



CITY OF LOMITA

24300 Narbonne Avenue
Lomita, CA 90717

CONTRACT DOCUMENTS AND SPECIFICATIONS

FOR

**APPIAN WAY PUMP STATION
ROOF REPLACEMENT**

**BIDS Due
June 10, 2024
01:00 P.M.**

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SECTION A
NOTICE INVITING BIDS



CITY OF LOMITA, CALIFORNIA
NOTICE INVITING BIDS

NOTICE IS HEREBY GIVEN that the City of Lomita, County of Los Angeles, California (hereinafter “City”) will receive sealed bids at the Office of the City Clerk, City Hall, 24300 Narbonne Avenue, Lomita CA 90717, **until 1:00 PM on June 10, 2024**, at which time all bids will be publicly opened and read in the City Council Chambers at the above address for:

APPIAN WAY PUMP STATION ROOF REPLACEMENT

The Appian Way Pump Station, located at 26255 Appian Way, Lomita, CA, is more than 30 years old and has an original wooden roof with one exhaust fan and four skylights. The condition of this wooden roof has deteriorated with extensive termite damage and infestation.

This pump station is a critical water facility that must remain functional and accessible at all times since it controls the pressure and water supply for a pressure zone within the City. Tenting the building was not an option due to concerns with access and safety of drinking water pumps located inside. Therefore, this project consists of removing the existing wooden frame in its entirety and replacing it with a metal truss roof system along with other associated improvements such as new skylights and other ceiling-mounted fixtures.

The Contractor shall perform all work required for such construction in accordance with the contract documents and subject to the terms and conditions of the contract, complete and ready for use.

Each bid must be submitted in writing on a bid proposal furnished by the City. Bids must conform and be responsive to all contract documents. All bids must be sealed and must be plainly marked in the lower left-hand corner **“APPIAN WAY PUMP STATION ROOF REPLACEMENT.”**

Plans and Specifications may be downloaded and printed from the City’s website at no charge at:

<https://lomitacity.com/current-bids-rfps/>

Prospective bidders who only view and/or print the plans and specifications from the City's website will not automatically be added to the City's plan holder list for this project unless they send an email to publicworks@lomitacity.com, and f.aboujaoude@lomitacity.com and provide the firm's name, address, telephone and contact person with a valid email address. This will ensure that the prospective bidder is listed as a "Plan Holder" and will be informed of any addenda and all information issued after obtaining the official form of proposal.

Addenda will be posted on the City website, but it shall be the bidder's responsibility to inquire for any addenda/updates to this Notice Inviting Bid prior to submitting their bid.

Each proposal must be accompanied by a cash deposit, a certified cashier's check, or a bidder's bond, made payable to the City of Lomita, in an amount not less than 10% of the total bid submitted.

The successful bidder will be required to furnish a faithful performance bond in the amount of 100% of the contract price, and a payment bond in the amount of 100% of the contract price, both in a form satisfactory to the City Attorney. The successful bidder will also be required to pay the State of California prevailing wage scale as determined by the Department of Industrial Relations, available at <http://www.dir.ca.gov/PublicWorks/PublicWorks.html>.

The City reserves the right to reject any or all bids and to waive any informality or irregularity in any bid received and to be the sole judge of the merits of the respective bids received. The award, if made, will be made to the lowest responsible bidder. plans and specifications will be available for review at City Hall.

The contractor shall possess a valid State of California Contractors License, **Class A or B**. All work shall be completed within **180 working days** from the date of the Notice to Proceed (NTP).

An optional site walk will be scheduled for May 9, 2024 at 10:00 am. For coordination purposes, email f.aboujaoude@lomitacity.com.

All questions regarding this bid must be submitted in writing on or before **1:00 PM on May 15, 2024**, via email at: publicworks@lomitacity.com, and f.aboujaoude@lomitacity.com.

Kathleen Horn Gregory, MMC
City Clerk

SECTION B
INSTRUCTIONS TO BIDDERS

INSTRUCTIONS TO BIDDERS

I. QUALIFICATION OF BIDDERS

1. Competency of Bidders

The Bidder shall be thoroughly competent and capable of satisfactorily performing the Work covered by the Bid. As specified in the Bid Documents, the Bidder shall furnish statements of previous experience on similar work. When requested, the Bidder shall also furnish the plan of procedure proposed; the organization, machinery, plant and other equipment available for the Work; evidence of its financial condition and resources; and any other such documentation as may be required by the City to determine if the Bidder is responsible.

2. Contractor's License

At the time of submitting the Bid, the Bidder shall be licensed as a contractor in accordance with the provisions of Chapter 9, Division 3, of the California Business and Professions Code. **The required prime contractor license for this project is a Class A Contractor's license.** However, the City reserves the right to award the Contract to a contractor with another class if the City determines that the license is proper for the work.

3. Contractor Registration Requirements

SB 854 amended the Labor Code to require all contractors bidding on public work to register with the Department of Industrial Relations (DIR) and to pay an annual fee. The registration requires contractors to provide the State with evidence of the contractors' compliance with several statutory requirements. The registration requirement took effect on July 1, 2014.

4. Bidder's Submittal and Contract Award Prohibited

Under California Labor Code section 1771.1, as amended by SB 854, unless registered with the DIR, a contractor may not bid, nor be listed as a subcontractor, for any bid proposal submitted for public work on or after March 1, 2015. Similarly, a public entity cannot award a public work contract to a non-registered contractor, effective April 1, 2015. Also refer to Section 5-3.1 of the Special Provisions.

5. Bidder Qualifications

Bidder Qualifications called for to be submitted at the time of bid include, but are not necessarily limited to:

- a. The Contractor shall have been in business under the same name and California Contractor's License for a minimum of 10 continuous years prior to the bid opening date for this project. The license used to satisfy this requirement shall be of the same type as required by the contract.
- b. The Contractor shall provide a minimum of 3 references for similar projects which have been successfully completed in the State of California with a construction cost of at least \$2M. during the past 5 years.
- c. The Contractor or the Subcontractor performing the construction of similar projects shall have a minimum of 10 years' experience under the same name and California Contractor's License.
- d. The Contractor shall perform above 50% of the contract with its own forces.
- e. The Contractor shall apply for a City of Lomita business license, details of which can be found in the link below:
<https://lomitaca.portal.opengov.com/categories/1091>

II. **BIDDER RESPONSIBILITY**

A responsible Bidder is a Bidder who has demonstrated the attribute of trustworthiness, as well as ability, fitness, capacity, and experience to satisfactorily perform the work.

Bidders are notified that, in accordance with the Lomita Municipal Code, the City Council may determine whether the Bidder is responsible based on a review of the Bidder's performance on other contracts.

If, based on the provisions and criteria set forth in the Lomita Municipal Code, the Public Works Director proposes not to recommend the award of contract to the apparent low bidder, the Director shall notify the Bidder in writing of its intention to recommend to the City Council that the Council award the contract to the 2nd lowest responsible bidder. If the Bidder presents evidence in rebuttal to the recommendation, the Director shall evaluate the merits of such evidence, and based on that evaluation, make a recommendation to the City Council.

III. **ADDENDA TO THE CONTRACT DOCUMENTS**

The City may issue Addenda to the Contract Documents during the period of advertising for any reason. The Bidder shall acknowledge the receipt of the Addenda in their Bid. The failure of the Bidder to do so may result in the rejection of the Bid as non-responsive. **Addenda will be posted on the City website, but it shall be the bidder's responsibility to inquire for any addenda/ updates to this Notice Inviting Bid prior to submitting their bid.**

IV. PREPARATION OF THE BID

1. Examination of Site, Plans and Specifications

Prior to submitting a Bid, the Bidder shall examine the Plans and the Work site, carefully read the Specifications, and satisfy itself that it has the abilities and resources to complete the Work. The Bidder agrees that if it is awarded the Contract, no claim will be made against the City based on ignorance or misunderstanding of the provisions of the Contract Documents, the nature and amount of the work, and the physical and climatic conditions of the work site.

The Contractor shall have included in the contract price a sufficient sum to cover all items, including labor, materials, tools, equipment, and incidentals, that are implied or required for the complete improvements as contemplated by the drawings, specifications, and other contract documents.

2. Estimated Quantities

The quantities shown in the Bid are approximate only. The Contractor will be paid for the actual quantities of work based on field measurements as provided for in these Specifications. The City reserves the right to increase or decrease the amount of any item or portion of work to be performed or materials furnished, or to delete any item, in accordance with the Specifications.

3. Bid Instructions and Submissions

The Bid shall be submitted on the Bid Proposal forms included with the Specifications. All Bid Documents must be completed, executed, and submitted with the Bid by the Bidder.

Required seven (7) Bid Proposal Documents:

- 1) Bidder's Proposal
- 2) Contractor's Affidavit
- 3) Bid Bond (10%)
- 4) List of Subcontractors
- 5) Construction Project References
- 6) Violations of Federal or State Law
- 7) Disqualification or Debarment

All prices submitted will be considered as including all sales or use taxes. The Bid Proposal must be completed in ink or in typewritten form. The

bid sum and all bid amounts on the form must be stated in words and numerals; in case of a conflict, words will take precedence.

In the case of discrepancy between unit bid price and total bid, the unit price shall prevail.

V. BID BOND

Each bid shall be accompanied by Bidder's Security in an amount equal to ten (10) percent of the bid amount, which security shall be lawful money of the United States of America and in one of the following forms: (i) cashier's check made payable to the City of Lomita, (ii) certified check made payable to the City of Lomita, or (iii) bid bond executed by an admitted surety insurer and made payable to the City of Lomita. The City Bid Bond form must be used.

VI. NON-RESPONSIVE BIDS AND BID REJECTION

1. A Bid in which anyone (1) of the required seven (7) Bid proposal documents are not completed, executed, and submitted may be considered non-responsive and be rejected.
2. A Bid in which the Contract Unit Prices are unbalanced, which is incomplete, or which shows alteration of form or irregularities of any kind, or which contains any additions or conditional or alternate Bids that are not called for, may be considered non-responsive and be rejected.

VII. AWARD OF CONTRACT

In accordance with the Lomita Municipal Code, the City Council reserves the right to reject all bids received, to take all bids under advisement for a period not-to-exceed ninety (90) days after date of opening thereof, to waive any informality or irregularity in the Bid, and to be the sole judge of the merits of material included in the respective bids received.

VIII. EXECUTION OF CONTRACT

After the Contract is awarded, the awardee shall execute the following eight (8) documents:

- 1) Contract - Public Works Agreement
- 2) Construction or Service Contract Endorsement
- 3) Performance Bond (100% of Bid price)
- 4) Labor and Material Bond (100% of Bid price)
- 5) Workers' Compensation Insurance Certificate
- 6) Verification of Insurance Coverage (Certificates and Endorsements)

- 7) Construction Permit Application Form
- 8) Business License Application Form

IX. APPRENTICESHIP EMPLOYMENT STANDARDS

The Contractor is directed to the provisions in Sections 1776, 1777.5 and 1777.6 of the California Labor Code concerning the employment of apprentices by the contractor or any subcontractor under them.

X. PERMITS, LICENSES AND PUBLIC WORKS AGREEMENT

The Contractor shall procure and execute all permits, licenses, pay all charges and fees, and give all notices necessary and incidental to the completion of the Work. The Contractor shall carry out a Public Works Agreement. A no fee Excavation Permit will be issued by the City of Lomita for this project. The Contractor shall obtain a City of Lomita Business License.

XI. INSURANCE

The Contractor shall maintain Automobile Liability, General Liability and Workers' Compensation Insurance as specified in the Public Works Agreement included in the Project Specifications.

XII. PRE-BID INQUIRIES

A Bidder with a Pre-Bid Inquiry must e-mail their question(s) on or before **1:00 PM on May 15, 2024**, via email at publicworks@lomitacity.com, f.aboujaoude@lomitacity.com.

Questions received after this date may not be considered.

XIII. LABOR CODE – SB 854

The bidder shall be registered with the Department of Industrial Relations (DIR) in accordance with the provisions of Section 1771.1 of the California Labor Code, as amended by SB 854. No public work contract may be awarded to a non-registered contractor or subcontractor after April 15, 2015.

XIV. PREVAILING WAGE

Pursuant to Section 1773 of the Labor Code, the general prevailing wage rates in the county, or counties, in which the work is to be done have been determined by the Director of the California Department of Industrial Relations. These wages are set forth in the General Prevailing Wage Rates for this project, available from the California Department of Industrial Relations' Internet web site at <http://www.dir.ca.gov/DLSR/PWD>

XV. GUIDELINES DURING GENERAL PANDEMIC CONDITIONS

Contractors shall comply with all local, state, and federal laws and regulations including, but not limited to, the Governor’s and Los Angeles County Health Officer’s orders and guidance related to any general pandemic conditions that may be announces including social distancing, and best practices.

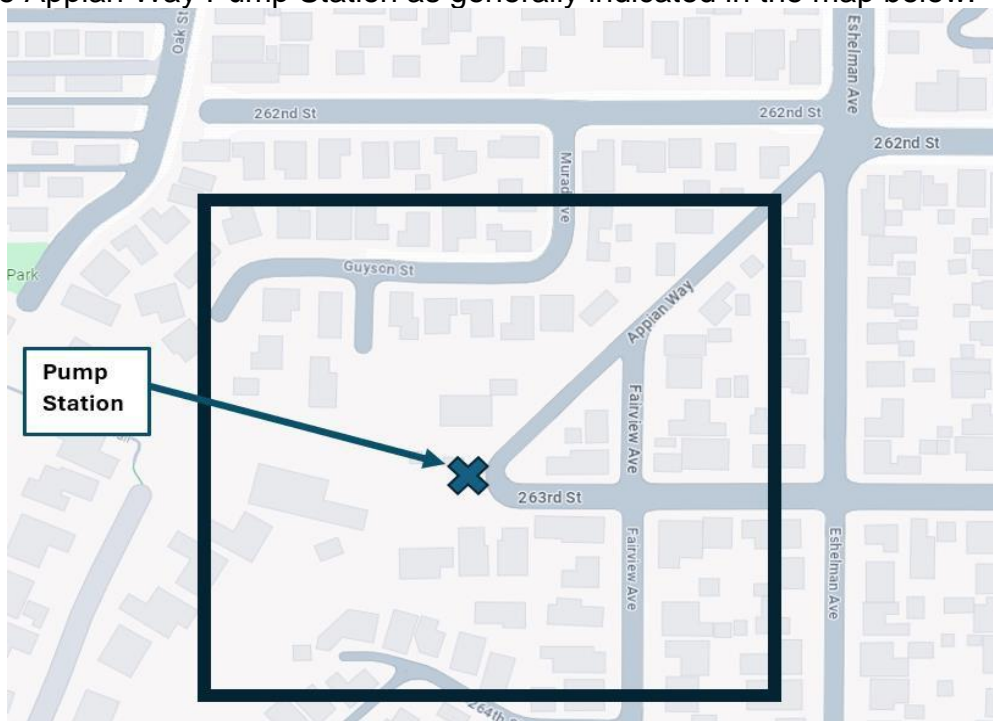
Contractors are required to check with the latest guidelines of the Los Angeles County Public Works and the Los Angeles County Public Health for construction sites during any possible health pandemics.

XVI. CONFROMANCE WITH CITY OF LOMITA NOISE ORDINANCE

The contractor shall abide by the noise regulations outlined in the City of Lomita Municipal Code (LMC). Section 4-4.04 of the LMC makes it unlawful to produce a noise within a residential area that exceeds 65 dBA in the daytime (7:00 AM to 9:00 PM) or 55 dBA in the nighttime (9:00 PM – 7:00 AM).

XVII. NOTIFICATION OF RESIDENTS OF START OF WORK

At least 5 business days before the start of work, the Contractor shall post written notifications at the doors of all households and apartments around the vicinity of the Appian Way Pump Station as generally indicated in the map below.



SECTION C
BID DOCUMENTS

(TO BE SUBMITTED WITH BID PACKAGE)

BIDDER'S PROPOSAL

APPIAN WAY PUMP STATION ROOF REPLACEMENT

Company: _____

Honorable Mayor and Members
of the Lomita City Council
Lomita, California

In accordance with the Notice Inviting Bids pertaining to the receiving of sealed proposals by the City Clerk of the City of Lomita for the above titled improvement, the undersigned hereby proposes to furnish all Work to be performed in accordance with the Plans, Specifications, Standard Drawings, and the Contract Documents, for the unit price or lump sum set forth in the following schedule.

