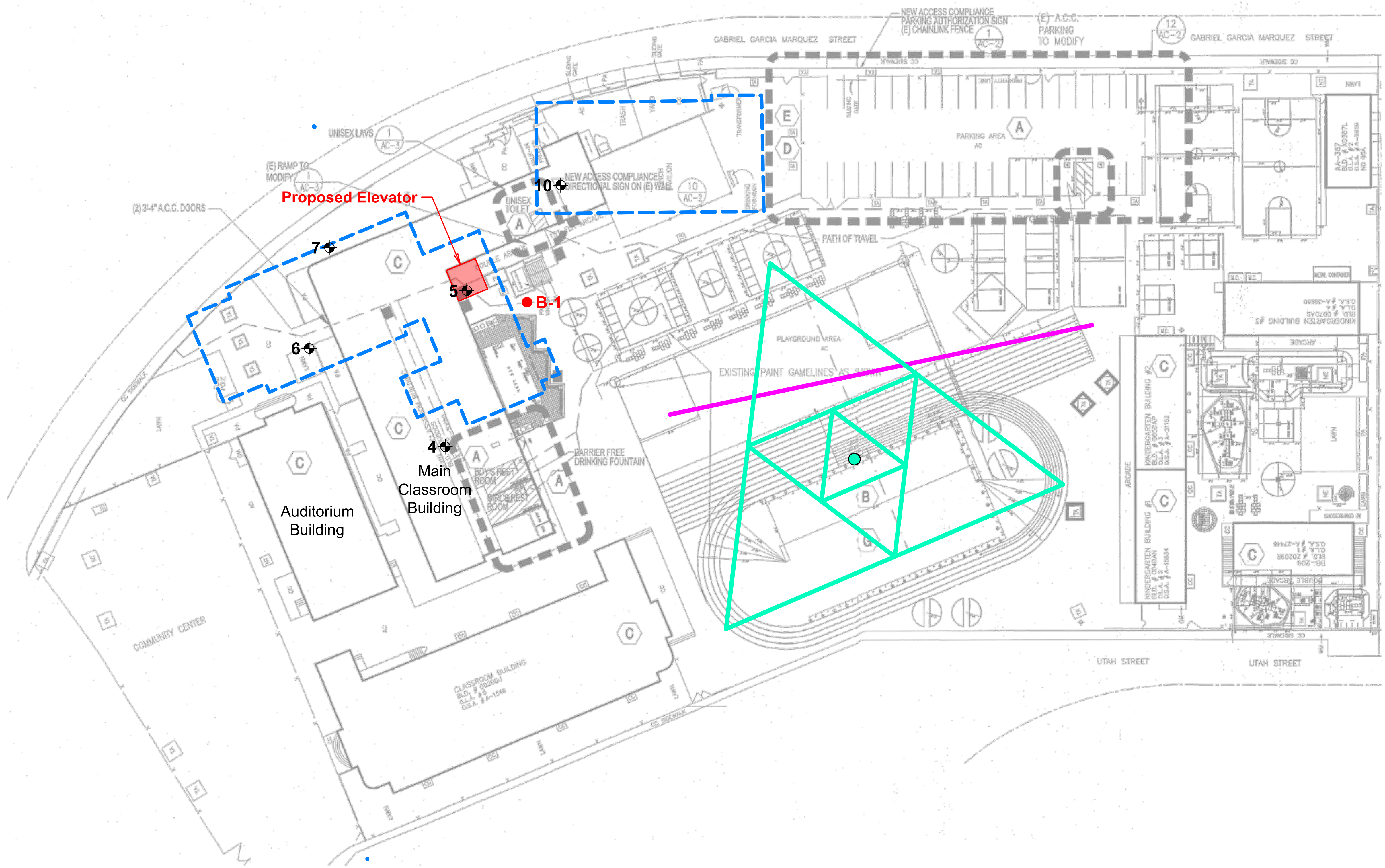
WSP USA
Environment & Infrastructure Inc.
6001 Rickenbacker Road
Los Angeles, California 90040
T: 323.889.5300
wsp.com

SITE VICINITY MAP

LAT: 34.04945° LON: -118.22479°	Proposed Elevator Utah Street Span School 255 Gabriel Garcia Marquez Street Los Angeles, California	FIGURE:	1
SCALE: 1:24,000			
DRAWN: PER			
CHECK: LH		PROJECT:	4953-23-0441
DATE: 2/7/2024			

Exported: 2/7/2024 7:42 AM

FIGURE 2 Plot Plan



LEGEND

B-1 ● Current Boring Location

10 ⌖ Prior Investigation (Job No. A-67272)

Surface Wave Measurement Line A1

Surface Wave Measurement Line A2

Demolished Buildings

Reference:
Site Plan Prepared by Los Angeles Unified School District, dated November 5, 2004, Sheet AC-0

0 30' 60' 120'

APPROXIMATE SCALE: 1" = 60'

wsp

WSP USA
6001 Rickenbacker Road,
Los Angeles, CA 90040
Phone 1(323) 889-5300
wsp.com

Plot Plan

LT,LNG:	
PREPARED BY:	VMN
SCALE:	1" = 60'
BY:	ET
CHKD:	ET
DATE:	02/12/2024

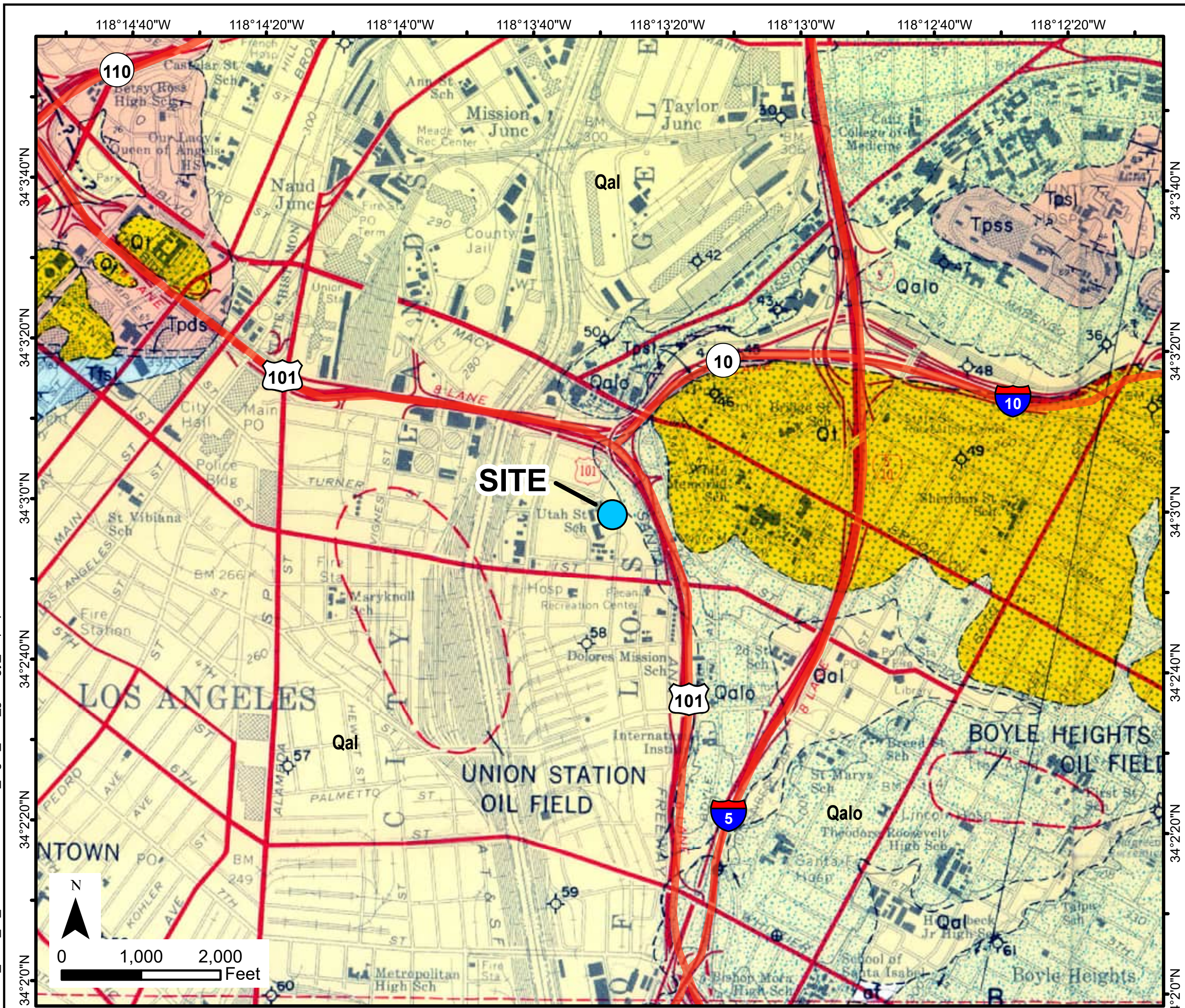
Proposed Elevator
Utah Street Span School
255 Gabriel Garcia Marquez Street
Los Angeles, California

FIGURE NO.
2

PROPOSAL NO.
4953-23-0441

Path: G:\4953_Geotech\2023\230441 LAUSD Utah Street ES Elevator\CAD\DWG\230441_Fig-2_Plot-Plan.dwg [B-17X11 (L)]
Date: February 12, 2024 - 11:56am By: USVN717902

FIGURE 3 Local Geology Map



Geologic Units

Unit - Description (Age)

Qal - Alluvium. Silt, sand, and gravel (Holocene)

Qalo - Old alluvium. Silt, sand, and gravel forming alluvial plain and terrace deposits (Pleistocene)

Qt - Terrace Deposits. Silt, sand, and gravel forming alluvial terrace and dissected alluvial plain deposits (Pleistocene)

Tfcg - Fernando Formation, Conglomerate, light to red brown (Plio.)

Tfsl - Fernando Formation. Siltstone, massive (Pliocene)

Tpsl - Puente Formation. Siltstone, well bedded (Late Miocene)

Tpds - Puente Formation. Diatomaceous shale, punky, dull white (Late Miocene)

Tpss - Puente Formation. Sandstone, medium to coarse grained, light brown to gray (Late Miocene)

Contacts:

- contact, location accurate
- contact, location approximate
- contact, location concealed
- contact, location inferred
- fault, location accurate
- fault, location approximate
- fault, location concealed
- fault, location inferred

Symbols:

- 23 Inclined Bedding
- 18 Inclined Bedding approx.
- 21 Overturned Bedding
- Vertical Bedding
- Horizontal Bedding
- 39 Inclined Foliation
- Foliation approx.
- Vertical Foliation

Folds:

- Anticline
- Syncline

Reference: Lamar, D.L., 1970, "Geology of the Elysian Park-Repetto Hills area, Los Angeles County, California," California Division of Mines and Geology Special Report 101, 45 p., map in pocket (1:24:000).

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LOCAL GEOLOGY MAP

LAT: LON:	34.04945° -118.22479°
SCALE:	1:24,000
DRAWN:	PER
CHECK:	RM
DATE:	2/7/2024

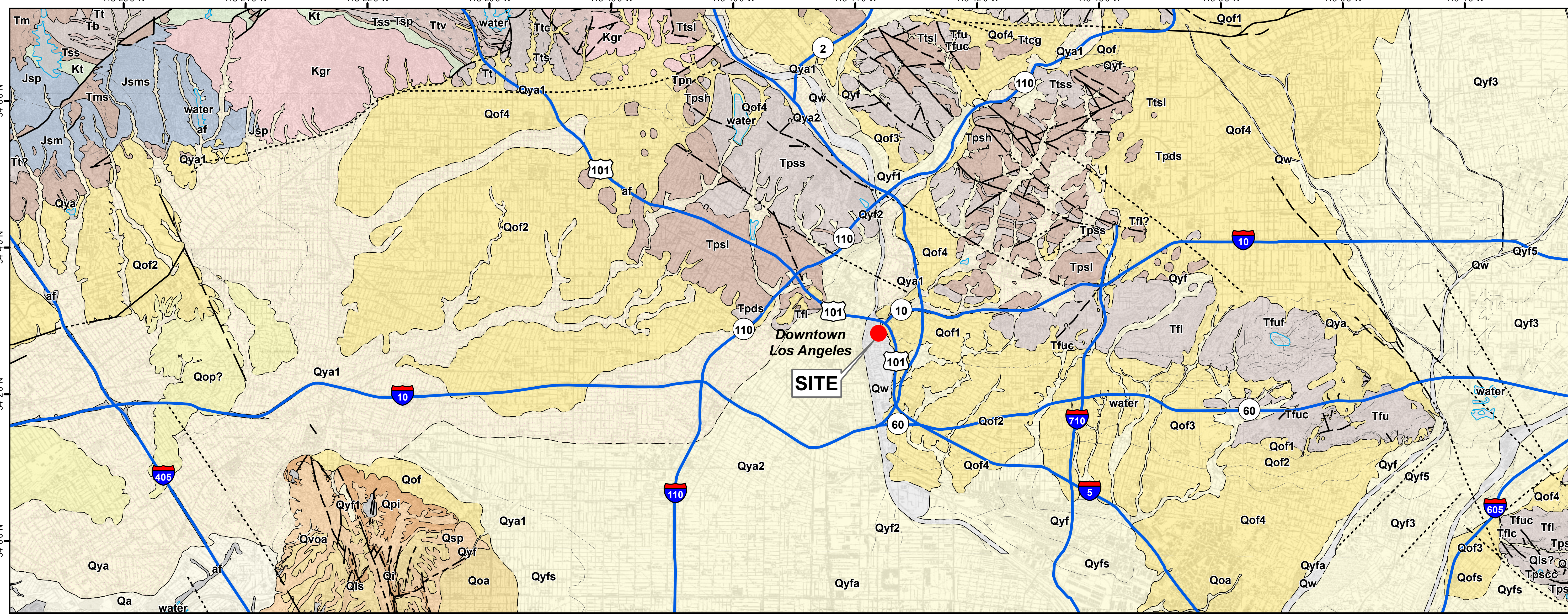
Proposed Elevator
Utah Street Span School
255 Gabriel Garcia Marquez Street
Los Angeles, California

FIGURE: **3**

PROJECT: 4953-23-0441

\\10.0.0.201\home\Work\Backup\Drive_E_20220615\Files\Work\GIS\4953_Geotech\2023\230441_LAUSD_Utah_St_ES\GIS\4953230441_Fig-3_local_geology_map.aprx

FIGURE 4 Regional Geology Map



Geologic Units

af - Artificial fill (latest Holocene)
Qa - Alluvial flood-plain deposits (late Holocene)
Qw - Very young wash deposits (late Holocene)
Qya - Young alluvial flood-plain deposits (Holocene/Late Pleistocene)
Qyf - Young alluvial fan and valley deposits (Holocene/late Pleistocene)
Qls - Landslide deposits (Holocene and Pleistocene)
Qoa - Old alluvial flood-plain deposits (late to middle Pleistocene)
Qof - Old alluvial fan deposits, undivided (late to middle Pleistocene)
Qofs - Old alluvial fan and valley deposits, silt (late to middle Pleistocene)
Qop - Old paralic deposits, undivided (late to middle Pleistocene)
Qvoa - Very old alluvium, undivided (middle to early Pleistocene)
Qi - Inglewood Formation, siltstone (early Pleistocene)
Qpi - Inglewood Formation, siltstone, fine sandstone (early Pleistocene)
Qsp - San Pedro Formation, sand and silty sand (early Pleistocene)
Tfl - Fernando Formation, silty sandstone and siltstone (Pliocene)
Tflc - Fernando Formation, conglomerate (Pliocene)
Tfu - Fernando Formation, upper member, silty sandstone (Pliocene)
Tfuc - Fernando Formation, sandstone, conglomerate (Pliocene)
Tfuf - Fernando Formation, fossiliferous sandstone (Pliocene)
Tpn - Puente Formation, siltstone, sandstone, shale (Pliocene and Miocene)
Tpsc - Puente Formation, Sycamore Canyon Member (Pliocene and Miocene)
Tpsh - Puente Formation, La Vida Member, shale (Miocene)
Tm - Modelo Formation, undivided, mudstone, siltstone, shale (late Miocene)
Tms - Modelo Formation, siltstone, clay shale (late Miocene)
Tpds - Puente Formation, diatomaceous shale (late Miocene)
Tpy - Puente FM, Yorba Member diatamaceous siltstone (late Miocene)
Tplv - Puente Formation, La Vida Member, siltstone (late Miocene)
Tps - Puente Formation, Soquel Member (late Miocene)
Tpsl - Puente Formation, siltstone and sandstone (late Miocene)
Tpss - Puente Formation, sandstone (late Miocene)
Tb - Basalt dikes, flows and breccias (Miocene)
Ttsl - Topanga Formation, siltstone/sandstone/siliceous shale (mid Miocene)
Ttss - Topanga Formation, sandstone (middle Miocene)
Ttcg - Topanga Group, conglomerate (middle Miocene)
Tt - Topanga Group, sedimentary/volcanic rocks (middle and early Miocene)
Tss - Santa Susana FM, clay and mudrock (early to late Paleocene)
Kgr - Granitic rocks (late Cretaceous)
Kt - Tuna Canyon Formation, undivided marine sandstone, siltstone and conglomerate (late Cretaceous)
Jsm - Santa Monica Slate (late Jurassic)
Jsms - Santa Monica Slate, spotted (late Jurassic)
Jsp - Santa Monica Slate, phyllite (late Jurassic)

Note: Some geologic units may have sub-units shown on map

Geologic Contacts and Symbols

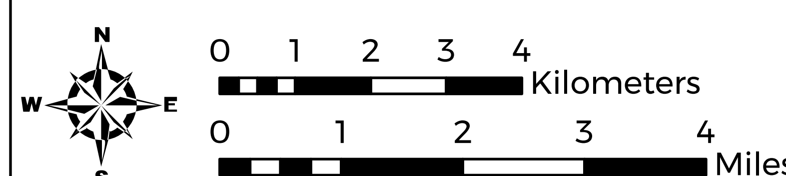
contact, identity and existence certain, location accurate
contact, identity and existence certain, location approximate
contact, identity and existence certain, location concealed
fault, identity and existence certain, location accurate
fault, identity and existence certain, location approximate
fault, identity and existence certain, location concealed

(Queried where contacts are questionable)

Project Site

4953230441_Fig-4_regional_geology_map

Reference:
Bedrossian, T.L., Roffers, P., Hayhurst, C.A., 2012, "Geologic Compilation of Quaternary Surficial Deposits in Southern California", California Geological Survey , vector spatial data, Special Report 217, December 2012.
Base:
USGS 7.5-minute topographic maps of the Beverly Hills, El Monte, Hollywood, Inglewood, Los Angeles, South Gate, Venice and Whittier Quadrangles.



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REGIONAL GEOLOGY MAP

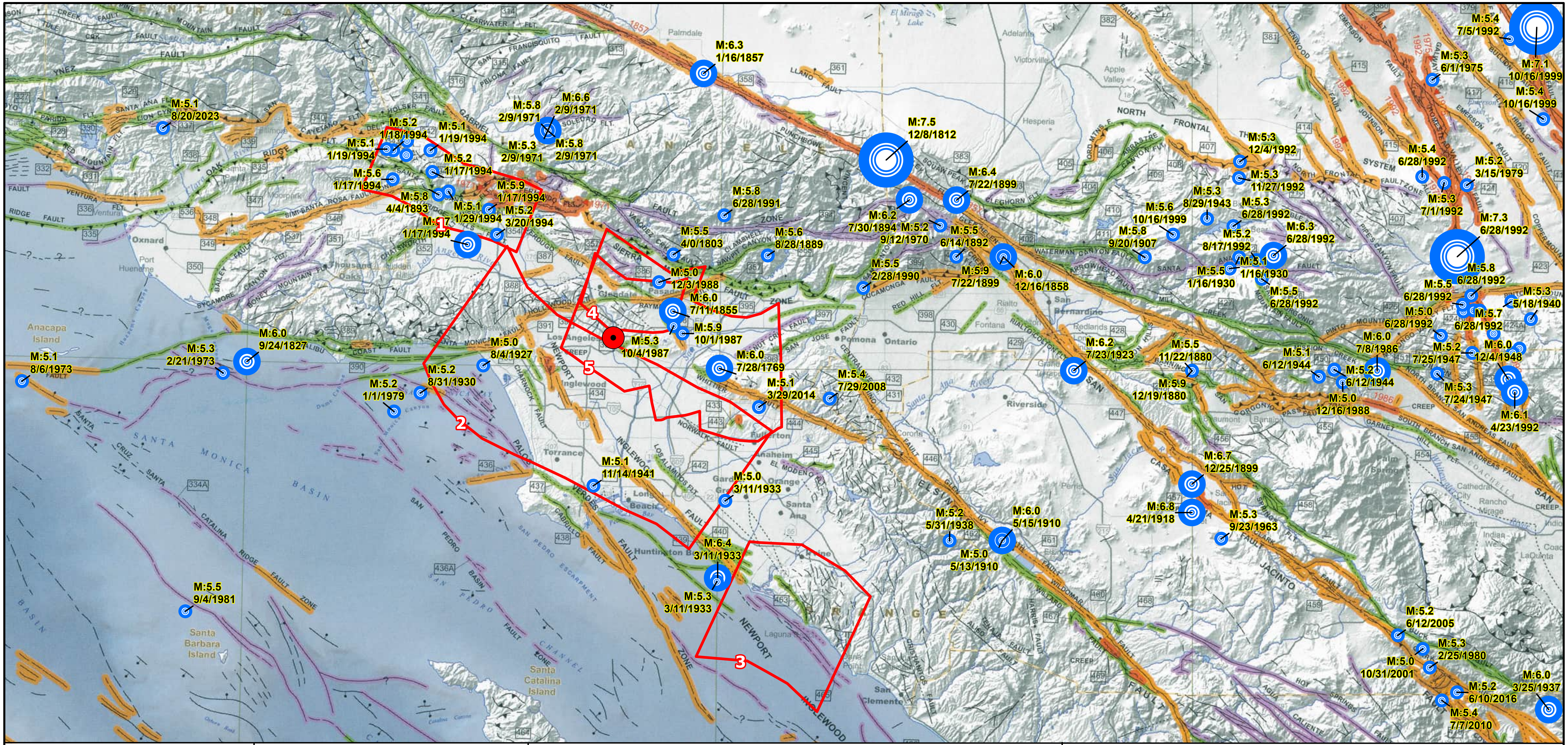
LAT:	34.04945°
LON:	-118.22479°
SCALE:	1:100,000
DRAWN:	PER
CHECK:	RM
DATE:	2/7/2024

Proposed Elevator
Utah Street Span School
255 Gabriel Garcia Marquez Street
Los Angeles, California

FIGURE:
4

PROJECT:
4953-23-0441

FIGURE 5 Regional Fault and Seismicity Map



N
W E
S
0 1.5 3 km
0 1 2 mi

Earthquakes

Approximate Epicenter of Historic Earthquakes

Mag. ≥ 7.0

Mag. 6.0 - 6.9

Mag. 5.0 - 5.9

Faults

Historic Fault Displacement

Holocene Fault Displacement

Evidence of Late Quaternary Fault Displacement

Undifferentiated Quaternary Faults

Bar and ball on downthrown side (relative or apparent)

Arrows along fault indicate relative or apparent direction of lateral movement

Arrows on fault indicates direction of dip

Low angle fault with barbs on upper plate. Fault surface generally dips less than 45 but locally may have been subsequently steepened.

Site

Blind Thrust Faults (surface projection)

Blind Thrust Index:

1 Northridge Thrust

2 Compton Thrust

3 San Joaquin Hills Thrust

4 Upper Elysian Park Thrust

5 Puente Hills Thrust

REFERENCES:
Jennings, C.W. and Bryant, W.A., 2010,"Fault Activity Map of California," California Geological Survey, GDM-006, May 2010
Earthquake Catalogs: California Geological Survey, 1769-1932; Southern California Earthquake Data Center (SCEDC), 1932-2023.
Working Group on California Earthquake Probabilities (WGCEP), 2016, Fault Database Tools, <http://www.wgcep.org/tools-fault_db>

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REGIONAL FAULT AND SEISMICITY MAP

LAT: LON:	34.04945° -118.22479°
SCALE:	1:750,000
DRAWN:	PER
CHECK:	RM
DATE:	2/7/2024

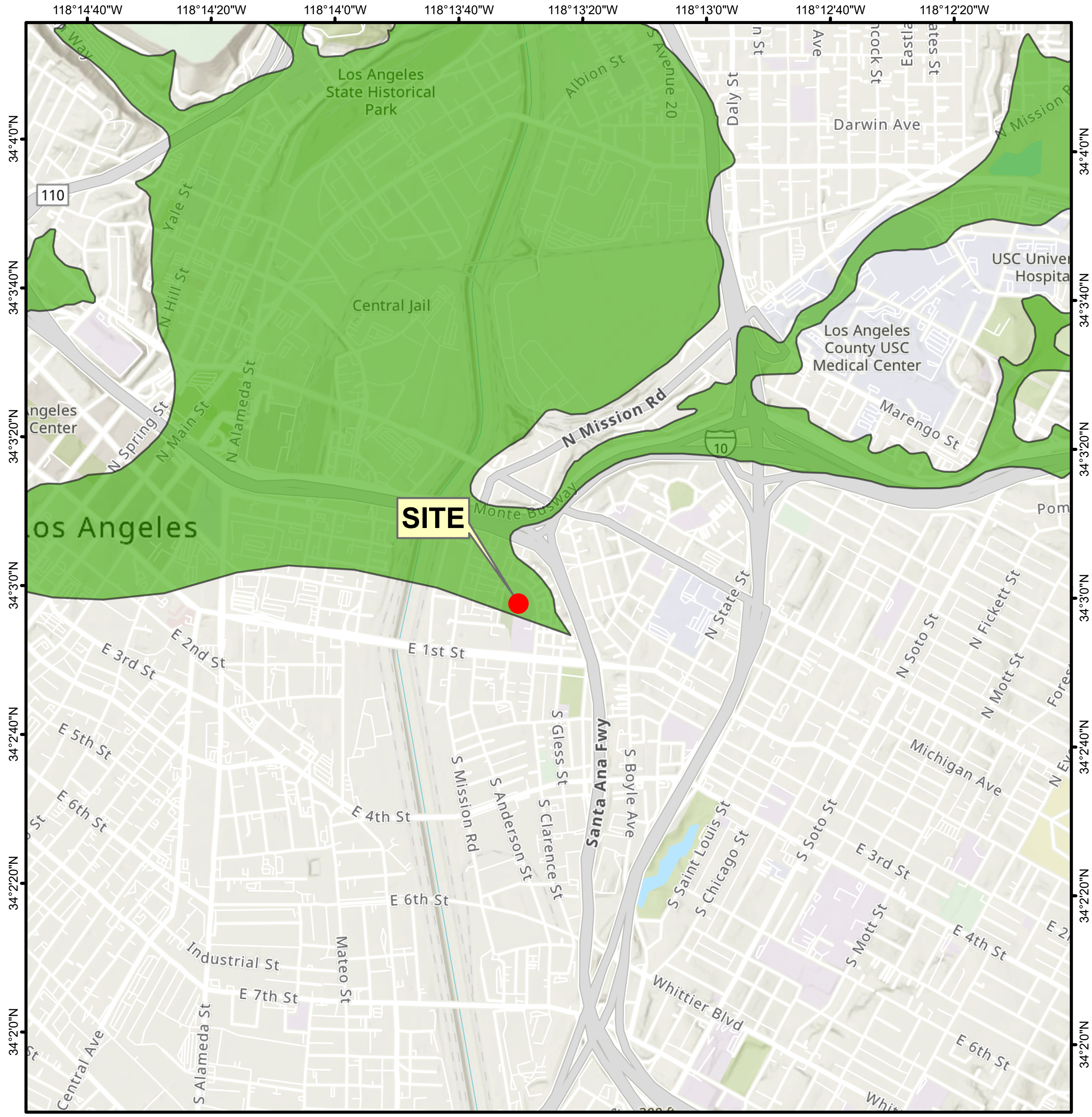
Proposed Elevator
Utah Street Span School
255 Gabriel Garcia Marquez Street
Los Angeles, California

FIGURE: 5

PROJECT: 4953-23-0441

4953230441_Fig-5_regional_fault_seismicity_map

FIGURE 6 Liquefaction Map



Explanation

Liquefaction Zone (CGS, 2018)

0 2,000 4,000 Feet

0 0.2 0.4 0.8 Miles

N S E W

Source: CGS, 2018, GIS files of Official Maps of Seismic Hazard Zones, Los Angeles quadrangle.

LIQUEFACTION MAP

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LAT:	34.04945°
LON:	-118.22479°
SCALE:	1:24,000
DRAWN:	PER
CHECK:	RM
DATE:	2/7/2024

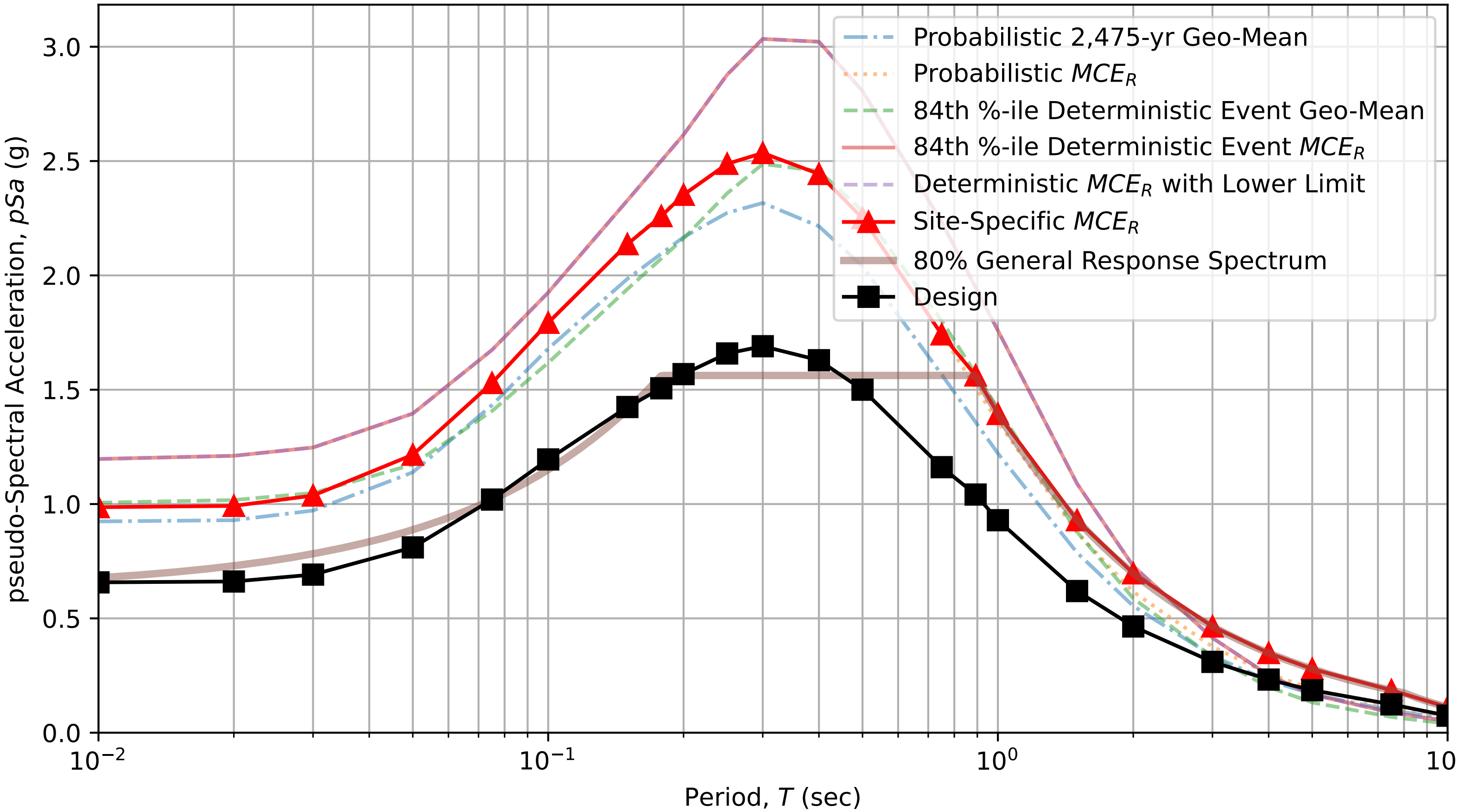
Proposed Elevator
Utah Street Span School
255 Gabriel Garcia Marquez Street
Los Angeles, California

FIGURE: 6

PROJECT: 4953-23-0441

495323044l_Fig-6_liquefaction_map

FIGURE 7 Site-Specific MCE_R and Design Response Spectra Development



By: WI 2/6/2024
Checked: MM

Proposed Elevator Utah Street Elementary School 255 Gabriel Garcia Marquez Street Los Angeles, California Project No. 4953-23-0441	wsp	Site-Specific MCE_R and Design Response Spectra Development Figure 7

APPENDIX A

CURRENT FIELD EXPLORATION AND LABORATORY TEST RESULTS

Appendix A

Field Explorations and Laboratory Test Results

Field Explorations

To supplement our prior data, the soil conditions beneath the site of the proposed project were further explored by drilling one exploratory boring to a depth of approximately 37 feet below the existing ground surface (bgs) at the location shown on Figure 2. The boring was drilled using 8-inch diameter hollow-stem-auger-type drilling equipment. The drilling of the current boring was terminated at a depth which was shallower than the planned depth of 50 feet due to refusal on a layer of cobbles/boulders.

The soils encountered were logged by our field technician, and undisturbed and bulk samples were obtained for laboratory inspection and testing. The logs of the boring are presented on Figure A-1; the depths at which undisturbed samples were obtained are indicated on the left side of the boring logs. The number of blows required to drive the Crandall sampler 12 inches using a 140-pound automatic hammer falling approximately 30 inches is indicated on the logs. In addition to obtaining undisturbed samples, standard penetration tests (SPT) were also performed; the results of the tests are indicated on the logs. The soils are classified in the accordance with the Unified Soil Classification System described on Figure A-2.

Relevant prior boring logs and laboratory test results from our previous investigation performed on the subject school campus are presented in Appendix B.

In addition, the results of the geophysical surface wave measurements performed by GEO*Vision* are presented in Appendix C.

Laboratory Test Results

Laboratory tests were performed on selected samples obtained from the current boring to aid in the classification of the soils and to evaluate their engineering properties.

The field moisture content and dry density of the soils encountered were determined by performing tests on the undisturbed samples. The results of the tests are presented on the left side of the boring logs.

Direct shear tests were performed on selected undisturbed samples to determine the strength of the soils. The tests were performed after soaking to near-saturated moisture content and at various surcharge pressures. The testing procedure was in general accordance with ASTM Designation D3080. The results of the tests are presented on Figure A-3, Direct Shear Test Data.

Hydroconsolidation testing was performed on a selected undisturbed sample to determine the effect of moisture on the compressibility of the soils. The testing procedure was in general accordance with ASTM Designation D4546. The results of the test are presented on Figure A-4, Hydroconsolidation Test Data.

The optimum moisture content and maximum dry density of the upper soils were determined by performing compaction testing on one sample. The test was performed in accordance with ASTM Designation D1557. The results of the test are presented on Figure A-5, Compaction Test Results.

Soil corrosivity tests were performed on selected samples of the upper on-site soils. The results of the tests are presented on Figure A-6.

BORING 1

DATE DRILLED: January 4, 2024
EQUIPMENT USED: Hollow Stem Auger
HOLE DIAMETER (in.): 8
ELEVATION (feet): 270**

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	MOISTURE (% of dry wt.)	DRY DENSITY (pcf)	BLOW COUNT* (blows/ft)	SAMPLE LOC.		DESCRIPTION
								3-inch-thick Asphalt Concrete over 8-inch-thick Gravel Base Course
								FILL - SILTY SAND - moist, light brown, fine- to medium-grained, some coarse, up to 10% brick and concrete fragments, 10 to 12 inches in diameter Becomes light brown to brown, fine-grained
265	5							
			7.9	96	12		SP	POORLY GRADED SAND - loose, moist, light gray, fine-grained
			1.5	105	30			Becomes medium dense, some gravel
							SW	WELL GRADED SAND with GRAVEL - medium dense, moist, light brownish gray, fine- to coarse-grained, up to 20% gravel 6- to 8-inch cobble at 9½ feet
260	10							
			1.9	106	31			
								6- to 10-inch cobble at 12½ feet
							SP/SW	Alternating WELL GRADED and POORLY GRADED SAND with GRAVEL - medium dense, moist, light brownish gray, approximately 15 to 20% gravel
255	15	30	1.7					
250	20		8.1	102	35			
							SP	POORLY GRADED SAND with GRAVEL - medium dense, moist, light brownish gray, fine- to medium-grained, with some coarser layers, approximately 20% gravel
								3½-inch-thick SILTY SAND layer, very moist, fine- to medium-grained
245	25	25	12.2					
240	30		--	--	56			
							SM	Thin layer of SILTY SAND - dense, moist, light to medium gray, fine- to medium-grained
							SW	WELL GRADED SAND with GRAVEL - very dense, moist, light brownish gray, fine- to medium-grained with coarser layers, up to 20% gravel
		50/2"						No sample recovery at 34 feet
235	35							Encountered large cobbles/boulders
								END OF BORING AT 37 FEET DUE TO REFUSAL
	40							

Notes:
Hand augered upper 5 feet to avoid damage to utilities. Groundwater was not encountered. Boring was backfilled with cement-bentonite grout

Field Tech: AR
Prepared By: WI
Checked By: LH

(CONTINUED ON FOLLOWING FIGURE)

THIS RECORD IS A REASONABLE INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. LATITUDE AND LONGITUDE OF BORING LOCATION SHOWN ON LOGS ARE APPROXIMATE; REFER TO PLOT PLAN FOR MORE ACCURATE LOCATION INFORMATION. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

BORING 1 (Continued)

DATE DRILLED: January 4, 2024
EQUIPMENT USED: Hollow Stem Auger
HOLE DIAMETER (in.): 8
ELEVATION (feet): 270**

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	MOISTURE (% of dry wt.)	DRY DENSITY (pcf)	BLOW COUNT* (blows/ft)	SAMPLE LOC.	
							via tremie and patched with asphalt.
225	45						
220	50						
215	55						
210	60						
205	65						
200	70						
195	75						
	80						

*Number of blows required to drive the Crandall sampler 12 inches using a 140-pound automatic hammer falling approximately 30 inches.

**Elevations based on USGS, 2016, Los Angeles County 10-foot Digital Elevation Model, in conjunction with Los Angeles County for the LARIAC project.

THIS RECORD IS A REASONABLE INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. LATITUDE AND LONGITUDE OF BORING LOCATION SHOWN ON LOGS ARE APPROXIMATE; REFER TO PLOT PLAN FOR MORE ACCURATE LOCATION INFORMATION. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

Field Tech: AR
Prepared By: WI
Checked By: LH

MAJOR DIVISIONS			GROUP SYMBOLS	TYPICAL NAMES
COARSE GRAINED SOILS (More than 50% of material is LARGER than No. 200 sieve size)	GRAVELS (More than 50% of coarse fraction is LARGER than the No. 4 sieve size)	CLEAN GRAVELS (Little or no fines)	GW	Well graded gravels, gravel - sand mixtures, little or no fines.
			GP	Poorly graded gravels or grave - 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.
	SANDS (More than 50% of coarse fraction is SMALLER than the No. 4 Sieve Size)	CLEAN SANDS (Little or no fines)	SW	Well graded sands, gravelly sands, little or no fines.
			SP	Poorly graded sands or gravelly sands, 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 of clayey fine sands or clayey silts and with slight plasticity.
			CL	Inorganic lays 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 sandy or silty soils, elastic silts.
			CH	Inorganic clays of high plasticity, fat clays
BEDROCK				SANDSTONE
				SILTSTONE
				GRANITE

Undisturbed Sample	Auger Cuttings
Split Spoon Sample	Bulk Sample
Rock Core	Crandall Sampler
Dilatometer	Modified California Sampler
Packer	No Recovery
Water Table at time of drilling	Water Table after drilling

Correlation of Penetration Resistance with Relative Density and Consistency

SAND & GRAVEL		SILT & CLAY	
No. of Blows	Relative Density	No. of Blows	Consistency
0 - 4	Very Loose	0 - 1	Very Soft
5 - 10	Loose	2 - 4	Soft
11 - 30	Medium Dense	5 - 8	Medium Stiff
31 - 50	Dense	9 - 15	Stiff
Over 50	Very Dense	16 - 30	Very Stiff
		Over 30	Hard

Reference: The Unified Soil Classification System, Corps of Engineers, U.S. Army Technical Memorandum No. 3-357, Vol. 1, March, 1953 (Revised April, 1960)

BOUNDARY CLASSIFICATIONS: Soils possessing characteristics of two groups are designated by combinations of group symbols.

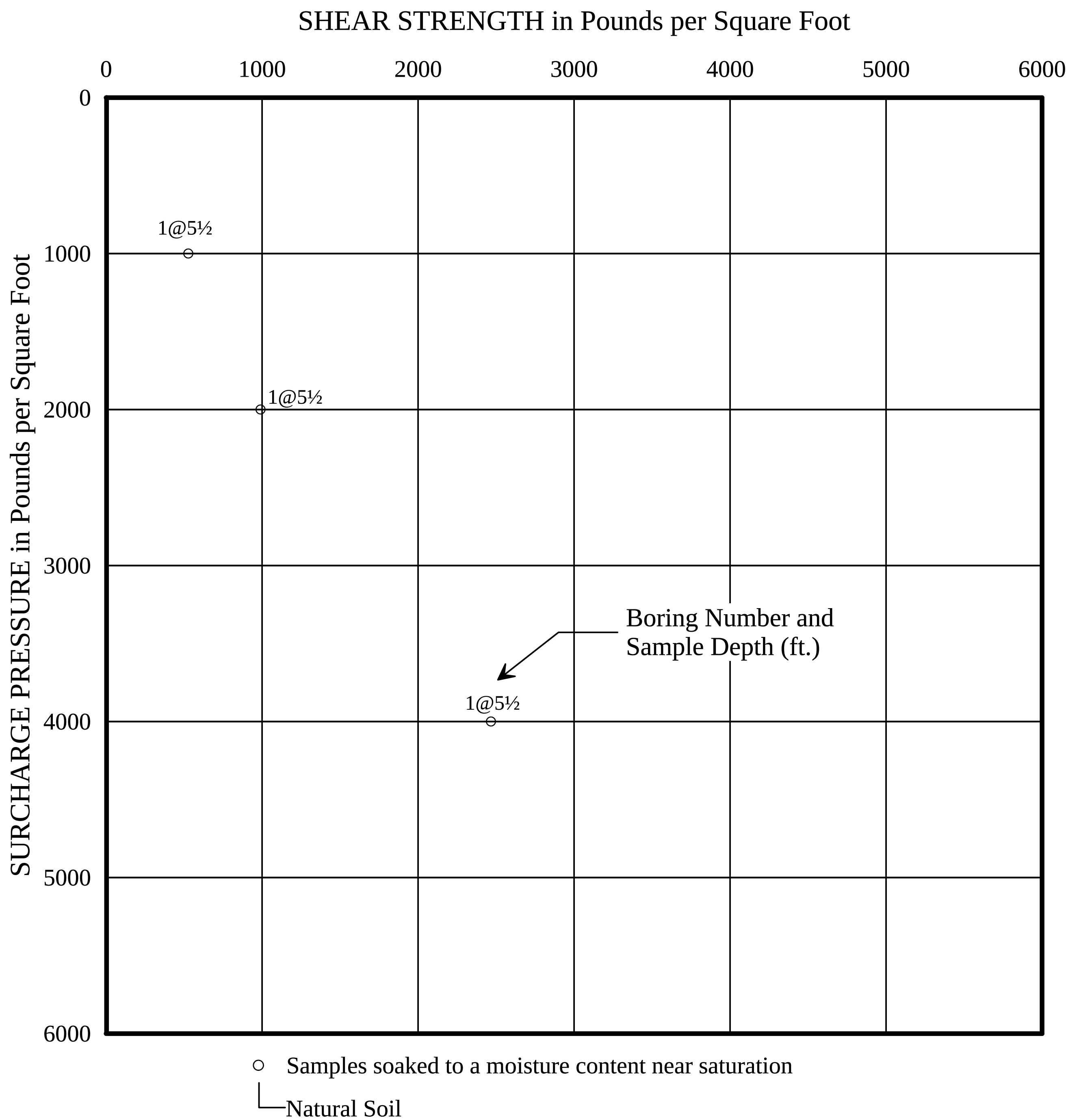
SILT OR CLAY	SAND			GRAVEL		Cobbles	Boulders
	Fine	Medium	Coarse	Fine	Coarse		

No.200 No.40 No.10 No.4 3/4" 3" 12"

U.S. STANDARD SIEVE SIZE

KEY TO SYMBOLS AND DESCRIPTIONS

Figure A-2



Prepared/Date: WI 1/22/2024
Checked/Date: LH 2/6/2024

Proposed Elevator
Utah Street Span School
255 Gabriel Garcia Marquez Street
Los Angeles, California

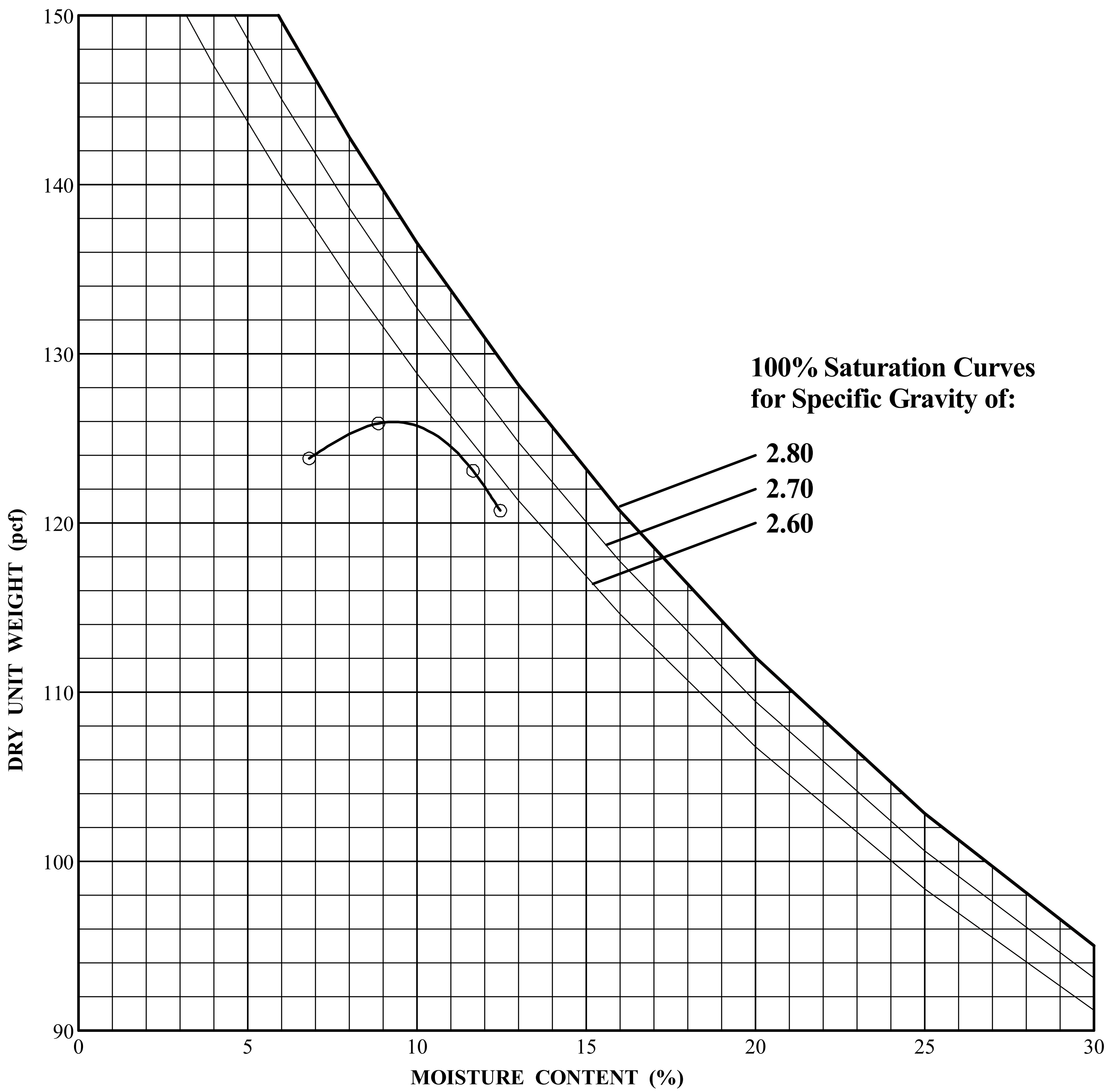
DIRECT SHEAR TEST DATA
Project No. 4953-23-0441
Figure A-3

BORING NUMBER AND SAMPLE DEPTH:	1 at 5½'
SOIL TYPE:	POORLY GRADED SAND
SURCHARGE PRESSURE: (lbs./sq.ft.)	1000
PERCENT COLLAPSE: (%)	0.07

Prepared/Date: WI 1/22/2024
Checked/Date: LH 2/6/2024

Proposed Elevator
Utah Street Span School
255 Gabriel Garcia Marquez Street
Los Angeles, California

HYDROCONSOLIDATION
TEST DATA
Project 4953-23-0441
Figure A-4



SYMBOL	BORING	DEPTH (ft)	CLASSIFICATION	OPTIMUM MOISTURE CONTENT (%)	MAXIMUM DRY UNIT WEIGHT (pcf)
○	1	0-5	FILL - SILTY SAND	9.2	126

Laboratory Test Method: ASTM D 1557

Prepared/Date: WI 1/22/2024
Checked/Date: LH 2/6/2024

LAUSD Utah Street Span School 255
Gabriel Garcia Marquez Street
Los Angeles, California

COMPACTION TEST RESULTS
Project No.: 4953-23-0441
Figure: A-5

AMEC FW_COMPACTION 3 TESTS C:\USERS\WDS_WYATT.IWANAGA2\ONEDRIVE - WSP O365\GINT LIBS\LIBRARY WOOD JUNE 2022.GLB
C:\USERS\WDS_WYATT.IWANAGA2\ONEDRIVE - WSP O365\LOCAL PROJECTS\LAUSD UTAH ST\230441_GINT LOGS.GPJ 2/6/24

Table 1 - Laboratory Tests on Soil Samples

WSP E&IS
Utah Street Elementary School
Your #4953-23-0441, HDR Lab #24-0010LAB
29-Jan-24

Sample ID			Boring 1 @ 0-5'
Resistivity		**Units**	
as-received		ohm-cm	18,400
saturated		ohm-cm	7,200
pH			7.7
Electrical Conductivity		mS/cm	0.08
Chemical Analyses			
Cations			
calcium	Ca^{2+}	mg/kg	51
magnesium	Mg^{2+}	mg/kg	4.0
sodium	Na^{1+}	mg/kg	27
potassium	K^{1+}	mg/kg	15
ammonium	NH_4^{1+}	mg/kg	ND
Anions			
carbonate	CO_3^{2-}	mg/kg	ND
bicarbonate	HCO_3^{1-}	mg/kg	162
fluoride	F^{1-}	mg/kg	3.0
chloride	Cl^{1-}	mg/kg	8.0
sulfate	SO_4^{2-}	mg/kg	32
nitrate	NO_3^{1-}	mg/kg	ND
phosphate	PO_4^{3-}	mg/kg	4.0
Other Tests			
sulfide	S^{2-}	qual	na
Redox		mV	na

Resistivity per ASTM G187, pH per ASTM G51, Cations per ASTM D6919, Anions per ASTM D4327, and Alkalinity per APHA 2320-B.

Electrical conductivity in millisiemens/cm and chemical analyses were made on a 1:5 soil-to-water extract.

mg/kg = milligrams per kilogram (parts per million) of dry soil.

Redox = oxidation-reduction potential in millivolts

ND = not detected

na = not analyzed

APPENDIX B

PRIOR FIELD EXPLORATION AND LABORATORY TEST RESULTS

BORING 1

DATE DRILLED: October 26, 1967
EQUIPMENT USED: 24"-Diameter Bucket

ELEVATION 99.3*

ELEVATION (ft.)	DEPTH (ft.)	MOISTURE (% of dry wt.)	DRY DENSITY (lbs./cu. ft.)	SAMPLE		
						3" ASPHALTIC PAVING
		5.5	101	■	SP	FILL - SAND - fine, brown
		6.4	95	■		Few pieces of concrete and brick
95	5					
		24.3	91	■	ML	FILL - SANDY SILT - patches of Sand, mottled brown
		3.4	105	■	SP	SAND - fine, few gravel, light brown
90	10					
		4.7	89	■		
						Layer of SILTY SAND
						About 30% gravel, few cobbles
85	15					
		2.5	125	■		
80	20					

NOTE: Water not encountered. Caving below 11½' (to 3' in diameter).

* Elevations refer to assumed datum; see Plate 1.

Soils classified in accordance with the Unified Soil Classification System.

LOG OF BORING

LEROY CRANDALL AND ASSOCIATES

JOB A-67272 DATE 11-17-67 DR UM O.E. 28 CHKD.

JOB A-67272 DATE 11-17-67 DR. V.M. O.E. 28 CHKD. [illegible]

BORING 2

DATE DRILLED: October 26, 1967
EQUIPMENT USED: 24"-Diameter Bucket

ELEVATION 99.5

ELEVATION (ft.)	DEPTH (ft.)	MOISTURE (% of dry wt.)	DRY DENSITY (lbs./cu. ft.)	SAMPLE	Soil	Description
						3" ASPHALTIC PAVING
		8.5	112	■	SM	FILL - SILTY SAND - fine, mottled brown
						Few pieces of concrete and brick
		8.0	100	■		Few pieces of wood
95	5	3.6	107	■		
		2.1	103	■	SP	SAND - fine, about 10% gravel and cobbles, light brown
90	10	2.5	105	■		
						Patches of Silt
						About 30% gravel, few cobbles
85	15	2.4	103	■		
80	20					

NOTE: Water not encountered. Caving below 5' (to 5' in diameter).

LOG OF BORING

LEROY CRANDALL AND ASSOCIATES

BORING 3

DATE DRILLED: October 25, 1967
EQUIPMENT USED: 24"-Diameter Bucket

ELEVATION 99.9

ELEVATION (ft.)	DEPTH (ft.)	MOISTURE (% of dry wt.)	DRY DENSITY (lbs./cu. ft.)	SAMPLE		
						3" ASPHALTIC PAVING
		4.9	118	■	SM	FILL - SILTY SAND - fine, few gravel and cobbles, nails, pieces of rubber, brick and concrete (to 18" in size), mottled brown
		5.1	109	■		
95	5	13.7	91	■		
		2.1	102	■	SP	SAND - fine, about 15% gravel, light brown
		2.6	107	■		Few cobbles
90	10					
		5.8	111	■		Patches of Silt
		1.6	102	■		About 35% gravel and cobbles
85	15					
		4.0	102	■		
80	20					

NOTE: Water not encountered. Caving below 4½' (to 4' in diameter).

JOB A-67272 DATE 11-17-67 DR. O.H. O.E. CB CHKD.

LOG OF BORING

LEROY CRANDALL AND ASSOCIATES

JOB A-67272 DATE 11-17-67 DR V.M O.E. 23 CHKD.

BORING 4

DATE DRILLED: October 25, 1967
EQUIPMENT USED: 24"-Diameter Bucket

ELEVATION 99.6

ELEVATION (ft.)	DEPTH (ft.)	MOISTURE (% of dry wt.)	DRY DENSITY (lbs./cu.ft.)	SAMPLE		Description
						3" ASPHALTIC PAVING
		4.8	121	■	SM	FILL - SILTY SAND - fine, few pieces of wood, rubber and brick, mottled brown
		3.5	94	■		About 10% gravel
95	5	8.9	91	■		
		3.6	98	■	SP	SAND - medium, about 15% gravel, few cobbles, light brown
90	10	1.8	111	■		About 25% gravel
85	15	2.1	114	■		

NOTE: Water not encountered. Caving below 10' (to 3' in diameter).

LOG OF BORING

JOB A-67272 DATE 11-17-67 DR. U.M. O.E. 28 CHKD. [illegible]

BORING 5

DATE DRILLED: October 27, 1967
EQUIPMENT USED: 24"-Diameter Bucket

ELEVATION 99.2

ELEVATION (ft.)	DEPTH (ft.)	MOISTURE (% of dry wt.)	DRY DENSITY (lbs./cu. ft.)	SAMPLE		
						3" ASPHALTIC PAVING
		3.3	103	■	SM	FILL - SILTY SAND - fine, about 10% gravel, large amount of concrete and brick; brown
						6" CONCRETE SLAB (GAD USED TO PENETRATE)
		7.9	111	■	ML	FILL - SANDY SILT - few small pieces of brick, brown and light brown
95	5					
		1.0	112	■	SP	SAND - fine, about 10% gravel, few cobbles, light brown
		1.5	101	■		
90	10					
		1.2	101	■		Patches of Silty Sand
						About 15% gravel
85	15					
		0.8	105	■		
80	20					

NOTE: Water not encountered. Caving from 5' to 7' and below 11' (to 3' in diameter).

LOG OF BORING

LEROY CRANDALL AND ASSOCIATES

JOB A-67272 DATE 11-17-67 DR. V.M. O.E. 28 CHKD. [illegible]

BORING 6

DATE DRILLED: October 25, 1967
EQUIPMENT USED: 24"-Diameter Bucket to 18'
18"-Diameter Bucket below 18'

ELEVATION 99.5

ELEVATION (ft.)	DEPTH (ft.)	MOISTURE (% of dry wt.)	DRY DENSITY (lbs./cu.ft.)	SAMPLE
		32.5	86	■
		32.7	80	■
95	5			
		5.3	92	■
		8.9	101	■
90	10			
85	15			
		3.3	115	■
80	20	15.3	114	■
75	25	4.2	123	■

Soil	Description
	2½" ASPHALTIC PAVING
CL	FILL - SILTY CLAY - few pieces of brick, mottled grey and brown
SM	FILL - SILTY SAND - fine, about 30% glass, wire, tar, brick and concrete, about 10% gravel, mottled brown
SP	FILL - SAND - fine, about 10% gravel, few pieces of brick, mottled grey and brown About 80% brick and concrete pieces (GAD USED TO PENETRATE) CONCRETE SLAB AND FOOTING
SP	SAND - fine, about 20% gravel, few cobbles, light brown
ML	SANDY SILT - few gravel, brown
SP	SAND - fine, about 15% gravel, light brown

NOTE: Water not encountered. Caving from 7' to 8½', 17' to 19' and below 21½' (to 4' in diameter).

LOG OF BORING

LEROY CRANDALL AND ASSOCIATES

BORING 7

DATE DRILLED: October 25, 1967
EQUIPMENT USED: 24"-Diameter Bucket

ELEVATION 98.6

ELEVATION (ft.)	DEPTH (ft.)	MOISTURE (% of dry wt.)	DRY DENSITY (lbs./cu.ft.)	SAMPLE		DESCRIPTION
						2½" ASPHALTIC PAVING
		18.0	94	■	SM	FILL - SILTY SAND - fine, about 10% gravel, few pieces of concrete and brick, brown CONCRETE FOOTING
95		2.0	97	■	SP	SAND - fine, few gravel, light brown
	5	4.8	89	■		
90		4.7	96	■		
	10	4.9	95	■		
85						Thin layers of Silt
	15	9.2	100	■	SW	SAND - well graded, about 40% gravel, light brown
80						
	20					

NOTE: Water not encountered. Caving below 12' (to 3' in diameter).

JOB A-6/2/2 DATE 11-17-67 DR. V.H. O.E. CHKD.

LOG OF BORING

LEROY CRANDALL AND ASSOCIATES

BORING 8

DATE DRILLED: October 26, 1967
EQUIPMENT USED: 24"-Diameter Bucket

ELEVATION 97.8

ELEVATION (ft.)	DEPTH (ft.)	MOISTURE (% of dry wt.)	DRY DENSITY (lbs./cu.ft.)	SAMPLE		DESCRIPTION
						3" ASPHALTIC PAVING
		8.1	124	■	SM	FILL - SILTY SAND - fine, about 20% gravel, few cobbles, pieces of concrete and brick, brown
95						
		10.2	110	■		
	5					
		7.2	108	■		6" Layer of broken concrete
					SP	SAND - fine, light brown
90		4.9	95	■		Few gravel
	10	4.3	101	■		
85						About 10% gravel
						Layer of SILTY SAND
	15	4.9	115	■		About 25% gravel

NOTE: Water not encountered. No caving.

LOG OF BORING

LEROY CRANDALL AND ASSOCIATES

JOB A-67272 DATE 11-17-67 DR J.H. O.E. 2B CHKD. [illegible]

BORING 9

DATE DRILLED: October 26, 1967
EQUIPMENT USED: 24"-Diameter Bucket

ELEVATION 98.1

ELEVATION (ft.)	DEPTH (ft.)	MOISTURE (% of dry wt.)	DRY DENSITY (lbs./cu.ft.)	SAMPLE		Description
						3" ASPHALTIC PAVING
		11.3	118		SM SP	FILL - SILTY SAND and SAND - about 10% gravel, pieces of brick and concrete, mottled brown
95		4.4	96			
					SP	SAND - fine, few gravel, light brown
	5	2.0	97			
		3.6	103			
90						
	10	16.4	91			
						About 10% gravel
85						About 20% gravel
	15	5.0	110			
80						
	20					

NOTE: Water not encountered. Caving below 10' (to 3' in diameter).

LOG OF BORING

LEROY CRANDALL AND ASSOCIATES

PLATE A-9

JOB A-67272 DATE 11-17-67 DR. V.H O.E. 23 CHKD. [illegible]

BORING 10

DATE DRILLED: October 26, 1967
EQUIPMENT USED: 24"-Diameter Bucket

ELEVATION 98.4

ELEVATION (ft.)	DEPTH (ft.)	MOISTURE (% of dry wt.)	DRY DENSITY (lbs./cu. ft.)	SAMPLE
		7.5	118	■
95		15.8	102	■
	5	13.0	105	■
90		4.7	103	■
	10	2.0	107	■
		3.0	104	■
85				
	15	3.4	107	■
80				
	20	24.3	105	■

2½" ASPHALTIC PAVING

SM FILL - SILTY SAND - fine, about 10% gravel, few cobbles, few pieces of concrete and brick, light brown and brown

Large amount of concrete and brick pieces, few pieces of wood

6" CONCRETE SLAB (GAD USED TO PENETRATE)

SP SAND - fine, few gravel, light brown

About 10% gravel

About 25% gravel and cobbles

Layer of SILTY SAND

NOTE: Water not encountered. Caving from 17' to 18½' (to 3' in diameter).

JOB A-67272 DATE 11-17-67 DR. J.M. O.E. 28 CHKD.

LOG OF BORING

LEROY CRANDALL AND ASSOCIATES

BORING 11

DATE DRILLED: October 26, 1967
EQUIPMENT USED: 24"-Diameter Bucket

ELEVATION 97.6

ELEVATION (ft.)	DEPTH (ft.)	MOISTURE (% of dry wt.)	DRY DENSITY (lbs./cu.ft.)	SAMPLE
		7.6	122	■
95		12.8	105	■
	5	29.0	79	■
90		27.1	72	■
	10	26.2	85	■
85				
	15	5.7	119	■
80				
	20			

3" ASPHALTIC PAVING

SM — FILL - SILTY SAND - fine, about 10% gravel, pieces of brick and concrete, mottled brown
6" layer of broken concrete

SM — SILTY SAND - fine, brown

SP — SAND - fine, few gravel, light brown

SM — SILTY SAND - fine, about 15% gravel, dark brown

SP — SAND - medium, about 20% gravel, few cobbles, light brown

NOTE: Water not encountered. No caving.