The undersigned hereby acknowledges that he/she has examined the copies of the plans, specifications and all Contract Documents for this project and is fully aware of scope of the work.

The undersigned also acknowledges that he/she has examined the project site and locality where the work is to be performed and the legal requirements and conditions affecting the cost, progress, and performance of the work in strict accordance with the Contract Documents.

The undersigned also acknowledges that timely completion of the project is important to the City. Therefore, time being of the essence, he/she proposes that the work commenced and will be completed within the time specified in the Notice Inviting Bids.

Specification or Items not indicated on Bid Form: The Contractor is to accommodate those portions of the work required by the specifications or contract documents, whose method of payment is not included in other bid items elsewhere.

In addition, bid items costs associated with bonds, insurance, traffic control, labor, equipment, materials, overhead, profits, all other indirect costs shall be considered full compensation for each bid item.

All work shall be completed within 180 working days from the date the notice to proceed is issued by the Engineer.

PROJECT BID SCHEDULE

Item No.	Item Description	Qty.	Unit	Unit Price	Total Bid
1	Mobilization and Demobilization (Includes Temporary CMU Wall Shoring)	1	LS	\$	\$
2	Existing Roof Demolition, Haul Away, and Disposal	1,480	SF	\$	\$
3	Furnish and install New Roof System	1,480	SF	\$	\$
4	Furnish and install Acrylic Domed Skylight	4	EA	\$	\$
5	Furnish and install Conduit & Wiring	1	LS	\$	\$
6	Furnish and install Wallpack	6	EA	\$	\$
7	Furnish and install Ceiling Light	9	EA	\$	\$
8	Furnish and install Exhaust Fan	1	EA	\$	\$
9	Furnish, install and relocate temporary electrical conduit and antenna and provide temporary protection to existing equipment during construction	1	LS	\$	\$
TOTAL BID (Items 1 through 9)				\$	

TOTAL BID:

(Figures) _____

(Words) _____

***BID MAY BE REJECTED IF TOTAL IS NOT SHOWN IN FIGURES AND WORDS.**

The undersigned furthermore agrees to enter and execute a contract, with necessary bonds, at the unit prices set forth herein and in case of default in executing such contract, with necessary bonds, the check or bond accompanying this bid and the money payable thereon shall be forfeited thereby to and remain the property of the City of Lomita.

The above unit prices include all work appurtenant to the various items as outlined in the Specifications and all work or expense required for the satisfactory completion of said items. In case of discrepancies between unit prices and totals, the unit prices shall govern.

The undersigned declares that it has carefully examined the Plans, Specifications, and Contract Documents, and has investigated the site of the work and is familiar with the conditions thereon.

Contractor _____

Date: _____ By: _____

Contractor's State License No.: _____ Class _____ Exp. Date: _____

Contractor's Address: _____

Phone: _____

7. That the Contractor did not, directly or indirectly, submit the Contractor's bid price or any breakdown thereof, or the contents thereof, or divulge information or data relative thereto, to any corporation, partnership, company, association, organization, bid depository, or to any member or agent thereof, or to any individual or group of Individuals, except to the City of Lomita, or to any person or persons who have a partnership or other financial interest with said Contractor in its business.

Dated this _____ day of _____, 2024

Subscribed and Sworn to

Contractor

Title

before me this _____ day of _____, 2024.

Notary Public in and for said.
County and State.
(Seal)

BID BOND (10%)

KNOW ALL MEN BY THESE PRESENTS: That we, _____

as principal, and _____

as sureties, are held and firmly bound unto the City of Lomita, State of California, in the penal sum of _____ dollars (\$_____), for the payment whereof we hereby bind ourselves, our successors, heirs, executors or administrators jointly and severally, firmly by these presents.

The condition of this obligation is such that, whereas the above bounded principal is about to file with and submit to the City of Lomita a bid or proposal for the performance of certain work as required in the City of Lomita, said work being: **APPIAN WAY PUMP STATION ROOF REPLACEMENT** in compliance with the Specifications therefor under an invitation of said City contained in a notice or advertisement for bids or proposals; now if the bid or proposal of the said principal shall be accepted and if the said work be thereupon awarded to the principal by said City and if the said principal shall enter into a contract with the said City in accordance with said bid or proposal, or if the bid or proposal of the said principal is rejected, then this bond shall be void and of no effect and otherwise in full force and effect.

WITNESS our hands this _____ day of _____, 20____.

Principal

Surety/Attorney-in-Fact

Signature

Name: _____
Local Address: _____
Phone No.: _____
Fax No.: _____

LIST OF SUBCONTRACTORS

APPIAN WAY PUMP STATION ROOF REPLACEMENT

The Bidder is required to fill in the following blanks in accordance with the provisions of the Subletting and Subcontracting Fair Practices Act (Chapter 2 of Division 5, Title 1 of the Government Code of the State of California) and should familiarize itself with Section 2-3 of the Standard Specifications.

Name Under Which Subcontractor is Licensed: _____

License Number: _____

Address of Office, Mill or Shop: _____

Specific Description of Sub-Contract: _____

Name Under Which Subcontractor is Licensed: _____

License Number: _____

Address of Office, Mill or Shop: _____

Specific Description of Sub-Contract: _____

Name Under Which Subcontractor is Licensed: _____

License Number: _____

Address of Office, Mill or Shop: _____

Specific Description of Sub-Contract: _____

Name Under Which Subcontractor is Licensed: _____

License Number: _____

Address of Office, Mill or Shop: _____

Specific Description of Sub-Contract: _____

Subcontractors listed in accordance with the provisions of Section 2-3 must be properly licensed under the laws of the State of California for the type of work which they are to perform. Do not list alternate subcontractors for the same work.

CONSTRUCTION PROJECT REFERENCE

(Work similar in magnitude and degree of difficulty completed by Contractor within the past three [3] years.)

1. Name (Firm/Agency): _____
Address: _____
Contact Person: _____ Telephone No.: _____
Title of Project: _____
Project Location: _____
Date of Completion: _____ Contract Amount: \$ _____

2. Name (Firm/Agency): _____
Address: _____
Contact Person: _____ Telephone No.: _____
Title of Project: _____
Project Location: _____
Date of Completion: _____ Contract Amount: \$ _____

3. Name (Firm/Agency): _____
Address: _____
Contact Person: _____ Telephone No.: _____
Title of Project: _____
Project Location: _____
Date of Completion: _____ Contract Amount: \$ _____

VIOLATIONS OF FEDERAL, STATE OR LOCAL LAWS

1. Has your firm or its officers been assessed any penalties by an agency for noncompliance or violations of Federal, State or Local labor laws and/or business or licensing regulations within the past five (5) years relating to your construction projects?

Yes/No: _____ Federal/State: _____

If "yes," identify and describe, (including agency and status): _____

Have the penalties been paid? Yes/No: _____

2. Does your firm or its officers have any ongoing investigations by any public agency regarding violations of the State Labor Code, California Business and Professions Code or State Licensing Laws?

Yes/No: _____ Code/Laws: _____ Section/Article: _____

If "yes," identify and describe, (including agency and status): _____

DISQUALIFICATION OR DEBARMENT

Has your firm, any officer of your firm, or any employee who has a proprietary interest in your firm ever been disqualified, removed, or otherwise prevented from bidding on, performing work on, or completing a federal, state or local project because of a violation of law or a safety regulation? Yes/No: _____. If yes, provide the following information (if more than once, use separate sheets):

Date: _____ Entity: _____

Location: _____

Reason: _____

Provide Status and any Supplemental Statement: _____

Has your firm been reinstated by this entity? Yes/No: _____

SECTION D
CONTRACT DOCUMENTS

**TO BE SUBMITTED
WITHIN TWENTY ONE (21) CALENDAR DAYS
AFTER AWARD OF CONTRACT**



CITY OF LOMITA PUBLIC WORKS AGREEMENT

CITY OF LOMITA PUBLIC WORKS AGREEMENT

This Public Works Agreement ("Agreement") is made and entered into as of the date executed by the City Manager and attested to by the City Clerk, by and between _____ (hereinafter referred to as "CONTRACTOR") and the City of Lomita, California, a municipal corporation (hereinafter referred to as "CITY").

RECITALS

- A. Pursuant to the Notice Inviting Sealed Bids for **Appian Way Pump Station Roof Replacement**, bids were received, publicly opened, and declared on the date specified in the notice.
- B. On _____, Lomita's City Council declared CONTRACTOR to be the lowest responsible bidder and accepted the bid of CONTRACTOR.
- C. The City Council has authorized the City Manager to execute a written contract with CONTRACTOR for furnishing labor, equipment, and material for the **APPIAN WAY PUMP STATION ROOF REPLACEMENT** Project in the City of Lomita.

NOW, THEREFORE, in consideration of the foregoing and the mutual covenants herein contained, it is agreed:

1. GENERAL SCOPE OF WORK: CITY agrees to engage CONTRACTOR and CONTRACTOR agrees to furnish all necessary labor, tools, materials, appliances, and equipment for and do the work for the **APPIAN WAY PUMP STATION ROOF REPLACEMENT** Project in the City of Lomita. The work shall be performed in accordance with the Plans and Specifications dated February 9th, 2024 (the "Specifications" attached as Exhibit A) and in accordance with bid prices set forth in CONTRACTOR'S Bid Proposal (attached as Exhibit B) and in accordance with the instructions of the City Engineer.
2. INCORPORATED DOCUMENTS TO BE CONSIDERED COMPLEMENTARY: The contract documents for the aforesaid project, a complete set of which is on file with the Lomita City Clerk's Office, shall consist of the Notice Inviting Bids, Instructions to Bidders, Bid Proposal, Builders General Provisions, Standard Specifications, Special Provisions, and all referenced specifications, details, standard drawings, and appendices; together with this Agreement and all required bonds, insurance certificates, permits, notices and affidavits; and also, including any and all addenda or supplemental agreements clarifying, amending,

or extending the work contemplated as may be required to insure its completion in an acceptable manner. All of the provisions of said contract documents are made a part hereof as though fully set forth herein. This contract is intended to require a complete and finished piece of work and anything necessary to complete the work properly and in accordance with the law and lawful governmental regulations shall be performed by CONTRACTOR whether set out specifically in the contract or not. Should it be ascertained that any inconsistency exists between the aforesaid documents and this written agreement, the provisions of this Agreement, the Builders General Provisions, and the Standard Specifications, in that order, shall control. Collectively, these contract documents constitute the complete agreement between CITY and CONTRACTOR and supersede any previous agreements or understandings.

3. **COMPENSATION:** CONTRACTOR agrees to receive and accept the prices set forth in its Bid Proposal as full compensation for furnishing all materials, performing all work, and fulfilling all obligations hereunder. Said compensation shall cover all expenses, losses, damages, and consequences arising out of the nature of the work during its progress or prior to its acceptance including those for well and faithfully completing the work and the whole thereof in the manner and time specified in the aforesaid contract documents; and also including those arising from actions of the elements, unforeseen difficulties or obstructions encountered in the prosecution of the work, suspension or discontinuance of the work, and all other unknowns or risks of any description connected with the work.
4. **TIME OF PERFORMANCE:** CONTRACTOR agrees to complete the work within **180 working days** from the date of the notice to proceed. By signing this Agreement, CONTRACTOR represents to CITY that the contract time is reasonable for completion of the work and that CONTRACTOR will complete such work within the contract time. In accordance with Government Code Section 53069.85, CONTRACTOR agrees to forfeit and pay CITY as liquidated damages, not as a penalty, the sum of \$1000.00 per day for each and every day of unauthorized delay beyond the completion date, which amount shall be deducted from any payments due or to become due the CONTRACTOR.
5. **PREVAILING WAGES:**

Pursuant to Labor Code § 1720, and as specified in 8 California Code of Regulations § 16000, CONTRACTOR must pay its workers prevailing wages. It is CONTRACTOR's responsibility to interpret and implement any prevailing wage requirements and CONTRACTOR agrees to pay any penalty or civil damages resulting from a violation of the prevailing wage laws.

In accordance with Labor Code § 1773.2, copies of the prevailing rate of per diem wages are available upon request from CITY's Engineering Division or the website for State of California Prevailing wage determination at <http://www.dir.ca.gov/DLSR/PWD>. CONTRACTOR must post a copy of the prevailing rate of per diem wages at the job site.

CITY directs CONTRACTOR's attention to Labor Code §§ 1777.5, 1777.6 and 3098 concerning the employment of apprentices by CONTRACTOR or any subcontractor.

Labor Code § 1777.5 requires CONTRACTOR or subcontractor employing tradesmen in any apprenticeship occupation to apply to the joint apprenticeship committee nearest the site of the public works project and which administers the apprenticeship program in that trade for a certificate of approval. The certificate must also fix the ratio of apprentices to journeymen that will be used in the performance of the contract. The ratio of apprentices to journeymen in such cases will not be less than one to five except:

When employment around coverage by the joint apprenticeship committee has exceeded an average of 15 percent in the 90 days before the request for certificate, or

When the number of apprentices in training in the area exceeds a ratio of one to five, or

When the trade can show that it is replacing at least 1/30 of its membership through apprenticeship training on an annual basis state-wide or locally, or

When CONTRACTOR provides evidence that CONTRACTOR employs registered apprentices on all his contracts on an annual average of not less than one apprentice to eight journeymen.

CONTRACTOR is required to make contributions to funds established for the administration of apprenticeship programs if CONTRACTOR employs registered apprentices or journeymen in any apprentice able trade on such contracts and if other contractors on the public works site are making such contributions.

CONTRACTOR and any subcontractor must comply with Labor Code §§ 1777.5 and 1777.6 in the employment of apprentices.

Information relative to apprenticeship standards, wage schedules and other requirements may be obtained from the Director of Industrial Relations, ex-officio the Administrator of Apprenticeship, San Francisco, California, or from the Division of Apprenticeship Standards and its branch offices.

CONTRACTOR and its subcontractors must keep an accurate certified payroll records showing the name, occupation, and the actual per diem wages paid to each worker employed in connection with this Agreement. The record will be kept open at all reasonable hours to the inspection of the body awarding the contract and to the Division of Labor Law Enforcement. If requested by CITY, CONTRACTOR must provide copies of the records at its cost.

6. LEGAL HOURS OF WORK: Eight (8) hours of labor shall constitute a legal day's work for all workmen employed in the execution of this contract, and CONTRACTOR and any subcontractor under it shall comply with and be governed by the laws of the State of California having to do with working hours

set forth in Division 2, Part 7, Chapter 1, Article 3 of the Labor Code of the State of California as amended.

CONTRACTOR shall forfeit, as a penalty to CITY, twenty-five dollars (\$25.00) for each laborer, workman or mechanic employed in the execution of the contract, by him or any subcontractor under it, upon any of the work hereinbefore mentioned, for each calendar day during which the laborer, worker or mechanic is required or permitted to labor more than eight (8) hours in violation of the Labor Code.

7. **TRAVEL AND SUBSISTENCE PAY:** CONTRACTOR agrees to pay travel and subsistence pay to each worker needed to execute the work required by this Agreement as such travel and subsistence payments are defined in the applicable collective bargaining agreements filed in accordance with Labor Code Section 1773.8.
8. **CONTRACTOR'S LIABILITY:** The City of Lomita and its officers, agents and employees ("Indemnitees") shall not be answerable or accountable in any manner for any loss or damage that may happen to the work or any part thereof, or for any of the materials or other things used or employed in performing the work; or for injury or damage to any person or persons, either workers or employees of CONTRACTOR, of its subcontractors or the public, or for damage to adjoining or other property from any cause whatsoever arising out of or in connection with the performance of the work. CONTRACTOR shall be responsible for any damage or injury to any person or property resulting from defects or obstructions or from any cause whatsoever.

CONTRACTOR will indemnify Indemnitees against and will hold and save Indemnitees harmless from any and all actions, claims, damages to persons or property, penalties, obligations or liabilities that may be asserted or claimed by any person, firm, entity, corporation, political subdivision, or other organization arising out of or in connection with the work, operation, or activities of CONTRACTOR, its agents, employees, subcontractors or invitees provided for herein, whether or not there is concurrent passive negligence on the part of any Indemnitee. In connection therewith:

- a. CONTRACTOR will defend any action or actions filed in connection with any such claims, damages, penalties, obligations, or liabilities and will pay all costs and expenses, including attorneys' fees, expert fees and costs incurred in connection therewith.
- b. CONTRACTOR will promptly pay any judgment rendered against CONTRACTOR or Indemnitees covering such claims, damages, penalties, obligations, and liabilities arising out of or in connection with such work, operations, or activities of CONTRACTOR hereunder, and CONTRACTOR agrees to save and hold the Indemnitees harmless therefrom.
- c. In the event Indemnitees are made a party to any action or proceeding filed or prosecuted against CONTRACTOR for damages or other claims arising out of or in connection with the work, operation, or activities hereunder, CONTRACTOR agrees to pay to Indemnitees and any all costs and expenses incurred by Indemnitees in such action or proceeding together with reasonable attorneys' fees.

CONTRACTOR'S obligations under this section apply regardless of whether or not such claim, charge, damage, demand, action, proceeding, loss, stop notice, cost, expense, judgment, civil fine or penalty, or liability was caused in part or contributed to by an Indemnitee. However, without affecting the rights of CITY under any provision of this agreement, Contractor shall not be required to indemnify and hold harmless CITY for liability attributable to the active negligence of CITY, provided such active negligence is determined by agreement between the parties or by the findings of a court of competent jurisdiction. In instances where CITY is shown to have been actively negligent and where CITY active negligence accounts for only a percentage of the liability involved, the obligation of Contractor will be for that entire portion or percentage of liability not attributable to the active negligence of City.

So much of the money due to the CONTRACTOR under and by virtue of the contract as shall be considered necessary by CITY may be retained by CITY until disposition has been made of such actions or claims for damages as aforesaid.

It is expressly understood and agreed that the foregoing provisions are intended to be as broad and inclusive as is permitted by the law of the State of California. This indemnity provision shall survive the termination of the Agreement and is in addition to any other rights or remedies which Indemnitees may have under the law.

This indemnity is effective without reference to the existence or applicability of any insurance coverage which may have been required under this Agreement or any additional insured endorsements which may extend to Indemnitees.

THE CONTRACTOR, on behalf of itself and all parties claiming under or through it, hereby waives all rights of subrogation and contribution against the Indemnitees, while acting within the scope of their duties, from all claims, losses and liabilities arising out of or incident to activities or operations performed by or on behalf of the CONTRACTOR regardless of any prior, concurrent, or subsequent passive negligence by the Indemnitees.

9. THIRD PARTY CLAIMS. In accordance with Public Contracts Code § 9201, CITY will promptly inform CONTRACTOR regarding third-party claims against CONTRACTOR, but in no event later than ten (10) business days after CITY receives such claims. Such notification will be in writing and forwarded in accordance with the "Notice" section of this Agreement. As more specifically detailed in the contract documents, CONTRACTOR agrees to indemnify and defend the City against any third-party claim.

10. WORKERS COMPENSATION: In accordance with California Labor Code Sections 1860 and 3700, CONTRACTOR and each of its subcontractors will be required to secure the payment of compensation to its employees. In accordance with the provisions of California Labor Code Section 1861, CONTRACTOR, by signing this contract, certifies as follows: "I am aware of the provisions of Section 3700 of the Labor Code which require every employer to be insured against liability for worker's compensation or to undertake self-insurance in accordance with the provisions of that code, and I will comply with such provisions before commencing the performance of the work of this contract.

11. INSURANCE: With respect to performance of work under this contract, CONTRACTOR shall maintain and shall require all of its subcontractors to maintain insurance as required in the Builders General Provisions.
12. ASSIGNMENT: This Agreement is not assignable nor the performance of neither party's duties delegable without the prior written consent of the other party. Any attempted or purported assignment or delegation of any of the rights of obligations of either party without the prior written consent of the other shall be void and of no force and effect.
13. INDEPENDENT CONTRACTOR: THE CONTRACTOR is and shall at all times remain as to the CITY, a wholly independent contractor. Neither the CITY nor any of its agents shall have control of the conduct of CONTRACTOR or any of CONTRACTOR'S employees, except as herein set forth. CONTRACTOR shall not at any time or in any manner represent that it or any of its agents or employees are in any manner agents or employees of CITY.
14. TAXES: CONTRACTOR is responsible for paying all retail sales and use, transportation, export, import, special or other taxes and duties applicable to, and assessable against any work, materials, equipment, services, processes, and operations incidental to or involved in this contract. CONTRACTOR is responsible for ascertaining and arranging to pay them. The prices established in the contract shall include compensation for any taxes CONTRACTOR is required to pay by laws and regulations in effect at the bid opening date.
15. LICENSES: CONTRACTOR represents and warrants to CITY that it has all licenses, permits, qualifications, insurance, and approvals of whatsoever nature which are legally required of CONTRACTOR to practice its profession. CONTRACTOR represents and warrants to CITY that CONTRACTOR shall, at its sole cost and expense, keep in effect or obtain at all times during the term of this Agreement any licenses, permits, insurance, and approvals which are legally required of CONTRACTOR to practice its profession. CONTRACTOR shall maintain a City of Lomita business license, if required under CITY ordinance.
16. RECORDS: CONTRACTOR shall maintain accounts and records, including personnel, property, and financial records, adequate to identify and account for all costs pertaining to this Agreement and such other records as may be deemed necessary by CITY or any authorized representative, and will be retained for three years after the expiration of this Agreement. All such records shall be made available for inspection or audit by CITY at any time during regular business hours.
17. SEVERABILITY. If any portion of these contract documents are declared by a court of competent jurisdiction to be invalid or unenforceable, then such portion will be deemed modified to the extent necessary in the opinion of the court to render such portion enforceable and, as so modified, such portion and the balance of this Agreement will continue in full force and effect provided that it does not frustrate the mutual intent of the parties herein.
18. WHOLE AGREEMENT: This Agreement supersedes any and all other agreements either oral or written, between the parties and contains all of the

covenants and agreements between the parties pertaining to the work of improvements described herein. Each party to this Agreement acknowledges that no representations, inducements, promises, or agreements, orally or otherwise, have been made by any party, or anyone acting on behalf of any party, which are not embodied herein, and that any other agreement, statements, or promise not contained in this Agreement shall not be valid or binding. Any modification of this Agreement will be effective only if signed by the party to be charged.

19. AUTHORITY: CONTRACTOR affirms that the signatures, titles, and seals set forth hereinafter in execution of this Agreement represent all individuals, firm members, partners, joint ventures, and/or corporate officers having a principal interest herein. Each party warrants that the individuals who have signed this Agreement have the legal power, right, and authority to make this Agreement and to bind each respective party. This Agreement may be modified by written amendment. The CITY's City Manager may execute any such amendment on CITY's behalf.

20. NOTICES: All notices permitted or required under this Agreement shall be in writing and shall be deemed made when delivered to the applicable party's representative as provided in this Agreement. Additionally, such notices may be given to the respective parties at the following addresses, or at such other addresses as the parties may provide in writing for this purpose.

Such notices shall be deemed made when personally delivered or when mailed forty-eight (48) hours after deposit in the U.S. mail, first-class postage prepaid, and addressed to the party at its applicable address. Courtesy copies of notices may be sent via electronic mail, provided that the original notice is deposited in the U.S. mail or personally delivered as specified in this Section.

CITY OF LOMITA, CA

24300 Narbonne Avenue, Lomita, CA 90717

Attention:

CONTRACTOR:

Attention:

21. DISPUTES. Disputes arising from this Agreement will be determined in accordance with the contract documents and Public Contracts Code §§ 10240-10240.13.

22. NON-DISCRIMINATION: No discrimination shall be made in the employment of persons in the work contemplated by this Agreement because of race, religion, color, medical condition, sex, sexual orientation, national origin, political affiliation or opinion, or pregnancy or pregnancy-related condition. A violation of this

section exposes CONTRACTOR to the penalties provided for in Labor Code Section 1735.

23. NO THIRD PARTY BENEFICIARY. This Agreement and every provision herein is for the exclusive benefit of the Contractor and the City and not for the benefit of any other party. There will be no incidental or other beneficiaries of any of the Contractor's or the City's obligations under this Contract.
24. TIME IS OF ESSENCE. Time is of the essence for every provision of the Contract Documents.
25. ACCEPTANCE OF FACSIMILE OR ELECTRONIC SIGNATURES. The Parties agree that this Agreement will be considered signed when the signature of a party is delivered by facsimile transmission, scanned, and delivered via electronic mail, or delivered using digital signature technology approved by CITY. Such facsimile or electronic signatures will be treated in all respects as having the same effect as an original signature.
26. GOVERNING LAW: This Agreement shall be governed by the laws of the State of California, and exclusive venue for any action involving this Agreement will be in Los Angeles County.

IN WITNESS WHEREOF, the parties hereto have executed this Agreement with all the formalities required by law on the respective dates set forth opposite their signatures.

State of California

CONTRACTOR'S License No. _____

CONTRACTOR

_____ By: _____
DATE

CONTRACTOR'S Business Phone _____

Emergency Phone at which CONTRACTOR can be reached at any time: _____

CITY OF LOMITA, CALIFORNIA

_____ By: _____
DATE _____, CITY MANAGER

ATTEST:

_____ By: _____
DATE Kathleen Horn Gregory, CITY CLERK

APPROVED AS TO FORM:

_____ By: _____
DATE Trevor Rusin, CITY ATTORNEY

Attachments: Exhibit A: Contractor's Bid Proposal

**CITY OF LOMITA
CONSTRUCTION OR SERVICE CONTRACT ENDORSEMENT**

To be attached to and made a part of all policies ensuring the liability of any person, firm or corporation performing services under contract for the City of Lomita.

Notwithstanding any inconsistent expression in the policy to which this endorsement is attached, or in any other endorsement now or hereafter attached thereto, or made a part thereof, the protection afforded by said policy shall:

1. Include the City of Lomita as an additional insured. (To include the elected officials, appointed officials, and employees.)
2. Indemnify and save harmless the City of Lomita against all claims resulting from the undertaking specified in the contract known as:

**PROPOSAL, SPECIFICATIONS, BOND, AND AFFIDAVIT
FOR
APPIAN WAY PUMP STATION ROOF REPLACEMENT**

This holds harmless assumption on the part of the underwriters shall include all costs of investigation and defense, including claims based on damage to substructures not shown, not located on the plans, or shown incorrectly.

3. Not to be cancelled except by notice to the City Attorney of the City of Lomita at least thirty (30) days prior to the date of cancellation.
4. Provide single limit for Bodily Injury Liability and Property Damage Liability combined, \$3,000,000 each Occurrence, and \$5,000,000 Aggregate.
5. Limited classifications, restricting endorsements, exclusions or other special provisions contained in the policy shall not act to limit the benefits of coverage as they shall apply to the City of Lomita as enumerated in this endorsement. However, nothing contained herein shall affect any rights of the insurer against the insured.
6. It is further expressly agreed by and between the parties hereto that the following two provisions, (a) and (b), are a part of this contract:
 - (a) That the CONTRACTOR specifically agrees to comply with applicable provisions of Section 1777.5 of the Labor Code relating to the employment by contractor or subcontractor under it, of journeyman or apprentices, or workmen, in any apprentice able craft or trade.
 - (b) By my signature hereunder, as CONTRACTOR, I certify that I am aware of the provisions of Section 3700 of the Labor Code which requires every employer to be insured against liability for Workers' Compensation or to undertake self-insurance in accordance with the provisions of that code,

and I will comply with such provisions before commencing the performance of the work of this contract.

The limits of liability as stated in this endorsement apply to the insurance afforded by this endorsement notwithstanding that the policy may have lower limits of liability applying elsewhere in the policy.

Duly Authorized Agent

Attached to and forming part of

Policy No.: _____

of the: _____

Date: _____

Expiration Date: _____

PERFORMANCE BOND

KNOW ALL MEN BY THESE PRESENTS:

That we, _____ as Principal(s) and _____ a corporation, incorporated, organized, and existing under the laws of the State of _____, and authorized to execute bonds and undertakings and to do a general surety business in the State of California, as Surety, are jointly and severally held and firmly bound unto the City of Lomita, a municipal corporation, located in the County of Los Angeles, State of California, in the full and just sum of: _____ Dollars (\$ _____), lawful money of the United States of America, for the payment of which sum, well and truly to be made, we bind ourselves and our respective heirs, executors, administrators, representative, successors and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH, that: **WHEREAS**, said Principal(s) have/has entered into, or are/is about to enter into, a certain written contract or agreement, dated as of the _____ day of _____, 20____, with the said City of Lomita for the **APPIAN WAY PUMP STATION ROOF REPLACEMENT** all as is more specifically set forth in said contract or agreement, a full, true and correct copy of which is hereunto attached, and hereby referred to and by this reference incorporated herein and made a part hereof;

NOW, THEREFORE, if the said Principal(s) shall faithfully and well and truly do, perform and complete, or cause to be done, performed and complete, each and all of the covenants, terms, conditions, requirements, obligations, acts and things, to be met, done or performed by said Principal(s), including any guarantee period as set forth in, or required by, said contract or agreement, all at and within the time or times, and in the manner as therein specified and contemplated, then this bond and obligation shall be null and void; otherwise it shall be and remain in full force, virtue and effect.

The said Surety, for value received, hereby stipulates and agrees that no amendment, change, extension of time, alteration or addition to said contract or agreement, or of any feature or item or items of performance required therein or thereunder, shall in any manner affect its obligations on or under this bond; and said Surety does hereby waive notice of any such amendment, change, extension of time, alteration, or addition to said contract or agreement, and of any feature or item or items of performance required therein or thereunder.

PERFORMANCE BOND (CONTINUED)

In the event any suit, action or proceedings is instituted to recover on this bond or obligation, said Surety will pay, and does hereby agree to pay, as attorney's fees for said City, such sum as the Court in any such suit, action or proceeding may adjudge reasonable.

EXECUTED, SEALED AND DATED this _____ day of _____, 20_____.

CORPORATE SEAL

PRINCIPAL(S):

BY _____

BY _____

CORPORATE SEAL

SURETY:

BY _____

LABOR AND MATERIAL BOND

KNOW ALL MEN BY THESE PRESENTS:

That we, [REDACTED] as Principal(s) and [REDACTED] a corporation, incorporated, organized, and existing under the laws of the State of [REDACTED], and authorized to execute bonds and undertakings and to do a general surety business in the State of California, as Surety, are jointly and severally held and firmly bound unto:

- (a) The State of California for the use and benefit of the State Treasurer, as ex-officio Treasurer and custodian of the Unemployment Fund of said State; and
- (b) The City of Lomita, California; and
- (c) Any and all persons who do or perform or who did or performed work or labor upon or in connection with the work or improvement referred to in the contract or agreement hereinafter mentioned; and
- (d) Any and all materialmen, persons, companies, firms, association, or corporations, supplying or furnishing any materials, provisions, provender, transportation, appliances or power, or other supplies used in, upon, for or about or in connection with the performance of the work or improvement contracted to be executed, done, made or performed under said contract or agreement; and
- (e) Any and all persons, companies, firms, associations, or corporations furnishing, renting, or hiring teams, equipment, implements or machinery for, in connection with, or contributing to, said work to be done or improvement to be made under said contract or agreement; and
- (f) Any and all persons, companies, firms, associations, or corporations who supply both work and materials;

and whose claim has not been paid by said Principal(s), in full and just sum of [REDACTED] Dollars (\$ [REDACTED]), lawful money of the United States of America, for the payment of which will and truly to be made, said Principal(s) and said Surety do hereby bind themselves and their respective heirs, executors, administrators, representatives, successors and assigns, jointly and severally, firmly by these presents.

LABOR AND MATERIAL BOND (CONTINUED)

THE CONDITION OF THE FOREGOING OBLIGATION IS SUCH, THAT: WHEREAS, said Principal(s) have/has entered into or are/is about to enter into a certain written contract or agreement, dated as of the _____ day of _____ 20 ____, with the City of Lomita for the **APPIAN WAY PUMP STATION ROOF REPLACEMENT**, all as is more specifically set forth in said contract or agreement, a full, true and correct copy of which is hereunto attached, and hereby referred to and by this reference incorporated herein and made a part hereof;

NOW, THEREFORE, if the said Principal(s) (or any of his/her, its, or their subcontractors) under said contract or agreement fails or fail to pay:

- (1) For any materials, provisions, provender, transportation, appliances, or power, or other supplies; or
- (2) For the hire of any teams, equipment, implements, or machinery; or
- (3) For any work or labor; supplies, furnished, provided, used, done or performed in, upon, for or about or in connection with the said work or improvement; or
- (4) For amounts due under the Unemployment Insurance Act of the State of California with respect to such work or improvement.

the Surety on this bond will pay the same in an amount not exceeding the sum hereinabove specified in this bond; and, also, in case suit is brought upon this bond, said Surety will (and does hereby agree to) pay a reasonable attorney's fee, to be fixed and taxed as costs, and included in the judgment therein rendered.