LOG OF BORING

LEROY CRANDALL AND ASSOCIATES

JOB A-67272 DATE 11-17-67 DR. VM O.E. WB CHKD. ACL

JOB A-67272 DATE 11-17-67 DR. S.M. O.E. 28 CHKD. [illegible]

BORING 12

DATE DRILLED: October 27, 1967
EQUIPMENT USED: 24"-Diameter Bucket

ELEVATION 96.2

ELEVATION (ft.)	DEPTH (ft.)	MOISTURE (% of dry wt.)	DRY DENSITY (lbs./cu.ft.)	SAMPLE		Description
						2½" ASPHALTIC PAVING
95		6.6	106	■	SM	FILL - SILTY SAND - fine, pieces of brick and pottery, brown
		3.1	106	■		
					SP	SAND - fine, few gravel, light brown
	5	2.5	99	■		
90						
		1.8	98	■		
						About 10% gravel, few cobbles
	10	2.2	118	■		
85						
						Medium
	15	1.1	110	■		
80						
	20					

NOTE: Water not encountered. Caving below 6' (to 3' in diameter).

LOG OF BORING

LEROY CRANDALL AND ASSOCIATES

JOB A-57272 DATE 11-22-67 DR. O.E. CHKD.

PIT NO.	ELEVATION	DEPTH TO TOP OF EXISTING FLOOR SLAB (F.S.) OR FOOTING (Ftg.)
A	99.5	1.6' (F.S.)
B	99.5	2.2' (Ftg.)
C	99.2	2.2' (Ftg.)
D	98.2	2.5' (F.S.) - broken
E	98.3	Neither (F.S.) nor (Ftg.) encountered within 5' depth

EXPLORATION PIT DATA

LEROY CRANDALL AND ASSOCIATES

PLATE B

MAJOR DIVISIONS			GROUP SYMBOLS	TYPICAL NAMES
COARSE GRAINED SOILS (More than 50% of material is LARGER than No. 200 sieve size)	GRAVELS (More than 50% of coarse fraction is LARGER than the No. 4 sieve size)	CLEAN GRAVELS (Little or no fines)	GW	Well graded gravels, gravel-sand mixtures, little or no fines.
			GP	Poorly graded gravels or gravel-sand mixtures, little or no fines.
		GRAVELS WITH FINES (Appreciable amt. of fines)	GM	Silty gravels, gravel-sand-silt mixtures.
			GC	Clayey gravels, gravel-sand-clay mixtures.
	SANDS (More than 50% of coarse fraction is SMALLER than the No. 4 sieve size)	CLEAN SANDS (Little or no fines)	SW	Well graded sands, gravelly sands, little or no fines.
			SP	Poorly graded sands or gravelly sands, little or no fines.
		SANDS WITH FINES (Appreciable amt. 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 sandy or silty soils, elastic silts.
			CH	Inorganic clays of high plasticity, fat clays.
			OH	Organic clays of medium to high plasticity, organic silts.
HIGHLY ORGANIC SOILS			Pt	Peat and other highly organic soils.

BOUNDARY CLASSIFICATIONS: Soils possessing characteristics of two groups are designated by combinations of group symbols.

P A R T I C L E S I Z E L I M I T S

SILT OR CLAY	SAND			GRAVEL		COBBLES	BOULDERS
	FINE	MEDIUM	COARSE	FINE	COARSE		

NO. 200 NO. 40 NO. 10 NO. 4 3/4 in. 3 in. (12 in.)

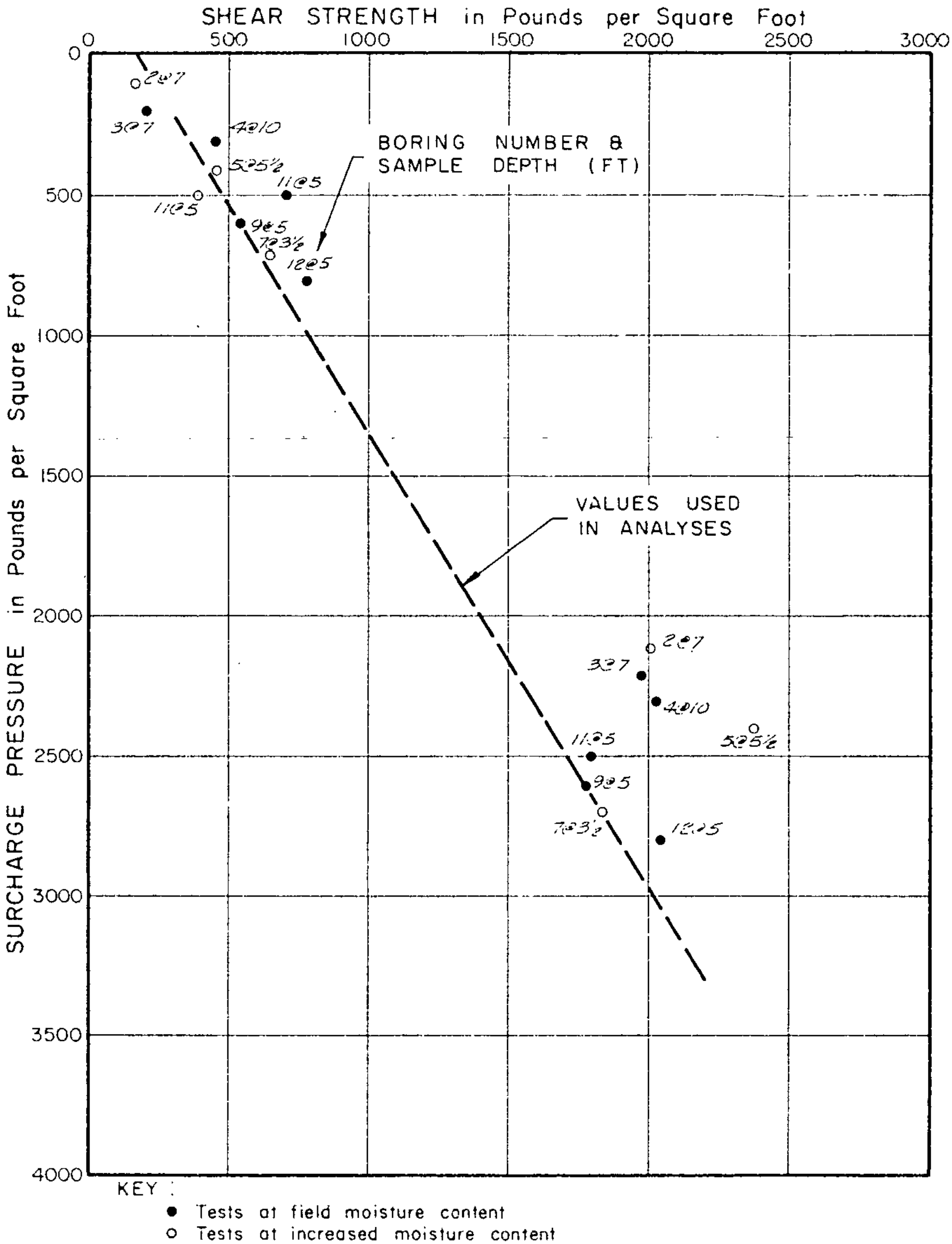
U. S. STANDARD SIEVE SIZE

UNIFIED SOIL CLASSIFICATION SYSTEM

Reference :
The Unified Soil Classification System, Corps of Engineers, U. S. Army Technical Memorandum No. 3-357, Vol. I, March, 1953. (Revised April, 1960)

LEROY CRANDALL & ASSOCIATES

PLATE C

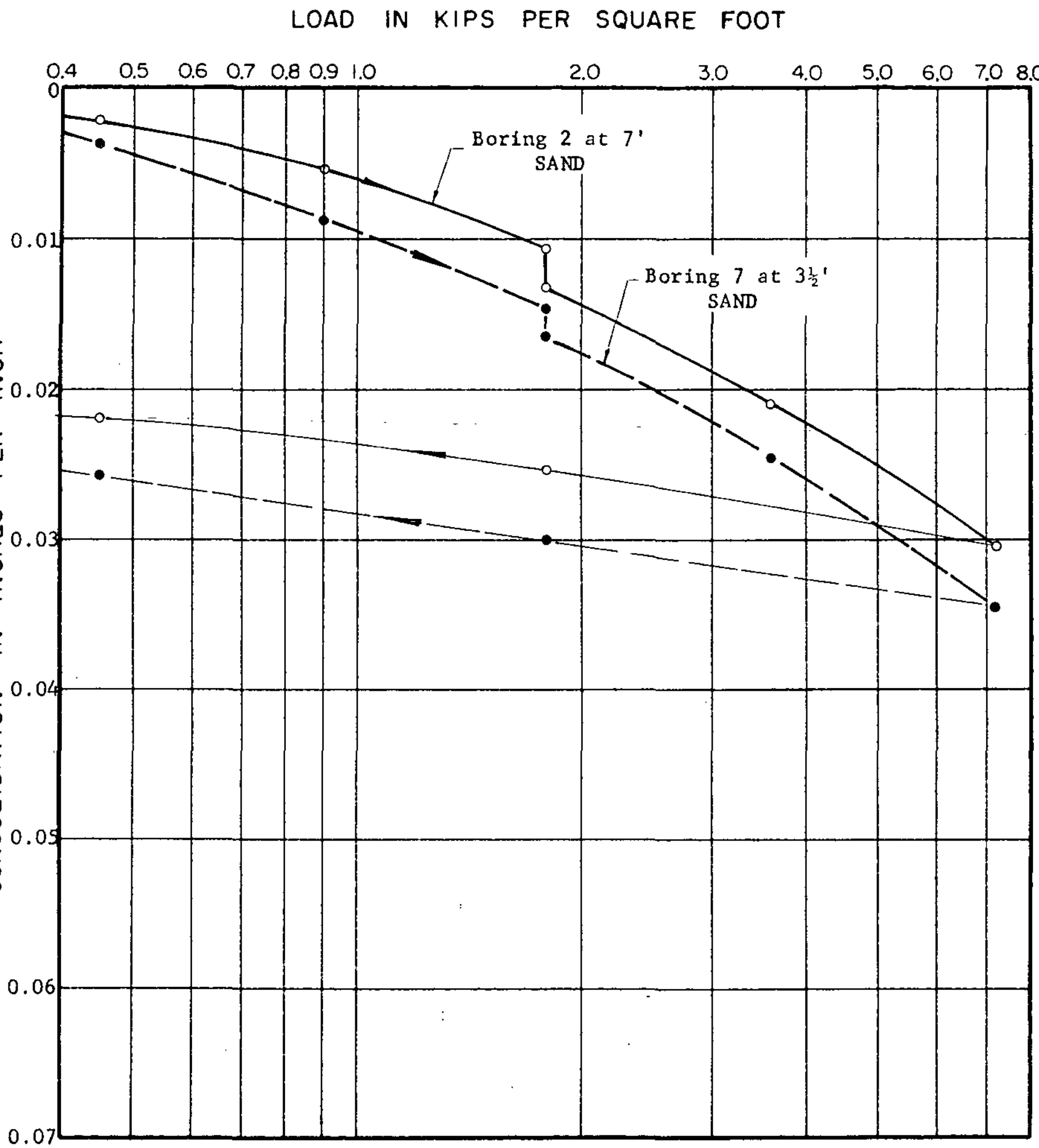


DIRECT SHEAR TEST DATA

LEROY CRANDALL & ASSOCIATES

PLATE D

JOB A-67212 DATE 11-24-67 DR. JP O.E. [illegible] CHKD. [illegible]

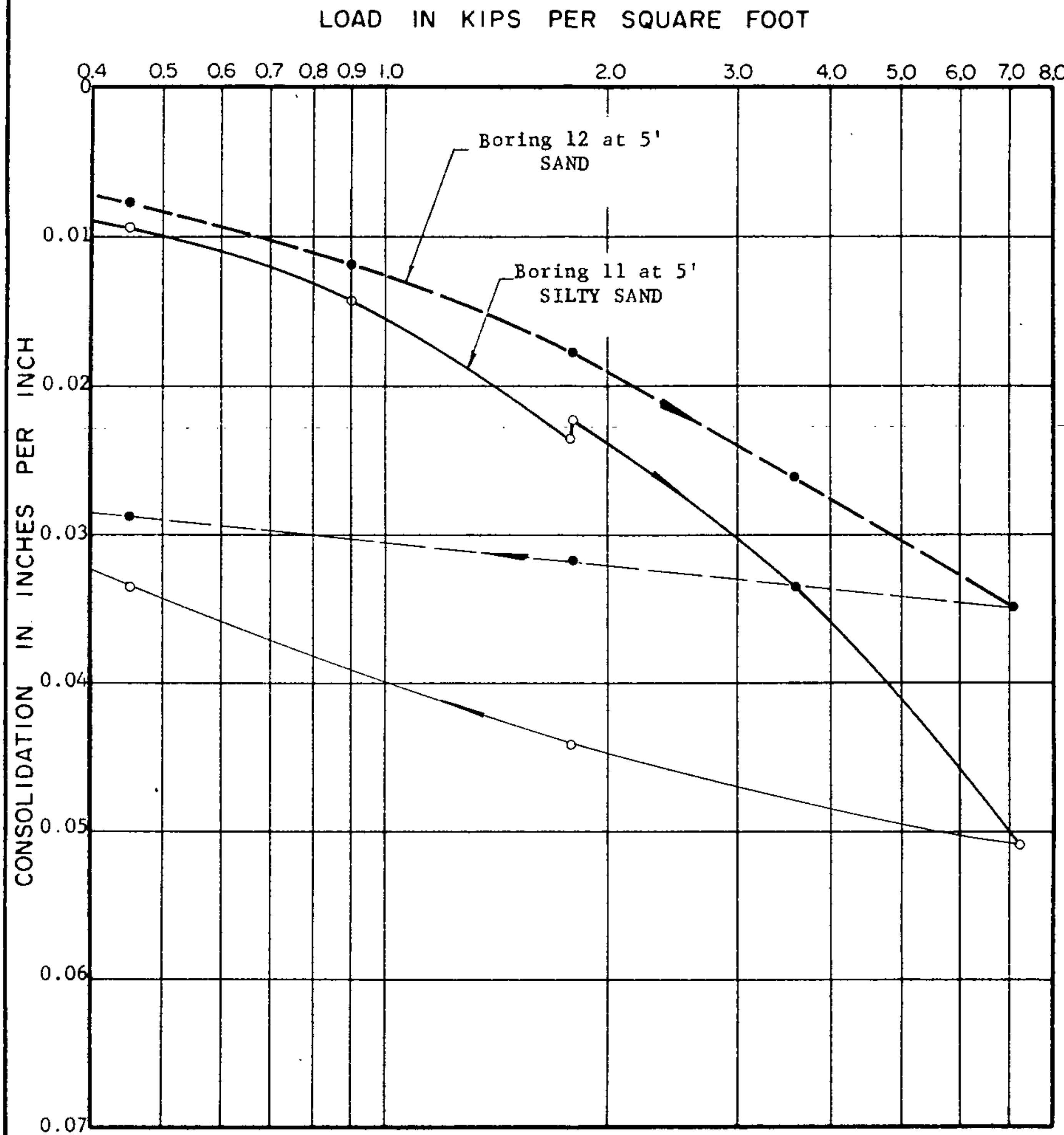


NOTE: Water added to samples after consolidation under a load of 1.8 kips per square foot.

JOB A-67272 DATE 11-17-67 DR. V.M O.E. 28 mf CHKD. RCK

CONSOLIDATION TEST DATA

LEROY CRANDALL & ASSOCIATES



NOTE: Water added to samples after consolidation under a load of 1.8 kips per square foot.

CONSOLIDATION TEST DATA

JOB A-67272 DATE 11-17-67 DR. UM O.E. ZB CHKD. ZB

LEROY CRANDALL & ASSOCIATES

PLATE E-2

BORING NUMBER AND SAMPLE DEPTH:	4 at 0' - 6½'	8 at 0' - 5'
SOIL TYPE:	FILL - SILTY SAND	FILL - SILTY SAND
OPTIMUM MOISTURE CONTENT: (% of Dry Wt.)	10	8
MAXIMUM DRY DENSITY: (Lbs./Cu.Ft.)	126	133

<u>TEST METHOD</u>: ASTM Designation D1557-66T method of compaction modified to use three layers.

COMPACTION TEST DATA

LEROY CRANDALL AND ASSOCIATES

PLATE F

JOB A-67272 DATE 11-24-67 DR O.E. VB:1b CHKD

APPENDIX C

SURFACE WAVE MEASUREMENTS

REPORT

SURFACE WAVE MEASUREMENTS

UTAH ELEMENTARY SCHOOL
LOS ANGELES, CALIFORNIA

GEO*Vision* Project No. 24003

Prepared for

WSP USA Environment and Infrastructure, Inc.
6001 Rickenbacker Road
Los Angeles, California 90040
(323) 889-5300

Prepared by

GEO*Vision*, Inc.
1124 Olympic Drive
Corona, California 92881
(951) 549-1234

Report 24003-01 Rev 0

January 22, 2024

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1 INTRODUCTION

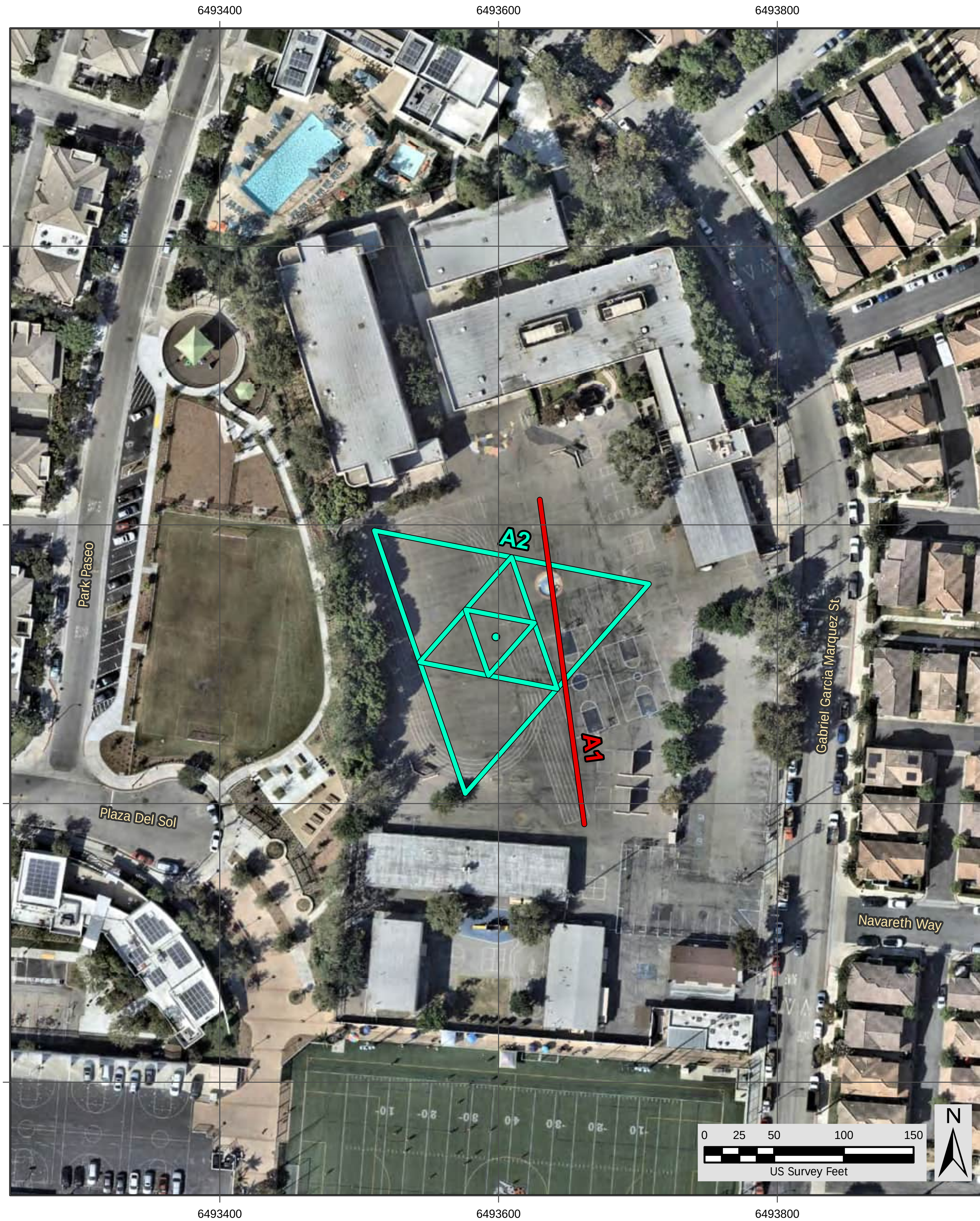
Active- and passive-source surface wave measurements were made at Utah Elementary School, Los Angeles, California on January 4, 2024. The purpose of this investigation was to provide a shear (S) wave velocity profile to a depth of 100 ft, or greater, and estimate the average S-wave velocity of the upper 100 ft (V_{S100ft}). The active-source surface wave technique utilized during this investigation consisted of the multi-channel analysis of surface waves (MASW) method. The passive-source surface wave technique consisted of the array microtremor method. The locations of the active- and passive-source surface wave arrays are shown on Figure 1. MASW measurements were made along a linear array (Array 1/A1) and microtremor measurements were made using a nested triangle array (Array 2/A2).

For seismic design, the 2022 California Buiilding Code (CBC) and 2018 International Building Code (IBC) reference the provisions in ASCE 7-16, Chapter 20 (Minimum Design Loads and Associated Criteria for Buildings and Other Structures). The Site Classes and associated S-wave velocity ranges outlined in Table 20.3-1 of ASCE 7-16 are as follows:

Site Class A – Hard rock – $V_{S100ft} > 5,000$ ft/s
Site Class B – Rock –$2,500 < V_{S100ft} \leq 5,000$ ft/s
Site Class C – Very dense soil and soft rock –$1,200 < V_{S100ft} \leq 2,500$ ft/s
Site Class D – Stiff soil – $600 < V_{S100ft} \leq 1,200$ ft/s
Site Class E – Soft clay soil – $V_{S100ft} \leq 600$ ft/s
Site Class F – Soils requiring site response analysis

At many sites, active-source surface wave techniques with the utilization of portable energy sources, such as hammers and weight drops, are sufficient to obtain S-wave velocity sounding to 100 ft depth. However, at sites with high ambient noise levels and/or very soft soils, these energy sources may not be sufficient to image to 100 ft depth and a larger energy source, such as a bulldozer, is necessary. Alternatively, passive-source surface wave techniques, such as the array microtremor method, can be used to extend the depth of investigation providing the site has sufficient ambient noise. Two-dimensional passive-source surface wave arrays (e.g., triangular, circular, or L-shaped arrays) are expected to perform significantly better than linear arrays.

This report provides the results of the active and passive surface wave measurements conducted at the site. An overview of the surface wave methods is given in Section 2. Field and data reduction procedures are discussed in Sections 3 and 4, respectively. Data modeling is presented in Section 5 and interpretation and results are presented in Section 6. References and our professional certification are presented in Sections 7 and 8, respectively.



Active Surface Wave Array (MASW)

Passive Nested Triangle Microtremor Array

Notes:
Coordinate System: NAD 1983 StatePlane California V FIPS 0405 Feet
Base map source: Nearmap (9-2023)

GEOVision geophysical services

Date:	1/8/2024
GV Project:	24003
Developed by:	C Garcia
Drawn by:	T Rodriguez
Approved by:	A Martin
File Name:	GV_24003

FIGURE 1
SITE MAP

UTAH ELEMENTARY SCHOOL
LOS ANGELES, CALIFORNIA

PREPARED FOR
WSP USA
ENVIRONMENT & INFRASTRUCTURE, INC.

2 OVERVIEW OF SURFACE WAVE TECHNIQUES

2.1 Introduction

Active- and passive-source (ambient vibration) surface wave techniques are routinely utilized for site characterization. Active-source surface wave techniques include the spectral analysis of surface waves (SASW) and multi-channel array surface wave (MASW) methods. Passive-source surface wave techniques include the horizontal over vertical spectral ratio (HVSR) method, and the array and refraction microtremor methods.

The basis of surface wave methods is the dispersive characteristic of Rayleigh and Love waves when propagating in a layered medium. Surface waves of different wavelengths (λ) or frequencies (f) sample different depths. As a result of the variance in the shear stiffness of the distinct layers, waves with different wavelengths propagate at different phase velocities; hence, dispersion. A surface wave dispersion curve is the variation of V_R or V_L with λ or f. The Rayleigh wave phase velocity (V_R) depends primarily on the material properties (V_S, mass density, and Poisson's ratio or compression wave velocity) over a depth of approximately one wavelength. The Love wave phase velocity (V_L) depends primarily on V_S and mass density. Rayleigh and Love wave propagation are also affected by damping or seismic quality factor (Q). Rayleigh wave techniques are utilized to measure vertically polarized S-waves (S_V-wave); whereas Love wave techniques are utilized to measure horizontally polarized S-waves (S_H-wave).

2.2 Surface Wave Techniques

The MASW and array microtremor techniques were utilized during this investigation and are discussed below.

2.2.1 MASW Technique

A description of the MASW method is given by Park, 1999a and 1999b and Foti, 2000. Ground motions are typically recorded by 24, or more, geophones typically spaced 1 to 3 m apart along a linear array and connected to a seismograph. Energy sources for shallow investigations include various sized hammers and vehicle mounted weight drops. When applying the MASW technique to develop a one-dimensional (1-D) V_S model, it is preferable to use multiple-source offsets from both ends of the array. The most routinely applied MASW technique is the Rayleigh-wave based MASW method, which we refer to as MAS_RW to distinguish from Love-wave based MASW (MAS_LW). MAS_RW and MAS_LW acquisition can easily be combined with P- and S-wave seismic refraction acquisition, respectively. MAS_RW data are generally recorded using a vertical source and vertical geophone but may also be recorded using a horizontal geophone with radial (in-line) orientation. MAS_LW data are recorded using transversely orientated horizontal source and transverse horizontal geophone.

A wavefield transform is applied to the time-history data to convert the seismic record from time-offset space to frequency-wavenumber (f-k) space in which the fundamental or higher surface-wave modes can be easily identified as energy maxima and picked. Frequency and/or wavenumber can easily be mapped to phase velocity, slowness, or wavelength using the following properties: $k = 2\pi/\lambda$, $\lambda = v/f$. Common wave-field transforms include: the f-k transform (a 2D fast Fourier transform), slant-stack transform (also referred to as interceptslowness or τ-p transform and equivalent to linear Radon transform), frequency domain beamformer, and phase-shift transform. The minimum wavelength that can be recovered from MASW data set without spatial aliasing is equal to the minimum receiver spacing. Occasionally, SASW analysis procedures are used to extract surface wave dispersion data, from fixed receiver pairs, at smaller wavelengths than can be recovered by wavefield transformation. Construction of a dispersion curve over the wide frequency/wavelength range necessary to develop a robust V_S model while also limiting the maximum wavelength based on an established near-field criterion (e.g., Yoon and Rix, 2009; Li and Rosenblad, 2011), generally requires multiple source offsets.

Although the clear majority of MASW surveys record Rayleigh waves, it has been shown that Love wave techniques can be more effective in some environments, particularly shallow rock sites and sites with a highly attenuative, low velocity surface layer (Xia, et al., 2012; **GEO***Vision*, 2012; Yong, et al., 2013; Martin, et al., 2014). Rayleigh wave techniques, however, are generally more effective at sites where velocity gradually increases with depth because larger energy sources are readily available for the generation of Rayleigh waves. Rayleigh wave techniques are also more applicable to sites with high velocity layers and/or velocity inversions because the presence of such structures is more apparent in the Rayleigh wave dispersion curves than in Love wave dispersion curves. Rayleigh wave techniques are preferable at sites with a high velocity surface layer because Love waves do not theoretically exist in such environments. Occasionally, the horizontal radial component of a Rayleigh wave may yield higher quality dispersion data than the vertical component because different modes of propagation may have more energy in one component than the other. Recording both the vertical and horizontal components of the Rayleigh wave is particularly useful at sites with complex modes of propagation or when attempting to recover multiple Rayleigh wave modes for multi-mode modeling as demonstrated in Dal Moro, et al, 2015. Joint inversion of Rayleigh and Love wave data may yield more accurate V_S models and offer a means to investigate anisotropy, where S_V- and S_H-wave velocity are not equal, as shown in Dal Moro and Ferigo, 2011.

2.2.2 Array Microtremor Technique

A detailed discussion of the array microtremor method can be found in Okada, 2003. Unlike active source techniques which use an active energy source (e.g., hammer), the array microtremor technique (also referred to as passive surface wave or array ambient vibration method) records background noise (ambient vibrations) emanating from ocean wave activity, wind noise, traffic, industrial activity, construction, etc. The technique uses 4, or more, receivers aligned in a 2-dimensional array. Triangle, circle, semi-circle, and “L” shaped arrays are commonly used, although any 2-dimensional arrangement of receivers can be used. For investigations of the upper 100 m, receivers typically consist of 1 to 4.5 Hz geophones. For deeper investigations, 5 to 120 s seismometers are generally utilized. The nested triangle array, which consists of several embedded equilateral triangles, is popular as it provides accurate dispersion curves with a relatively small number of geophones. The “L” array is useful at sites located at the corner of intersecting streets. The maximum receiver separation in an array should be at a minimum equal to the desired depth of investigation. Typically, 15 to 60 minutes of ambient vibration data is recorded depending on the size of the array, desired depth of investigation, and noise conditions. Investigations to depths on the order of 1 km may require that ambient vibrations are recorded for a much longer duration. The surface wave dispersion curve is typically estimated from array microtremor data using various f-k methods such as beamforming (Lacoss, et al., 1969), and maximum-likelihood (Capon, 1969), and the spatial-autocorrelation (SPAC) method. The beam-forming and maximum-likelihood methods are generally referred to as the frequency wavenumber (FK) and high-resolution frequency wavenumber (HRFK or HFK) methods. The SPAC method was originally based on work by Aki, 1957 and has since been extended and modified (Ling and Okada, 1993 and Ohori *et al*., 2002) to permit the use of noncircular arrays, and is now collectively referred to as extended spatial autocorrelation (ESPAC or ESAC). Further modifications to the SPAC method permit the use of irregular or random arrays (Bettig *et al*., 2001). Although it is common to apply SPAC methods to obtain a surface wave dispersion curve for modeling, other approaches involve direct modeling of the coherency data, also referred to as SPAC coefficients (Asten, 2006 and Asten, *et al*., 2015). The beam-forming and maximum-likelihood methods are generally referred to as the frequency wavenumber (FK) and high-resolution frequency wavenumber (HRFK or HFK) methods, respectively. More recently, a Rayleigh wave three-component beamforming method (RTBF) has been developed (Wathelet, et al., 2018) and appears to offer significant resolution enhancements over other methods.

FK, HRFK and RTBF methods are generally expected to perform better when ambient vibration sources are not azimuthally well-distributed (e.g., rural area where the primary noise source is a large industrial facility). SPAC methods are expected to perform better when noise sources are azimuthally well-distributed (e.g., in a large, urbanized area).

The minimum wavelength surface wave that can be extracted from an array microtremor dataset acquired utilizing a symmetric array is typically set equal to the minimum receiver spacing. The maximum wavelength is often set equal to twice the maximum receiver separation for SPAC analysis and the maximum receiver spacing for FK analysis.