This bond shall (and it is hereby made to) insure to the benefit of any and all persons entitled to file claims under Section 1192.1 of the Code of Civil Procedure of the State of California, so as to give a right of action to them or their assigns in any suit brought upon this bond, all as contemplated under the provisions of Section 4205 of the Government Code, and of Chapter 1 of Title 4 of Part 3 of the Code of Civil Procedure, of the State of California.

This bond is executed and filed in connection with said contract or agreement hereunto attached to comply with each and all the provisions of the laws of the State of California above mentioned or referred to, and of all amendments thereto, and the obligors so intend and do hereby bind themselves accordingly.

WORKERS' COMPENSATION INSURANCE CERTIFICATION

APPIAN WAY PUMP STATION ROOF REPLACEMENT,

In compliance with Section 7-4 of the Standard Specifications, the CONTRACTOR shall complete and submit the following certification with a Certificate of Insurance before execution of the contract.

I am aware of, and will comply with, Section 3700 of the Labor Code, requiring every employer to be insured against liability for Workers' Compensation or to undertake self-insurance before commencing any of the work.

DATED: _____

CONTRACTOR

By: _____
Signature

Title: _____

SECTION E

SPECIAL PROVISIONS

**CITY OF LOMITA
APPIAN WAY PUMP STATION ROOF REPLACEMENT**

PROJECT TECHNICAL SPECIFICATIONS

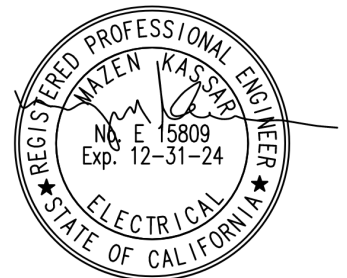
<u>SECTION</u>	<u>DESCRIPTION</u>
02050	DEMOLITION
02222	PROTECTING EXISTING FACILITIES
03600	GROUT
05120	STRUCTURAL STEEL AND MISCELLANEOUS METALWORK
05300	METAL DECKING
07411	METAL ROOF PANELS
07620	SHEET METAL FLASHING AND TRIM
07900	JOINT SEALERS
15870	EXHAUST VENTILLATION FAN
16010	GENERAL ELECTRICAL REQUIREMENTS
16050	BASIC ELECTRICAL MATERIALS AND METHODS
16073	HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS
16075	ELECTRICAL IDENTIFICATION
16120	LOW VOLTAGE WIRE AND CABLE
16130	RACEWAYS AND BOXES
16511	INTERIOR LIGHTING
16521	EXTERIOR LIGHTING



02/9/2024



02/9/2024



02/9/2024

SECTION 02050 DEMOLITION

PART 1: GENERAL

1.01 DESCRIPTION

This Section includes demolition and removal of existing building roof system.

1.02 SUBMITTALS

A. Submit schedule of demolition. Include details about specific tasks that must be completed prior to demolition of existing building roof. Identify demolition time constraints. Demolition schedule shall be a part of the Construction Schedule.

B. Provide tickets documenting proper disposal of contaminated materials.

1.03 MEASUREMENT AND PAYMENT

Full compensation for demolition including furnishing all materials, labor, tools, equipment, and incidentals and disposal or delivery of removed items and performing all the work described in this Section and as indicated on the Plans shall be included in the Contract lump sum price paid for Demolition and no additional compensation shall be allowed therefor.

RECYCLING

1.04

All materials that can be recycled in lieu of disposal shall be recycled.

PART 2: MATERIALS

(Not Used)

PART 3: EXECUTION

3.01 GENERAL

Perform removal, replacement, and demolition work in accordance these specifications and as shown on the Plans.

3.02 CONSTRAINTS

The existing Pump Station Facility shall remain in service during the demolishing of the existing roof. Contractor shall take action to cover and protect facility components.

3.03 DEMOLITION

A. Building roof to be demolished shall be removed in their entirety and disposed of offsite.

- B. Perform the work in a manner that will not damage parts of the structure not intended to be removed. If, in the opinion of the Engineer, the method of demolition used may endanger or damage parts of the structure or affect the satisfactory operation of the facilities, promptly change the method when so notified by the Engineer.

3.04 **DUST CONTROL**

- A. Provide misting water sprays sufficient to reduce airborne dusting from demolition work.
- B. Apply additional water dust suppression applied during dry weather.
- C. Avoid dust-generating work must be avoided on high wind days.

3.05 **DISPOSAL**

All construction debris shall be disposed of in accordance with all State and local laws and requirements.

3.06 **ASBESTOS**

The City of Lomita conducted laboratory testing on the roof of the pump station by a third party. No asbestos was detected as shown in the test reports in Appendix III.

END OF SECTION

SECTION 02222 PROTECTING EXISTING FACILITIES

PART 1: GENERAL

1.01 DESCRIPTION

This section describes materials and procedures for protecting existing improvements.

1.02 SUBMITTALS

- A. Submit method of protection for all interior piping and equipment.
- B. Submit method of temporary support, bracing or shoring of the existing CMU building walls.
- C. Submit documentation of existing facilities including a copy of all photos and/or video.

1.03 DOCUMENTATION OF EXISTING FACILITIES

- A. Documentation shall clearly show the condition of existing facilities including existing cracks, settlement, paint blemishes, etc. within 50' of the limits of construction and within the limits of construction.
- B. Documentation shall be provided at least 48 hours prior to start of construction at the site.
- C. In the event that the Contractor fails to document adequately, the Contractor shall repair any defect noted at the end of Construction at the Contractor's cost.

1.04 MEASUREMENT AND PAYMENT

Full compensation for Protecting Existing Facilities including furnishing all materials, labor, tools, equipment, and incidentals and performing all work described in this Section and as indicated on the Plans, except for potholes, shall be included as part of the Contract price paid for related bid item(s) and no additional compensation shall be allowed therefor.

PART 2: MATERIALS

2.01 REPLACEMENT IN KIND

- A. Except as indicated on the Plans or as specifically authorized by the Engineer, reconstruct utilities with new material of the same size, type, and original quality as that removed.
- B. Damage to existing building elements, piping and equipment shall be repaired to original condition or better or shall be reconstructed or replaced in-kind.

- C. Damage to existing roads and adjacent properties shall be repaired to original condition or better or shall be reconstructed in-kind.
- D. Replace portion of damaged street improvements, driveway, sidewalk, or pavement to the nearest construction joint unless otherwise noted.

PART 3: EXECUTION

3.01 GENERAL

- A. Replace in kind improvements, such as pavement, curbs and gutters, ramps, barricades, traffic islands, signalization, fences, signs, mail boxes, etc., that are cut, removed, damaged, or otherwise disturbed by the construction.
- B. When protecting in place, the contractor shall take into account all loads, including surcharges and potential surcharges.

3.02 DOCUMENTATION

- A. At least 48 hours prior to beginning physical construction, the Contractor shall document the condition of all potentially impacted roads, the project site, adjacent properties and any other potentially affected areas.
- B. At least 48 hours prior to documenting the condition of potentially affected areas, the Contractor shall notify the Engineer. The Engineer may accompany the Contractor during the documentation process and may provide additional documentation. If the Engineer also provides documentation, the Contractor is not relieved of his responsibility to document conditions.
- C. Documentation shall include pictures and/or video. The documentation shall be kept and made available to the Owner throughout construction and for a period of three years after the Notice of Completion has been filed.

3.03 PROCEDURES

- A. Protect in Place: Protect all improvements in place, unless otherwise specified.
- B. Contractor shall provide temporary support, bracing and shoring for all CMU building wall prior to the removal of the existing roof. Removal and reinstallation of the existing wall mounted acoustical panels may be required. The temporary support, bracing and shoring shall remain in place until the new roof structure and diaphragm are completely installed. The design configuration, installation and maintenance of the temporary support, bracing and shoring is the sole responsibility of the contractor. The bracing shall keep the existing walls in their “as constructed” positions. The contractor shall document the condition of the existing walls prior to beginning construction and shall monitor the condition and positions of the wall during and after construction.

END OF SECTION

SECTION 03600 GROUT

PART 1: GENERAL

1.01 SCOPE OF WORK

- A. The CONTRACTOR shall furnish all materials for grout in accordance with the provisions of this Section and shall form, mix, place, cure, repair, finish, and do all other work as required to produce finished grout, in accordance with the requirements of the Contract Documents.
- B. The following types of grout shall be covered in this Section:
 - 1. Non-Shrink Grout: This type of grout is to be used wherever grout is shown in the Contract Documents, unless another type is specifically referenced.
 - 2. Cement Grout
 - 3. Epoxy Grout

1.02 REFERENCES SPECIFICATIONS, CODES, AND STANDARDS

- A. Specifications, codes, and standards shall be referred to herein.
- B. Commercial Standards:

CRD-C621	Corps of Engineers Specification for Non-shrink Grout
ASTM C109	Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2-in or 50-mm Cube Specimens)
ASTM C531	Test Method for Linear Shrinkage and Coefficient of Thermal Expansion of Chemical- Resistant Mortars, Grouts, and Monolithic Surfacing
ASTM C579	Test Methods for Compressive Strength of Chemical-Resistant Mortars and Monolithic Surfacing
ASTM C827	Test Method for Early Volume Change of Cementitious Mixtures
ASTM C1107	Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Non-shrink)
ASTM D696	Test Method for Coefficient of Linear Thermal Expansion of Plastics

1.03 CONTRACTOR SUBMITTALS

- A. The CONTRACTOR shall submit certified test results verifying the compressive strength, shrinkage, and expansion requirements are within the limits specified herein.
- B. Manufacturer's literature containing instructions and recommendations on the mixing, handling, placement, and appropriate uses for each type of non-shrink and epoxy grout used in the work.

QUALITY ASSURANCE**A. Field Tests:**

1. Compression test specimens will be taken during construction from the first placement of each type of grout, and at intervals thereafter as selected by the ENGINEER to ensure continued compliance with these specifications. The specimens will be made by the ENGINEER or its representative.
2. Compression tests and fabrication of specimens for cement grout and non-shrink grout will be performed as specified in ASTM C 109 at intervals during construction as selected by the ENGINEER. A set of three specimens will be made for testing at 7 days, 28 days, and each additional time period as appropriate.
3. Compression tests and fabrication of specimens for epoxy grout will be performed as specified in ASTM C 579, Method B, at intervals during construction as selected by the ENGINEER. A set of three specimens will be made for testing at 7 days, and each earlier time period as appropriate.
4. All grout, already placed, which fails to meet the requirements of these specifications, is subject to removal and replacement at the cost of the CONTRACTOR.
5. The cost of all laboratory tests on grout will be borne by the OWNER, but the CONTRACTOR shall assist the ENGINEER in obtaining specimens for testing. However, the CONTRACTOR shall be charged for the cost of any additional tests and investigation on work performed which does not meet the specifications. The CONTRACTOR shall supply all materials necessary for fabricating the test specimens.

B. Construction Tolerances: The CONTRACTOR shall set and maintain concrete forms and perform finishing operations so as to ensure that the completed work is within the tolerances specified herein. Surface defects and irregularities are defined as finishes and are to be distinguished from tolerances. Tolerance is the specified permissible variation from lines, grades, or dimensions shown. Where tolerances are not stated in the specifications, permissible deviations will be in accordance with ACI 117 – *Standard Tolerance for Concrete Construction and Materials*.

1. The following construction tolerances are hereby established and apply to finished walls and slab unless otherwise shown:

<u>Item</u>	<u>Tolerance</u>
Variation of the constructed linear outline from the established position in plan.	In 10 feet: 1/4-inch; In 20 feet or more: 1/2-inch
Variation from the level or from the grades shown.	In 10 feet: 1/4-inch; In 20 feet or more: 1/2-inch
Variation from the plumb	In 10 feet: 1/4-inch; In 20 feet or more: 1/2-inch

PART 2: PRODUCTS

2.01 CEMENT GROUT

1. Cement Grout: Cement grout shall be composed of one part cement, three parts sand, and the minimum amount of water necessary to obtain the desired consistency. Where needed to match the color of adjacent concrete, white portland cement shall be blended with regular cement as needed. The minimum compressive strength at 28 days shall be 4000 psi.
2. Application: Cement grout shall be used at all locations where “dry pack” material is specified on the Contract Documents.

2.02 PREPACKAGED GROUTS

A. Non-Shrink Grout:

1. Non-shrink grout shall be a prepackaged, inorganic, non-gas-liberating, non-metallic, cement-based grout requiring only the addition of water. Manufacturer's instructions shall be printed on each bag or other container in which the materials are packaged. The specific formulation for each class of non-shrink grout specified herein shall be as recommended by the manufacturer for the particular application required for this project.
2. Class A non-shrink grouts shall have a minimum 28 day compressive strength of 7000 psi; shall have no shrinkage (0.0 percent) and a maximum 4.0 percent expansion in the plastic state when tested in accordance with ASTM C-827; and shall have no shrinkage (0.0 percent) and a maximum of 0.2 percent expansion in the hardened state when tested in accordance with CRD C 621.
3. Class B non-shrink grouts shall have a minimum 28 day compressive strength of 5000 psi and shall meet the requirements of CRD C 621.
4. Application:
 - a. Class A non-shrink grout shall be used for the repair of all holes and defects in concrete members which are water bearing or in contact with soil or other fill material, grouting under all equipment base plates, and at all locations where “grout” is specified in the contract documents; except, for those applications for Class B non-shrink grout and epoxy grout specified herein. Class A non-shrink grout may be used in place of Class B non-shrink grout for all applications.
 - b. Class B non-shrink grout shall be used for the repair of all holes and defects in concrete members which are not water-bearing and not in contact with soil or other fill material, grouting under all base plates for structural steel members, and grouting railing posts in place.
5. Manufacturers and Product:
 - a. Class A Grout
 - 1) Five Star “Five Star Fluid Grout 100”

- 2) Masterbuilders “Masterflow 928”
- 3) Approved equal

b. Class B Grout

- 1) Five Star “Five Star Grout”
- 2) Masterbuilders “Set Grout”
- 3) Approved equal

B. Epoxy Grout:

1. Epoxy grout shall have the ability to be poured, be non-shrinking and a 100 percent solids system. The epoxy grout system shall have three components: resin, hardener, and specially blended aggregate, all premeasured and prepackaged. The resin component shall not contain any non-reactive diluents. Resins containing butyl glycidyl ether (BGE) or other highly volatile and hazardous reactive diluents are not acceptable. Variation of component ratios is not permitted unless specifically recommended by the manufacturer. Manufacturer's instructions shall be printed on each container in which the materials are packaged. Epoxy grout shall be **Masterflow 648 CP by Master Builders Technologies; Conbextra EPR by Fosroc Ltd.; Sikadur 42 Grout-Pak by Sika Products.**
2. The chemical formulation of the epoxy grout shall be that recommended by the manufacturer for the particular application.
3. The mixed epoxy grout system shall have a minimum working life of 45 minutes at 75 degrees F.
4. The epoxy grout shall develop a compressive strength of 5000 psi in 24 hours and 10,000 psi in seven days when tested in accordance with ASTM C 579, Method B. There shall be no shrinkage (0.0 percent) and a maximum 4.0 percent expansion when tested in accordance with ASTM C 827.
5. The epoxy grout shall exhibit a minimum effective bearing area of 95 percent. This shall be determined by a test consisting of filling a 2-inch diameter by 4-inch high metal cylinder mold covered with a glass plate coated with a release agent. A weight shall be placed on the glass plate. At 24 hours after casting, the weight and plate shall be removed and the area in plan of all voids measured. The surface of the grout shall be probed with a sharp instrument to locate all voids.
6. The peak exotherm of a 2-inch diameter by 4-inch high cylinder shall not exceed 95 degrees F when tested with 75 degree F material at laboratory temperature. The epoxy grout shall exhibit a maximum thermal coefficient of 30×10^{-6} inches/inch/degree F when tested according to ASTM C 531 or ASTM D 696.
7. Application: Epoxy grout shall be used to embed all anchor rods and reinforcing steel required to be set in grout, and for all other applications required in the Contract Documents.

2.03 CURING MATERIALS

Curing materials shall be as recommended by the manufacturer of prepackaged grouts.

2.04 CONSISTENCY

The consistency of grouts shall be that necessary to completely fill the space to be grouted for the particular application. Dry pack consistency is such that the grout is plastic and moldable but will not flow. Where "dry pack" is called for in the Contract Documents, it shall mean a grout of that consistency; the type of grout to be used shall be as specified herein for the particular application.

2.05 MEASUREMENT OF INGREDIENTS

- A. Measurements for cement grout shall be made accurately by volume using containers. Shovel measurement shall not be allowed.
- B. Prepackaged grout shall be mixed with the recommended volume of water in order to achieve the desired grout consistency.

PART 3: EXECUTION

3.01 GENERAL

- A. The finish of the grout surface shall match that of the adjacent concrete.
- B. The manufacturer of Class A non-shrink grout and epoxy grout shall provide on-site technical assistance upon request.
- C. Base concrete or masonry must have attained its design strength before grout is placed, unless authorized by the ENGINEER.
- D. Grout samples shall be taken as specified in subsection 1.04A of this Section.

3.02 CONCRETE PATCH AND REPAIR

- A. Patching Small Holes:
 - 1. Holes which are less than 12 inches in their least dimension and extend completely through concrete members, shall be filled with non-shrink grout.

3.03 GROUTING PROCEDURES

- A. Prepackage Grouts: All mixing, surface preparation, handling, placing, consolidation, curing, and other means of execution for prepackaged grouts shall be done according to the instructions and recommendations of the manufacturer.
- B. Grouting:
 - 1. The original concrete shall be blocked out or finished off a sufficient distance below the plate to provide for a one-inch minimum thickness of grout or a thickness as shown on the Drawings.

2. After the plate has been set in position at the proper elevation by steel wedges, the space between the bottom of the plate and the original concrete surface shall be filled with non-shrink grout. The mixture shall be a trowelable consistency and tamped or rodded solidly into the space between the plate and the base concrete. A backing board or stop shall be provided at the back side of the space to be filled with grout. Where this method of placement is not practical or where required by the ENGINEER, alternate grouting methods shall be submitted for acceptance by the ENGINEER.

3.04 **CONSOLIDATION**

Grout shall be placed in such a manner so as to assure that the space to be grouted is completely filled. The consistency of the grout when applied shall meet the requirements stated.

END OF SECTION

SECTION 05120 STRUCTURAL STEEL

PART 1: GENERAL

1.01 SCOPE OF WORK

The CONTRACTOR shall furnish, fabricate, and place all structural steel and make all connections necessary to provide a complete work and in accordance with the Contract Documents.

1.02 REFERENCES

A. American Institute of Steel Construction (AISC):

1. Specification for Structural Steel Buildings—Allowable Stress Design and Plastic Design, excluding Section A7.1
2. Allowable Stress Design Specification for Structural Joints using ASTM A325 or A490 Bolts.
3. Manual of Steel Construction, Allowable Stress Design
4. Seismic Provisions for Structural Steel Buildings
5. Code of Standard Practice for Steel Buildings and Bridges, excluding Sections 3, 4, 7.11.3.3, 7.11.4, 7.11.5, and 7.13
6. AISC Quality Certification Program
7. AISC Erector Certification Program

B. American Society of Mechanical Engineers (ASME):

BPVC SEC IX Qualification Standard for Welding and Brazing Procedures, Welders, Brazers, and Welding and Brazing

C. American Society of Nondestructive Testing (ASNT):

ASNT-TC-IA Personnel Qualification and Certification in Nondestructive Testing

D. American Welding Society (AWS):

D1.1 Structural Welding Code-Steel
QC 1 Standard for AWS Certification of Welding Inspectors

E. ASTM International (ASTM):

A6	Standard Specification for General Requirements for Rolled Structural Steel Bars, Plates, Shapes, and Steel Piling.
A36	Standard Specification for Structural Steel
A53 S	Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless
A123	Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
A143	Standard Practice for Safeguarding Against Embrittlement of Hot-Dip Galvanized Structural Steel Products and Procedures for Detecting Embrittlement
A153	Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware
A307	Standard Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength
A325	Standard Specification for High-Strength Bolts for Structural Steel Joints
A384	Standard Practice for Safeguarding Against Warpage and Distortion During Hot-Dip Galvanizing of Steel Assemblies
A385	Standard Practice for Providing High-Quality Zinc Coatings (Hot-Dip)
A490	Standard Specification for Heat-Treated Steel Structural bolts, 150 ksi Minimum Tensile Strength.
A500	Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes
A501	Standard Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing
A563	Standard Specification for Carbon and Alloy Steel Nuts
A572	Standard Specification for High-Strength Low Alloy Columbium-Vanadium Structural Steel
A588	Standard Specification for High-Strength Low Alloy Structural Steel with 50 ksi Minimum Yield Point to 4 in. thick
A673	Standard Specification for Sampling Procedure for Impact Testing of Structural Steel
A780	Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings
A992	Standard Specification for Steel for Structural Shapes for Use in Building Frames
B695	Standard Specification for Coatings of Zinc Mechanically Deposited on Iron and Steel.
F436	Standard Specification for Hardened Steel Washers
F959	Standard Specification for Compressible-Washer-Type Direct Tension Indicators for Use with Structural Fasteners
F1852	Standard Specification for "Twist Off" Type Tension Control Structural Bolt/Nut/Washer Assemblies, Steel, Heat Treated, 120/150 ksi Minimum Tensile Strength

1.03 SUBMITTALS

A. Action Submittals:

1. Provide shop drawings showing erection plans, member size and their connections.
2. Anchor bolt layouts.
3. Hardened washer details (if applicable).
4. Joint details for complete penetration welds
5. Schedules for fabrication procedures
6. Primer and other coatings for items in this Section
7. Name and address of manufacturer(s)
8. Product specifications
9. Manufacturers' testing procedures and standards
10. Preparation and installation or application instructions, as appropriate

B. Informational Submittals:

1. Mill Certificates of tests made in accordance with ASTM A6.
2. Certified Mill Test Reports for Bolts and Nuts:
 - a. Name and address of manufacturer.
 - b. Bolts correctly marked.
 - c. Marked bolts and nuts used in required mill tests and manufacturer's inspection tests.
3. Methods proposed to resolve misalignment between anchor bolts and bolt holes in steel members.
4. Welding Procedures, Qualifications, and Inspection Report
5. AISC Quality Certification: AISC certificate showing name and address of certified firm, effective date, and category of certification.
6. As-built redline markups shall be submitted at the completion of work, which indicate and document all changes and deviations from the contract document during the construction. As-built redline markups shall be submitted in digital PDF format.

1.04 **QUALITY ASSURANCE**

- A. Mill identification marks in accordance with ASTM A6.
- B. AISC Quality Certification for Fabricator: Conventional Steel Structures (Sbd).

C. **Welding Qualifications:**

1. Welding Procedure Specifications: In accordance with AWS D1.1 (Annex E) or ASME BPVC SEC IX (Forms QW-482 and QW-483).
2. Welder/Welding Operator Performance Qualifications: In accordance with AWS D1.1 (Annex E), or ASME BPVC SEC IX (Form QW-484).
3. Certified Welding Inspector: Certified in accordance with AWS QC1, and having prior experience with the welding codes specified.
4. Testing Agency: Personnel performing tests shall be Nondestructive Testing Level II Certified in accordance with ASNT SNT-TC-1A.

1.05 **DELIVERY, STORAGE, AND HANDLING**

- A. Delivery: Load structural members in such a manner that they will be transported and unloaded without damage to coatings and without being excessively stressed, deformed, or otherwise damaged.
- B. **Storage:**
1. Protect structural steel members and packaged materials from corrosion and deterioration.
 2. Store in dry area and not in direct contact with ground.
 3. Protect fasteners from dirt and moisture. Do not remove lubricant from bolts and nuts.
 4. Handle materials to avoid distortion or damage to members or supporting structures.

PART 2: PRODUCTS

2.01 **MATERIALS**

- A. Rolled Plates, Shapes except W-Shapes, and Bars: ASTM A36, unless indicated otherwise.
- B. Plate material for frame connections shall be ASTM A572, Grade 50, where indicated on Drawings.
- C. Steel Pipe: ASTM A53, Type E or S, Grade B.
- D. Square and Rectangular Hollow Structural Sections (HSS): ASTM A500, Grade B (F_y equals 46 ksi).

2.02 **FASTENERS**

- A. Machine Bolts (M.B.): ASTM A307

- B. Nuts: ASTM A563, type to match bolt type and finish.
- C. Hardened Steel Flat and Beveled Washers: ASTM F436, type to match bolt finish.

2.03

FABRICATION

A. General:

- 1. Fabricate as shown and in accordance with AISC Specification for Structural Steel Buildings and AISC Code of Standard Practice for Steel Buildings and Bridges.
- 2. Columns shall be full length members without splices, unless shown otherwise or approved by ENGINEER.
- 3. Mark and match mark materials for field assembly.
- 4. Complete assembly, including bolting and welding of units, before start of finishing operations.
- 5. Fabricate to agree with field measurements.

B. Connections:

- 1. Shop Connections: Weld or bolt, as shown.
- 2. Meet requirements of AISC Manual of Steel Construction tables for bolted double-angle shear connections, unless indicated otherwise.
- 3. Meet OSHA requirements for one independent bolt at beams framing in to column web connections.
- 4. Provide oversized holes for anchor bolts in column base plates in accordance with AISC Manual of Steel Construction, unless indicated otherwise.

C. Welded Construction:

- 1. Conform to governing welding codes for type of weld and material for each weld.
- 2. Groove and Butt Joint Welds: Complete penetration, unless otherwise indicated.
- 3. Interface with Other Work.

D. Holes:

- 1. As necessary or as indicated for securing other Work to structural steel framing, and for passage of other Work through steel framing members.
- 2. No flame-cut holes will be permitted without prior approval of ENGINEER.

3. Weld threaded nuts to framing, and other specialty items as shown to receive other Work.

E. Steel Roof Framing Coating System:

1. Surface Preparation: SSPC SP-6.
2. Type: Epoxy / Polyurethane
3. Shop Prime Coat: Apply two coats to a dry-film thickness of 8 mils; 66 Hi-Build Expoxoline or engineer approved equivalent. Do not shop prime the following surfaces, unless indicated otherwise:
 - a. Faying surfaces of slip critical bolted connections.
 - b. Within 2 inches of field-welded connections.
 - c. Steel members to be completely encased in reinforced concrete or coated with cementitious fireproofing.
4. Finish Coat: One coat of 5 mil dry-film thickness; Tnemec Series 73, 74, or 75 Endura-Shield or approved equivalent.
5. Total dry film thickness of system shall be 13 mils.

F. Galvanizing:

1. Fabricate steel to be galvanized in accordance with ASTM A143, A384, and A385. Avoid fabrication techniques that could cause distortion or embrittlement of steel.
2. Remove welding slag, splatter, burrs, grease, oil, paint, lacquer, and other deleterious material prior to delivery for galvanizing.
3. Remove by blast cleaning or other methods surface contaminants and coatings not removable by normal chemical cleaning process in the galvanizing operation.
4. Hot-dip galvanize steel members, fabrications, and assemblies after fabrication in accordance with ASTM A123.
5. Hot-dip galvanize A325 bolts, nuts, washers, and hardware components in accordance with ASTM A153.
6. Oversize holes to allow for zinc alloy growth.
7. Shop assemble bolts, nuts, and washers with special lubricant and test in accordance with ASTM A325 and A563.
8. Galvanize components of bolted assemblies separately before assembly.

2.04 SOURCE QUALITY CONTROL

A. Welding:

1. Visually inspect fabrication welds in accordance with AWS D1.1, Section 6 and Table 6.1, Visual Inspection Acceptance Criteria.
2. An independent testing agency will be retained by CITY to perform the following inspection and testing of fabrication welds.
 - a. Groove welds:
 - 1) Radiographic (RT) or ultrasonic (UT) testing for 10 percent of randomly selected welds, unless otherwise indicated.
 - 2) Use RT only for butt joint groove welds.
 - b. Fillet welds larger than 5/16-inch: Liquid penetrant (PT) or magnetic particle (MT) for 10 percent of randomly selected welds, unless otherwise indicated.
 - c. All Welds: 100 percent visually inspected (VT).
3. The Certified Welding Inspector (CWI) shall perform inspection prior and during assembly, during welding, and after welding. CWI duties include:
 - a. Verifying conformance of specified job material and proper storage.
 - b. Monitoring conformance with approved Welding Procedure Specification.
 - c. Monitoring conformance of Welder/Welding Operator Performance Qualification.
 - d. Inspecting weld joint fit-up and in-process inspection.
 - e. Providing 100 percent visual inspection of all welds.
 - f. Supervising nondestructive testing personnel and evaluating test results.
 - g. Maintaining records and preparing report confirming results of inspection and testing comply with the Work.
4. Repair and retest rejected weld defects until sound weld metal has been deposited in accordance with appropriate welding codes.

B. Special inspection of fabrication process and shop welding will be provided by CITY as indicated on Drawings.

C. Hot-Dip Galvanizing:

1. An independent testing agency will be retained by CITY to inspect and test hot-dip galvanized fabricated items in accordance with ASTM A123 and A153.

2. Visually inspect and test for thickness and adhesion of zinc coating for minimum of three test samples from each lot in accordance with ASTM A123 and A153.
3. Reject and retest nonconforming articles in accordance with ASTM A123 and A153.

PART 3: EXECUTION

3.01 STEEL MEMBER ERECTION

- A. Meet requirements of AISC Specification for Structural Steel Buildings and AISC Code of Standard Practice for Steel Buildings and Bridges, with exceptions as specified.
- B. CONTRACTOR is responsible for design and installation of temporary bracing to support components as erection proceeds.
- C. Welded Connections:
 1. Welding and Fabrication by Welding: Conform to AWS D1.1 Structural Welding Code based on material and type of weld.
 2. Groove and Butt Joint Welds: Complete penetration, unless otherwise indicated.

3.02 ANCHOR BOLTS

- A. Coordinate installation of anchor bolts and other connectors required for securing structural steel to in-place work.
- B. Provide templates and other devices for presetting bolts and other anchors to accurate locations.
- C. Projection of anchor bolts beyond face of concrete and threaded length shall be adequate to allow for full engagement of all threads of hold-down nuts, adjustment of leveling nuts, washer thicknesses, and construction tolerances, unless indicated otherwise.
- D. Placement Tolerances:
 1. As required by AISC Code of Standard Practice for Steel Buildings and Bridges, unless indicated otherwise.
 2. Embedded anchor bolts shall not vary from the dimensions as shown on Drawings by more than the following:
 - a. Center to center of any two bolts within an anchor group: 1/8 inch.
 - b. Center to center of adjacent anchor bolt groups: 1/4 inch.
 - c. Variation from perpendicular to theoretical bearing surface: 1:50.

3.03 **SETTING BASES AND BEARING PLATES**

- A. Clean concrete and masonry bearing surfaces of bond reducing materials and roughen to improve bond to bearing surfaces.
- B. Clean bottom surface of base and bearing plates.
- C. Set loose and attached base plates and bearing plates for structural members on wedges, shims, leveling nuts, or other adjustable devices. Use leveling plates where indicated on Drawings.
- D. Tighten anchor bolts after supported members have been positioned and plumbed. Do not remove wedges or shims, but if protruding, cut off flush with edge of base or bearing plate prior to placing grout. Weld plate washers to base plates where indicated in Drawings.
- E. Grout Under Base plates: As specified in Section 03600, GROUT, prior to placing loads on structure.