2.3 Surface Wave Dispersion Curve Modeling

The dispersion curves generated from the active and passive surface wave soundings are generally combined and modeled using iterative forward and inverse modeling routines. The final model profile is assumed to represent actual site conditions. The theoretical model used to interpret the dispersion curve assumes horizontally layered, laterally invariant, homogeneous-isotropic material. Although these conditions are seldom strictly met at a site, the results of active and/or passive surface wave testing provide a good “global” estimate of the material properties along the array. The results may be more representative of the site than a borehole “point” estimate.

The surface wave forward problem is typically solved using the Thomson-Haskell transfer-matrix (Thomson, 1950; Haskell, 1953) later modified by Dunkin (1965) and Knopoff (1964), dynamic stiffness matrix (Kausel and Roësset, 1981), or reflection and transmission coefficient (Kennett, 1974) methods. All of these methods can determine fundamental- and higher-mode phase velocities, which correspond to plane waves in 2-D space. The transfer-matrix method is often used in MASW and passive surface-wave software packages, whereas the dynamic stiffness matrix is utilized in many SASW software packages. MAS_RW and/or passive surface-wave modeling may involve modeling of the fundamental mode, some form of effective mode, or multiple individual modes (multi-mode). As outlined in Roësset et al. (1991), several options exist for forward modeling of Rayleigh wave SASW data. One formulation considers only fundamental mode plane Rayleigh-wave motion (called the 2-D solution), whereas another includes all stress waves (e.g., body, fundamental, and higher mode surface waves) and incorporates a generalized receiver geometry (3-D global solution) or actual receiver geometry (3-D array solution).

The fundamental mode assumption is generally applicable to modeling Rayleigh-wave dispersion data collected at normally dispersive sites, providing there are not abrupt increases in velocity or steep velocity gradients. Effective-mode or multi-mode approaches are often required for irregularly dispersive sites and sites with steep velocity gradients at shallow depth. If active and passive surface wave data are combined or MAS_RW data are combined from multiple seismic records with different source offsets and receiver gathers, then effective-mode computations are limited to algorithms that assume far-field plane Rayleigh wave propagation. Local search (e.g., linearized matrix inversion methods) or global search methods (e.g., Monte Carlo approaches such as simulated annealing, generic algorithm, and neighborhood algorithm) are typically used to solve the inverse problem.

The maximum wavelength (λ_{max}) recovered from a surface wave data set is typically used to estimate depth of investigation although a sensitivity analysis of the V_S models would be a more robust means to estimate depth of investigation. For normally dispersive velocity profiles with a gradual increase in V_S with depth, the maximum depth of investigation is on the order of $\lambda_{max}/2$ for both Rayleigh and Love wave dispersion data. For velocity profiles with an abrupt increase in V_S at depth, the maximum depth of investigation is on the order of $\lambda_{max}/3$ for Rayleigh wave dispersion data but less than $\lambda_{max}/3$ for Love wave dispersion data. The depth of investigation can be highly variable for sites with complex velocity structure (e.g., high velocity layers).

As with all other surface geophysical methods, the inversion of surface wave dispersion data does not yield a unique V_S model and multiple possible solutions may equally fit the experimental data. Based on experience at other sites, the shear wave velocity models (V_S and layer thicknesses) determined by surface wave testing are within 20% of the velocities and layer thicknesses that would be determined by other seismic methods (Brown, 1998). The average velocity of the upper 30 m, however, is much more accurate, often to better than 5%, because it is not sensitive to the layering in the model. V_{S30} does not appear to suffer from the non-uniqueness inherent in V_S models derived from surface wave dispersion curves (Martin et al., 2006, Comina et al., 2011). Therefore, V_{S30} is more accurately estimated from the inversion of surface wave dispersion data than the resulting V_S models.

It may not always be possible to develop a coherent, fundamental mode dispersion curve over sufficient frequency range for modeling due to dominant higher modes with the higher modes not clearly identifiable for multi-mode modeling. It may, however, be possible to identify the Rayleigh wave phase velocity of the fundamental mode at 40 m wavelength (V_{R40}) in which case V_{S30} can at least be estimated using the Brown et al., 2000 relationship:

$$V_{S30} = 1.045V_{R40}$$

This relationship was established based on a statistical analysis of many of surface wave data sets from sites with borehole velocity control and has been further evaluated by Martin and Diehl, 2004, and Albarello and Gargani, 2010. Further investigation of this approach has revealed that V_{S30} is generally between V_{R40} and V_{R45} with V_{R40} often being most appropriate for shallow groundwater sites and V_{R45} for deep ground water sites.

3 FIELD PROCEDURES

Two types of surface wave data were acquired at the site: an active-source surface wave array to characterize near-surface velocity structure and a passive-source surface wave array to characterize deeper velocity structure. The active- and passive-source surface wave sounding locations at the site are shown in Figure 1. Active-source surface wave data were acquired along Array 1 (A1) using the MASW technique. Passive-source surface wave data were acquired along Array 2 (A2) using the array microtremor method. The surface wave arrays were surveyed using a Trimble R10 GPS system with the RTX differential correction service.

MASW equipment used during this investigation consisted of Geometrics Geode signal enhancement seismographs, 4.5 Hz vertical geophones, seismic cables, a 4-lb hammer, 20-lb sledgehammer, and 240-lb accelerated weight drop (AWD). MASW data were acquired along a linear array of 48 geophones spaced 5 ft apart for a length of 235 ft (A1). Source locations were offset between 5 and 60 ft from the end geophone locations and at nominal 40 ft intervals in the interior of the array. The AWD was utilized at the off-end source locations with the 4-lb hammer also used at the 5 ft offset source locations. Both the 4-lb hammer and 20-lb sledgehammer were utilized at all interior source locations. Data from the transient impacts (hammers) were generally averaged 5 to 10 times to improve the signal-to-noise ratio. All field data were saved to hard disk and documented on field data acquisition forms.

The array microtremor equipment consisted of two Geometrics Geode signal enhancement seismographs, 4.5 Hz vertical geophones, and seismic cables. Array 2 (A2) consisted of three nested triangles with the length of the side of the largest triangle being 200 ft. To total of 43, 4.5 Hz geophones were distributed at 20 ft intervals around the outer triangle, 25 ft intervals around the inner two triangles and at the center of the array. Ambient noise measurements were made for about one hour at a 2-millisecond sample rate. The field geometry and associated files names were documented in field notes.

4 DATA REDUCTION

The MASW data were reduced using the software Seismic Pro Surface V9 developed by Geogiga and multiple in-house scripts for various data extraction and formatting tasks, with all data reduction documented in a Microsoft Excel spreadsheet.

The following steps were used for data reduction:

- Input seismic records to be used for analysis into software package.
- Check and correct source and receiver geometry as necessary.
- Select offset range used for analysis (multiple offset ranges utilized for each seismic record as discussed below) and document in spreadsheet.
- Apply phase shift transform to seismic record to convert the data from time – offset to frequency – phase velocity space.
- Identify, pick, save, and document dispersion curve.
- Change the receiver offset range and repeat process.
- Repeat process for all seismic records.
- Use in-house script to apply near-field criteria with maximum wavelength set equal to 1.0 times the source to midpoint of receiver array distance.
- Use in-house script to merge multiple dispersion curves extracted from the MASW data collected along each seismic line for a specific source type (different source locations, different receiver offset ranges, etc.).
- Edit dispersion data, as necessary (e.g., delete poor quality curves and outliers).
- Calculate a representative dispersion curve at equal log-frequency or log-wavelength spacing for the MASW dispersion data using a moving average, polynomial curve fitting routine.

This unique data reduction strategy, which can involve combination of over 50 dispersion curves for a 1-D sounding, is designed for characterizing sites with complex velocity structure that do not yield surface wave dispersion data over a wide frequency range from a single source type or source location. The data reduction strategy ensures that the dispersion curve selected for modeling is representative of average conditions beneath the array and spans as broad a frequency/wavelength range as possible while considering near field effects.

The array microtremor data were reduced using the Seisimager software package developed by Oyo Corporation/Geometrics, Inc., and the following steps:

The processing sequence for implementation of the ESAC method in the SeisImager software package is as follows:

- Input seismic record(s) for a dataset into software.
- Optionally, extract subarrays with different apertures from the array.
- Load receiver geometry (x and y positions) for each channel in seismic record.
- Apply time-segmentation routine to break the data file(s) into multiple 30 to 60 second seismic records, as necessary.
- Calculate the SPAC coefficients for each seismic record and average.
- Optionally, select a subset of receiver offset ranges for analysis (e.g., only select receiver pairs with multiple azimuths).

- For each frequency calculate the RMS error between the SPAC coefficients and a Bessel function of the first kind and order zero over a user defined phase velocity range and velocity step.
- Plot an image of RMS error as a function for frequency (f) and phase velocity (v).
- Identify and pick the dispersion curve as the continuous trend on the f-v image with the lowest RMS error.
- Repeat the process for all arrays and time blocks.
- Use an in-house script to convert dispersion curves to appropriate format for editing.
- Edit dispersion data, as necessary, and use in-house script to combine all dispersion data after setting maximum wavelength to about 2 times the maximum receiver spacing.
- Calculate a representative dispersion curve for the passive dispersion data from each array using a moving average polynomial curve fitting routine.

The representative dispersion curves from the active and passive surface wave data were combined and the moving average polynomial curve fitting routine in WinSASW V3 was used to generate a composite representative dispersion curve for modeling. During this process, the active and passive surface wave dispersion data were given equal weights. An equal logarithm wavelength sample rate was used for the representative dispersion curve to reflect the gradual loss in model resolution with depth.

5 DATA MODELING

Surface wave data were modeled using the fundamental mode Rayleigh wave routine in the WinSASW V3 software package. During this process, an initial velocity model was generated based on general characteristics of the dispersion curve and the inverse modeling routine utilized to adjust the layer V_S until an acceptable agreement with the observed data was obtained. Layer thicknesses were adjusted, and the inversion process repeated until a V_S model was developed with low RMS error between the observed and calculated dispersion curves. In many cases, once an acceptable V_S model is developed, layer thicknesses are adjusted, and the inversion process repeated to develop an ensemble of V_S models with similar RMS error to quantify non-uniqueness. However, the primary purpose of this investigation was to estimate V_{S100ft} and, therefore, it was not considered necessary to develop multiple V_S models. Data inputs into the modeling software include layer thickness, S-wave velocity, P-wave velocity or Poisson's ratio, and mass density. P-wave velocity and mass density only have a very small influence (i.e., less than 10%) on the S-wave velocity model generated from a surface wave dispersion curve. However, realistic assumptions for P-wave velocity, which is significantly impacted by the location of the saturated zone, and mass density will slightly improve the accuracy of the S-wave velocity model.

Constant mass density values of 107 to 126 lb/ft^3 were used in the velocity profiles for subsurface soils/rock depending on P- and S-wave velocity. Within the normal range encountered in geotechnical engineering, variation in mass density has a negligible (±2%) effect on the estimated V_S from surface wave dispersion data. During modeling of Rayleigh wave dispersion data, the compression wave velocity, V_P, for unsaturated sediments was estimated using a Poisson's ratio, v, of 0.3 and the relationship:

$$V_P = V_S\,[(2(1-v))/(1-2v)]^{0.5}$$

Poisson's ratio has a larger effect than density on the estimated V_S from Rayleigh wave dispersion data. Achenbach (1973) provides approximate relationship between Rayleigh wave velocity (V_R), V_S and v:

$$V_R = V_S\,[(0.862 + 1.14\,v)/(1 + v)]$$

Using this relationship, it can be shown that V_S derived from V_R only varies by about 10% over possible 0 to 0.5 range for Poisson's ratio where:

$$V_S = 1.16V_R \text{ for } v = 0$$
$$V_S = 1.05V_R \text{ for } v = 0.5$$

The common range of Poisson's ratio for unsaturated sediments is about 0.25 to 0.35. Over this range, V_S derived from modeling of Rayleigh wave dispersion data will vary by about 5%. For the purpose of data modeling, the depth to the high Poisson's ratio, saturated zone was assumed to be at a depth of about 40 ft based on review of seismic refraction first-arrival data.

6 INTERPRETATION AND RESULTS

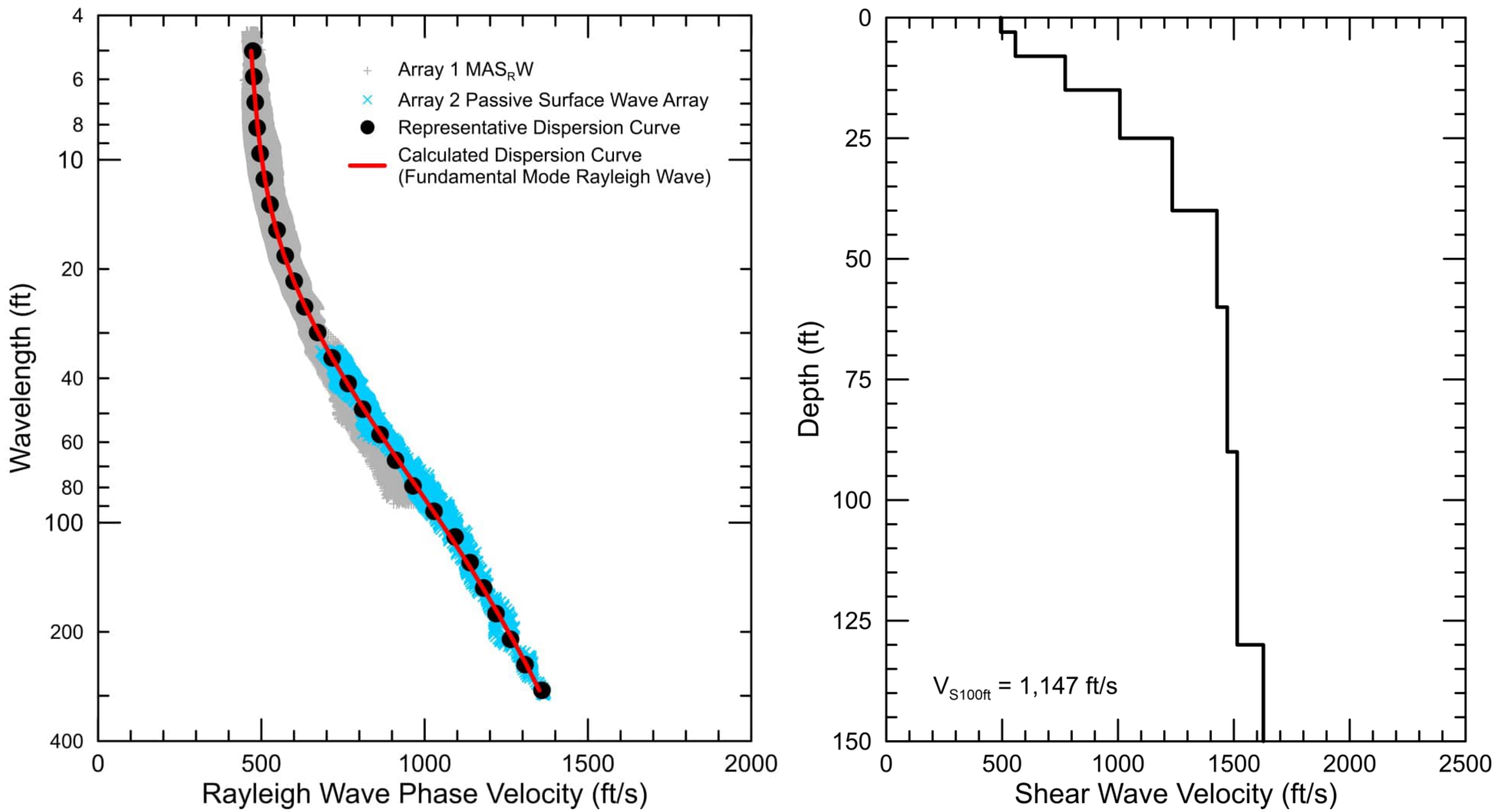
A V_S model was developed from the Rayleigh wave dispersion data derived from MASW and array microtremor data acquired along Arrays 1 and 2 (A1 and A2). The fit of the calculated fundamental mode Rayleigh wave to the observed Rayleigh wave dispersion data and the modeled V_S profile for the surface wave sounding is presented as Figure 2. The resolution decreases gradually with depth due to the loss of sensitivity of the dispersion curve to changes in V_S at greater depth. The Rayleigh wave phase velocities from the microtremor array track the upper envelope of those from the MASW data in the overlapping wavelength region. Scatter in dispersion data from the two methods is expected to be primarily associated with lateral velocity variability beneath the arrays. The V_S profile used to match the field data is provided in tabular form as Table 1.

The estimated depth of investigation for the combined active- and passive-source surface wave sounding is about 150 ft. V_S increases with depth from about 495 ft/s near the surface to 1,625 ft/s at a model depth of 130 ft.

The average shear wave velocity to a depth of 100 ft (V_{S100ft}) is 1,147 ft/s for the V_S model. Therefore, per the criteria in the 2022 CBC and ASCE/SEI 7-16, the site is classified as Site Class D, stiff soil.

Table 1 Arrays 1 and 2 V_S Model

Depth to Top of Layer (ft)	Layer Thickness (ft)	S-Wave Velocity (ft/s)	Inferred P-Wave Velocity (ft/s)	Inferred Poisson's Ratio	Inferred Unit Weight (lb/ft^3)
0.0	3.0	494	924	0.300	107.0
3.0	5.0	557	1043	0.300	111.0
8.0	7.0	772	1445	0.300	118.0
15.0	10.0	1008	1886	0.300	120.0
25.0	15.0	1234	2309	0.300	122.0
40.0	20.0	1427	5500	0.464	124.0
60.0	30.0	1472	5500	0.461	125.0
90.0	40.0	1514	5750	0.463	125.5
130.0	Half Space	1627	5750	0.456	126.0



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Project No: 24003	FIGURE 2 SURFACE WAVE MODEL - ARRAYS 1 AND 2
Date: JAN 12, 2024	UTAH ELEMENTARY SCHOOL LOS ANGELES, CALIFORNIA
Drawn By: A MARTIN	
Approved By: Antony J Martin	PREPARED FOR WSP USA ENVIRONMENT & INFRASTRUCTURE, INC.
R:\GVProjects\2024\24003 - WSP\Report\Figure 2.cdr	

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8 CERTIFICATION

All geophysical data, analysis, interpretations, conclusions, and recommendations in this document have been prepared under the supervision of and reviewed by a **GEO*Vision*** California Professional Geophysicist.

Reviewed and approved by,

PROFESSIONAL GEOPHYSICIST
ANTONY JEFFREY MARTIN
GP 989
STATE OF CALIFORNIA

01/22/2024

Antony J. Martin | Date
California Professional Geophysicist, P. Gp.
GEO*Vision* Geophysical Services

∗ This geophysical investigation was conducted under the supervision of a California Professional Geophysicist using industry standard methods and equipment. A high degree of professionalism was maintained during all aspects of the project from the field investigation and data acquisition, through data processing interpretation and reporting. All original field data files, field notes and observations, and other pertinent information are maintained in the project files and are available for the client to review for a period of at least one year.

A professional geophysicist's certification of interpreted geophysical conditions comprises a declaration of his/her professional judgment. It does not constitute a warranty or guarantee, expressed or implied, nor does it relieve any other party of its responsibility to abide by contract documents, applicable codes, standards, regulations, or ordinances.

SECTION 07 1800 - TRAFFIC COATING

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:
   2. Cementitious waterproof deck coating.

B. Related Requirements:
   1. Division 01 - General Requirements.
   2. Section 03 3000 - Cast-In-Place Concrete.
   3. Section 06 1000 - Rough Carpentry.
   4. Section 07 6000 - Flashing and Sheet Metal.

1.02 REGULATORY REQUIREMENTS

A. Liquid materials shall be non-combustible and shall not emit solvents, or other recognized pollutants, into the atmosphere.

B. The deck coating system shall be certified by Underwriter's Laboratories (UL) approved Class A designation for fireproof construction.

1.03 SUBMITTALS

A. Shop Drawings: Submit details of installation and terminations.

B. Product Data:
   1. Submit manufacturer's product literature.
   2. Submit laboratory test reports indicating conformance with this section.

C. Material Samples: Submit Samples for each color selected of elastomeric deck coating, approximately 2-inch by 3-inch in size, installed to a suitable backing material.

D. Certificates: Submit a certificate stating applicator is approved by the manufacturer, and upon completion, submit a certificate stating that elastomeric deck coating has been installed in conformance with reviewed submittals and manufacturer's recommendations.

E. Installation Instructions: Submit manufacturer's installation procedures.

F. Closeout Submittals: Submit manufacturer's printed maintenance and repair instructions.

1.04 QUALITY ASSURANCE

A. Qualifications:

2. Deck coating shall be product of a manufacturer who has been regularly engaged in the manufacture of this product for at least 10 years. Manufacturer shall supply references of at least five satisfactory installations in which deck coating has been in service for at least five years.
3. Qualifications of Installer: Installer shall have at least five years experience in work of the type required by this section, and is approved by manufacturer to install the specified products.

B. Binders and other liquid and dry components shall be completely mixed and packaged at factory.

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 Project Inspector, Architect, OAR, Contractor, waterproofing applicator, and a technical representative of the elastomeric waterproofing material manufacturer. The waterproofing applicator and material manufacturer's technical representative shall inspect the substrates to receive Work of this section and report defective conditions to Project Inspector, Architect, OAR and Contractor.

D. Manufacturer's Representative: Provide arrangements necessary to have a trained representative of the manufacturer visit the Project site on a weekly basis during elastomeric waterproofing Work to review installation procedures.

E. Materials shall comply with current State of California and South Coast Air Quality Management District requirements for volatile organic compounds.

1.05 DELIVERY, STORAGE AND HANDLING

A. Deliver materials to the Project site in manufacturers unopened containers bearing manufacturer's labels.

1.06 PROJECT CONDITIONS

A. Weather Conditions: Do not apply work of this Section if temperature of surfaces to receive coating or ambient temperature is below 40 degrees Fahrenheit (4.44 degrees Celsius) or above 90 degrees Fahrenheit (32.22 degrees Celsius). Do not install materials when water or dampness in any form is present on the substrate, if materials are wet, or if rain is imminent.

B. Install suitable impervious type masking to preclude staining of surfaces to remain exposed wherever elastomeric waterproofing abuts or laps on to other finish surfaces, and provide additional protection as necessary to supplement masking; cover entire area of building subject to damage or staining.

C. Protect adjacent Work during installation of Work of this Section.

1.07 WARRANTY

A. Manufacturer shall provide a five year material warranty.

B. Installer shall provide a five year labor warranty.

PART 2 - PRODUCT

2.01 SYSTEMS

B. Basis of Design Cementitious Waterproofing System.
   1. Polycoat Products, Poly-I-Gard 246SF.
   2. Gaco Western, GW-15-U64.
   3. NeoGard, Auto-Gard FC.
   4. Life Paint Co., Life Deck AL Systems ICC ESR 2701.
   5. Equal.

2.02 MATERIALS

1. Base Coat Cement: Portland cement blended with a variety of silica sand and proprietary additives.
   a. Product:
      1) Life Paint Company; LD-1.
2. Acrylic Cement Modifier: High-solids acrylic-polymer cement modifier.
   a. Product:
      1) Life Paint Company; LD-81.
3. Top Coat: 100% Acrylic Concrete/Masonry Pigmented Sealer.
   a. Product:
      1) Life Paint Company; 15 Series.
4. Waterproofing Membrane: 40 mil thick rubberized asphalt, self-sealing, self-adhering waterproof membrane reinforced with a non-woven polyester fabric.
   a. Product:
      1) Life Paint Company; Life Deck AL UT, Seal Guard
5. Metal Lath: 2.5 pounds per square yards hot dipped galvanized.
   a. Product:
      1) Life Paint Company; Life Deck Metal Lath.

2.03 Accessory Materials

A. Sealant: As recommended by manufacturer and as specificed in Section 07 9200 - Joint Sealants -.

B. Flashing: Refer to Section 07 6000 - Flashing and Sheet Metal -.

C. Staples 1 inch minimum crown by 5/8 inch long, 16 gauge non-corrosive
   1. Product:
      a. Senco P10 or equal.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify that all other work done in this area under other sections has been completed and accepted by the Architect and the Contractor and meet the manufacturer's requirements prior to starting the coating application.

C. Verify that substrate is free of ridges, sharp projections and damages.

3.02 PREPARATION

A. Surface shall be prepared in accordance with manufacturer recommendation. Clean, and sweep free of loose particles and debris, which might prevent proper installation of the surfacing materials, and remove oil and grease.

C. Mask-off all adjoining areas that are not to receive elastomeric deck coating.

3.04 INSTALLATION

A. Install in accordance with manufacturer's written recommendations.

B. Install waterproofing.

C. Install flashing.

D. Install metal lath, base, intermediate, and top coats per manufacturer's instructions and at the required gallons per square feet rates to obtain the dry thickness mils.

3.05 CLEANUP

A. Clean stains from adjacent surfaces. Remove foreign matters from finished coating surfaces.

B. Remove rubbish, debris, and waste materials and legally dispose of off the Project site.

3.06 FIELD QUALITY CONTROL

A. After coating has cured, flood test horizontal area by adding water to a depth of 2 to 3 inches (76.2 mm). Retain water at specified depth for a period of 24 hours. If leakage occurs, repair coating and repeat testing.

3.07 PROTECTION

A. Protect the Work of this section until Substantial Completion.

END OF SECTION

SECTION 08 7100

DOOR HARDWARE

1

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

1. Door hardware.
2. Door Hardware Schedule.
3. Fire Department Key Vault.

B. Related Requirements:

1. Division 01 - General Requirements.
2. Section 06 2000 - Finish Carpentry.
3. Section 08 1113 - Hollow Metal Doors and Frames.
4. Section 08 1613 - Fiberglass Doors and Frames.
5. Section 08 1416 - Flush Wood Doors.
6. Section 08 3313 - Coiling Counter Doors.
7. Section 08 3323 - Overhead Coiling Doors and Grilles.
8. Section 08 4113 - Aluminum Entrances and Storefronts.
9. Section 14 2423 - Hydraulic Passenger Elevators.
10. Section 26 0500 - Common Work Results for Electrical.
11. Section 26 0513 - Basic Electrical Materials and Methods
12. Section 28 3100 - Fire Detection and Alarm
13. Section 28 1600 - Intrusion Detection Systems

C. Items listed in other sections and not included herein as “Door Hardware”

1. Cabinet hardware, except keying.

2. Bath accessories, excepting keying.

3. Nameplates, room numbers exit signs.

4. Disabled access signs.

5. Roll-up door hardware, except cylinders and padlocks.

6. Smoke detectors, 120VAC power, wiring, and conduit.

7. Door position switches.

8. Access panels, except padlocks.

9. Gate hardware, except locking devices.

10. Local alarms and annunciators.

1.02 DESIGN REQUIREMENTS

A. Design Requirements:

1. Exit doors, including each leaf of a pair of doors, shall always be operable from the inside by the simple turn of a lever or by pushing an exit device without the use of a key or any special knowledge or effort; this includes doors of toilet and storage rooms.

2. Unless otherwise specified, hand activated door opening hardware shall be located 36 inches above the finish floor.

3. Dead bolts are not permitted unless operable with a single effort by a lever type hardware.

4. The force applied to operate exit hardware shall not require more than 15 lbs. applied in the direction of travel.

B. Regulatory Requirements:

1. Comply with CBC requirements.

2. Hardware for fire doors shall conform to requirements of UL - Fire Protection and Accident Hazard Equipment and the California State Fire Marshal listing, NFPA - 80 and CBC requirements for positive pressure testing.

3. Hardware shall meet the requirements of CBC, Chapter 11B.

1.03 SUBMITTALS

A. Shop Drawings:

1. Wiring Diagrams: Submit diagrams, templates, instruction, and installation manuals, for electrical and electronic hardware.

B. Product Data: Finish Hardware Schedule:

1. Submit schedule including recap sheet:

a. Include manufacturer's name, catalog number, relevant dimensions, fasteners, location of item in Work, door index number, frame material, door material, door size and thickness, door type, handing, fire-rating (if any), and sound-rating (if any).

b. Hardware shall be listed by "Headings" in following manner:

1) HEADING NO. 1

1 SINGLE/PAIR OF DOORS NO. (Room and Number) from/to (Room and Number)

1 SINGLE/PAIR OF DOORS NO. (Room and Number) from/to (Room and Number)

SPEC. NO. List the appropriate numbers from the specified LIST OF FINISH HARDWARE

List of finish hardware

2) HEADING NO. 2, etc.

C. Material Samples: Submit Samples of door hardware as required by Architect.

D. Submittal Review Time: In lieu of what is specified in Section 01 3300, allow at least twenty-eight days in the Milestones Schedule for Architect and OAR review following receipt of submittal.

1.04 QUALITY ASSURANCE

A. Each type of finish hardware furnished for the Work shall be of same make or manufacture, unless otherwise specified. Where existing items are being supplemented with new items, match existing items, subject to current code requirements and accessibility recommendations.

B. Coordinate and deliver templates or physical Samples of finish hardware items to manufacturer of interfacing items, such as doors and frames, in a timely manner to insure orderly progress of Work.

C. Comply with the following as a minimum requirement:

1. Conform to Builders Hardware Manufacturers Association (BHMA) Finish Code, latest edition.

2. DHI WDHS.3: Recommended Locations for Architectural Hardware for Wood Flush Doors

3. DHI WDHS.4: Recommended Hardware Reinforcement Locations for Mineral Core Wood Flush Doors.

4. HMMA 831: Recommended Hardware Locations for Custom Hollow Metal Doors and Frames

1.05 DELIVERY, STORAGE AND HANDLING

A. Package each item of hardware and each lockset individually, complete with necessary installation instructions, screws and fastenings, and installation templates; marked with item number corresponding to number on Finish Hardware Schedule.

1.06 WARRANTY

A. Manufacturer shall provide a minimum two year material warranty except as follows:

1. Provide a ten year manufacturer's material warranty for door closers.

2. Provide a five year manufacturer's material warranty for locksets and exit devices.

1.07 MAINTENANCE MATERIALS

A. Extra Materials:

1. Provide five percent or a minimum or one, whichever is greater, of the following hardware: locksets, exit devices, closers, fire rated smoke seals, seals, and electric or electronic hardware. Transmit to OAR before Substantial Completion.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Butts and Hinges:

1. Width of hinges shall be of sufficient size to clear trim. Where provided with magnetic holders, hinge width shall be of sufficient size to ensure door is parallel to wall when magnetic holders are engaged.

2. Furnish one pair of hinges for door leaves up to 5-foot high. Furnish one additional hinge for every additional 30 inches or fraction thereof.

3. Butts for doors shall be non-rising, loose pins, with button tip.

4. Exterior and interior out-swinging doors with butt hinges shall be furnished with hinges furnished with a setscrew in hinge barrel to make pin non-removable (NRP); Butt hinges at exterior out-swinging doors shall have stainless steel pins and bearings.

5. Hinges installed on painted doors shall be BHMA 600 finishes. Hinges installed on stained and varnished doors shall be BHMA 626 for bronze/brass base metals and BHMA 652 for steel base metal. Exterior doors shall have non-ferrous hinges. Fire-rated doors shall have steel or stainless steel hinges.

B. Locksets and Trim:

1. Unless otherwise specified, locks shall be of mortise type, complying with ANSI A156.13, grade 1.

2. Unless otherwise specified, escutcheons shall be 7 ½-inch by 2 ¼-inch wide by 0.050 thick minimum.

3. Levers shall be cast, and shall return to within ½ inch of face of door.

4. Outside lever shall be pinned. Inside lever shall be by "Allen Head Set Screw" or by "Spanner Ring Nut".

5. Lock strikes shall be curved lip type, with exposed edges and corners rounded, of sufficient length to protect jamb and trim, and shall not extend more than 1/8 inch beyond trim, jambs or face of doors in pairs. At out-swinging pairs with overlapping astragal, strike shall have a 7/8 inch lip-to-center dimension. Dust box shall be provided for door locks.