3.04 **FIELD ASSEMBLY**

- A. Set structural frames accurately to lines and elevations shown.
- B. Clean bearing surfaces and other surfaces that will be in permanent contact before assembly.
- C. Align and adjust various members forming a part of a complete frame or structure before permanently fastening.
- D. Level and plumb individual members of structure within tolerances shown in AISC Code of Standard Practice for Steel Buildings and Bridges.
- E. Establish required leveling and plumbing measurements on mean operating temperature of structure. Make allowances for difference between temperature at time of erection and mean temperature at which structure will be completed and in service.
- F. Perform necessary adjustments to compensate for minor discrepancies in elevations and alignment.
- G. Provide additional field connection material as required by AISC Code of Standard Practice for Steel Buildings and Bridges.
- H. Splice members only where indicated and accepted on shop drawings.

3.05 **MISFITS AT BOLTED CONNECTIONS**

- A. Where misfits in erection bolting are encountered, immediately notify ENGINEER for approval of one of the following methods of correction:
 - 1. Ream holes that must be enlarged to admit bolts and use oversized bolts.

2. Plug weld misaligned holes and redrill holes to admit standard size bolts.
 3. Drill additional holes in connection, conforming with AISC Standards for bolt spacing and end and edge distances, and add additional bolts.
 4. Reject member containing misfit, incorrect sized, or misaligned holes and fabricate new member to ensure proper fit.
- B. Do not enlarge incorrectly sized or misaligned holes in members by burning or using a drift pin.

3.06 **MISFITS AT ANCHOR BOLTS**

- A. Resolve misalignments between anchor bolts and bolt holes in steel members in accordance with approved submittal.
- B. Do not flame cut to enlarge holes without prior approval of ENGINEER.

3.07 **GAS CUTTING**

- A. Do not use gas cutting torches in field for correcting fabrication errors in structural framing.
- B. Secondary members not under stress and concealed in finished structure may be corrected by gas cutting torches, if approved by ENGINEER.
- C. Finish flame-cut sections equivalent to sheared and punched appearance.

3.08 **REPAIR AND CLEANING**

- A. Immediately after erection, clean field welds, bolted connections, and abraded areas of shop primer.
- B. Remove and grind smooth tack welds, fit-up-lugs, and weld runoff tabs.
- C. Remove weld back-up bars and grind smooth where indicated on Drawings.
- D. Apply touchup paint primer by brush or spray of same thickness and material as that used in shop application and as specified in Section 09900, PAINTING.

3.09 **REPAIR OF DAMAGED HOT-DIP GALVANIZED COATING**

- A. Conform to ASTM A780.
- B. For minor repairs at abraded areas, use sprayed zinc conforming to ASTM A780.
- C. For flame cut or welded areas, use zinc-based solder, or zinc sticks, conforming to ASTM A780.
- D. Use magnetic gauge to determine that thickness is equal to or greater than base galvanized coating.

FIELD QUALITY CONTROL

A. Welded Connections:

1. Visually inspect field welds in accordance with AWS D1.1, Section 6 and Table 6.1, Visual Inspection Acceptance Criteria.
2. An independent testing agency will be retained by CITY to perform the following inspection and testing of field welds.
3. Unless otherwise specified, perform nondestructive testing (NDT) of welds at a spot testing frequency as shown below in accordance with the referenced welding codes. Perform ultrasonic on complete joint penetration groove welds that cannot be readily radiographed. In case there is a conflict the higher frequency level of NDT shall apply:
 - a. Complete Joint Penetration (CJP) Butt Joint Welds: 10 percent random Radiographic (RT).
 - b. Groove Welds:
 - 1) Radiographic (RT) or ultrasonic (UT) testing for 10 percent of randomly selected welds, unless otherwise indicated.
 - 2) Use RT only for butt joint groove welds.
 - c. Fillet Welds Larger Than 5/16 Inch: Liquid penetrant (PT) or magnetic particle (MT) testing for 10 percent of randomly selected welds, unless otherwise indicated.
 - d. Partial Joint Penetration (PJP) Groove Welds: 10 percent random PT or MT.
 - e. All Welds: 100 percent visually inspected (VT).
4. Weld Acceptance:
 - a. Visual Testing:
 - 1) Structural Pipe and Tubing: AWS D1.1, paragraph 6.9, Visual Inspection, Tubular Connections.
 - 2) All Other Structural Steel: AWS D1.1, paragraph 6.9, Visual Inspection, Statically Loaded Nontubular Connections.
 - 3) Stud Connections: AWS D1.1, paragraph 7.8.1.
 - b. Ultrasonic Testing: Perform UT of CJP groove welds in accordance with AWS D1.1, paragraph 6.13.3, Class R Indications.
 - c. Radiographic Testing: Perform RT of CJP butt joint welds in accordance with AWS D1.1, paragraph 6.12.1.
 - d. PT or MT:

- 1) Perform on fillet and PJP groove welds in accordance with AWS D1.1, paragraph 6.10.
 - 2) Acceptance shall be in accordance with VT standards specified above.
5. The CWI shall be present whenever field welding is performed. The CWI shall perform inspections prior and during assembly, during and after welding. CWI duties include:
- a. Verifying conformance of specified job material and proper storage.
 - b. Monitoring conformance with approved WPS.
 - c. Monitoring conformance of WPQ.
 - d. Inspecting weld joint fit-up and in-process inspection.
 - e. Providing 100 percent visual inspection of all welds.
 - f. Supervising nondestructive testing personnel and evaluating test results.
 - g. Maintaining records and preparing report confirming results of inspection and testing comply with the Work.
6. Repair and retest rejected weld defects until sound weld metal has been deposited in accordance with appropriate welding codes.
- B. Special inspection will be provided by City as indicated on Drawings.

END OF SECTION

SECTION 05300 METAL DECKING

PART 1: GENERAL

1.01 SCOPE OF WORK

Contractor shall furnish and install the metal decking product and all appurtenance complete, and shall coordinate all of the work hereunder with the related work specified in other Sections, in accordance with the requirements of the Contract Documents.

1.02 RELATED SECTIONS

Section 05120 Structural Steel

1.03 REFERENCES

A. Codes: All codes, as referenced herein

AISI	Specifications for the Design of Cold-Formed Steel Structural Members: American Iron and Steel Institute
ASTM A 653	Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
ASTM A 780	Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings.
ASTM A 924	Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process
DOD P-21035A	Paint, High Zinc Dust Content, Galvanizing Repair (metric); US Department of Defense

B. SDI Publication No. 27: Steel Deck Institute Design Manual for Composite Decks, Form Decks, Roof Decks and Cellular Metal Floor Deck with Electrical Distribution; Steel Deck Institute, Inc.

C. Manufacturers' Standards: In addition to the standards listed above, the metal deck products and their installation shall be in accordance with the manufacturer's published recommendations, specifications and I.C.C. report.

1.04 ACTION SUBMITTALS

A. Decking Submittal:

1. Provide a layout plan of decking showing type and section properties of the deck panel, reinforcing channels, pans, special jointing, and accessories.
2. Location of the openings, deck laps, and deck attachment details.

1.05 **SUBMITTALS FOR INFORMATION**

- A. The manufacturer's specifications, literature, published installation instructions and current I.C.C. report for metal decking product shall be submitted to the ENGINEER.
- B. Operation manuals for mechanical fastener installation tools.

1.06 **QUALITY ASSURANCE**

- A. Comply with the requirements of the following, except where exceeded by the Contract Documents or requirements of governing authorities:
 - 1. AISI "Specifications for the Design of Cold-Formed Steel Structural Members"
 - 2. SDI "Steel Deck Institute Design Manual for Composite Decks, Form Decks, Roof Decks and Cellular Metal Floor Deck with Electrical Distribution"

1.07 **DELIVERY, STORAGE, AND HANDLING**

- A. Delivery of Materials: Manufactured materials shall be delivered in original, unbroken packages, containers, or bundles bearing the name of the manufacturer.
- B. Storage: Separate sheets and store units on dry wood sleepers, sloped to promote drainage. Cover metal decking panels with waterproof material, ventilate to avoid condensation.

PART 2: PRODUCTS

2.01 **MATERIALS**

- A. Metal deck material shall conform to ASTM A 653, Structural Quality grade 33 or higher. See drawings for gauge of deck panel.
- B. Galvanizing of the metal deck shall conform to ASTM A 924, G90 coating as defined in ASTM A653.
- C. Galvanized surface repair shall be in conformance with Federal Specification DOD P-21035A.
- D. Acceptable Manufacturers: Roof deck design is based on the following products.
 - 1. Steel Roof Deck:
 - a. Verco; PLB-36 (1 ½" deep)
 - b. Approved equal

2.02 **ACCESORIES**

- A. Provide pour stops, column closures, end closures, cover plates, girder fillers, ridge plates, finish strips, reinforcing channels, and other accessories required for complete installation.
- B. Accessories shall comply with requirements of SDI and deck manufacturer.

2.03 **MECHANICAL FASTENERS**

- A. Pneumatic Driven Fasteners:
 - 1. Pneumatic driven steel deck fasteners with corrosion-resistance finish.
 - 2. Manufacturers and Product:
 - a. Pneutek, Hudson NH; Pneutek K66075
 - b. Approved equal
- B. Powder Actuated Fasteners:
 - 1. Powder driven steel deck fasteners with corrosion-resistance finish.
 - 2. Manufacturers and Product:
 - a. Hilti, Inc., Tulsa OK; X-HSN 24 Metal Deck Fasteners
 - b. Approved equal

2.04 **METAL DECK SIDELAP AND DECK END CONNECTION**

- A. Deck Sidelap connection shall be PunchLok II System – Verco Sidelap Connection 2 (VSC2)
- B. Deck panel ends shall be connected with a lap-type connection. Butt-type panel ends connection is not allowed.

PART 3: EXECUTION

3.01 **GENERAL**

- A. The installation shall conform to applicable codes and the manufacturer's published or written recommendations, specifications, and published installation instructions for the type of deck being installed. Work shall be coordinated with the work of other trades.
- B. The roofing work shall be performed by an installer authorized by the roofing system manufacturer.
- C. Contractor shall investigate the support framing and the conditions under which decking work is to be performed. Any unsatisfactory conditions shall be addressed prior to starting this work.

3.02 **INSTALLATION**

- A. Decking shall be oriented perpendicular to the framing members.
- B. Side seams shall be tight fitting and secured together in accordance with the Contract Documents.
- C. No damaged pieces of decking shall be installed.

END OF SECTION

SECTION 07411 METAL ROOF PANELS

PART 1: GENERAL

1.01 SUMMARY

A. Section Includes: Factory-formed sheet metal roofing, including flashings and trim.

1.02 REFERENCES

A. American Society for Testing and Materials (ASTM):

1. ASTM A653/A653M Standard Specification for Steel Sheets, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
2. ASTM A792/A792M Standard Specification for Steel Sheet, 55% Aluminum-Zinc Alloy Coated by the Hot Dip Process.
3. ASTM B209 Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
4. ASTM D2247 Standard Practice for Testing Water Resistance of Coatings in 100% Relative Humidity.
5. ASTM E1680 Standard Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls and Doors Under Specified Pressure Differences Across the Specimen.
6. ASTM E1646 Standard Test Method for Water Penetration of Exterior Windows, Curtain Walls and Doors by Uniform Static Air Pressure Difference.
7. ASTM G90 Standard Practice for Performing Accelerated Outdoor Weathering of Non-Metallic Materials Using Concentrated Natural Sunlight.
8. ASTM D 2244 - Standard Practice for Calculation of Color Tolerances and Color Differences from Instrumentally Measured Color Coordinates.
9. ASTM D 4214 - Standard Test Methods for Evaluating the Degree of Chalking of Exterior Paint Films
10. ASTM E 119 - Standard Test Methods for Fire Tests of Building Construction and Materials
11. ASTM E 1592 - Standard Test Method for Structural Performance of Sheet Metal Roof and Siding Systems by Uniform Static Air Pressure Difference.

12. ASTM E 2140 - Standard Test Method for Water Penetration of Metal Roof Panel Systems by Static Water Pressure Head.

B. Underwriters Laboratories (UL):

1. UL 263 - Fire Tests of Building Construction and Materials.
2. 580 - Tests for Uplift Resistance of Roof Assemblies.
3. UL 790 - Standard Test Methods for Fire Tests of Roof Coverings.
4. UL 2218 - Impact Resistance of Prepared Roof Covering Materials.

C. Sheet Metal and Air Conditioning Contractors' National Association (SMACNA);
"Architectural Sheet Metal Manual"

E. California Building Code

1.03 **ADMINISTRATIVE REQUIREMENTS**

A. Pre-installation Meetings:

1. Schedule meeting to discuss roof project requirements, substrate conditions, manufacturer's installation instructions and manufacturer's warranty requirements before start of work onsite.
2. Required attendees: Contractor, metal deck & roof installer, and any other subcontractors who have equipment penetrating the roof or work that requires roof access or traffic.

1.04 **SYSTEM DESCRIPTION**

A. Performance Requirements: Provide sheet metal roofing which has been manufactured, fabricated and installed to withstand structural and thermal movement, wind loading and weather exposure to maintain manufacturer's performance criteria without defects, damage, failure or infiltration of water.

1. Air infiltration: Maximum 0.06 cfm per lineal foot (0.33 m³/hr per linear meter) of seam at static pressure of 6.24 psf (3.0 kPa) when tested per ASTM E1680.
2. Water penetration:
 - a. No uncontrolled water penetration through the joints at a static pressure of 6.24 psf (3.0 kPa) when tested in accordance with ASTM E1646.
3. Fire rating: Class A
4. Uplift Tests:

- a. UL 580 Class 90
 - b. ASTM E 1592 (1.5", 2" & 3")
5. Class 4 Impact Resistance: UL 2218
 6. Fire Resistance: UL 263
 7. ICC-ES: ESL 1082

B. Finish Performance Requirements:

1. Two coat coil applied, baked on full strength (70% resin, PVF2) fluorocarbon coating consisting of a nominal 0.25 mil dry film thickness primer, and a nominal dry film thickness of 0.7 -0.8 mil color coat for a total 0.9 to 1.1 mil total system dry film thickness.
2. Color change and fade resistance: No cracking, peeling, blistering or loss of adhesion when tested in accordance with ASTM G23; color change, after removal of surface deposits such as dirt or chalk, maximum 5 NBS units.
3. Humidity resistance: No blistering, peeling or loss of adhesion after 1000 hours testing, in accordance with ASTM D2247.

1.05 SUBMITTALS

- A. General: Submit listed submittals in accordance with Conditions of the Contract and Division 1 Submittal Procedures Section.
- B. Product Data: Submit manufacturer's product data for specified products.
- C. LEED Submittal Documentation:
 1. Product Test Reports for applicable sustainable sites credits: For roof panels, indicating that panels comply with solar reflectance index requirement.
 2. Product Data for applicable materials and resources credits: Indicating percentages by weight of post-consumer and pre-consumer recycled content for products having recycled content. Contractor to provide a statement indicating cost for each product having recycled content.
- D. Shop Drawings: Submit shop drawings showing layout, profiles and product components, including anchorage, accessories, finish colors and textures.
 1. Indicate layout of roofing panels and roof panel sizes, including custom-fabricated roofing panels if indicated; indicate each item of trim and accessories.
 2. Indicate in detailed drawings profile and gauge of interior and exterior sheets, and locations and types of fasteners; indicate locations, gauges, shapes and methods of attachment of roofing panels, trim and accessory items.
 3. Include Sealant location and denote those that are factory and field applied.

4. Indicate products/materials required for construction activities and field worked conditions of this section not supplied by manufacturer of products of this section.
- E. Samples: Submit selection and verification samples for finishes, colors and textures.
1. Selection Samples: For each product requiring color selection, 2 sets of manufacturer's sample chips representing full range of colors and finishes available.
 2. Verification Samples: For each color and finish selected, 2 chips indicating match to selected color and finish.
- F. Warranties:
1. Substrate Warranty
 2. Finish Warranty
 3. Weather Tightness Warranty (if applicable)
- G. Test and Evaluation Reports: Showing compliance with specified performance characteristics and physical properties.
- H. Quality Assurance Submittals: Submit the following:
1. Contractor Certificates: Contractor's certification that:
 - a. Manufacturer of products of this section meets specified qualifications.
 - b. Installer of products of this section meets specified qualifications.
 2. Manufacturer Certificates: Product certificates signed by manufacturer certifying materials comply with specified performance characteristics and physical requirements.
 3. Manufacturer's Instructions: Manufacturer's installation instructions.
 4. Manufacturer's Field Reports: Manufacturer's field reports if required.
- I. Closeout Submittals: Submit the following:
1. Warranty: Warranty documents specified herein.
- J. Buy American Certification: Manufacturer's letters of compliance indicating supplied products comply with requirements.