6. Locksets throughout shall be lever type of same manufacture.

C. Exit Devices:

1. Unless otherwise specified, exterior doors shall be furnished with rim touch bar device; right hand reverse active leaf - night latch function by cylinder by hardened cylinder ring by flush pull by sex nut and bolt. Left-hand reverse inactive leaf - exit only by flush pull by sex nut and bolt.

2. Unless otherwise specified, interior doors shall be furnished with rim touch bar device; right hand reverse active leaf-lever handle by cylinder, left hand reverse inactive leaf; exit only.

3. Fire labeled exit devices shall conform to UL label requirements and be listed by the California State Fire Marshal.

4. Exit devices throughout shall be touch bar types of same manufacture. Exit devices shall meet ANSI BHMA, A153.3 Grade 1.

5. Lever design shall match lock levers.

6. Exit devices shall be furnished sized for the specific door width and height.

D. Door Closers:

1. Door closers shall conform to ANSI A156.4, Grade 1.

2. Door closers shall be heavy duty, rigid parallel arm; provide regular arm for regular bevel doors.

3. Door closer shall be full rack and pinion type, adjustable back check, and sweep and latch speed with key regulating screws.

4. Door closer shall have full fitted cover of plastic or stainless steel, attached to door closer body with tamperproof screws.

5. Provide spacer block or support bracket for securing fifth screw on closer arm shoe. Provide special brackets, shoes, or other attachment devices as required.

6. Maximum pressure to operate doors shall not exceed following:

a. Fire rated doors: The authority having jurisdiction may determine the maximum force, not to exceed 15.0 pounds to operate fire doors to achieve positive latching.

b. Exterior doors: 5.0 pounds.

c. Interior doors: 5.0 pounds.

7. Door closers shall be installed at the following:

a. Exterior doors.

b. Fire rated doors.

c. Corridor doors.

d. Toilet doors.

E. Protection Plates: Furnish kick plates of 10-inch high by 2-inch less door width on single doors, 10-inch high by 1 inch less door width on pairs of doors. Provide one plate for push side of closer-equipped doors. Furnish mop plates 4-inch high by 1 inch less door width on doors swinging into toilet rooms.

1. Kick and mop plates shall be a minimum 0.050 inch thick; Type 304 stainless steel, with finished beveled edges (B4E).

F. Stops:

1. Floor stops shall be mounted to protect door and trim.

2. Furnish stop of appropriate height, minimum ¾ inch above undercut of door.

3. Where the specified floor stop cannot be installed or would present a pedestrian hazard, omit and furnish a heavy-duty overhead stop (626 finish); if closer is specified, furnish closer with integral spring-cushion stop arm.

G. Weather stripping/Gasketing:

1. Install gaskets and intumescent seals on fire rated doors and frames.

2. Unless otherwise specified, install weather stripping on doors from air-conditioned spaces to the exterior: fastener-applied frame seals, nylon-brush door sweeps, and, at pairs, astragals.

H. Thresholds: Unless otherwise specified, thresholds shall conform to CBC Chapter 11B accessibility standards and ADAAG.

I. Push Plates: Plates shall be 0.050 thick, 6-inch by 16-inch minimum, with beveled edges.

1. Door Pulls: Pulls shall have protective plate mounted under pull, 0.050 inches thick, 4-inch by 16-inch beveled on four edges.

2. Hardware Cutouts: Pull plates and push plates installed over locking hardware shall have cylinder and turn lever cutouts as required.

J. Automatic Flush Bolts:

1. Strike plates for automatic bolts shall be provided for active door.

2. Provide dust proof strikes for bottom bolts.

K. Coordinators:

1. Provide brackets as required for items fastened to coordinators.

2. Provide door strike plates for both doors with coordinators.

L. Smoke Detectors and Magnetic Holders: Coordinate electrical devices with Division 26 and the Drawings.

M. Fasteners: Shall match finish of hardware. Provide fasteners for all hardware at toilet rooms, custodian rooms, kitchen doors, and exterior doors: stainless steel for chrome, aluminum, or stainless finish hardware; brass or bronze for brass or bronze finish hardware.

N. Key vault: Locate box as indicated on drawings.

1. Knox Box: Model 4400 series for low rise buildings with recessed mounting kit, or other as approved by local fire authority.

2. Construction: High Security Industrial/Government key box. UL listed double-action rotating tumblers and hardened steel pins accessed by a biased cut key. ¼" thick steel housing with ½ inch thick steel door with interior gasket seal and stainless steel door hinge. Lock shall have a 1/8 inch thick steel dust cover with tamper seal mounting capability.

3. Installation of Key Vault: Refer to manufacturer's printed instructions and LA City Fire Department's Fire Prevention Bureau's Requirement 75. Connect wiring conduit through one of the holes provided.

4. Labeling: The word "FIRE" shall be placed on the Key Box door in ¾ inch contrasting letters

2.02 FINISH

A. Unless otherwise specified, finish of hardware shall be dull chromium-plated BHMA 652 for steel-based metals, BHMA 626 for brass-based metals, except for kickplate, escutcheons, push plates, lock strike plates, and exit device touch bars, which shall be BHMA 630. Levers for locksets and exit devices shall be BHMA 626.

B. Unless otherwise specified, overhead door closers and brackets shall be BHMA 689, to match other finish hardware in same room or space.

2.03 CYLINDERS AND KEYING

A. Project shall be keyed in accordance with keying schedule, prepared and furnished by the OAR.

B. Provide a cylinder security collar (SPEC. NO. 42) at each exterior door cylinder. Provide cylinder collars and spacers at all cylinders as needed to provide a neat, tight and secure fit of the cylinder to the locking hardware.

C. Permanent Cylinders:

1. Permanent cylinders shall be standard core type, 7-pins maximum.

a. Permanent cylinders as manufactured by [_TBD______________] shall be Owner furnished. The Work of this section includes obtaining the permanent cylinders from the Owner, and pinning, stamping, and installing.

b. Provide to the OAR an approved hardware schedule and floor plans. OAR shall return with keying added to the approved hardware schedule, bitting chart, and a complete sample set of permanent keys. OAR will provide notification when the cylinders are available for pick-up at the District's Central Lock Shop located at 1240 Naomi Street, Los Angeles.

2. Permanent cylinders shall be pinned with third-party (e.g., "LAB") 0.005 inch increment pins.

3. Pin cylinders according to OAR-furnished sample set of permanent keys, OAR-furnished bitting chart and OAR-furnished key schedule.

4. Change keys and master keys shall operate inside and outside cylinder on two cylinder locks, unless otherwise indicated.

5. Provide the set number of change key only stamped on cylinder faces.

D. Key Control:

1. Permanent cylinders and sample set of permanent keys shall be not used during the construction phase of the Project. Temporary construction cylinders and keys used for securing the Work is included as part of the Work of this section and will not be provided by the Owner.

2. Upon Substantial Completion of the Work, sample set of original keys shall be returned to the OAR. Duplication of Owner keys, or retaining keys, is not permitted.

3. Provide four unstamped, uncut nickel silver key blanks per cylinder to the OAR prior to Substantial Completion. Key blanks shall be by the permanent cylinder manufacturer and of the same keyway as the sample set of permanent keys or keyway designated by Owner.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Finish hardware shall be installed as specified in Finish Hardware Schedule.

1. Placement of Hardware: Finish hardware shall be installed as indicated on hardware placement sheets attached to end of this section.

2. Provide necessary screws, bolts, anchors, and fastenings, of required sizes and type for proper installation of hardware. Exposed screws shall have Phillips heads, and wood screws shall be fully threaded.

3. Fitting: Hardware shall be accurately fitted and, with exception of prime-coated butt hinges, bar-type coordinators, and flat astragals, shall be removed before finish painting is installed. Upon completion of finish painting and/or sealing, permanently install the hardware.

4. Anchorage of Hardware: Hardware fastened to concrete, masonry, or gunite construction shall be provided with drop-in expansion anchors by "Red Head Multi Set II", “Rawl Steel”, or as otherwise required by hardware manufacturer. Pilot holes of suitably lesser diameter shall be drilled prior to the insertion of wood and sheet metal screws.

5. Door escutcheons and push plates shall be installed with stainless steel or bronze, oval, "Phillips Head", fully threaded screws, not less than 3/4 inch - No. 6.

6. Exit devices shall be mounted with non-ferrous sex nuts and fully threaded machine screws, except where through bolts engage outside trim of locking case.

7. Mullion strike shall be installed with fully threaded machine screws.

8. Door closer shall be installed for maximum degree of opening of each door.

9. Following shall be installed with sex nuts and fully threaded machine screws.

    a. Door closers.

    b. Door pulls.

10. Install exterior doorstops as required. On new concrete, stops shall be installed with 1/4-20 screws. On asphalt concrete, stops shall be installed with 1/4-20 screws to an anchor plate set in a concrete monument. Anchor plate shall be Trimco 1268, or equal. Floor stops shall not be located in the path of travel and shall be located no more than 4 inches from walls.

11. Kickplate:

    a. Kickplates shall be installed with screws at each corner, and screws evenly spaced along each side not more than 3 inches apart on centers.

    b. Except on wood doors, screws shall be undercut pan head.

12. Thresholds shall be installed with 1/4-20 screws, set in Pour-Roc or mastic per section 07 9200, and coped to trim.

13. Sound Seals and Weather stripping / Gasketing:

a. A mounting screw shall be installed within 2 inches of cuts or corners of weather stripping and/or gasketing.

b. Sound seals and weather stripping and/or gasketing shall be installed with No. 8 - 3/4 inch Tek Phillips pan head screws.

14. Exterior doors not otherwise specified shall be provided with SPECS.1, 18, 28, 33, 36, 39, 42, 46, 54.

15. Interior doors not otherwise specified shall be provided with SPECS 2, 18, 28, 33, 35, 39, 42, 54.

3.02 ADJUSTING AND CLEANING

A. Before Substantial Completion, hardware shall be cleaned and inspected. Where hardware is deemed defective, repair or replace as required.

B. Door Closers: Final adjustments shall be performed before Substantial Completion, with mechanical system balanced and in operation.

3.03 EXAMINATION

A. Upon completion of installation, verify correct installation of hardware, according to reviewed Hardware Schedule and Keying Schedule. Verify that finish hardware is in optimum working condition.

3.04 PROTECTION

A. Protect the Work of this section until Substantial Completion.

3.05 LIST OF FINISH HARDWARE

A. Following items designated by "SPEC NO." comprise the list of Finish Hardware, from which hardware shall be furnished as specified and required to complete the Work:

1. HINGES

SPEC. NO. 1 --Full Mortise Hinges -- Non-Ferrous -- For Exterior Reverse Bevel Doors

Ball or oilite bearings, 4 1/2-inch by 4-inch, or as required to clear projections, primed or plated as required. Furnish with security studs. Furnish with stainless steel non-removable pins and bearings.

	Bommer	Hager	Mc Kinney
Reg. Wt. -	BB5001-A	BB1191-NRP-SH	TA2314-NRP-SSF

Heavy Wt. -	BB5005--A	BB1199-NRP-SH	T4A3386-NRP-SSF

	Stanley	Ives	PBB
Reg. Wt. -	FBB191-NRP-Sec. St.	5BB1 NRP/SS	BB21-NRP
Heavy Wt.	FBB199-NRP-Sec. St.	5BB1HW NRP/SS	4B21-NRP

SPEC. NO. 2 -- Full Mortise -- General Interior Doors

Steel, ball or oilite bearings, 4 1/2-inch by 4-inch, or as required to clear projections, primed or plated as required. Furnish with non-removable pins at outswinging doors.

Bommer	Hager	Mc Kinney	Stanley	Ives	PBB
BB5000	BB-1279	TA-2714	FBB-179	5BB1	BB81

SPEC. NO. 3 --Full Mortise Swing Clear Hinges -- Non-Ferrous -- For Exterior Reverse Bevel Doors

Ball or oilite bearings, 4 1/2-inch by 4-inch, or as required to clear projections, primed or plated as required. Furnish with security studs. Furnish with stainless steel non-removable pins and bearings.

	Hager	Mc Kinney
Reg. Wt. -	AB7001-NRP-SH	TA2395-NRP-SSF
Heavy Wt. -	AB7502-NRP-SH T4A3395-NRP-SSF	

	Ives	PBB
Reg. Wt. -	5BB1SC NRP/SS	SCBB51-NRP
Heavy Wt. -	5BB1SCHW NRP/SS	SC4B51-NRP

2. LOCKSETS

SPEC. NO. 4 -- Lock -- Interior Doors

One cylinder: Key in cylinder locks or unlocks outside lever, inside lever always free. Protected front and deadlocking latch.

Corbin/Russwin	Sargent	Schlage	Marks	Townsteel
ML2055NSM	8237LW1L	L-9070-06N	LA318J	MSE-R-05-S

SPEC. NO. 5 -- Lock -- Classroom Security

Two cylinders: Key in inside cylinder locks or unlocks outside lever, key in outside cylinder retracts latch, inside lever always free. Protected front and deadlocking latch.

Corbin/Russwin	Sargent	Schlage	Marks
ML2052NSM	8238LW1L	L-9071-06N	LA318GJ-32D-G3

Townsteel
MSE-R-32-L-I/S Only-S

SPEC. NO. 6 -- Lock -- Cylinder Both Sides

Two cylinders: Dead bolt operated by key in either cylinder, latch bolt retracted by lever from either side. Protected front. Do not install at exit doors.

Corbin/Russwin	Sargent	Schlage	Marks	Townsteel
ML2022NSM	8226LW1L	L-9466-06N	LA118C	MSE-R-14-S

SPEC. NO. 7 -- Latchset

Latch bolt retracted by lever from either side. Protected front.

Corbin/Russwin	Sargent	Schlage	Marks	Townsteel
ML2010NSM	8215LW1L	L-9010-06N	LA118N	MSE-R-01-S

SPEC. NO. 8 -- Lock -- Private Toilet -- with Emergency Key

Latch bolt retracted by lever from either side, except when deadbolt is projected by turn inside, turning inside lever retracts both deadbolt and latch bolt simultaneously. In emergency, bolt can be operated by emergency key from outside. Turn shall be oval shaped minimum 1 3/4-inch by 1 inch at center with 1 1/4-inch projection.

Corbin/Russwin	Sargent	Schlage	Marks
ML2030NSM	8265LW1L	L-9040-06N -XL11-761	LA118LF

Townsteel
MSE-R-19-S

SPEC. NO. 9 -- Lock -- Special Rooms

One cylinder: Key in cylinder retracts latch bolt. Outside lever always rigid, inside lever always free. Protected front and deadlocking latch.

Corbin/Russwin	Sargent	Schlage	Marks
ML2057NSM	8204LW1L	L-9080-06N	LA118EW

Townsteel

MSE-R-07-S

SPEC. NO. 10 -- Lock -- Single Occupancy Faculty Toilets

Latch set contains a lever handle on each side with an oval shaped privacy bolt and latch on the inside. In an emergency, the lockset must open for the exterior with a key that overrides the privacy latch mechanism. From the interior, the occupant may open the door by activating the door lever which releases the privacy latch and door simultaneously. For existing staff use single occupancy restrooms only.

Corbin/Russwin	Sargent	Schlage	Marks
ML2029 NSM M34	8250LW1L	L-9486-06N by L538-375	LA118LH

Townsteel

MSE-R-15-S-ADA

SPEC. NO. 11 -- Lock -- Connecting Room Lock

Two cylinders: Key in cylinder locks or unlocks both levers. Protected front and deadlocking latch. Do not install at exit doors.

Corbin/Russwin	Sargent	Marks
ML2042-404F90-8-NSM	8237 by DBL CYL by 82-3093LW1L	LA118JC

Townsteel

MSE-R-09-S x TS5621 & TS 5620

Locking Hub Rollback kit

Schlage

L-9066-06N-XL11-897

SPEC. NO. 12 -- Lock -- Special Gate Lock

Two cylinders: Latchbolt by key from either. Both levers always rigid. Auxiliary latch deadlocks latchbolt. Do not install at exit gates.

Corbin/Russwin Sargent Schlage Marks Townsteel

ML2032 NSM	8217LW1L	L-9082-06N	LA118WW	MSE-R-30-S

SPEC. NO. 13 -- Lock – Hold Back Function

One cylinder: Key in cylinder locks or unlocks outside lever, inside lever always free. Latchbolt can be held in a retracted position by key, or released by key. Protected front and deadlocking latch. Install on non-rated doors

Corbin/Russwin	Sargent	Schalge	Marks
ML 2056 NSM	8289LW1L	L9076-06N	LA118JR

Townsteel

MSE-R-06-S

SPEC. NO. 14 -- Lock – Hold Back Function

One cylinder: Key in cylinder locks retracts latch, inside lever always free. Latchbolt can be held in a retracted position by key, or released by key. Protected front and deadlocking latch. No exterior lever trim. To be used in conjunction with Spec. No. 93. Install on non-rated doors

Corbin/Russwin	Sargent	Schalge	Marks
ML 2056 NSM-M30	8291LW1L	L9076 LLL-06N	LA118JM-F5

Townsteel

MSE-R-06-S-LO

SPEC. NO. - 15 – Electronic Lock – Single Occupancy Public-Use Toilets

Lock is standalone, operable by keypad or HID Corp 1000 35 bit card. Keypad or HID card unlocks lever. Privacy deadbolt projected by turn inside a minimum 1 ¾” x 1” at center with 1 ¼” projection. HID or keypad is disabled when deadbolt is activated. Shall include small format interchangeable core (SFIC Best/Falcon type) less core.

Alarmlock: PDL4500 DB

3. PANIC HARDWARE AND FIRE LABELED HARDWARE

SPEC. NO. 16 -- Exit Device -- Single Door – Aluminum Store Front Door

Exit device shall be rim night latch function with a 3/4 inch latch bolt, dead latch, dogging device and a stainless steel touch pad. Furnish standard Allen-type dogging key with suitable hole for key ring. Furnish with offset pull (see SPEC. NO. 49).

Corbin Russwin	Precision	Sargent	Von Duprin	Dorma
ED4200 x K157	2403	8504	35A-NL-OP	5303 x JP03

Detex
4003 x CBK

SPEC. NO. 17 -- Exit Device -- Pair Doors – Aluminum Storefront Doors

Exit device shall be rim rod night latch function by exit only function with a 3/4 inch latch bolt, dead latch, dogging device and a stainless steel touch pad. Furnish standard Allen-type dogging key with suitable hole for key ring. Furnish with offset pull (see SPEC. NO. 49)

Corbin Russwin	Precision	Sargent	Von Duprin	Dorma
Active Door				
ED4200 x K157	2403	8504	35A-NL-OP	5303 x JP03
Inactive Door				
ED4200	2401	8510	35A-EO	5303

SPEC. NO. 18 -- Exit Device -- Single Door

Exit device shall be rim night latch function with a 3/4 inch latch bolt, dead latch, dogging device and a stainless steel touch pad. Furnish standard Allen-type dogging key with suitable hole for key ring.

	Corbin/Russwin	Precision	Dorma
Int.	ED5200xN955	2108 x V4908A	9300 x YR08
Ext.	ED5200xK157	2103	9300 x HRT03
	Sargent	Von Duprin	Detex
Int.	8813-743-8ETL	98L-996L-06	1008DA
Ext.	8804X Less Pull	98NL-OP	1003 X CBK

Adams Rite 8800 Series at aluminum doors.

SPEC. NO. 18P – Exit Devices – Interior Pair Wood or Hollow Metal Doors

devices shall be surface-vertical rod types less bottom rods, ANSI 08 function, key locks and unlocks lever by exit only function.

	Corbin Russwin	Precision	Detex
Active Door	ED5470xN955xM55	2208xV4908AxLBR	2108 DA
Inactive Door	ED5470xM55	2201xLBR	2101
	Sargent	Von Duprin	Dorma
Active Door	8713-743ETL-LBR	9827L-994L-06-LBR	9400 LB x YR08
Inactive Door	8710-LBR	9827EO-LBR	9400 LB

SPEC. NO. 19 -- Exit Device -- Exit Only -- Single Door

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.

Corbin/Russwin	Precision	Sargent	Von Duprin	Dorma	Detex
ED5200	2101	8810	98EO	9300	1001

SPEC. NO. 20 -- Fire Rated Exit Device -- Single Door

Exit device shall be ANSI 08 function, key locks and unlocks lever.

Corbin/Russwin	Precision	Detex
ED5200AxN955	FL2108 x V4908A	F1008 DA
Sargent	Von Duprin	Dorma
12-8813-743-8ETL	98LF-994L-06	F9300 x YR08

SPEC. NO. 21 -- Fire Rated Exit Device -- Single Door

Exit device shall be self-latching, with exit only function, less dogging feature.

Corbin/Russwin	Precision	Detex
ED5200A	FL2101	F1001
Sargent	Von Duprin	Dorma

12-8810	98EO-F	F9300

SPEC. NO. 21P –Interior Fire Rated Pair Wood or Hollow Metal Doors

Exit devices shall be surface-vertical rod types less bottom rods, ANSI 08 function, key locks and unlocks lever by exit only function. Exit devices shall be self latching, less dogging feature.

	Corbin Russwin	Precision	Detex
Active Door	ED5470B/FxN955xM55	FL2208xV4908AxLBR	F2108 LD
Inactive Door	ED5470B/FxM55	FL2201xLBR	F2101 LD
	Sargent	Von Duprin	Dorma
Active Door	12-8713-743ETL-LBR	9827LF994L-06-LBR	F9400 LB x YR08
Inactive Door	12-8710-LBR	9827EO-F-LBR	F9400 LB

SPEC. NO. 21DE – Exit Devices – Interior Fire Rated Double Egress Pair Wood or Hollow Metal Doors

Exit devices shall be surface-vertical rod type less bottom rods, exit only function. Exit devices shall be self-latching, less dogging feature. Furnish two exit devices per double egress pair.

Corbin Russwin	Dorma	Precision	Sargent
ED5470B/FxM55	F9400 LB	FL2201xLBR	12-8710-LBR
Von Duprin	Detex		
9827EO-FxLBR	F2101 LD		

SPEC. NO. 22 – Mortise Panic Exit Devices – Interior Pair Wood or Hollow Metal Doors

Devices shall be at active door a mortise panic devise with open back strike with Inactive door with surface-vertical rod types less bottom rods, ANSI 08 function, key locks and unlocks lever by exit only function.

	Corbin Russwin	Precision	
Active Door	ED5657xN955xM55	2308xV4908A	
Inactive Door	ED5470xM55 2201xLBR	2201-LBR	
	Sargent	VonDuprin	Dorma

Active Door	8913-743ETL	9875L-994L-06	9500 x YR08
Inactive Door	8710-LBR	9827EO-LBR	9400 LBR

SPEC. NO. 23 -- Removable Mullion Non-labeled -- Pairs of Doors with Exit Devices

14 gage steel, approximately 2-inch by 3-inch. Furnish complete with soffit and sill fittings and fastenings as required.

Corbin/Russwin	Precision	Sargent	Von Duprin	Dorma	Detex
707A(7')708A(8')	822	980	4954	1330	90KR

SPEC. NO. 24 -- Removable Mullion Labeled -- Pairs of Doors Exit Devices

Listed as Fire Exit Hardware. Furnish complete with soffit and sill fittings and fastenings as required.

Corbin/Russwin	Precision	Sargent	Von Duprin	Dorma	Detex
707A(7')708A(8')	FL822	12-980	9954	F1300	F90KR

SPEC. NO. 25 -- Automatic Flush Bolts -- Labeled and Non-labeled Doors

Complete with necessary strikes and screws. Furnish 2 each inactive leaf.

	Door Controls	Ives	Rockwood
Wood or Composite	942 NH x 80	FB40P x DP2	1942NHx80
Hollow Metal	842 NH x 80	FB30P x DP2	1842NHx80

SPEC. NO. 26 -- Coordinator -- Labeled and Non-labeled Doors

Bar-type, complete with necessary strikes, bars, brackets, and screws.

Door Controls	Ives	Dorma	Rockwood
600 Series	COR Series	TS 93 GSR	1600

4. AUXILIARY LOCKS

SPEC. NO. 27 -- Padlock

Bronze or brass case, hardened steel shackle, length to fit condition; plated, brass chain, master-keyed. Furnish by same manufacturer as lock cylinder key system.

5. DOOR CLOSERS

SPEC. NO. 28 -- Door Closer -- 180 Degree, Hold Open Arm

	L.C.N.	Stanley
Out swing	4041-H-EDA	D-4550HEDA
In-swing	4041-H (to 120°)/4041T-H-Top Jamb (past 120°)	D-4550H/51H

	Norton	Sargent	Dorma
Out swing	PR7500H xTorx	281 PH10 x Torx	8916 SP8T
In-swing	7500 x Torx less 1618	281-H x Torx	8916 PH

SPEC. NO. 29 -- Door Closer -- 180 Degree, Delayed Action

	L.C.N.	Dorma	Stanley
Out-swing	4041 DA EDA	8916 DA AF	D-4550DAEDA
In-swing	N/A for 180°	8916 DA SPA	D-4550DA/51DA

	Norton	Sargent
Out-swing	PR7500DA x Torx	281 P10-DA x Torx
In-swing	7500DA x Torx less 1618	281-DA x Torx

SPEC. NO. 30 –Electromechanical Door Closer – Maximum 170° Electronic Hold Open

For use on fire rated doors requiring hold open. At pairs, furnish a slave unit without smoke detector on one leaf tied into a master detector unit (types below) on the other leaf.

	LCN
Outswing	4410ME-B80
Inswing	N/A for 170°

	Norton	Sargent	Dorma
Outswing	7220/7230MPS	12-80-2990	8916 EMF PT
Inswing	7210MPS	12-80-2960	8916 EMF T

6. DOOR STOPS AND HOLDERS

SPEC. NO. 31 -- Door Type Holder

Cast bronze made to template, secured to door with oval head bronze machine screws and washers; when door has kickplate, mount sex bolts under kickplate. Provide strike of recommended height; install short strike whenever possible.

Ives	Trimco	Rockwood
FS40 Series	1260-SeriesxFloor Strike	491 Series x Floor Strike

SPEC. NO. 32 – Interior Floor-Mounted Door Stop

1-3/4 inches high, secured rubber.

Don-Jo	Trimco	Rockwood
1448	1214	481

SPEC. NO. 33 – Exterior Floor-Mounted Door Stop

Cast bronze, 2-1/4 inches high, secured rubber.

Trimco	Rockwood
1214CK	481H x Trox

7. **SPEC. NO. 34** – **NOT USED.**THRESHOLDS

SPEC. NO. 35 -- Aluminum Threshold -- Interior Door

Width 4-inch, height 1/2 inch. Full width of opening and coped to trim.

N.G.P.	Pemko	Reese
424A	170A	S-204A

SPEC. NO. 36 -- Aluminum Threshold -- Exterior Door

Half-saddle, height 1/2 inch. Threshold shall have one full-length bearing. Full width of opening, and coped to trim. For ¼ inch rise.

N.G.P.	Pemko
653	158A

SPEC. NO. 37 -- Aluminum Threshold Strip -- Interior Door or Opening

Where cork, vinyl composition tile and other floor coverings terminate, except at raised cement thresholds, or where other thresholds are specified. Width 1 inch to 1 3/8-inch, height 1/4 inch with 1/8 inch offset.

N.G.P.	Pemko	Reese
432	N/A	T040A

SPEC. NO. 38 -- Aluminum Threshold -- Interior Door or Opening

Width 2 1/4-inch or 2 ½-inch, height 3/16 inch or 1/4 inch.

N.G.P.	Pemko	Reese
410A	173A	S-225A

8. MISC. AUXILIARY HARDWARE

SPEC. NO. 39 – Kick and Mop Plates

Ives	Trimco	Don-Jo	Rockwood
8400	KOO50/KM0050	90	K1050

SPEC. NO. 40 – Lock Guard

9 ½ to 10-inch by 1 ½ to 2 1/8-inch with lugs to receive flat Phillips head through-bolts.

Don-Jo	Markar	Trimco	Rockwood
NLP-110	M-930LG	5000	321 x 630

SPEC. NO. 41 -- Astragal

Stainless steel, 2 inches by height of door, secured by Phillips flat head through-bolts.

N.G.P.	Pemko	Reese	Anemostat
139SS	357SS	183SS	FBA x SS

SPEC. NO. 42 -- Cylinder Guard Ring

Manufactured of hardened materials to resist removal by wrenches and other devices. Furnish of sufficient length for cylinder. Provide appropriate filler rings as required.

Furnish plated versions only. Install with all cylinders exposed to the exterior of the building, but not necessarily limited to that application.

Corbin/Russwin	Keedex	Major
416F39	K-24/K-24L	CG/CGL

SPEC. NO. 43 – Automatic Door Bottom

At exterior doors with surface applied walk off mats in lieu of Spec 101 door sweep. To ensure ADA 5 pound door pressure opening.

	Pemko	NGP	Reese
Semi-mortise Wood	430MRL	421NA	521C
Full-mortise Wood	411RL	335N	370A
Hollow Metal	420PKL	320N	372A

SPEC. NO. 44 – Panic guard protection kickplate.

Install for latches and end caps of exit devices Existing Doors with exposed rod panic devices

Trimco PG Series Panic Guard

SPEC. NO. 45 -- Push Plate

Provide cutout for cylinder or turn lever as required. Provide beveled on all four edges.

Ives	Trimco	Don-Jo	Rockwood
8311-5 4x16	1010-3	7110	132-70C

SPEC. NO. 46 -- Anti-Vandal Pull

Stainless steel or bronze, 5-inch by 5-nch by 1 inch. Provide with attached lugs for through bolting from inside. Furnish vandal-resistant screws. Furnish without cylinder cutout for exit only doors.

Trimco	Rockwood
1111C3-black coating at wood doors	BF94 – black coating at wood doors
1096 – RC – SP at single metal outswinging doors	

1097 – RC – SP at pairs metal out swinging doors and at single or pair in-swing doors

Ives

VR900 - at single metal out swinging doors

VR900LLP - at pairs metal outswinging doors and at single or pair inswing doors

SPEC. NO. 47 -- Coat and Hat Hook

Cast aluminum, Two prong, 1 1/8-inch inches projection, suitable for behind door application. Furnish three for teacher's wardrobes. Furnish quantities as indicated at other locations.

Ives	Don-Jo	Rockwood
582	302	796

SPEC. NO. 48 -- Cane Bolt

Steel, zinc-plated, 18 inches, with padlock eyes welded to bolt to lock in closed position. Two strikes each bolt to hold gate in open or closed position.

Hager	Richards-Wilcox	Stanley
1408	524-P21	1009

SPEC. NO. 49 – Offset Tube Door Pull

For installation on aluminum storefront doors with exit devices. Pulls shall be satin stainless steel (BHMA 630) and be mounted with spanner-screw through-bolts.

Don-Jo	Forms+Surfaces	Trimco	Rockwood
1158	DT1021-12"	1191-4	BF158

SPEC. NO. 50 – Wall-mounted Electro-magnetic Door Holder

For installation on fire-rated doors requiring hold-open

LCN	Norton	Rixson	Dorma	RSG
SEM7850	R6933	FM998	EM-F24120	DH1224 Series

SPEC. NO. 51 – Meeting Stile Astragals – Fire-rated Pairs with Vertical Rod Exit Devices

N.G.P.	Pemko	Reese
140PA(set)	351Cx351CS	95Cx95CP

SPEC. NO. 52 – Adhesive Smoke Seals – Fire-rated Metal Doors

N.G.P.	Pemko	Reese
5050B	S88D	797B

SPEC. NO. 53 – Adhesive Intumescent Seals – Fire-rated Wood Doors

At single doors, furnish frame seals only. At pairs, furnish both frame seals and astragal seal.