1.06 **QUALITY ASSURANCE**

A. Manufacturer Qualifications:

1. Provider of "hands on" installer training at manufacturer or customer facility.
2. Minimum of ten years' experience in manufacturing metal roof systems.

3. Provider of product produced in a permanent factory environment with fixed roll-forming equipment and also possesses the capability to roll form continuous panels on jobsites with a factory technician for jobs with panel lengths in excess of 50'

B. Installer Qualifications:

1. At least five years' experience in the installation of structural standing seam metal roof panels.
2. Experience on at least five projects of similar size, type and complexity as this project that have been in service for a minimum of two years with satisfactory performance of the roof system.
3. Employer of workers for this project who are competent in techniques required by manufacturer for installation indicated and who shall be supervised at all times when material is being installed.
4. Certificate: When requested, submit certificate indicating qualification.

C. Buy American Compliance: Materials provided under Work of this Section shall comply with the following requirements:

1. Buy American Act of 1933 BAA-41 U.S.C §§ 10a – 10d.
2. Buy American provisions of Section 1605 of the American Recovery and Reinvestment Act of 2009 (ARRA).

1.07 **DELIVERY, STORAGE & HANDLING**

A. General: Comply with Division 1 Product Requirements Sections.

1. Ordering: Comply with manufacturer's ordering instructions and lead time requirements to avoid construction delays.

B. Delivery: Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact. Identify fabricated components with UL 90 label where appropriate.

C. Delivery and Acceptance Requirements: Ensure all panels are received in good condition. In cases where damage is visible, note all paperwork; inform architect and project superintendent.

D. Packing, Shipping, Handling and Unloading:

1. Roofing panels to be crated to protect panels from shipping damage.
2. Package trim and accessories in waterproof wrapping paper.

E. Storage and Protection: Store materials protected from exposure to harmful conditions. Store material in dry, above-ground location.

1. Stack prefinished material to prevent twisting, bending, abrasion, scratching and denting. Elevate one end of each skid to allow for moisture runoff.
2. Store products of this section in manufacturer's unopened packaging until installation of products
3. Maintain dry, heated storage area for products of this section until installation of products.
4. Remove strippable plastic film before storage under high-heat conditions.

1.08 **PROJECT CONDITIONS**

- A. Field Measurements: Verify actual measurements/openings by field measurements before fabrication; show recorded measurements on shop drawings. Coordinate field measurements, fabrication schedule with construction progress to avoid construction delays.
- B. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit assembly of metal panels to be performed in accordance with manufacturers' written instructions and warranty requirements.

1.09 **WARRANTY**

- A. Project Warranty: Refer to Conditions of the Contract for project warranty provisions.
 1. Panel Material: Furnish manufacturers 25 year warranty covering the panel against rupture, structural failure, or perforation.
 2. Panel Coating: Furnish manufacturer's 40-year warranty covering cracking, checking, and peeling, and 30 year warranty covering fade and chalk on the Two coat coil applied, baked on full strength (70% resin, PVF2) fluorocarbon coating.
 - a. Manufacturer's warranty may exclude surface deterioration due to physical damage and corrosive environments.
- B. Special Warranty: Installer's standard form in which installer agrees to repair or replace panels that fail due to poor workmanship or faulty installation within the specified warranty period.
 1. Warranty Period: 10 years from date of Substantial Completion.

PART 2: PRODUCTS

2.01 METAL ROOF PANELS

- A. Manufacturer: McElroy Metal, Inc.

1. Contact: 1500 Hamilton Rd., Bossier City, LA 71111; Telephone: (800) 950-6531; Fax: (318) 747-8099; E-mail: info@mcelroymetal.com; website: www.mcelroymetal.com.
2. Proprietary Products: McElroy Metal Preformed Sheet Metal Roofing Panels.

B. Substitutions:

1. Basis of Design Product: Subject to compliance with requirements provide McElroy Metal Medallion Lok
2. Substitution Limitations
 - a. Requests for approval must be submitted in writing at least ten (10) days prior to bid date, and are accompanied by all related test reports and design calculations listed in section 1.4 and Design and Performance criteria Section 2.2.
 - b. Substitute manufacturers will be approved by written addendum to all bidders. Voluntary alternates will not be considered. Substitutions will not be permitted after the bid date of this project.
 - c. Roof panels proposed for substitution shall fully comply with specified requirements in appearance, assembly, and performance.

- C. Forming: Use continuous end rolling method. No end laps are permitted on panels without architect approval. No portable rollforming machines will be permitted on this project, no installer—owner or installer-rented machines will be permitted. It is the intent of the Architect to provide factory-manufactured panel systems only for this project.

2.02 MANUFACTURED UNITS

A. McElroy Metal Medallion-Lok Panels:

1. Profile: Vertical leg standing seam panel with male/female seams that are interlocked via snapping during installation.
2. Size: 1.75” high seam by 16” width; Length as indicated on drawings.
3. Panel Surface: Striated
4. Material: Galvalume steel sheet conforming to ASTM A792, AZ55 coating for bare; AZ50 coating for painted; 24 standard gauge sheet thickness.

2.03 METAL ROOF PANEL ACCESSORIES

- A. General: Provide complete metal roof panel assembly incorporating trim, copings, fasciae, gutters and downspouts, and miscellaneous flashings. Provide required fasteners, closure strips, support plates, and sealants as indicated in manufacturer's written instructions.
- B. Flashing and Trim: Match material, thickness, and finish of metal panel face sheet.

- C. Panel Clips: ASTM A 653/A 653M, G90 (Z180) hot-dip galvanized zinc coating, configured for concealment in panel joints, and identical to clips utilized in tests demonstrating compliance with performance requirements.
- D. Panel Fasteners: Self-tapping screws and other acceptable corrosion-resistant fasteners recommended by roof panel manufacturer. Where exposed fasteners cannot be avoided, supply fasteners with EPDM or neoprene gaskets, with heads matching color of metal panels by means of factory-applied coating.
- E. Joint Sealers: Manufacturer's standard or recommended liquid and preformed sealers and tapes, and as follows:
 - 1. Factory-Applied Seam Sealant: Manufacturer's standard hot-melt type.
 - 2. Tape Sealers: Manufacturer's standard non-curing butyl tape, AAMA 809.2.
 - 3. Concealed Joint Sealant: Non-curing butyl, AAMA 809.2.
- F. Steel Sheet Miscellaneous Framing Components: ASTM C 645, with ASTM A 653/A 653M, G60 (Z180) hot-dip galvanized zinc coating.

2.04 FABRICATION

- A. General: Provide factory fabricated and finished metal panels and accessories meeting performance requirements, indicated profiles, and structural requirements.
- B. Fabricate metal panel joints configured to accept factory-applied sealant providing weathertight seal and preventing metal-to-metal contact and minimizing noise resulting from thermal movement.
- C. Form panels in continuous lengths for full length of detailed runs, except where otherwise indicated on approved shop drawings.
- D. Sheet Metal Flashing and Trim: Fabricate flashing and trim to comply with manufacturer's written instructions, approved shop drawings, and project drawings. Form from materials matching metal panel substrate.

2.05 FINISHES

- A. Two coat coil applied, baked on full strength (70% resin, PVF2) fluorocarbon coating consisting of a nominal 0.25 mil dry film thickness primer, and a nominal dry film thickness of 0.7 -0.8 mil color coat for a total 0.9 to 1.1 mil total system dry film thickness. Finish to be selected from manufacturer's standard color selection. The back side of the material should be 0.25 mil primer and a 0.25 mil polyester wash coat.
 - 1. Roof Panel Color:
 - a. City to Select from full range of manufacturer's standard colors.
 - 2. Roof Related Trim/Accessories Color:

- b. City to select from full range of manufacturer's standard colors.

2.06 SOURCE QUALITY

- A. Source Quality: Obtain metal panel products from a single manufacturer.
- B. Quality Control: Obtain standing seam metal roof panels, trim and other accessories from a manufacturer capable of providing on-site technical support and installation assistance.

PART 3: PART 3 EXECUTION

3.01 MANUFACTURER'S INSTRUCTIONS

- A. Compliance: Comply with manufacturer's product data, recommendations and installation instructions for substrate verification, preparation requirements and installation.
 - 1. Strippable Film: Remove manufacturer's protective film, if any, from surfaces of roofing panels.
- B. Site Verification of Conditions: Verify substrate conditions, which have been previously installed under other sections, are acceptable for product installation in accordance with manufacturer's instructions.
 - 1. Verification of Conditions:
 - a. Panel support systems are ready for construction activities of this section and within specified tolerances.
 - b. Rough-in utilities are in correct locations.
 - 2. Installer's Examination:
 - a. Have installer of this section examine conditions under which construction activities of this section are to be performed, then submit written notification if such conditions are unacceptable.
 - b. Transmit 2 copies of installer's report to Architect within 24 hours of receipt.
 - c. Delay construction activities of this section until unacceptable conditions have been corrected.
 - d. Beginning construction activities of this section indicates installer's acceptance of conditions.

3.02 PREPARATION

- A. Coordination: Coordinate metal roofing with other work to provide a noncorrosive and leak-proof installation.
 - 1. Install substrate boards, hat channels, purlins, or furring channels in accordance with manufacturer's recommendations.

2. Coordinate work, with installation of other associated work, to ensure quality application.
3. Coordinate work with installation of associated metal flashings and building walls.
4. Coordinate work to minimize foot traffic and construction activity on installed finished surfaces.
5. Coordinate location of pipe penetrations to allow centering of pipe in panel.
6. Coordinate location of roof curbs, to allow proper integration with roof panel.
7. Coordinate work to minimize foot traffic and construction activity on installed finished. surfaces.
8. Dissimilar Metals: Prevent galvanic action of dissimilar metals.

3.03 INSTALLATION

- A. General: Install metal roofing panels to profiles, patterns and drainage indicated and required for leak-proof installation. Provide for structural and thermal movement of work. Seal joints for leak-proof installation.
1. Shim or otherwise plumb substrates receiving metal panels.
 2. Flash and seal metal panels at perimeter of all openings. Fasten with self-tapping screws.
 3. Do not begin installation until air- or water-resistive barriers and flashings that will be concealed by metal panels are installed.
 4. Install screw fasteners in predrilled holes for clip installation.
 5. Locate and space fasteners in uniform vertical and horizontal alignment.
 6. Install flashing and trim as metal panel work proceeds.
 7. Install continuous length panels.
 8. Align bottoms of metal panels and fasten with blind rivets, bolts, or self-tapping screws.
 9. Fasten flashings and trim around openings and similar elements with self-tapping screws.
 10. Provide weathertight EPDM Flashing for pipe- and conduit-penetrating panels.
 11. Seams: Provide uniform, neat seams.
 12. Fix panels at location depicted on reviewed shop drawings.
 13. Allow for required panel clearance at penetrations for thermal movement.
 14. Align pipe penetrations to occur at center of roof panel. Report and have corrected improperly placed penetrations before proceeding with panel installation. Remove and replace roof panels which have improperly placed penetration flashings.
 15. Allow for required panel clearance at penetrations for thermal movement.
 16. Fasteners: Conceal fasteners where possible in exposed work. Cover and seal fasteners and anchors for watertight and leak-proof installation.
 17. Sealant-Type Joints: Provide sealant-type joint where indicated. Form joints to conceal sealant. Comply with Division 7 Joint Sealants Section for sealant installation.

B. Roofing Installation:

1. Install roofing plumb, true and in correct alignment with structural framing, in accordance with shop drawings and manufacturer's printed installation instructions.
2. Install roofing using manufacturer's concealed fastening system or non-corroding fasteners color-matched to panel.
3. Install trim using concealed fasteners where possible; sight-exposed non-corroding fasteners color-matched to trim are permitted on vertical surfaces only.

C. Installation Tolerances:

1. Variation from Plumb: Maximum 1/8" (3.2 mm) in 20 feet (6.096 m).
2. Variation from Level: Maximum 1/8" (3.2 mm) in 20 feet (6.096 m).
3. Variation from True Plane: Maximum 1/4" (3.2 mm) in 20 feet (6.096 m).

D. Underlayment Installation

1. Underlayment to be supplied by metal roof panel manufacturer.
2. Self-adhered High-Temperature Underlayment: Provide self-adhering, cold-applied, sheet underlayment, a minimum of 40 mils thick adhesive, with release-paper backing. Provide primer when recommended by underlayment manufacturer.
3. Thermal Stability: Stable after testing at 240 degree F; ASTM D1970.
4. Low-Temperature Flexibility: Passes after testing at minus 20 degree F; ASTM D1970.
5. Supplied by metal roof panel manufacturer.

E. Accessory Installation: Install accessories using techniques recommended by manufacturer and which will assure positive anchorage to building and weathertight mounting. Provide for thermal movement. Coordinate installation with flashings and other components

1. Substrate boards
 - a. General: As indicated in the Drawings

F. Flashing and Trim Installation: Comply with performance requirements, manufacturer's written installation instructions, and the SMACNA "Architectural Sheet Metal Manual." Provide concealed fasteners where possible, and install units to true level. Install work with laps, joints, and seams that will be permanently watertight.

G. Metal Roof Curbs: .063 minimum thickness welded aluminum, or 18 gauge minimum welded stainless steel, factory-insulated, with integral cricket, and designed to fit roof panel module, sized to meet specification.

3.04 **FIELD QUALITY REQUIREMENTS**

- A. Site Tests: (Post-Installation Testing): Owner reserves right to perform post-installation testing of installed metal panel installation.

3.05 **CLEANING**

- A. Cleaning: Remove temporary coverings and protection of adjacent work areas.
- B. Repair or replace damaged installed products.
- C. Clean installed products in accordance with manufacturer's instructions prior to Owner's acceptance.
- D. Remove construction debris from project site and legally dispose of debris.
- E. Remove strippable coating and perform dry wipe-down cleaning of panels as erected.

3.06 **PROTECTION**

- A. Protection: Protect installed product's finish surfaces from damage during construction:
 - 1. Protect installed products from damage by subsequent construction activities.
 - 2. Replace products having damage other than minor finish damage.
 - 3. Repair products having minor damage to finish in accordance with panel Manufacturer's recommendation
 - 4. Architect shall be sole judge of acceptability of repair to damaged finishes; replace products having rejected repairs

END OF SECTION

SECTION 07620 SHEET METAL FLASHING AND TRIM

PART 1: GENERAL

1.01 SECTION INCLUDES

- A. Fabricated sheet metal items, including flashings and counter flashings.
- B. Sealants for joints within sheet metal fabrications.

1.02 REFERENCE STANDARDS

- A. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels; 2013.
- B. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2015.
- C. ASTM C920 - Standard Specification for Elastomeric Joint Sealants; 2014.
- D. ASTM D4586/D4586M - Standard Specification for Asphalt Roof Cement, Asbestos-Free; 2007 (Reapproved 2012).
- E. CDA A4050 - Copper in Architecture - Handbook; current edition.
- F. SMACNA (ASMM) - Architectural Sheet Metal Manual; 2012.

1.03 SUBMITTALS

- A. Shop Drawings: Indicate material profile, jointing pattern, jointing details, fastening methods, flashings, terminations, and installation details.

1.04 QUALITY ASSURANCE

- A. Perform work in accordance with SMACNA (ASMM) and CDA A4050 requirements and standard details, except as otherwise indicated.
- B. Maintain one copy of each document on site.
- C. Fabricator and Installer Qualifications: Company specializing in sheet metal work with Five years of documented experience.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Stack material to prevent twisting, bending, and abrasion, and to provide ventilation. Slope metal sheets to ensure drainage.
- B. Prevent contact with materials that could cause discoloration or staining.

PART 2: PRODUCTS

3.01 SHEET MATERIALS

- A. Galvanized Steel: ASTM A653/A653M, with G90/Z275 zinc coating; minimum 24 gage, (0.0239 inch) (0.61 mm) thick base metal.
- B. Pre-Finished Galvanized Steel: ASTM A653/A653M, with G90/Z275 zinc coating; minimum 24 gage, (0.0239) inch (0.61 mm) thick base metal, shop pre-coated with PVDF coating.
 - 1. PVDF (Polyvinylidene Fluoride) Coating: Superior Performance Organic Finish, AAMA 2605; multiple coat, thermally cured fluoropolymer finish system.
 - 2. Color: As selected by Architect from manufacturer's custom colors.