	N.G.P.	Pemko	Reese
Frame	9440B	HSS2000 x S88D	GIS x 797B
Astragal	9500B x 2525B	HSS2000 x S77D	GIS x 798B

SPEC. NO. 54 – Exterior Door Seals. Furnish frame seals and door sweeps at exterior doors. At pairs, furnish astragal in addition to frame seals and door sweep. Furnish factory-cut for narrow frames where occurs. Furnish exterior door seals with stainless steel fasteners.

	N.G.P.	Pemko	Reese
Frame Seals	700SA	2891AS	755A
Door Sweep/Drip	C627A	3452CNB	354C
Astragal	140PA (SET)	351C x 351CS	95C x 95CP

SPEC. NO. 55 -- Padlock Hasp

Steel, zinc plated, secured with galvanized bolts, nuts, and washers, 6 inches, 3 ½-inch for lead-lined cabinet doors.

Hager	Stanley
WS-1941	SP-941

SPEC. NO. 56 -- Padlock Eyes

Steel, zinc plated.

Stanley

1245

SPEC. NO. 57 -- Key Tags

Furnish one fiber marker for each new file key, marked, attached, and placed as required.

Aladdin	Ke-Master	Lund	Telkee
OG	K9002	C-1507	2GF

FINISH HARDWARE SCHEDULE

A. HEADING 1

Single door 62837 Auditorium to All gender Restroom -AUDITORIUM SPEC. NOS. 2, 8, 29, 39, 32, 52.

B. HEADING 2

~~Pair Un-equal leaf door 62840A Exterior from Auditorium -AUDITORIUM BLDG.~~

Pair Un-equal leaf door 62840B Exterior from Auditorium -AUDITORIUM BLDG.

SPEC. NOS. 1, 25, 26, 22, 28, 31, 39, 46, 41, 42, 54, 36, THRESHOLD 2727A x MS&ES MITERED BOTH ENDS BY PEMKO or EQUALS.

C. HEADING 3

Single door 214240A Corridor to Girls Restroom –CLASSROOM BLDG.

Single door 214254A Corridor to Boys Restroom –CLASSROOM BLDG.

SPEC. NOS. 2, 4, 29, 39, 52. OVERHEAD SURFACE STOP & HOLD N9013 630 ABH

D. HEADING 4

Single door 214240B Exterior from Girls Restroom –CLASSROOM BLDG

SPEC. NOS. 5

REUSE ALL EXISTTING DOOR HARDWARE EXCEPT TO REMOVE EXISTING LOCKSET. PATCH EXISTING SCREW HOLES AND PREP DOOR FOR NEW LOCKSET.

E. HEADING 5

Single door ~~21424~~21425B Exterior from Boys Restroom –CLASSROOM BLDG

SPEC. NOS. 5, 39.

REUSE ALL EXISTTING DOOR HARDWARE EXCEPT TO REMOVE EXISTING LOCKSET. PATCH EXISTING SCREW HOLES AND PREP DOOR FOR NEW LOCKSET.

F. HEADING 6

Single door 60652 Nurse from Nurse's Restroom –MAIN CLASSROOM BLDG

SPEC. NOS. 2, 8. 29, 39, 32, 52. OVERHEAD SURFACE STOP & HOLD N9013 630 ABH

G. HEADING 7

Single door 60720A Exterior from Boys Restroom – MAIN CLASSROOM BLDG

SPEC. NOS. 39.

REUSE ALL EXISTTING DOOR HARDWARE EXCEPT TO REMOVE EXISTING KICK PLATE AND REPLACE WITH NEW KICK PLATE.

H. HEADING 8

Single door 60720B Exterior to Boys Restroom – MAIN CLASSROOM BLDG

REMOVE DOOR AND DOOR HARDWARE.

I. HEADING 9

Single door 60726 ~~Exterior to Boys Restroom~~ Cot to Nurse– MAIN CLASSROOM BLDG

SPEC. NOS. 7

REUSE ALL EXISTTING DOOR HARDWARE EXCEPT TO REMOVE EXISTING LATCHSET. PATCH EXISTING SCREW HOLES AND PREP DOOR FOR NEW LATCHSET.

J. HEADING 10

Pair door 61044A Exterior from Corridor - MAIN CLASSROOM BLDG.

SPEC. NOS. 1, 25, 26, 22, 28, 31, 39, 46, 41, 42, 54, 36,

K. HEADING 11

Pair door 61044B Exterior from Corridor - MAIN CLASSROOM BLDG.

SPEC. NOS. 36

REUSE ALL EXISTTING DOOR HARDWARE EXCEPT TO REMOVE EXISTING THRESHOLD. PATCH EXISTING SCREW HOLES AND PREP FLOOR FOR NEW THRESHOLD.

L. HEADING 12

Single door 61045 Exterior from Elev. Mach. Rm. –MAIN CLASSROOM BLDG

SPEC. NOS. 1, 9, 40, 42, 43, 29, 39, 33, 54.

M. HEADING 13

Single door 274031A Exterior from Girls Restroom – MAIN CLASSROOM BLDG

SPEC. NOS. 39.

REUSE ALL EXISTTING DOOR HARDWARE EXCEPT TO REMOVE EXISTING KICK PLATE AND REPLACE WITH NEW KICK PLATE.

N. HEADING 14

Single door 274031B Exterior to Girls Restroom – MAIN CLASSROOM BLDG

REMOVE DOOR AND DOOR HARDWARE.

O. HEADING 15

Pair door ~~29308~~39308 Exterior from Covered Balcony - MAIN CLASSROOM BLDG.

SPEC. NOS. 1, 25, 26, 22, 28, 31, 39, 46, 41, 42, 54, 36.

P. HEADING 16

Single door 61984A Kinder Classroom from Kinder Toilet –KINDER ~~GARRDEN~~ GARDEN #1 & #2

Single door 61984B Kinder Classroom from Kinder Toilet –KINDER ~~GARRDEN~~ GARDEN #1 & #2

Single door 62259 Kinder Classroom from Kinder Toilet –KINDER ~~GARRDEN~~ GARDEN #1 & #2

Single door 62262 Kinder Classroom from Kinder Toilet –KINDER ~~GARRDEN~~ GARDEN #1 & #2

SPEC. NOS. 2, 7, 39, 32, 52.

Q. HEADING 17

Single door 61845 Exterior from Kinder Classroom 45-KINDER GARDEN #1 & #2

SPEC. NOS. 5

RE-USE ALL EXISTTING DOOR HARDWARE EXCEPT TO REMOVE EXISTING LOCKSET. PATCH EXISTING SCREW HOLES AND PREP DOOR FOR NEW LOCKSET.

R. HEADING 18

Single door 61846 Exterior from Storage – KINDER GARRDEN #1 & #2

Single door 61983 Exterior from Kinder Garden #44 – KINDER GARDEN #1 &v#2

Single door ~~62848~~62484 Exterior from Storage-KINDER GARDEN #1 & #2.

RE-SWING EXISTING DOOR. RE-USE ALL EXISTTING DOOR HARDWARE EXCEPT TO ADJUST DOOR HARDWARE FOR RE-SWING DOOR. PATCH EXISTING SCREW HOLES AND PREP DOOR AND FRAME FOR DOOR HARDWARE.

S. HEADING 19

Single door ~~612261~~62261 Exterior from Kinder Classroom -KINDER GARDEN #1 &2

SPEC. NOS. 5, 29.

RE-USE ALL EXISTTING DOOR HARDWARE EXCEPT TO REMOVE EXISTING LOCKSET AND CLOSER. PATCH EXISTING SCREW HOLES AND PREP DOOR FOR NEW LOCKSET AND CLOSER.

T. HEADING 20

Single door 62254A Kinder Classroom from Kinder Toilet –KINDER GARRDEN #3

Single door 62254B Kinder Classroom from Kinder Toilet –KINDER GARRDEN #3

SPEC. NOS. 2, 7, 39, 32, 52.

U. HEADING 21

Single door 61985 Exterior from Kinder Classroom #46 -KINDER GARDEN #3

Single door 61986 Exterior from Kinder Classroom #47 -KINDER GARDEN #3

SPEC. NOS. 29.

RE-USE ALL EXISTTING DOOR HARDWARE EXCEPT TO REMOVE EXISTING CLOSER. PATCH EXISTING SCREW HOLES AND PREP DOOR FOR NEW CLOSER.

V. HEADING 22

Single door 61480A Kinder Classroom from Kinder Toilet #47 –BUILDING BB-209

Single door 61480B Kinder Classroom from Kinder Toilet #46 –BUILDING BB-209

SPEC. NOS. 2, 7, 39, 32, 52.

W. HEADING 23

Single door ~~61981~~161481 Exterior from Storage. – BUILDING BB-209

SPEC. NOS. 1, 9, 40, 42, 28, 39, 33, 54.

X. HEADING 24

Single door 62834 Auditorium to All Gender Restroom -AUDITORIUM

SPEC. NOS. 8.

REUSE ALL EXISTTING DOOR HARDWARE EXCEPT TO REMOVE EXISTING LOCKSET. PATCH EXISTING SCREW HOLES AND PREP DOOR FOR NEW PRIVACY.

Y. HEADING 25

Single door 62836 Auditorium to Storage. –AUDITORIUM

SPEC. NOS. 2, 9, 28, 39, 32, 53.

Z. HEADING 26

Single door 62514 Exterior from Faculty Toilet. –MAIN CLASSROOM

SPEC. NOS. 10.

REUSE ALL EXISTTING DOOR HARDWARE EXCEPT TO REMOVE EXISTING LOCKSET. PATCH EXISTING SCREW HOLES AND PREP DOOR FOR FACULTY PRIVACY

AA. HEADING 27

Single door 60720C Corridor from Boys Toilet - MAIN CLASSROOM BLDG.

Single door 274031C Corridor from Boys Toilet - MAIN CLASSROOM BLDG.

REMOVE EXISTING DOOR LATCH AND REUSE THE REMAING OF EXISTTING DOOR HARDWARE PATCH EXISTING SCREW HOLES.

HARDWARE PLACEMENT

MORTISE LOCKSET (HP-ML)

NOTES:

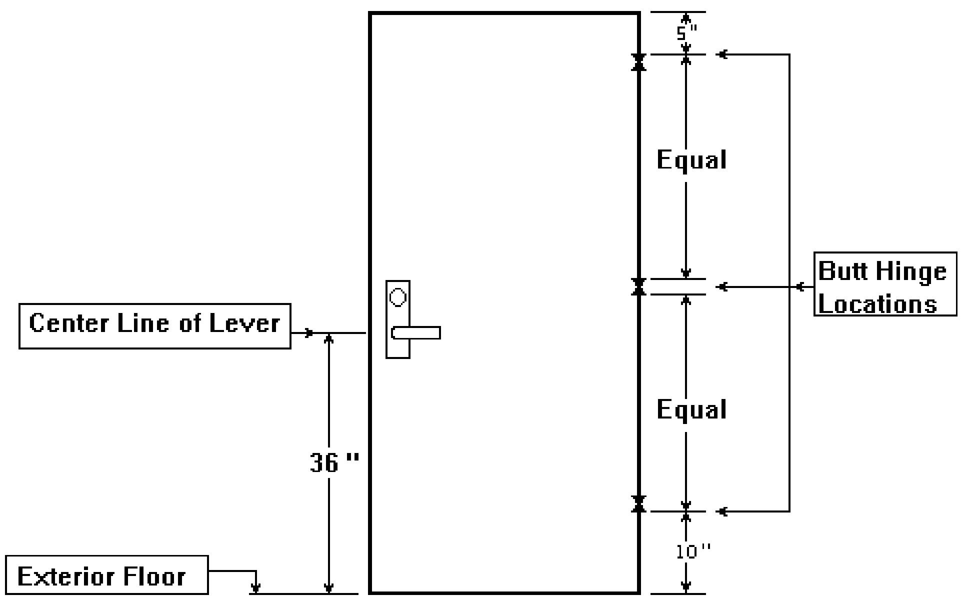
Lock Strikes: Strikes shall be boxed, with curved lip of sufficient length to protect the trim and jamb.

Hinges Reinforcement of steel doors and frames shall be per Specification Section 08110.

All Frames Head shall have door closer reinforcement, full length of head, whether or not closers are called for. Reinforcement shall be per Specification Section 08 1113. No mutes or mute holes.

Door Closer Install according to manufacturers' template. With closer installed, doors shall have maximum swing possible, 90 degrees minimum.

Doorstop Unless otherwise directed, doorstop or spike shall be mounted within 4 inches of the wall.

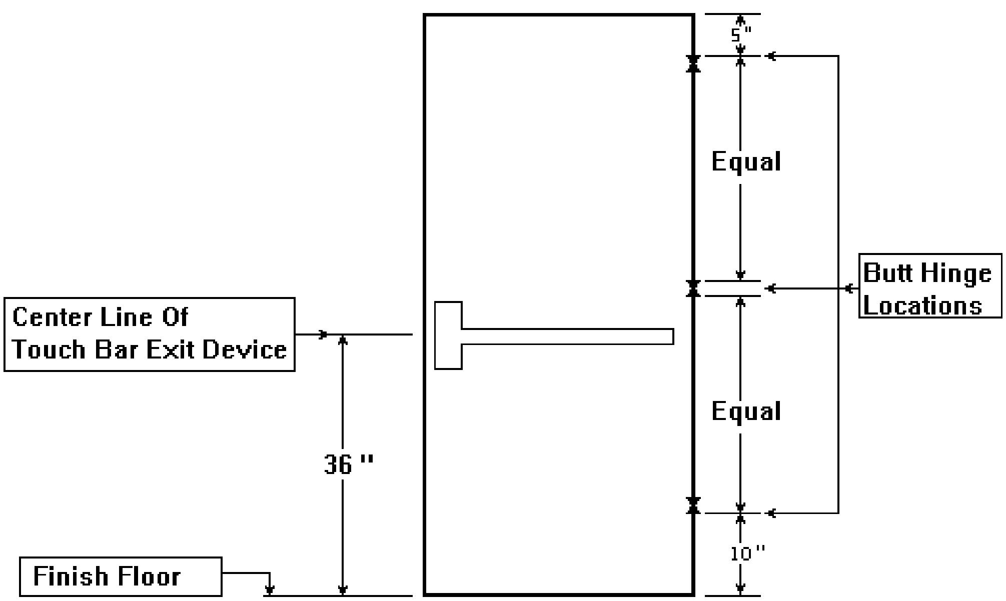


HARDWARE PLACEMENT

EXIT DEVICE (HP-ED)

NOTES:

Kickplate	Where specified 10 inches height, width 1 inch less than total width of door between stops. Secured with flat head undercut, full thread screws
Hinges	Reinforcement of steel doors and frames shall be per Specification Section 08 1113.
All Frames	Head shall have door closer reinforcement full length of head, whether or not closers are called for. Reinforcement shall be per Specification Section 08 1113. No mutes or mute holes.
Door Closer	Install according to manufacturers' template. With closer installed, doors shall have maximum swing possible, 90 degrees minimum.
Door stop	Unless otherwise directed, doorstop or spike shall be mounted within 4 inches of the wall.

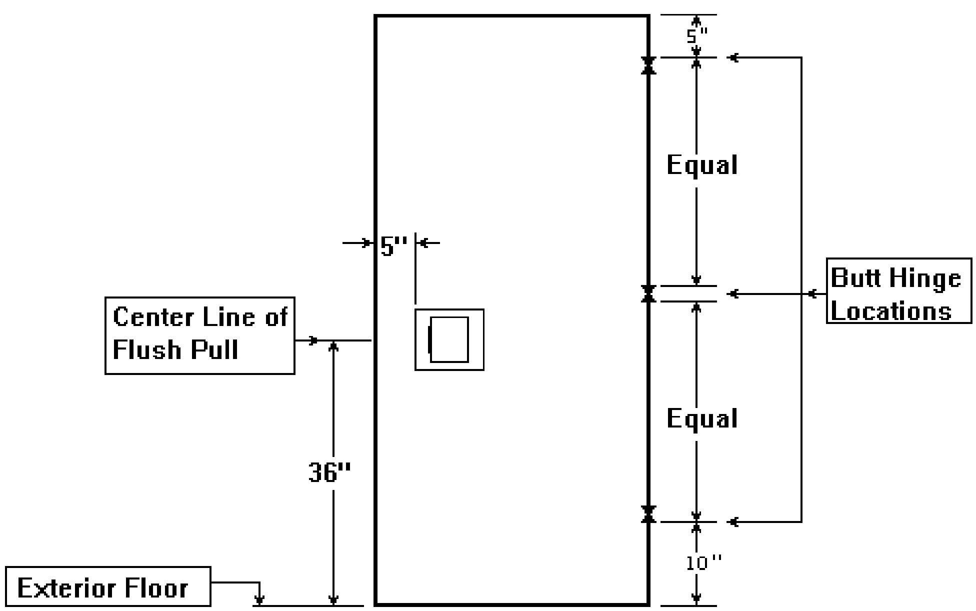


HARDWARE PLACEMENT

FLUSH PULL (HP-FP)

NOTES:

Hinges	Reinforcement of steel doors and frames shall be per Specification Section 08 1113.
All Frames	Head shall have door closer reinforcement full length of head, whether or not closers are called for. Reinforcement shall be per Specification Section 08 1113. No mutes or mute holes.
Door Closer	Install according to manufacturers' template. With closer installed, doors shall have maximum swing possible, 90 degrees minimum.
Doorstop	Unless otherwise directed, doorstop or spike shall be mounted within 4" of the wall.



HARDWARE PLACEMENT

AUXILIARY HARDWARE (HP-AUX)

NOTES:

Kickplate — Where specified 10 inches height, width 1 inch less than total width of door between stops. Secured with countersunk head, full thread screws.

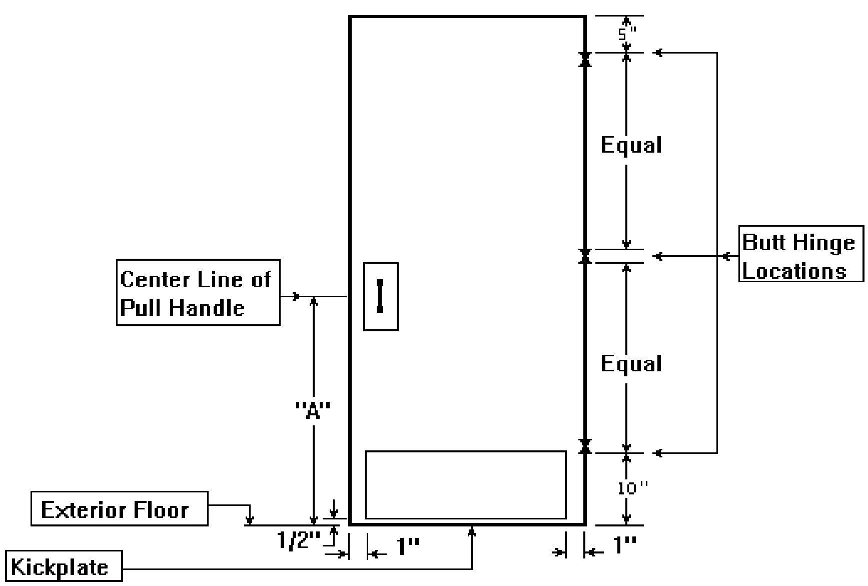
Hinges — Reinforcement of steel doors and frames shall be per Specification Section 08 1113.

All Frames — Head shall have door closer reinforcement, full length of head, whether or not closers are called for. Reinforcement shall be per specification Section 08 1113. No mutes or mute holes.

Door Closer — Install according to manufacturers' template. With closer installed, doors shall have maximum swing possible, 90 degrees minimum.

Door stop — Unless otherwise required doorstop or spike shall be mounted within 4 inches of the wall.

HIGH SCHOOL	A = 40 inches X 2 3/4 inches
MIDDLE SCHOOL	A = 38 inches X 2 3/4 inches
ELEMENTARY PRIMARY CENTERS.	A= 36 inches X 2 3/4 inches



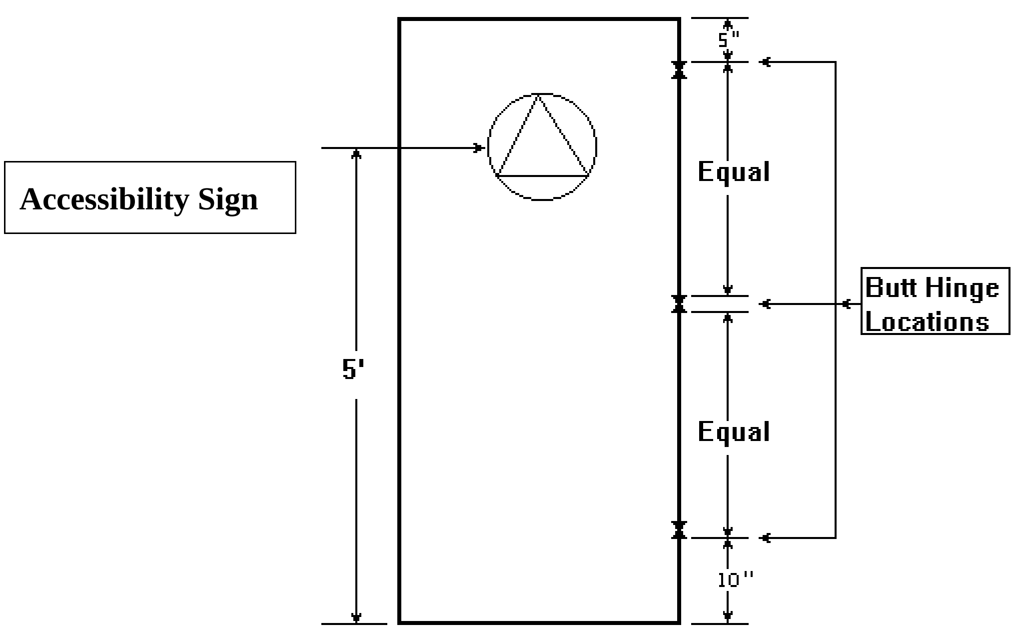
HARDWARE PLACEMENT

IDENTIFICATION SYMBOL (HP-RR)

NOTES:

Hinges	Reinforcement of steel doors and frames shall be per Specification Section 08 1113.
All Frames	Head shall have door closer reinforcement full length of head, whether or not closers are called for. Reinforcement shall be per Specification Section 08 1113. No mutes or mute holes.
Door Closer	Install according to manufacturers' template. With closer installed, doors shall have maximum swing possible, 90 degrees minimum.
Door stop	Unless otherwise required doorstop or spike shall be mounted within 4 inches of the wall.

IDENTIFICATION SYMBOLS - To be installed per CBC Chapter 11B.



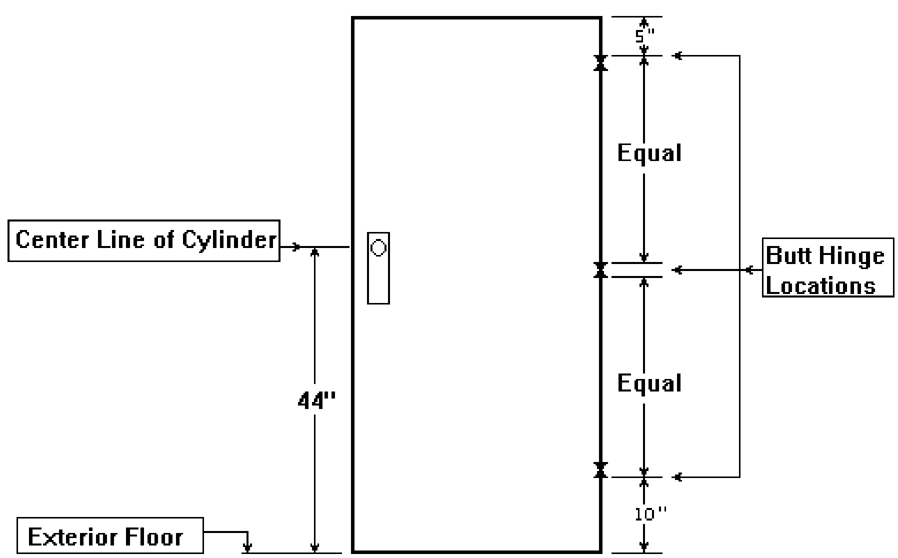
HARDWARE PLACEMENT

DEADBOLT (HP-DB)

EDIT NOTE: **ON ALL DOOR AND FRAME SHOP DRAWINGS, DO NOT ACCEPT STRIKE LOCATION DIMENSIONS. CROSS THEM OUT. INSTEAD OF ACCEPTING DIMENSIONS, ADD CORRECTION NOTE, "COORDINATE STRIKE LOCATION WITH HARDWARE INSTALLER TO INSURE THAT CENTERLINE OF CYLINDER IS 44 INCHES ABOVE EXTERIOR FLOOR."**

NOTES:

Lock Strike	Strike shall be boxed, to protect the jamb.
Hinges	Reinforcement of steel doors and frames shall be per Specification Section 08 1113.
All Frames	Head shall have door closer reinforcement full length of head, whether or not closers are called for. Reinforcement shall be per Specification Section 08 1113. No mutes or mute holes.
Door Closer	Install according to manufacturers' template. With closer installed, doors shall have maximum swing possible, 90 degrees minimum.
Door stop	Unless otherwise required doorstop or spike shall be mounted within 4 inches of the wall.



HARDWARE PLACEMENT

DUTCH DOOR (HP-DD)

NOTES:

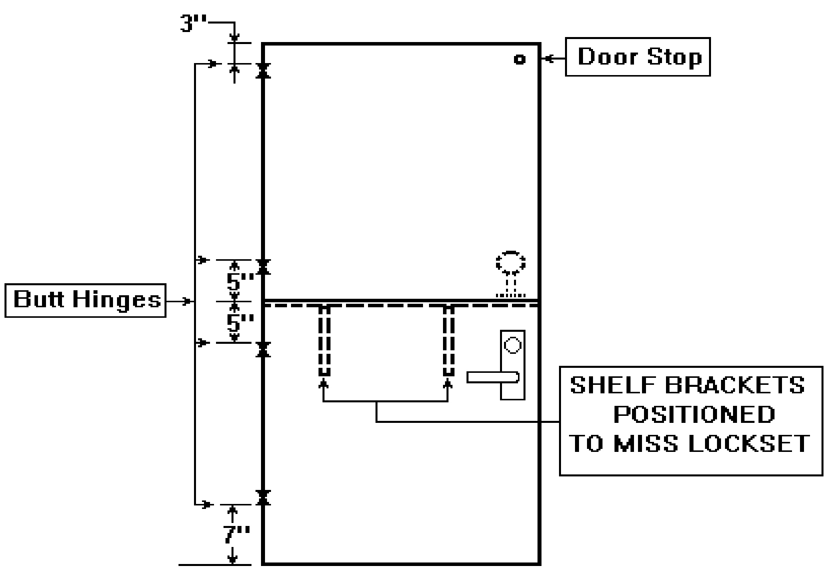
Lock Strikes: Strikes shall be boxed, with curved lip of sufficient length to protect the trim and jamb.

Hinges Reinforcement of steel doors and frames shall be per Specification Section 08 1113.

All Frames Head shall have door closer reinforcement full length of head, whether or not closers are called for. Reinforcement shall be per Specification Section 08 1113. No mutes or mute holes.

Door Closer Install according to manufacturers' template. With closer installed, doors shall have maximum swing possible, 90 degrees minimum.

Door stop Unless otherwise directed doorstop or spike shall be mounted within 4 inches of the wall.



END OF SECTION

SECTION 28 1000

ACCESS CONTROL SYSTEMS (ACS)

1

PART 1 – GENERAL

1.01 SUMMARY

A. Section Includes: Access Control System monitoring, badging and field hardware that includes cards/fobs, card readers, door contacts, request-to-exit devices, input boards, output boards, field controllers and supporting power, cabling and network infrastructure.

B. Access Control System shall be integrated with LAUSD's Security Management System (SMS).

1.02 RELATED SECTIONS

A. Applicable Division 1 sections.

B. Section 00 70 00: General Conditions.

C. Section 01 77 00: Contract Closeout.

D. Section 21 23 23: Excavating, Backfilling and Compacting for Utilities.

E. Section 06 10 00: Rough Carpentry.

F. Section 26 05 00: Common Works Results for Electrical.

G. Section 26 05 13: Basic Electrical Materials and Methods.

H. Section 26 05 26: Grounding and Bonding.

I. Section 26 05 33: Raceways and Boxes Fittings and Supports.

J. Section 26 24 16: Panelboards and Signal Terminal Cabinets.

K. Section 26 52 00: Emergency Power Systems.

L. Section 27 05 36: Cable Trays for Communications.

N. Section 14 00 00: General Elevator Requirements.

O. .

1.03 REFERENCES

A. IEC/EN/UL 60950-1: – Information Technology Equipment - Safety - Part 1: General Requirements.

B. IEC/EN/UL 60950-22: Technology Equipment Safety – Part 22: Equipment to be Installed Outdoors.

C. IEEE 802.3at (Power over Ethernet Plus) – Power over Ethernet Plus.

D. IEEE 802.1X (Authentication) – Standard for Local and metropolitan area .networks-Port-Based Network Access Control (Authentication).

E. IPv4 (RFC 791) – Internet Protocol Version 4.

F. IPv6 (RFC 2460) – Internet Protocol Version 6.

G. QoS – DiffServ (RFC 2475) – Scalable End-to-End Quality of Service Model.

H. IEC/EN 60529 IP66 (Ingress protection) – Degrees of Protection Provided by Enclosures (IP Code).

I. NEMA 250 Type 4X – Enclosures for Electrical Equipment.

J. IEC/EN 62262 IK10 – Degrees of protection provided by enclosures for electrical equipment against external mechanical impacts (IK code).

1.04 SUBMITTALS

A. List of Materials: Submit a complete list of proposed materials.

B. Shop Drawings: Provide detailed and dimensioned Shop Drawings indicating kind, weight and thickness of materials, method of fitting and fastening parts together, location and number of parts or modules, sizes, and complete details of method of fitting suspension and fastening luminaires in place. Provide wiring and cabling diagrams. Drawings shall contain sufficient information to assemble and install equipment at the Project site without further instructions.

C. Installation Instructions: Submit manufacturer's written installation instructions for luminaires and accessories.

1.05 SUBSTITUTIONS

A. Equipment and materials that deviate from these requirements shall not be accepted without written approval from OWNER’S Information Technology project manager. When deviating or proposing material substitutions the following information shall be submitted:

1. Substitution request form substantiating reasons and benefits to OWNER, and all necessary documents to validate the claims made in the substitution form.
2. Submittals must comply with contract general provisions.
3. The CONTRACTOR assumes all responsibility for additional costs, directly or indirectly, associated with proposing and installing an approved substitution products. All substituted products must meet the intent of form and function identified in the specification.

1.06 QUALITY ASSURANCE

A. The CONTRACTOR or security sub-CONTRACTOR shall be a licensed security CONTRACTOR with a minimum of five (5) years’ experience installing and servicing systems of similar scope and complexity, and evidence that CONTRACTOR has completed at least three (3) projects of similar scope, and is currently engaged in the installation and maintenance of systems herein described.

B. All installation, configuration, setup, program and related work shall be performed by electronic technicians thoroughly trained by the manufacturer in the installation and service of the equipment provided.

C. The CONTRACTOR or designated sub-CONTRACTOR shall submit installer's third party verified credentials of completion of manufacturer certification. The CONTRACTOR system programmer shall have attended manufacturer training and obtained the highest level certifications in Integrated Security Management System (ISMS) that supports the ACS and VMS.

D. The CONTRACTOR shall provide four (4) current references from clients with systems of similar scope and complexity that became operational in the past three (3) years. At least three (3) of the references shall be utilizing the same system components, in a similar configuration as the proposed system.

E. The access control system shall be in compliance with applicable industry standards listed under article 1.04-References.

1.07 WARRANTY

A. All Access Control system components and labor furnished by the CONTRACTOR including wiring, software, and hardware and custom parts shall be fully warranted for parts, materials, and labor and travel expenses for a minimum of three (3) years from date of the final acceptance of the Access Control System.

B. The manufacturer shall provide warranty and optional extended warranty for the hardware for a total period of five years. If enacted as part of the contract, the CONTRACTOR will repair or replace parts and/or labor per the warranty for the length of this warranty at no cost to the client.

C. The media on which the Software Product resides will be free from defects in materials and workmanship. Software defects shall be covered through Service Releases and Cumulative Updates, which shall be provided for a period of 1 year from the date of the software purchase.

D. The MANUFACTURER and CONTRACTOR shall provide a Software Service Agreement for the warranty period above and optional extended warranty period as selected by the client. If enacted as part of the contract, the CONTRACTOR will patch, update and upgrade software necessary to maintain a current version system.

PART 2 – PRODUCTS

2.01 SYSTEM GENERAL REQUIREMENTS

A. The ACS shall be an enterprise class IP access control software solution. It shall be fully embedded within a unified security platform (USP) as part of the Integrated Security Management System (ISMS). This platform shall allow the seamless unification of the ACS with an IP video management system (VMS).

B. The ACS shall be scalable to support configurations consisting of estimated 10,000 doors with facilities spanning multiple geographic areas.

C. The ACS shall support an unrestricted number of logs and historical transactions (events and alarms) with the maximum allowed being limited by the amount of hard disk space available.

D. The ACS shall support a variety of access control functionalities, including but not limited to:

1. Controller management, door management, elevator management, and area management.
2. Cardholder and cardholder group management, credential management, and access rule management.
3. Badge printing and template creation.
4. People counting, area presence tracking, and mustering.
5. Offering a framework for third party hardware integration such as card and signature scanner.

E. Certifications. The ACS shall have the following certifications:

1. UL-294.
2. ULC-S319.
3. EN-60839-11-1.

2.02 ACS ACCESS MANAGEMENT

A. The ACS shall be based on an open architecture able to support multiple access control hardware manufacturers. The ACS shall be able to integrate with multiple non-proprietary interface modules and controllers, access readers, and other third party applications.

B. The ACS shall be an IP enabled solution. All communication between the ACS and hardware controllers shall be based on standard TCP/IP protocol.

C. Access Manager Role

1. The Access Manager Role shall be the server that synchronizes all access control hardware units under its control, such as door controllers and IO modules. It shall also be able to validate and log all access activities and events when the door controllers and IO modules are online.
2. The Access Manager Role shall maintain the communication link with the hardware controllers under its control. It shall also continuously monitor whether the controllers are online or offline.
3. Synchronization of hardware units shall be automated and transparent to users and shall occur in the background. It shall also be possible to manually synchronize units or to synchronize units on a schedule.
4. The Access Manager Role shall support doors and controllers located within one or more facilities. The Access Server shall support a minimum of 200 readers and up to 1024 readers per computer.

D. The Access Server shall store all access events associated with the doors, areas, hardware zones (hardware input points), elevators, and controllers under its direct control.

2.03 ACS GLOBAL CARDHOLDER MANAGEMENT

A. The ACS shall support global cardholder management and synchronization between a central independent site and remote independent sites, all of which can have their own Directory and databases.

B. It shall be possible to synchronize the following entities and their configuration data:

1. Cardholders (incl. custom fields).

2. Cardholder groups.

3. Credentials.

4. Badge templates.

C. Cardholders and other synchronized entities can be added centrally and synchronized to remote sites for central cardholder management.

D. Cardholders and other synchronized entities can be added at remote sites and synchronized to the central site and other remote sites.

E. The ACS shall support the assignment of a single card per cardholder across all of an organization's sites.

F. Manual and scheduled synchronization shall be supported.

2.04 ACS HARDWARE COMPATIBILITY LIST

A. The ACS shall have an open architecture that supports the integration of third party IP-based door controllers and IO modules. The ACS shall simultaneously support mixed configurations of access control hardware from multiple vendors.

B. The ACS shall support multiple types of hardware devices: single-reader controllers, 2-reader controllers, 1- to 64-reader controllers, integrated readers and door controllers, and Power-over-Ethernet (PoE) enabled door controllers.

C. The ACS shall support most industry standard card readers that output card data using the Wiegand protocol and Clock-and-Data.

D. The ACS shall support the IP-enabled controllers.

2.05 NOT USED .

2.12 ACS ELEVATOR MANAGEMENT

A. The ACS shall support the configuration and management of elevators. A user shall be able to add, delete, or modify an elevator if he or she has the appropriate privileges.

B. The ACS shall be able to control access to specific floors using a reader within the elevator cab. Control shall be available through the use of a controller with an interface to a reader and to multiple output modules with relays.

C. Elevator floor selections shall be tracked using a controller with an interface to multiple input modules. Floor tracking shall be available within an elevator activity report.

D. The elevator control module shall continue to function in offline mode should communication between the ACS and the controller fail.

E. The ACS shall support one or more cameras per elevator cab. Video shall then be associated to elevator access events, such as access grant or access denied.

2.14 NOT USED

2.15 NOT USED .

PART 3 – EXECUTION

3.01 INSTALLATION

A. The CONTRACTOR shall carefully follow instructions in documentation provided by the manufacturer to ensure all steps have been taken to provide a complete, reliable, and easy-to-operate system.

B. All equipment shall be tested and configured in accordance with instructions provided by the manufacturer prior to installation.

C. All firmware found in products shall be the latest and most up-to-date provided by the manufacturer, or of a version as specified by the integrator of the ACS system.

D. All equipment requiring users to log on using a password shall be configured with user/site-specific password/passwords. No system/product default passwords shall be allowed.

3.02 TESTING

A. The ACS system shall be tested in accordance with the following:

1. Conduct a complete inspection and test of all installed access control system componants. This includes testing and verifying connection to equipment of other divisions.

2. Provide staff to test all devices and all operational features of the system.

3. Correct deficiencies until satisfactory results are obtained.

4. Submit written copies of test results.

B. Provide a complete checklist for all equipment and components tested.

3.03 PROTECTION

A. Protect the Work of this section until Substantial Completion.

3.04 OWNER ORIENTATION TRAINING

A. Before contract closeout provide the following training and orientation:

1. Provide a minimum 48 hours training for LAUSD designated representatives. The content of the training is advanced instruction on the use, programming, maintenance and troubleshooting of the access control system, devices and components.

2. Materials shall include training manuals and hands-on lab exercises.

3. The training shall be provided at the equipment manufacturer's authorized training facility located in Los Angeles County.

4. Training shall consist of classroom instruction including intensive course work covering the following topics:

a) Product Features and Technical Specifications.

b) Implementation and Design as–built documentation, including familiarization with drawing sets, symbols and notation as well as other record documents.

c) Complete understanding of the system architecture and design of implemented solution.

d) Complete function and feature analysis on implemented solution including programming, operation, trouble shooting, error messages, etc.

3.05 CLEANUP

A. Remove rubbish, debris, and waste materials and legally dispose of off the Project site.

END OF SECTION

SECTION 32 1236

SEAL FOR BITUMINOUS SURFACING

1

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

1. Surface sealer over bituminous surfacing.

B. Related Requirements:

1. Division 01 - General Requirements.
2. Section 32 0117 - Pavement Repair.
3. Section 32 1216 - Asphalt Paving.
4. Section 32 1723 - Pavement Marking.

1.02 SUBMITTALS

A. Product Data: Submit manufacturer's product information and application procedures for bituminous surfacing.

1.03 QUALITY ASSURANCE

A. Comply with the Standard Specifications For Public Works Construction, current edition.

B. Agitate bulk materials during transport.

1.04 MAINTENANCE

A. Extra Materials: Provide 10 gallons in unopened containers.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Provide one of the following surface seals:

Product Name	Manufacturer
1. Guard-Top	CALMAT / Industrial Asphalt

2. Over Kote Diversified Asphalt Product
3. Park Top Western Colloid Products
4. Sure Seal Asphalt Coating Engineering
5. Super Drive Top. SAF– T Seal. Inc.
6. Equal.

PART 3 - EXECUTION

3.01 SURFACE PREPARATION

A. Thoroughly wash surfaces with water to remove dirt, debris, excessive oil and grease, or other foreign matter.

3.02 APPLICATION

A. Install seal coat in strict accordance with manufacturer's written directions and recommendations.

B. Install two coats of surface seal to new bituminous surfacing. First coat shall be installed before flood testing. Clean surface and allow to dry before installing second coat. Second coat shall be installed after bituminous surfacing has passed flood test.

C. Where new bituminous surfacing is installed adjacent to existing bituminous surfacing, overlap surface seal a minimum of 12 inches onto existing bituminous surfacing.

D. Where existing bituminous surfacing is indicated to be patched and sealed, install two coats of surface seal after patching. Refer to Section 32 1216 - Asphalt Paving.

3.03 PROTECTION OF SURFACES

A. Protect sealed and unsealed surfaces from damage and traffic during performance of the Work of this section and until surface seal has thoroughly set and cured. Do not permit traffic of any kind for at least 24 hours after completion of installation.

B. Protect the Work of this section until Substantial Completion.

3.04 TESTING

A. OWNER reserves the right to obtain samples, perform tests to ensure compliance with the Specifications, and to review weight slips and invoices of materials delivered to the Project site.

B. After first coat of surface seal has been installed and after a 24-hour period, flood test entire area in presence of the Project Inspector. Inspect area after waiting one hour. Entire area tested shall be free of standing water or puddles in excess of 0.01 foot.

Practical field measurement: 0.01 foot = two quarters stacked. Repair areas of standing water or puddles and flood test locally; install surface seal and retest as necessary.

3.05 CLEAN UP

A. Remove rubbish, debris, and waste materials and legally dispose of off the Project site.

END OF SECTION

SECTION 32 1723 - PAVEMENT MARKINGS

1

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:
   1. Parking stripes, markings and accessibility symbols.
   2. Fire lane “No Parking.”
   3. Curb marking and red curbs.

B. Related Requirements:
   1. Division 01 - General Requirements.
   2. Section 32 1236 - Seal for Bituminous Surfacing.

1.02 SUBMITTALS

A. Shop Drawings: Submit Shop Drawings, indicating location, extent, color and texture of markings.

B. Material Samples: Submit color Samples.

1.03 PROJECT CONDITIONS

A. Do not install markings when adverse weather conditions are forecasted.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Paint: Water emulsion-based traffic paint must be approved by OEHS (LAUSD’s Office of Environmental Health and Safety)
   1. Dunn Edwards: Vin-L-Stripe.
   2. Pervo Paint Company: Acrylic Traffic Paint.
   3. Sherwin Williams: Setfast Acrylic Traffic Paint.
   4. Vista Paint Corporation: Traffic Paint.
   5. Equal.

PART 3 - EXECUTION

3.01 PAVEMENT MARKINGS

A. Application of Paint:

1. Prior to application of paint, allow the pavement to properly cure. Clean and prepare in accordance with paint manufacturer's written recommendations.
2. Provide mechanical equipment to apply paint in a uniform, straight or curved pattern, without gaps, holidays, runs, or other defects.
3. Do not permit traffic until paint has completely cured.
4. Apply two coats in thickness recommended by manufacturer.
5. Playground Markings: Submit Samples to Architect for review. Limited color palettes may be submitted.

B. Marking Width and Color: Unless indicated otherwise, marking width and color are as follows:

Location	Width	Color
Parking stall lines	4 inches	White
Traffic markings		
Striping:	4 inches	Yellow
General	4 inches	Yellow
Accessible Parking	4 inches	Blue
International Symbol of Accessibility (ISA)	2 inches	White on blue background
Athletic Court Lines:	2 inches	*White
Letters and numbers:		As indicated

1. *Where two sets of lines overlap, one set shall be white and the other set shall be yellow.

3.02 PROTECTION

A. Protect the Work of this section until Substantial Completion.

3.03 CLEANUP

A. Remove rubbish, debris, and waste materials and legally dispose of off the Project site.

END OF SECTION

SECTION 32 1726 - DETECTABLE WARNING SURFACING

1

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:
   1. Precast concrete detectable warning tile pavers installed on mortar bed over concrete slab.

B. Related Requirements:
   1. Division 01 - General Requirements.
   2. Section 31 2200 – Grading.
   3. Section 31 2316 - Excavation and Fill for Pavement.
   4. Section 31 2326 - Base Course.
   5. Section 32 1216 - Asphalt Paving.
   6. Section 32 1313 – Site Concrete.

1.02 REFERENCES

A. ASTM International (ASTM):
   1. ASTM A1046- Standard Specification for Steel Sheet, Zinc-Aluminum-Magnesium Alloy-Coated by the Hot-Dip Process.
   2. ASTM C33 - Standard Specification for Concrete Aggregates.
   3. ASTM C67 – Standard Methods of Sampling and Testing Brick and Structural Clay Tile.
   4. ASTM C140 - Standard Test Methods for Sampling and Testing Concrete Masonry Units and Related Units.
   5. ASTM C144 - Standard Specification for Aggregate for Masonry Mortar.
   6. ASTM C150 - Standard Specification for Portland Cement.
   7. ASTM C920 – Standard Specifications for Elastomeric Joint Sealants.
   8. ASTM C936 - Standard Specification for Solid Concrete Interlocking Paving Units.

B. The Masonry Society (TMS); American Concrete Institute (ACI), and American Society of Civil Engineers (ASCE):
   1. TMS 602 / ACI 530.1 / ASCE 6 - Specifications for Masonry Structures.
      a. Tile Council of North America (TCNA):

C. TCNA Handbook for Ceramic, Glass, and Stone Tile Installation.
   1. TCNA F101 - Mortar Installation.
   2. TCNA EJ171 - Movement Joints.

D. American National Institute Standards (ANSI):
   1. ANSI A118.4 - Specifications for Modified Dry-Set Cement Mortar.

2. ANSI A118.7 – Specifications for High Performance Cement Grouts for Tile Installation.

1.03 REGULATORY REQUIREMENTS

A. Detectable warning surfacing shall conform to:
   1. Title 28 Code of Federal Regulations, Part 36, Subpart D: 2010 ADA Standards for Accessible Design, 2010 Standards for Public Accommodations and Commercial Facilities: Title III.
   2. CBC Section 11B-705, Detectable Warnings and Detectable Directional Texture.

B. Installed detectable warning pavers shall provide consistent side to side and end to end spacing that complies with the regulatory requirements.

1.04 PROJECT CONDITIONS

A. Weather Limitations for Mortar and Grout:
   1. Cold Weather Requirements: The cold weather construction provisions of TMS 602 / ACI 530.1 / ASCE 6 shall be implemented when the ambient temperature falls below 40 degF.
   2. Hot Weather Requirements: The hot weather construction provisions of TMS 602 / ACI 530.1 / ASCE 6 shall be implemented when the ambient temperature exceeds 100º F or 90º F with a wind velocity greater than 8 mph.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Products covered under this Section shall be produced by a single manufacturer, unless otherwise specified, with a minimum of five years proven production experience.

B. Installer Qualifications: Installer shall have a minimum of three years proven construction experience with the work specified in this Section.

C. Pre-Installation Conference: CONTRACTOR shall coordinate and conduct pre-installation conference in conformance to Section 01 3119 Project Meetings.

D. Field applied primers, paintings, sealers, adhesives and cleaners shall be approved by the OWNER's Office of Environmental Health and Safety (OEHS).

1.06 SUBMITTALS

A. Product Data: Manufacturer's data sheets on each product to be used, including installation instructions maintenance recommendations.

B. Shop Drawings: Submit layout drawings showing pattern of detectable warning pavers and provide details at curbs and adjacent construction. Indicate pavers requiring cutting.

C. Material Test Reports: Submit current test reports from an independent testing laboratory indicating that materials used comply with the specification requirements and the proposed products meet the properties specified.

D. Samples: For each finish product specified, two complete sets of color chips representing manufacturer's full range of available colors and patterns. Color will be selected by ARCHITECT.

1.07 DELIVERY, STORAGE AND HANDLING

A. Protect detectable warning pavers during shipment, storage and construction against damage. Store a minimum of 4 inches (101.6 mm) off the ground on pallets in a dry location and cover with polyethylene to protect from contact with materials which would cause staining or discoloration.

1.08 WARRANTY

A. Detectable Warning Pavers shall remain free from defects for a period of five years.

B. CONTRACTOR shall warrant that his work will remain free from defects of labor and materials used in conjunction with his work for three years.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Hanover Architectural Products.

B. StepStone, Inc.

C. Tile Tech Pavers Inc.

D. Wausau Tile Co.

E. Equal.

2.02 MATERIALS

A. Detectable Warning Paver Materials:
   1. Portland Cement: In conformance with ASTM C150.
   2. Aggregates: In conformance with ASTM C33, cleaned and properly graded to size. Aggregates shall be a blend from 200 mesh to 5/8 inch (15.88 mm).
   3. Coloring: Pigments used shall be inorganic, resistant to alkalinity and used per manufacturer’s recommendations.
   4. Color Blending: Factory-blend pre-cast paver that has a natural color range so products taken from one batch will have the same range as products from a separate batch.

5. Cleaner: Liquid neutral chemical cleaner with pH factor between 7 and 8, of formulation recommended by sealer manufacturer and approved by OWNER's OEHS.
6. Sealer: Colorless, slip and stain resistant penetrating or acrylic sealer with pH factor between 7 and 10 that does not affect color or physical properties of precast paver surface. Sealer shall be approved by OWNER's OEHS.

B. Setting Bed, Mortar and Miscellaneous Materials:
1. Setting Bed:
    a. Portland Cement: In conformance to ASTM C150.
    b. Aggregate: Sand in conformance to ASTM C144. Sand shall be clean, graded and pass a 16 mesh screen.
    c. Reinforcing Mesh: In conformance to ASTM A1046. 2 inches (50.8 mm) X 2 inches (50.8 mm)
2. Mortar: In conformance to ANSI A118.4.
3. Grout: In conformance to ANSI 118.7. Grout colors: selected by the ARCHITECT from the manufacturer's complete color range.
4. Water: Potable and free from deleterious substances.
5. Mortar and Grout Mixes: Comply with referenced standards and with manufacturers' written instructions for mix proportions, mixing equipment, mixer speeds, mixing containers, mixing times, and other procedures needed to produce setting-bed and joint materials of uniform quality and with optimal performance characteristics. Discard mortars and grout if they have reached their initial set before being used.
6. Primer: As recommended by the mortar material manufacturer and approved by OWNERS's OEHS.
7. Sealant and backing materials: In conformance to ASTM C920, Type T, joints subject to pedestrian and vehicular traffic and approved by OWNERS's OEHS.

2.03 DETECTABLE WARNING PAVER FABRICATION

A. Detectable Warning Pavers: Factory precast concrete pavers with raised truncated domes conforming to CBC Section 11B-705.
1. Dome Size: Base diameter of 0.90 inch (22.86 mm) minimum and 0.92 inch (23.37 mm) maximum, a top diameter of 0.45 inch (11.43 mm) minimum and 0.47 inch (11.94 mm) maximum and a height of
    a. 0.20 inch (5.08 mm).
2. Dome Spacing: Truncated domes in a detectable warning surface shall have a center-to-center spacing of 2.3 inches (58.42 mm) minimum and 2.4 inches (60.96 mm) maximum, and a base-to-base spacing of 0.65 inch (16.51 mm) minimum, measured between the most adjacent domes on a square rigid.
3. Color: In conformance to CBC section 11B-705.1.1.3.
4. Contrast: Detectable warning materials shall provide a 70 percent minimum visual contrast with adjacent walking surfaces.
5. Resiliency: Detectable warning surfaces shall differ from adjoining surfaces in resiliency or sound-on-cane contact.

B. Physical Properties:
1. Size: Nominal 12 inches (304.8 mm) x12 inches.
2. Thickness: Nominal 2 inches (50.8 mm).
3. Sizing Dimensions: Shall not differ by more than 1/16 inch (1.59 mm) from width, height, length or thickness. Unit shall conform to a true plane and not differ by more than 1/16 inch in either concave and/or convex warpage.
4. Compressive Strength: Shall not be less than 8,000 psi (55158.08 kPa) per ASTM C140.
5. Water Absorption: Shall not be greater than 6% per ASTM C936 or ASTM C140.
6. Freeze/Thaw: Durability of the paver shall meet the freeze/thaw tests per Section 8 of ASTM C67 and shall have no breakage and not greater than 1 % loss in dry weight of any individual unit when subject to 50 cycles of freeze/ thaw.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine concrete base and verify no sealers, curing compounds or other coatings have been be applied. If present remove in accordance to paver manufacturer.

B. Concrete base shall have a fine broom finish or wood float finish. If not provided scarify mechanically as recommended by paver manufacturer.

C. Remove debris and loose particles and sweep concrete surfaces.

3.02 SETTING BED

A. Installation of mortar bed shall conform to TCA F101.

B. Install red wood float strips so that a straight edge can reach the maximum edges of the intended mortar bed. Verify top of float strips are at the correct elevation to allow a flush installation of the detectable warning pavers with the adjacent surfaces.

C. Moisten concrete base and float strips.

D. Apply a thin, continuous coat of pure Portland cement slurry on the concrete surface or dust a thin layer of dry Portland cement on the concrete and wet it. Broom to completely coat the concrete surface with a thin and uniform coating.

E. Place welded wire fabric on chairs or spacers or small mounds of mortar to hold the reinforcement at the center of the setting bed. Welded wire fabric shall overlap a minimum of one mesh.

F. Mix and apply mortar setting bed material in accordance with the manufacturer's instructions to a thickness of 1-1/4 inches (32 mm). Trowel mortar between the float strips compacting the mortar as much as possible.

G. Using the float strips as the guide cut off the excess mortar placing the excess further down the area to be floated.

H. While the mortar bed is still plastic or has not cured remove the float strips and fill the grooves with fresh mortar.

3.03 PAVER INSTALLATION

A. Do not use unit pavers with chips, cracks, voids, discolorations, or other defects that might be visible or cause staining in finished work.

B. Cut unit pavers with motor-driven masonry saw equipment to provide clean, sharp, unchipped edges. Cut units to provide pattern indicated and to fit adjoining work neatly. Use full units without cutting where possible. Hammer cutting is not acceptable.

C. Lay pavers in pattern on mortar bed as indicated on the Drawings.

D. Apply mortar using the flat side of the trowel first. Move notched side of trowel in a parallel pattern allowing for air to escape. Apply bod coat over the entire setting surface including grout joints. “Back-butter” pavers with 1/8 inch (3.18 mm) thick mortar for full mortar to mortar contact.

E. Position paver on mortar bond coat using a slight back and forth motion. “Squeeze up” mortar minimum 1/8 inch (3.18 mm) in grout joints along tile edges and corners eliminating air voids.

F. Level pavers using a straight edge or taught string.

G. Placement Tolerances:
   1. Maximum of 1/16 inch (1.59 mm) height variation between adjacent pavers.
   2. Individual pavers shall not vary more than 1/16 inch (1.59 mm) from level across width of the paver.
   3. Paved areas shall not vary more than 1/4 inch (6.35 mm) from level in a distance of ten feet measured at any location and in any direction.
   4. The surface elevation of pavers shall be 1/8 ich to 1/4 inch (6.35 mm) above adjacent drainage inlets.

3.04 EXPANSION AND CONTROL JOINTS

A. Locate expansion and control joints as indicated on the Drawings and where pavers are in contact with dissimilar materials such as curbs, concrete pavement and walls.

B. Joints shall be uniform, straight of 3/16 inch (4.76 mm) wide.

C. Install in accordance with TCA Detail EJ171,

D. Carry joint completely through the assembly to surface.
   1. Keep joints clear of mortar setting materials and grout.
   2. Apply backer materials and sealant in joints following manufacturer’s instructions.

3.05 GROUTING

A. Follow grout manufacturer’s instructions.

B. Dampen grout joints prior to grout insertion.

C. Install grout using a grout bag or a tuck pointer. Tool the joint with a round tool (“spoon”) or brick jointer.

D. Allow excess grout to set up briefly until it can be swept off using a stiff brush or broom.

E. For final cleaning use cheesecloth, clean damp sponge or when necessary, steel wool. Do not use any acidic cleaners to remove excess grout or grout haze.

F. Remove, scrub and wash clean mortar stains and all other types of soiling from exposed paver surfaces.

G. Apply sealer in accordance with manufacturer’s directions.

3.06 CLEAN UP

A. Remove rubbish, debris, and waste materials and legally dispose of off the Project Site.

3.07 PROTECTION

A. Protect the Work of this section until Substantial Completion.

END OF SECTION

ATTACHMENT A

Columbia
LIGHTING

DATE:	LOCATION:
TYPE:	PROJECT:
CATALOG #:	

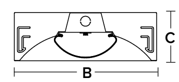
LCAT14

1' × 4' LED CONTEMPORARY ARCHITECTURAL TROFFER

FEATURES

- High efficiency acrylic center lens features linear prisms for high performance without pixelation
- Appropriate for offices, schools, medical, and public spaces
- High performance reflector with matte white paint standard
- LED modules and electrical accessible from below
- Optional architecturally styled integration of daylight and occupancy sensor(s)
- QR code traceability
- Compatible with Dual-Lite inverters

Typical Dimensions and Weights				
Sizes	(A) Length Inches (mm)	(B) Width Inches (mm)	(C) Height Inches (mm)	Weight lbs (kg)
1x4	47.75 (1213)	11.75 (298)	3.98 (101)	11.25 (5.1)



CONTROLS TECHNOLOGY

SPECIFICATIONS

CONSTRUCTION

- Luminaire housing, reflectors and end caps are die-formed code-gauge cold-rolled steel
- High transmission extruded acrylic enclosed lens features linear prisms with custom frost for high efficacy without pixelation
- All reflective surfaces are finished after fabrication with unique formula high-reflectivity matte white paint for soft, uniform indirect illumination

OPTICS

- Removable lens for easy access to LED module and electrical components

INSTALLATION

- An access plate is furnished with each luminaire for fast wiring access without the necessity to open the fixture or wireway
- Luminaire fits recessed exposed Grid ceilings (G); four integral T-bar clips with holes for seismic wires are standard
- Can be placed in Slot Grid (SG) style ceiling with regress ⅜" above ceiling plane
- A Flange Kit (FK) accessory is available for recessed hard ceiling applications
- Surface Mount (SM) option allows placement below ceiling plane
- Cable Mount (CM) option allows suspension below ceiling plane

ELECTRICAL

- 60,000 hour LEDs at L80 for reduced maintenance
- 83 CRI standard or optional 90 CRI for color sensitive applications

CONTROLS

- Optional SpectraSync™Tunable White solution integrates seamlessly into a variety of control systems
- NX Lighting Controls provides options for standalone and networked integrated sensor with wired or wireless connectivity for NX system deployments
- NX Connect is a standalone wireless deployment for room based application using wireless enabled and battery operated devices

CERTIFICATIONS

- Emergency battery pack options are California Energy Commission (CEC) Title 20 Compliant
- IC label is standard for recessed products. Note that IC label is void if product is installed on site with a combination of both battery pack plus through wiring or for air return fixtures
- All luminaires are built to UL1598 and bear appropriate cCSAus labels
- CSA certified to UL 924 standards with battery pack or DTS (Dimming Bypass Module) options

CERTIFICATIONS (CONTINUED)

- Damp Location label standard
- Adheres to LM79, LM80, and TM21 industry standards
- The DTS, Dimming Bypass Module, is for emergency circuit control loads including sensors and wireless systems CSA certified to UL 924.
- Product configurations not including battery packs or controls meet federal procurement law requirements under the Trade Agreements Act (FAR 52.225-11). See Buy America(n) Solutions
- DLC® (DesignLights Consortium) Qualified. Please refer to the DLC website for specific product qualifications at www.designlights.org

WARRANTY

- 5 year warranty

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DATE:	LOCATION:
TYPE:	PROJECT:
CATALOG #:	

LCAT14

1' × 4' LED CONTEMPORARY ARCHITECTURAL TROFFER

ORDERING GUIDE

Example: LCAT14–35MLG–ESDU

CATALOG #

LCAT14 –

Model	CRI	Color Temp	Nominal Lumens [2]	Ceiling Type	Shielding	Air Function	Driver [5]
LCAT14 1' x 4' LED Contemporary Architectural Troffer	**Blank** >80	**30** 3000K	**XW** 2484-2680	**G** Grid Lay-in [3]	**Blank** Curve	**Blank** Static	**E** Fixed Output
	9 >90	**35** 3500K	**VW** 3073-3317	**SM** Surface Mount [4]	**R** Rectangular	**A** Air Return Side Slots	**ED** 0–10V Dimming [6]
		40 4000K	**MW** 3444-3716	**CM** Cable Suspended Mount [4]			**ED1** 0–10V 1% Dimming
		50 5000K	**LW** 4188-4520				**EDD** 0–10V Dim-to-Off [7]
		2765T 2700K–6500K SpectraSync™ Tunable White [1]	**ML** 4555-4833				**ESD** Step Dimming
			HL 5322-5744				**LUTH** Hi-lume 1% EcoSystem LED driver with Soft-on, Fade-to-Black dimming technology [7,8]
			VL 7205-7776				**DALIP** Powered by DALI [7,8]
			XL 7799-8417				

Voltage	
U	120–277V
347	347V

Options	
ELL14	Emergency Battery Pack Installed, 1400 Lumens [8,9,10]
ELL14ST	Emergency Battery Pack, 1400 Lumens, Self Test [8,9,10]
ELL14H2	Emergency Battery Pack, 2-Hour Run Time [8,9,10,11]
DTS	Dimming Bypass Module [8,10,12]
C388	3-wire Flex
C488	4-wire Flex
C588	5-wire Flex
GLR	Fast Blow Fuse
EOR	End of Row (SM and CM only. Provides end wiring access for continuous row mounting.)
INT	Intermediate (SM and CM only. Provides ends with wiring access for continuous row mounting.)
CP	Chicago Plenum

Control Options [13]

NX Lighting Controls

Networked Wireless

NXW	NX Networked Wireless Radio Module NXRM2 and Bluetooth Programming, without Sensor [14,15,16]
NXWSM	NX Networked Wireless Enabled Integral NXSMP2-SMI PIR Occupancy Sensor with Automatic Dimming Photocell and Bluetooth Programming [14,16]

Networked Wired

NXE	NX Wired Dual RJ45 SmartPORTS , without Sensor [14,15,16]
NXESM	NX Wired Dual RJ45 SmartPORTS and Integral NXSMP2-SMI PIR Occupancy Sensor with Automatic Dimming Photocell and Bluetooth Programming [14,15,16]

Independent Control

NXCS	NX Connect NXC-WIZ20 Wireless Indoor Occupancy and Photocell Sensor [8,17,18,19,21]

Other Lighting Controls

Networked Wireless

LVR	Lutron Vive Integral Fixture Control DFCSJ-OEM-RF (RF only) [8,19,20,21]
LVS	Lutron Vive Integral Fixture Control DFCSJ-OEM-OCC with Daylight and Occupancy Sensing [8,19,20,21]
AWNR	Lutron Athena Integral Fixture Control A-WN-DO1-RF-WH (RF only) [8,16,19,22]
AWNS	Lutron Athena Integral Fixture Control A-WN-D01-OCC-WH with Daylight and Occupancy Sensing [8,16,19]

Independent Control

ODPG	Occupancy and Daylight Sensors w/ Grouping, Philips SNS200 [8,19,21]

Accessories

☐ **FK14**	1' × 4' Single Flange Kit (Shipped separately)
☐ **CM48YSC3F-KIT**	48" Cable Mount Kit for 1' wide Cable Mount fixtures, 3-wire
☐ **SMK-LCAT 1x4**	1x4 Surface Mount Kit, Field Install

Notes:

1 Available with ED driver and 80 CRI only. Not available with VL or XL lumen package
2 Refer to performance tables for exact values and available lumen outputs for fixture size
3 For drywall, order G with flange kit accessory
4 Not available with Air Return (A) air function
5 Dimming curves may vary dependent upon lumen output and driver option chosen. Separate dimming circuits are recommended if multiple driver options are chosen.
6 1V minimum low-end trim recommended when paired with a 0-10V dimmer
7 Not available in all lumen packages, refer to Driver Availability table
8 Not available with 347V
9 To determine lumen output in emergency mode, multiply the battery pack wattage by the fixture lumens per watt (LPW)
10 For compatibility with Dual-Lite Litegear inverters, contact lighting representative
11 Not available for use in Canada
12 For emergency circuit control loads including sensors and wireless systems CSA certified to UL 924. See wiring diagram.

All Controls

13 Minimum ambient temperature: 0°C (32°F)

NX Lighting Controls Options

14 NX combined with SpectraSync is not available in 347V
15 Not compatible with Surface Mount Kit
16 Available with ED, ED1 or EDD drivers only
17 NX Connect devices can be configured using the NX Connect Mobile App, available in the Apple App Store
18 NX Connect devices are not compatible with NX Networked Wireless or Wired Options

Other Lighting Controls Options

19 Not available with SpectraSync
20 Vive is a trademark of Lutron Electronics Co., Inc.
21 Only available with DALIP driver option
22 When installing in a hard ceiling application room side mounting is suggested, please consult factory

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Columbia LIGHTING

DATE:	LOCATION:
TYPE:	PROJECT:
CATALOG #:	

LCAT14

1' × 4' LED CONTEMPORARY ARCHITECTURAL TROFFER

PRODUCT EXCEPTIONS & DETAILS

Driver options listed below are available for the outputs as shown.

DRIVER AVAILABILITY TABLE								
	XW	VW	MW	LW	ML	HL	VL	XL
E	X	X	X	X	X	X	X	X
ED	X	X	X	X	X	X	X	X
ED1	X	X	X	X	X	X	X	X
EDD	X	X	X	X	X	X	X	X
ESD	X	X	X	X	X	X	X	X
LUTH	X	X	X	X	X	X		
DALIP	X	X	X	X	X	X	X	X
347	X	X	X	X	X	X		

DELIVERED LUMENS

(View 90 CRI data on supplemental document)

Product Availability 80 CRI					
Lumen Package	Shielding	Color	Lumens	Input Watts	LPW
XW		3000K	2591	17.2	150
		3500K	2636		153
		4000K	2680		156
		5000K	2680		156
	R	3000K	2484		144
		3500K	2526		147
		4000K	2569		149
		5000K	2569		149
VW		3000K	3206	21.7	148
		3500K	3262		150
		4000K	3317		153
		5000K	3317		153
	R	3000K	3073		142
		3500K	3126		144
		4000K	3179		147
		5000K	3179		147
MW		3000K	3592	24.4	147
		3500K	3654		150
		4000K	3716		152
		5000K	3716		152
	R	3000K	3444		141
		3500K	3503		144
		4000K	3562		146
		5000K	3562		146
LW		3000K	4369	30.1	145
		3500K	4445		148
		4000K	4520		150
		5000K	4520		150
	R	3000K	4188		139
		3500K	4261		142
		4000K	4333		144
		5000K	4333		144

Product Availability 80 CRI (continued)					
Lumen Package	Shielding	Color	Lumens	Input Watts	LPW
ML		3000K	4672	31.1	150
		3500K	4752		153
		4000K	4833		156
		5000K	4833		156
	R	3000K	4555		144
		3500K	4478		147
		4000K	4633		149
		5000K	4633		149
HL		3000K	5552	37.9	146
		3500K	5648		149
		4000K	5744		151
		5000K	5744		151
	R	3000K	5322		140
		3500K	5414		143
		4000K	5506		145
		5000K	5506		145
VL		3000K	7517	52.2	144
		3500K	7646		147
		4000K	7776		149
		5000K	7776		149
	R	3000K	7205		138
		3500K	7329		140
		4000K	7454		143
		5000K	7454		143
XL		3000K	8136	55.6	146
		3500K	8276		149
		4000K	8417		151
		5000K	8417		151
	R	3000K	7799		140
		3500K	7933		143
		4000K	8068		145
		5000K	8068		145

PROJECTED LUMEN MAINTENANCE

Calculation Method	Ambient Temp	25,000 hrs	50,000 hrs	60,000 hrs *
TM-21-11	25C/77F	0.94	0.89	0.87
TM-21-21	25C/77F	0.94	0.88	0.86

* Lumen maintenance values calculated per TM-21 using six times the LM-80 test time for the LED and in-situ thermal testing of the luminaire.

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LCAT14

1' × 4' LED CONTEMPORARY ARCHITECTURAL TROFFER

NX LIGHTING CONTROLS

NX LIGHTING CONTROLS

	Control Option Ordering Logic & Description		Control Option Functionality								Control Option Components	
			Networkable	Grouping	Scheduling	Occupancy/ Motion	Daylight Harvesting	0-10V Dimming	On/Off Control	Bluetooth App Programming		
NX Wireless	NXW	NX Networked Wireless Radio Module NXRM2 and Bluetooth Programming, without Sensor	✓	✓	✓	–	–	✓	✓	✓		NXRM2-H
	NXWSM	NX Networked Wireless Enabled Integral NXSMP2-SMI PIR Occupancy Sensor with Automatic Dimming Photocell and Bluetooth® Programming	✓	✓	✓	✓	✓	✓	✓	✓		NXSMP2-SMI
NX Wired	NXE	NX Wired Dual RJ45 SmartPORTS , without Sensor	✓	✓	✓	–	–	✓	✓	✓[1]		NXDSP
	NXESM	NX Wired Dual RJ45 SmartPORTS and Integral NXSMP2-SMI PIR Occupancy Sensor with Automatic Dimming Photocell and Bluetooth® Programming	✓	✓	✓	✓	✓	✓	✓	✓		NXDSP NXSMP2-SMI
NX Independent	NXCS	NX Connect NXC-WIZ20 Wireless Indoor Occupancy and Photocell Sensor	–	✓	–	✓	✓	✓	✓	✓[2]		NXC-WIZ20

1 Requires NXBTC, order separately.
2 Requires use of NX Connect App available for download from Apple app store.

DEFAULT SETTINGS

NX Wireless & Wired		
	Occupancy Sensor	Enabled
	Occupancy Sensor Sensitivity	7 Minutes
	Occupancy Sensor Timeout	15 Minutes
	Occupied Dim Level	100%
	Unoccupied Dim Level	0% (OFF)
	Daylight Sensor	Disabled
	Bluetooth	Enabled
	2.4GHz Wireless Mesh	Off
	Passcode Factory Passcode: HubbN3T!	Enabled

NX Independent - NX Connect		
	Settling/Dwell Time	5 sec
	Hold Time	10 min
	Group Hold Time	10 min
	Grace Time	-
	Strategy	Auto ON/OFF
	Occupancy Sensitivity	5 (highest)
	Occupancy Indicator	ON
	Partial Off/Standby	0%
	Background Level	50%
	Task Level	100%
	Daylight Harvesting	-
	Low Ambient Output	250%
	High Ambient Output	OFF

CONTROLS TECHNICAL SUPPORT

1-800-888-8006 (7:00 am–7:00 pm est)

APP INFORMATION

NX Lighting Controls App

The NX Lighting Controls App is a free to use mobile application for programming both an NX Lighting Controls System or Standalone Bluetooth Sensors. The mobile app allows you to configure devices, discover and setup wireless enabled luminaires and program your NX system settings.

Android

Apple iOS

NX Connect App

The NX Connect mobile App is a free to use mobile application for programming a NX Connect System. The mobile App allows you to discover, configure and share your NX Connect system.

Apple iOS

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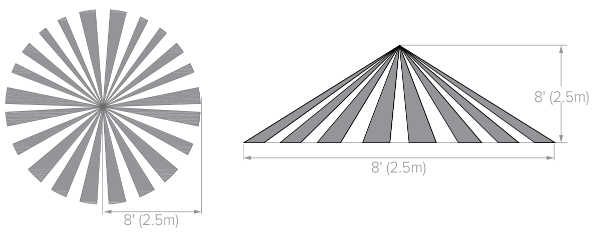
LCAT14

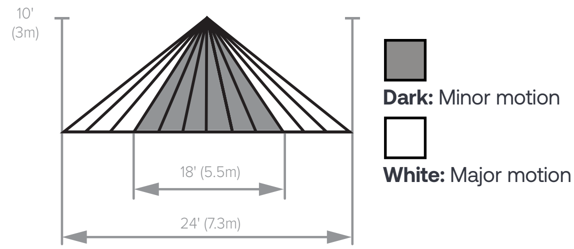
1' × 4' LED CONTEMPORARY ARCHITECTURAL TROFFER

COVERAGE PATTERNS

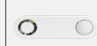
NXWSM/NXESM (NXSMP2-SMI SENSOR)



NXCS (NXC-WIZ20 SENSOR)



OTHER LIGHTING CONTROLS

	Control Option Ordering Logic & Description		Control Option Functionality								Control Option Components	
			Networkable	Grouping	Scheduling	Occupancy/ Motion	Daylight Harvesting	0-10V Dimming	On/Off Control	Bluetooth App Programming		
Other	ODPG	Occupancy sensing, daylight harvesting and task tuning in one device.[1]	–	√	–	√	√	√	√	√[3]		SNS200
	LVR	The Vive integral fixture control is a radio frequency (RF) device that controls either Lutron EcoSystem or DALI drivers based on RF input from Pico remote controls, Radio Powr Savr wireless sensors, or Vive hubs.[2]	√	√	√	–	–	–	√	–		DFCSJ-OEM-RF
	LVS		√	√	√	√	√	–	√	–		DFCSJ-OEM-OCC
	AWNR	The Athena wireless node is a radio frequency (RF) device that enables simple, digital control of individual light fixtures in an Athena control system.[3]	√	√	–	–	–	√	√	–		A-WN-D01-RF-WH
	AWNS		√	√	√	√	√	√	√	–		A-WN-D01-OCC-WH

1 Philips MasterConnect App required for field configuration.
2 Lutron Vive Hub required to enable Networking, Grouping and Scheduling.
3 Lutron Athena Hub required to enable Networking, Grouping and Scheduling.

Philips EasySense Controls (ODPG option) & Accessories:

- Occupancy sensing, daylight harvesting, task tuning and grouping in one device
- Standalone control or grouping to wireless switches[1]
- Uses Philips field apps for on site commissioning[2]
- Ability to create scenes for various room configurations
- Cost-effective solution for energy-savings and code-compliancy strategies
- DLC® Qualified: Listed on the QPL for Networked Lighting Controls. Please refer to the DLC website for specific product qualifications at www.designlights.org

1 Wireless switches only compatible with ODPG Philips EasySense
2 Requires android device or IR dongle.

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LCAT14

1' × 4' LED CONTEMPORARY ARCHITECTURAL TROFFER

DATE: | LOCATION:
TYPE: | PROJECT:
CATALOG #:

CONTROLS (CONTINUED)

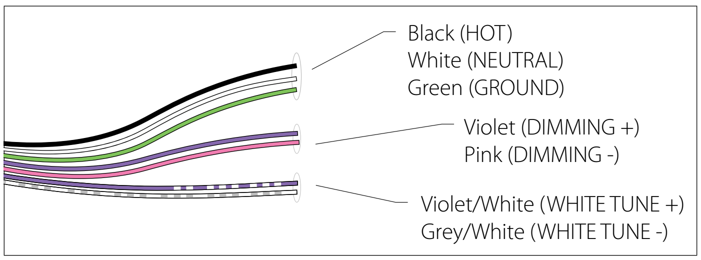
SpectraSync™ Color Tuning Technology:

Control your space based on the needs of the application, specific activities throughout the day and preferences of the occupants with distinct SpectraSync™ Color Tuning Technologies.

SPECTRASYNC COLOR TUNING TECHNOLOGY		
Mode	Kelvin Range	Description
Tunable White	2700K–6500K	Offers users the ability to tailor CCT to their personal preference, enhancing task visibility, material and colors or the aesthetics of the space

SpectraSync Tunable White

Requires two 0–10V controllers, one for intensity and one for CCT.
Minimum 5% dimming.

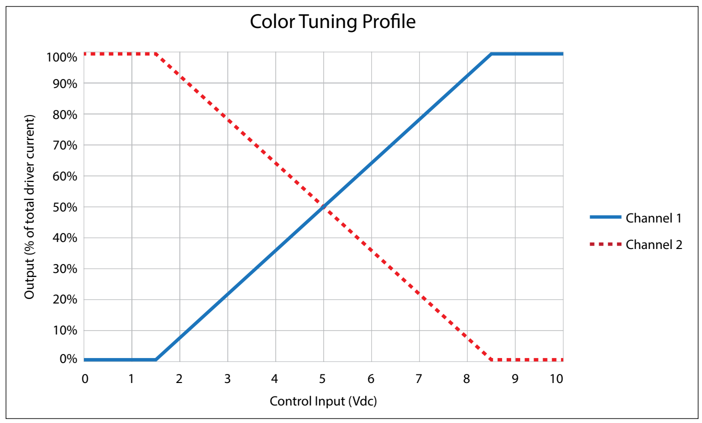


SpectraSync Tunable White luminaires are provided with two 0–10V circuits. The violet and pink circuit is for wiring to any qualified 0–10V controller for dimming. The violet/white and grey/white circuit is for wiring to any qualified 0–10V controller for Tunable White CCT control.

Controller Manufacturer Data

SpectraSync Tunable White was designed to be used with sinking style dimmers (provided by others) and is compatible with:

- NX Lighting Controls Room Controller (NXRC) and In-fixture Controllers (NXFM)
- Lutron: DVTV, DVSTV, and NFTV dimmers
- Wattstopper: ADF120277 and CD4BL (Titan) dimmers



To enable scheduling and for use with NX wall control preset stations please refer to NX SpectraSync technical sheet.

DELIVERED LUMENS, SPECTRASYNC™

Shielding	Lumen Output	Watts	2700		3000		3500		4000		5000		6500	
			Lumens	LPW	Lumens	LPW	Lumens	LPW	Lumens	LPW	Lumens	LPW	Lumens	LPW
Curve	XW	19	2200	113	2299	119	2340	121	2370	122	2448	126	2412	124
	VW	28	3012	110	3147	114	3204	116	3245	118	3352	122	3301	120
	MW	32	3499	108	3656	113	3722	115	3769	117	3894	121	3835	119
	LW	36	4188	116	4376	122	4455	124	4512	125	4660	129	4590	128
	ML	38	4487	117	4689	122	4773	125	4834	126	4994	130	4919	128
	HL	44	5173	118	5405	123	5502	125	5573	127	5756	131	5670	129
	VL	58	6501	113	6793	118	6915	120	7004	122	7235	126	7126	124
Rectangle	XW	21	2295	111	2398	116	2441	119	2472	120	2554	124	2516	122
	VW	28	2916	106	3047	111	3102	113	3141	114	3245	118	3196	116
	MW	32	3508	109	3666	113	3732	116	3780	117	3904	121	3846	119
	LW	36	4063	113	4246	118	4322	120	4378	122	4522	126	4454	124
	ML	38	4545	119	4749	124	4834	126	4896	128	5058	132	4982	130
	HL	44	5034	116	5260	121	5355	123	5423	125	5602	129	5518	127
	VL	58	6322	109	6606	114	6725	116	6811	118	7035	122	6930	120

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Columbia LIGHTING

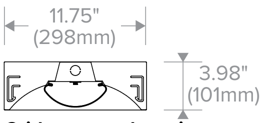
LCAT14

1' × 4' LED CONTEMPORARY ARCHITECTURAL TROFFER

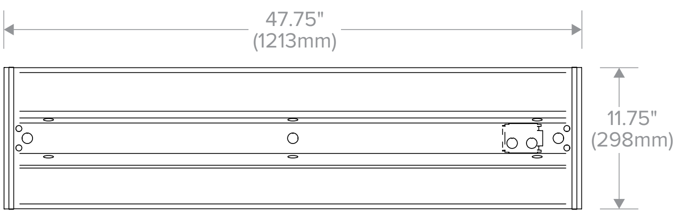
DATE:	LOCATION:
TYPE:	PROJECT:
CATALOG #:	

DIMENSIONS

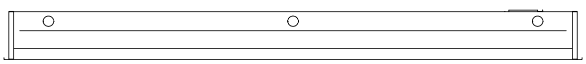
GRID



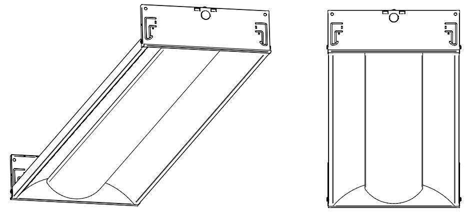
Grid, recessed section



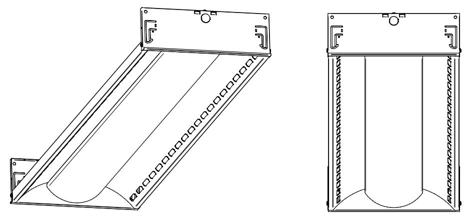
Grid, back of housing



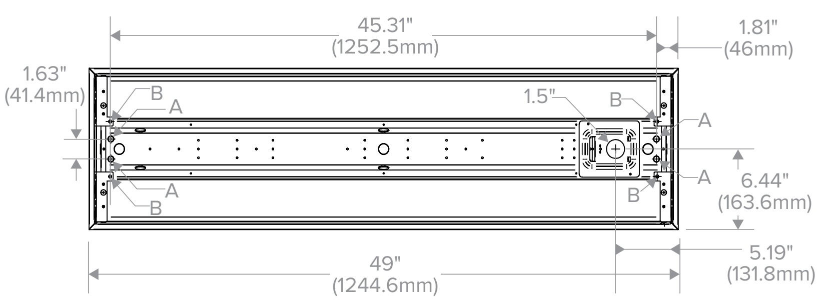
GRID, STATIC



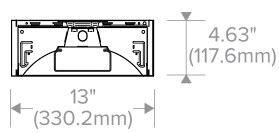
GRID, AIR RETURN



SURFACE MOUNT OR CABLE MOUNT, STATIC ONLY



Surface Mount (SM) and Cable Mount (CM), back of housing



Surface section (SM)

Surface Mount:
Order SM ceiling type. Mounting collar required for surface mounting. (4) Mounting knock-outs, 3⁄8", provided in center channel as indicated at left, marked A.

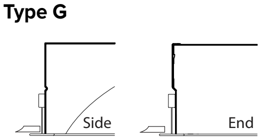
Cable Mount:
Order CM ceiling type. Use CM48Y1SC3F48 48" Cable Mount Kit for 1' wide CM trim fixtures. Mounting holes are provided in diagonal straps shown at left, marked B.

* For Cable Mount a 2" x 3" access plate with (4) **⅞"** KOs provided in place of Mounting Collar shown.

NOTE: All dimensions are in inches; dimensions and specifications are subject to change without notice. Please consult factory or check sample for verification.

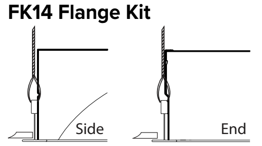
CEILING COMPATIBILITY

Type G



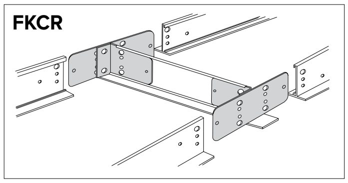
For lay-in installation in exposed grid ceilings. Maximum tee widths of 1" and maximum tee heights of 2" allowed.

FK14 Flange Kit



For hard ceiling applications, order FK14 flange kit. Flange kit wires directly into concealed ceiling opening for a clean, finished appearance.

FKCR



For flanged fixtures in row configurations, the FKCR adapter bracket kit is required in addition to the FK14 kit. Order one less FKCR than the total number of fixtures in row. (Example: Row of two, order (2) FK14 & (1) FKCR)

Row cut out dimensions using FK14s & FKCR adapters:
Width 12⅜", Length [48" × (# in row)] + ⅜".
Example: (48" × 2) + 3/8" = 96⅜"

Flange kit cut out dimension for single unit only: 12⅜" × 48⅜"

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Columbia LIGHTING

LCAT14

1' × 4' LED CONTEMPORARY ARCHITECTURAL TROFFER

DATE: LOCATION:

TYPE: PROJECT:

CATALOG #:

PHOTOMETRY

LCAT14-35MLG-EU

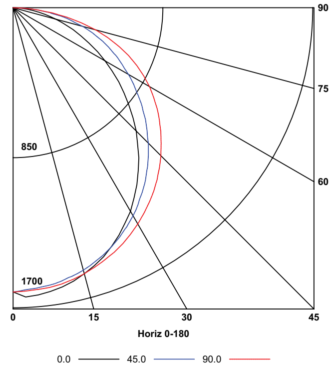
LUMINAIRE DATA

Test No.	**16480**
Description	**1' x 4' LED architectural troffer with frosted linear prismed lens**
Delivered Lumens	**4830**
Watts	**38.30**
Efficacy	**126**
Mounting	**Recessed**
Spacing Criterion	**0° = 1.23 90° = 1.30**

ZONAL LUMEN SUMMARY

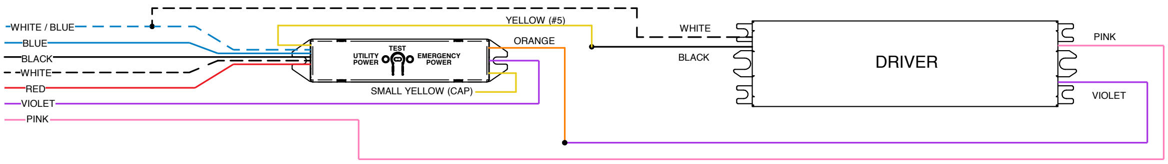
Zone	Lumens	% Luminaire
0–30	1253	25.9
0–40	2054	42.5
0–60	3663	75.8
0–90	4830	100
0–180	4830	100

POLAR GRAPH



ADDITIONAL INFORMATION

DTS WIRING DIAGRAM (0–10V DIMMING DRIVER SHOWN)



WHITE/BLUE	Emergency Neutral
BLUE	Emergency Line
BLACK	Utility Line (Unswitched Hot)
WHITE	Utility Neutral
RED	Switched Hot
VIOLET	Dimming
PINK	Dimming

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ATTACHMENT B

DUAL LITE® EASY ID™

EVHC Series
High Lumen LED Emergency Light

Catalog Number	
Comments	Type

FEATURES

Application
The EVHC series is a high lumen output emergency lighting unit designed for high mounting height applications. The EVHC Series has a flame-rated, UV stable thermoplastic housing and a lightly textured white or black finish. Integral LED based lamp-heads are fully adjustable. Unit provides a full 90 minutes of emergency lighting. Includes micro-controller based 3-stage charger and Lithium Iron Phosphate (LiFePO) battery. The EVHC accepts 120 through 277VAC input at 50 or 60Hz. The EVHC-EasyID adds a highly visible status panel that indicates a malfunction, or battery needs replacement. This panel works with Spectron self-test, self-diagnostics. The EasyID models also include an easy access battery compartment. The EVHC is not designed for self-diagnostic operation at 220-240VAC.

Construction
The EVHC series housing and back-plate are made from durable injection molded ABS thermoplastic. Lamp-head front halves are made of die-cast aluminum for thermal dissipation. Back half of lamp-head made of glass filled thermo-plastic. LED lens are made of poly-carbonate.

Installation
Universal mounting template molded in the back plate aids in quick installation. Unit mounts to all single gang and standard 3 ½" and 4" square or octagonal electrical boxes. Conduit entry through a molded-in knock-out at the top center and at the upper half of each side. Fixture includes a battery compartment and door, which allows easy access to the battery assembly and connection for ease of service. Pre-stripped AC input leads provided. Unit may be ceiling or wall mounted.

Illumination
The EVHC series provides bright and uniform illumination and is specifically designed for higher mounting heights above 9'. Coverage provided by 2 integrally mounted lamp-heads using 3 high power LEDs each. The LEDs are located in a specially designed heat dissipating lamp-head, which is fully adjustable. The EVHC6I-WM photometrics are available for download at www.dual-lite.com.

Compliances
Listed to UL924 Standard, NFPA 101, NFPA 70
Damp Location Listed

Warranty
LED Lifetime Warranty

EasyID Alert System

ACCESSORIES

EVHCR2	Double Remote
WGA3	Wire Guard - 10"H x 14"L x 6"D

NOTE: The EVHC12 with remote capacity will only power the EVHCR2 shown above. The EVHC12 is not designed to run any other remote.

ORDERING GUIDE

EVHC _ _ _ – _

Model	Capacity	Self-Diagnostics	Finish	Options
EVHC	**6** 6 Watts	**Blank** No Self-Diagnostics	**Blank** White	**06L** 6 watt LED lamps [1]
	12 12 Watts	**I** Spectron® Self-Diagnostics [3]	**B** Black	
		ID EasyID Status Panel with Battery Compartment [2,3,4]		

[1] Only available on EVHC with 12 watt capacity
[2] ID option only available in white finish
[3] Not for use with 220-240VAC input
[4] Only available with EVHC6ID and EVHC12ID-06L

HUBBELL® Lighting

EVHC Series
High Lumen LED Emergency Light

SPECIFICATIONS

Additional Ordering Information

	Battery	Capacity	Lamp(w)	Lumens per Lamp	Remote Watts	Run-Time	Extended Runtime	Remote Capable	Remote Part Number
EVHC6	$LiFePO_4$	6 watts	3 watts	326	0	90 min	No	No	N/A
EVHC6I	$LiFePO_4$	6 watts	3 watts	326	0	90 min	No	No	N/A
EVHC12	$LiFePO_4$	12 watts	3 watts	326	6	90 min	Yes	Yes	EVHCR2
EVHC12I	$LiFePO_4$	12 watts	3 watts	326	6	90 min	Yes	Yes	EVHCR2
EVHC12-06L	$LiFePO_4$	12 watts	6 watts	546	0	90 min	No	No	N/A
EVHC12I-06L	$LiFePO_4$	12 watts	6 watts	546	0	90 min	No	No	N/A

Electronics

Upon failure of the normal utility power, a solid-state transfer switch automatically activates the emergency LED lamp-heads. Upon resumption of normal utility power, the battery is disconnected from the load and recharged through a micro-controller based 3-stage charger. The battery is a maintenance-free Lithium Iron Phosphate ($LiFePO_4$) type. The EVHC series accepts 120 through 277VAC at 50 or 60 Hz. A low voltage battery disconnect (LVD) feature protects the battery from severe damage during prolonged power failures. Manual testing is available at any time using the push-to-test button.

The EVHCR2 can be mounted up to 53' using 18 gage wire.

Number of Lamps: 2 lamp-heads with 3 high-power LEDs per head

Lamp Color: Cool White, 5000K

Total Lamp Output: Standard Model, 326 lumens per lamp-head
Optional 6W Lamps, 546 lumens per lamp-head

Rated LED lifecycle: greater than 100,000 hrs.

Standard Features Include:

- Intelligent 2-wire input
- External push-to-test switch and AC-on indicator
- Battery re-charge within 24 hours
- AC Lock-out circuit
- Low voltage battery disconnect
- Conduit entry knock-out located at the top center and upper half of each side
- Micro-controller based 3-stage charger
- Flashing trouble code for "Battery Disconnect" or "Charger Fault"

Optional Features:

- Self-diagnostics monitors LED status, LED driver circuit, battery capacity and charger function and displays any fault detection by means of a flashing code
- Self-Test feature automatically runs a 1 minute test once a month and an alternating 30 or 60 minute test once every 6 months. Multi-color LED indicator provides visible fault detection and charging status
- User initiated 1, or 90-minute system test feature
- 15 minute re-transfer delay
- Automatic unit transfer in brown-out conditions (below 80% of nominal AC input voltage)
- "EasyID" option allows for easy battery replacement with no access to high voltage components. Includes polarity sensitive connector.

Operating Temperature Range:

Damp Listed: 50° to 104°F (10° to 40°C)

Input Power Consumption

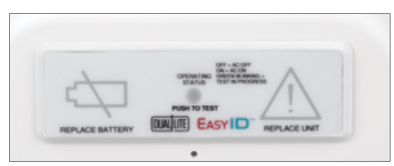
	Input Volts	Amps.	Max. Watts
EVHC6	120	0.028	2.3
	277	0.028	2.2
EVHC6I	120	0.023	2.3
	277	0.028	2.2
EVHC12	120	0.040	3.7
	277	0.040	4.0
EVHC12I	120	0.035	3.7
	277	0.040	4.0

Maintenance Mode Power Consumption - 120 VAC - 0.32W; 277 VAC - 0.36W

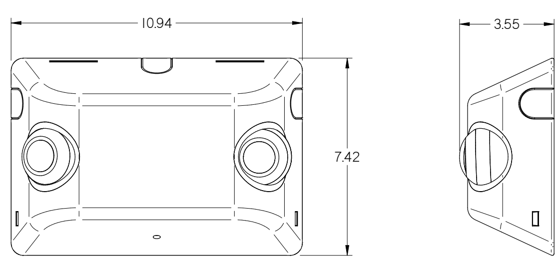
EasyID Alert System

This unit includes a highly visual alert system to communicate two failure modes which consist of "Replace Battery" or "Replace Unit". The system works in conjunction with the Spectron Self-Test/Self-Diagnostic functionality. If a malfunction occurs, the unit will flash a Service Alert code which is associated with either failure mode. In the case of REPLACE BATTERY, a new battery must be installed. In the case of REPLACE UNIT, the unit must be replaced. When the unit is in a serviceable condition, neither of the failure modes are illuminated and the green LED is On. Additional information can be found on the Instruction Sheet.

EasyID Status Panel



DIMENSIONS



Web: *www.dual-lite.com* • Tech Support: *(866)-313-3909*
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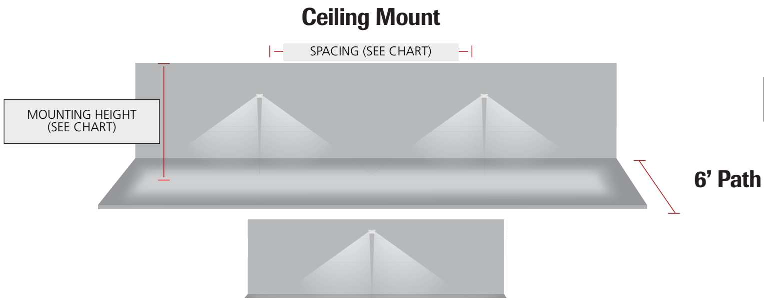
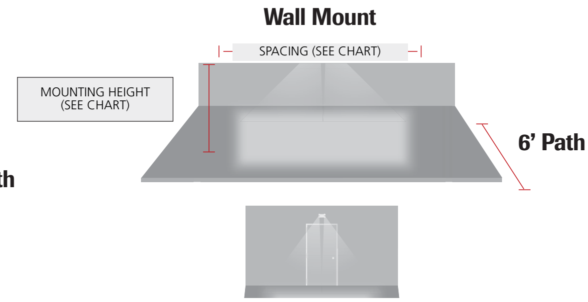
APPLICATION INFORMATION





*** Multiple unit spacing based on 6' path**

	Ceiling Mount						Wall Mount
EVHC	CH=30', R=10/10/10						CH=9' R=80/50/20
Mounting Height	20'	18'	16'	14'	12'	10'	7.5'
Max Spacing @ 1 FC Avg	40'	42'	44'	47'	49'	51'	57'
Max Spacing @ 1 FC Min	26'	25'	24'	23'	22'	20'	23'

	Ceiling Mount						Wall Mount
EVHC - 06L	CH=30', R=10/10/10						CH=9' R=80/50/20
Mounting Height	20'	18'	16'	14'	12'	10'	7.5'
Max Spacing @ 1 FC Avg	62'	65'	67'	70'	72'	75'	83'
Max Spacing @ 1 FC Min	35'	33'	32'	31'	29'	27'	34'

Meets Life Safety Code minimum illuminance of 0.1 fc and average illuminance of 1.0 fc.
Assumes open space with no obstructions, wall mounting height shown in above table, ceiling mounting height shown in above table and reflectances of 80/50/20.
Photometry files available on the Dual-Lite web site (www.dual-lite.com).

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