3.02 ACCESSORIES

- A. Fasteners: Galvanized steel, with soft neoprene washers.
- B. Primer: Zinc chromate type.
- C. Protective Backing Paint: Zinc molybdate alkyd.
- D. Sealant to be Concealed in Completed Work: Non-curing butyl sealant.
- E. Sealant to be Exposed in Completed Work: 1; elastomeric sealant, 100 percent silicone with minimum movement capability of plus/minus 25 percent and recommended by manufacturer for substrates to be sealed; clear.
- F. Plastic Cement: 1, Type I.

3.03 FABRICATION

- A. Form sections true to shape, accurate in size, square, and free from distortion or defects.
- B. Form pieces in longest possible lengths.
- C. Hem exposed edges on underside 1/2 inch (13 mm); miter and seam corners.
- D. Form material with flat lock seams, except where otherwise indicated; at moving joints, use sealed lapped, bayonet-type or interlocking hooked seams.
- E. Fabricate corners from one piece with minimum 18 inch (450 mm) long legs; seam for rigidity, seal with sealant.
- F. Fabricate vertical faces with bottom edge formed outward 1/4 inch (6 mm) and hemmed to form drip.

PART 3: EXECUTION

3.01 EXAMINATION

- A. Verify roof openings, curbs, pipes, sleeves, ducts, and vents through roof are solidly set, reglets in place, and nailing strips located.
- B. Verify roofing termination and base flashings are in place, sealed, and secure.

3.02 PREPARATION

- A. Install starter and edge strips, and cleats before starting installation.
- B. Install surface mounted reglets true to lines and levels, and seal top of reglets with sealant.
- C. Back paint concealed metal surfaces with protective backing paint to a minimum dry film thickness of 15 mil (0.4 mm).

3.03 INSTALLATION

- A. Secure flashings in place using concealed fasteners, and use exposed fasteners only where permitted..
- B. Apply plastic cement compound between metal flashings and felt flashings.
- C. Fit flashings tight in place; make corners square, surfaces true and straight in planes, and lines accurate to profiles.

3.04 FIELD QUALITY CONTROL

- A. Inspection will involve surveillance of work during installation to ascertain compliance with specified requirements.

END OF SECTION

SECTION 07900 JOINT SEALERS

PART 1: GENERAL

1.01 SECTION INCLUDES

- A. Sealants and joint backing.

1.02 REFERENCE STANDARDS

- A. ASTM C834 - Standard Specification for Latex Sealants; 2014.
- B. ASTM C919 - Standard Practice for Use of Sealants in Acoustical Applications; 2012.
- C. ASTM C920 - Standard Specification for Elastomeric Joint Sealants; 2014.
- D. ASTM C1193 - Standard Guide for Use of Joint Sealants; 2016.
- E. ASTM D2240 - Standard Test Method for Rubber Property--Durometer Hardness; 2005 (Reapproved 2010).
- F. SCAQMD 1168 - South Coast Air Quality Management District Rule No.1168; current edition.

1.03 ADMINISTRATIVE REQUIREMENTS

- A. Coordinate the work with other sections referencing this section.

1.04 SUBMITTALS

- A. Product Data: Provide data indicating sealant chemical characteristics.
- B. Manufacturer's Installation Instructions: Indicate special procedures.

1.05 QUALITY ASSURANCE

- A. Maintain one copy of each referenced document covering installation requirements on site.
- B. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum three years documented experience.
- C. Applicator Qualifications: Company specializing in performing the work of this section with minimum three years documented experience and approved by manufacturer.

1.06 MOCK-UP

- A. Construct mock-up with specified sealant types and with other components noted.

- B. Mock-up may remain as part of the Work.

1.07 **FIELD CONDITIONS**

- A. Maintain temperature and humidity recommended by the sealant manufacturer during and after installation.

1.08 **WARRANTY**

- A. Correct defective work within a five year period after Date of Substantial Completion.
- B. Warranty: Include coverage for installed sealants and accessories which fail to achieve airtight seal, exhibit loss of adhesion or cohesion, or do not cure.

PART 2: PRODUCTS

2.01 **MANUFACTURERS**

- A. Gunnable and Pourable Sealants:
 - 1. Adhesives Technology Corporation: www.atc.ws.
 - 2. BASF Construction Chemicals-Building Systems: www.buildingsystems.basf.com.
 - 3. Bostik Inc: www.bostik-us.com.
 - 4. ARDEX Engineered Cements: www.ardexamericas.com.
 - 5. Dow Corning Corporation: www.dowcorning.com.
 - 6. Hilti, Inc: www.us.hilti.com.
 - 7. Momentive Performance Materials, Inc (formerly GE Silicones): www.momentive.com.
 - 8. Pecora Corporation: www.pecora.com.
 - 9. The QUIKRETE Companies: www.quikrete.com.
 - 10. Tremco Global Sealants: www.tremcosealants.com.
 - 11. Sherwin-Williams Company: www.sherwin-williams.com.
 - 12. Sika Corporation: www.usa-sika.com.
 - 13. W.R. Meadows, Inc: www.wrmeadows.com.

2.02 **SEALANTS**

- A. Sealants and Primers - General: Provide products having volatile organic compound (VOC) content as specified in Section 016116.

- B. General Purpose Exterior Sealant: Polyurethane; ASTM C920, Grade NS, Class 25 minimum; Uses M, G, and A; single component.
1. Color: To be selected by CITY from manufacturer's standard range.
 2. Applications: Use for:
 - a. Control, expansion, and soft joints in masonry.
 - b. Joints between concrete and other materials.
 - c. Joints between metal frames and other materials.
 - d. Other exterior joints for which no other sealant is indicated.
 3. Polyurethane Products:
 - a. BASF Construction Chemicals-Building Systems; -: www.buildingsystems.basf.com.
 - b. Sherwin-Williams Company; Stampede-1/-TX Polyurethane Sealant: www.sherwin-williams.com.
 - c. Sherwin-Williams Company; Stampede 1H Hybrid Sealant: www.sherwin-williams.com.
 - d. Sherwin-Williams Company; Stampede 2NS Polyurethane Sealant: www.sherwin-williams.com.
 - e. Sika Corporation; Sikaflex-1a: www.usa-sika.com.
 - f. Sika Corporation; Sikaflex-15 LM: www.usa-sika.com.
 - g. Sika Corporation; Sikaflex-2c NS EZ Mix: www.usa-sika.com.
 - h. Substitutions: Approved equal.
- C. General Purpose Interior Sealant: Acrylic emulsion latex; ASTM C834, Type OP, Grade NF single component, paintable.
1. Color: To be selected by CITY from manufacturer's standard range.
 2. Applications: Use for:
 - a. Interior wall and ceiling control joints.
 - b. Joints between door and window frames and wall surfaces.
 - c. Other interior joints for which no other type of sealant is indicated.

3. Products:
 - a. Sherwin-Williams Company; White Lightning 3006 Siliconized Acrylic Latex Caulk: www.sherwin-williams.com.
 - b. Sherwin-Williams Company; 850A Acrylic Latex Caulk: www.sherwin-williams.com.
 - c. Sherwin-Williams Company; 950A Siliconized Acrylic Latex Caulk: www.sherwin-williams.com.
 - d. Sherwin-Williams Company; Bolt Quickdry Siliconized Acrylic Latex Caulk: www.sherwin-williams.com.
 - e. Sherwin-Williams Company; Powerhouse Siliconized Acrylic Latex Sealant: www.sherwin-williams.com.
 - f. Substitutions: Approved equal.
- D. Nonsag Tamper-Resistant Sealant: ASTM C920, Grade NS, Class 12-1/2, Uses M, G, and A; single or multi- component.
 1. Type: Polyurethane.
 2. Color: To be selected by CITY from manufacturer's standard range.
 3. Applications: Use for the following joints in secure areas.
 - a. Interior wall and ceiling control joints.
 - b. Joints between door and window frames and wall surfaces.
 - c. Other interior joints for which no other type of sealant is indicated.
 4. Products:
 - a. Pecora Corporation; DynaFlex Flexible Polyurethane Security Sealant: www.pecora.com.
 - b. Pecora Corporation; DynaFlex SC Polyurethane STPU Security Sealant: www.pecora.com.
 - c. Substitutions: Approved equal.
- E. Acoustical Sealant for Concealed Locations:
 1. Composition: Acrylic latex emulsion sealant.
 2. Applications: Use for concealed locations only:

- a. Sealant bead between top stud runner and structure and between bottom stud track and floor/concrete slab.
- 3. Products:
 - a. Hilti, Inc.; CP 506 Smoke and Acoustical Sealant: www.us.hilti.com.
 - b. Hilti, Inc.; CP 572 Smoke and Acoustical Spray Sealant: www.us.hilti.com.
 - c. Substitutions: Approved equal.
- F. Self-leveling or Non-sag Silicone Sealant: ASTM D5893, Type S, Grade NS or P, Class 100/50 minimum; Uses T, A, G, M, O; single component, neutral curing, non-bleeding.
 - 1. Color: To be selected by CITY from manufacturer's standard range.
 - 2. Products:
 - a. Sika Corporation; Sikasil 728NS: www.usa-sika.com.
 - b. Sika Corporation; Sikasil 728SL: www.usa-sika.com.
 - c. Substitutions: Approved equal.
- G. Nonsag Hybrid Silicone Sealant: ASTM C920, Type S, Grade NS, Class 50, Uses NT, A, G, M, O; single component, moisture-cured, non-sagging, non-bleeding.
 - 1. Color: White.
 - 2. Movement Capability: Plus 50 percent, minus 50 percent.
 - 3. Products:
 - a. Sika Corporation; SikaHyflex-150 LM: www.usa-sika.com.
 - b. Substitutions: Approved equal.

2.03 ACCESSORIES

- A. Primer: Non-staining type, recommended by sealant manufacturer to suit application.
- B. Joint Cleaner: Non-corrosive and non-staining type, recommended by sealant manufacturer; compatible with joint forming materials.
- C. Joint Backing: Round foam rod compatible with sealant; ASTM D1667, closed cell PVC; oversized 30 to 50 percent larger than joint width.
- D. Bond Breaker: Pressure sensitive tape recommended by sealant manufacturer to suit application.

PART 3: EXECUTION

3.01 EXAMINATION

- A. Verify that substrate surfaces are ready to receive work.
- B. Verify that joint backing and release tapes are compatible with sealant.

3.02 PREPARATION

- A. Remove loose materials and foreign matter that could impair adhesion of sealant.
- B. Clean and prime joints in accordance with manufacturer's instructions.
- C. Perform preparation in accordance with manufacturer's instructions and ASTM C1193.
- D. Protect elements surrounding the work of this section from damage or disfigurement.
- E. Exposed Concrete Joints: Test joint filler in inconspicuous area of concrete. Verify specified product does not stain or discolor concrete.

3.03 INSTALLATION

- A. Perform work in accordance with sealant manufacturer's requirements for preparation of surfaces and material installation instructions.
- B. Perform installation in accordance with ASTM C1193.
- C. Perform acoustical sealant application work in accordance with ASTM C919.
- D. Install bond breaker where joint backing is not used.
- E. Install sealant free of air pockets, foreign embedded matter, ridges, and sags.
- F. Apply sealant within recommended application temperature ranges. Consult manufacturer when sealant cannot be applied within these temperature ranges.
- G. Tool joints concave.
- H. Concrete Joint Filler: Install concrete joint filler per manufacturer's written instructions. After joint filler is fully cured, shave joint filler flush with top of concrete.

3.04 CLEANING

- A. Clean adjacent soiled surfaces.

3.05 PROTECTION

- A. Protect sealants until cured.

END OF SECTION

SECTION 15870 EXHAUST VENTILLATION FAN

PART 1: GENERAL

1.01 SCOPE OF WORK

Contractor shall furnish and install the roof mounted exhaust ventilation fan, thermostat, and all related electrical and controls as required herein and elsewhere to provide a complete working exhaust ventilation system.

1.02 REFERENCES

ANSI/AMCA 210	Laboratory Methods of Testing Fans for Rating.
ANSI/AMCA 330	Laboratory Methods of Testing In-Duct Sound Power Measurement Procedure for Fans.
ANSI/AFBMA 9	Ball Bearings, Load Ratings and Fatigue Life for.
ANSA/AFBMA 11	Roller Bearings, Load Ratings and Fatigue Life for.
AMCA 300	Test Code for Sound Rating.
AMCA 301	Methods for Calculating Fan Sound Ratings from Laboratory Test Data.
NEC	National Electric Code
NEMA	National Electric Manufacturers Association
UBC	Uniform Building Code
UL	Underwriter's Laboratories, Inc.

1.03 SUBMITTALS

- A. Product catalogue cut sheets indicating selected size, application, materials of construction, and options.
- B. Manufacturer's installation instructions.
- C. Operation and Maintenance information in accordance with Section 01730 "Operating and Maintenance Manual".
- D. Submit in accordance with Front End documents.

PART 2: MATERIALS

2.01 ROOF VENTILLATION FAN

- A. The direct drive centrifugal roof exhaust fan shall have the following performance: 2,500 cfm @ 0.125 SP, 3/4 hp, 1495 RPM, 115 volts, 60 hertz single phase motor.

- B. Fans shall be listed by UL and rated in accordance with AMCA and bear the AMCA certified rating seal.
- C. The fan housing shall be constructed of spun aluminum. The fan wheels shall be backward inclined, centrifugal type (non-overloading) and constructed of aluminum. The fan shall be provided with single piece windband. Each wheel shall be statically and dynamically balanced. The bearing and drive components shall be isolated from the air stream. The motor cover shall be easily removed for service.
- D. Motors shall be located out of the air stream with a aluminum motor cover. Fan shafts shall be ground, and polished steel sized so that the first critical speed is at least 25% over the maximum operating speed. The unit shall be provided with heavy duty pillow block bearings that are 100% factory tested and are designed for all handling applications with a minimum (L50) life more than of 500,000 hours.
- E. The drive shall be sized for a minimum of 150% of drive horsepower. The unit shall be provided with a NEMA 1 disconnect switch. A disconnect device/switch shall be factory installed and wired from the fan motor to the motor compartment.
- F. The unit shall be coated per the manufacturer's recommendations.

2.02 CONTROL

- A. Ventilator shall be controlled by a remote programable thermostat.
- B. If thermostat location is not shown on Plans, Contractor shall propose a location, submit, and obtain approval for the location at no additional cost.

2.03 PAINTING

Paint exposed surfaces of fans per Section 09900, "Painting and Coating".

2.04 ACCEPTABLE MANUFACTURERS

Greenheck Model No. 140 CUBE
Approved equivalent

PART 3: EXECUTION

3.01 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials in manufacturer's original unopened containers and packaging, with labels clearly indicating manufacturer, material, products included and location of installation.
- B. Store materials in a dry area indoors, protected from damage and in accordance with manufacturer's instructions. For long term storage follow manufacturer's installation, operations, and maintenance manual.

- C. Handle and lift fans in accordance with the manufacturer's instructions. Protect materials and finishes during handling and installation to prevent damage. Follow all safety warning posted by the manufacturer.
- D. Protect equipment from dust and atmospheric exposure.
- E. Provide temporary closures for equipment openings designed for air flow.

3.02 EXAMINATION

- A. Take measurements and verify dimensions to ascertain fit of installation.
- B. Ascertain that support and openings are correctly located.

3.03 PREPARATION

Before installation remove dust and debris from equipment and ducts. During installation and until equipment is operated, protect equipment and ducts from dust and debris by covering openings.

3.04 INSTALLATION

- A. Adjust alignment of ducts where necessary to resolve conflicts with architectural features or to resolve conflicts with the work of other trades.
- B. Install and wire unit fans and controls in accordance with manufacturer's recommendations.

3.05 FIELD QUALITY CONTROL

- A. Test equipment and installation to verify that tightness, operation, and unit vibration is within manufacturer's submitted limits.
- B. Test equipment performance for air flow.

END OF SECTION

SECTION 16010 GENERAL ELECTRICAL REQUIREMENTS

PART 1 - GENERAL

1.01 DESCRIPTION

- A. This section includes general requirements for materials and installation of the electrical system.
- B. The Contractor shall furnish all labor, supervision, tools, equipment, and materials necessary for a tested and working electrical system as indicated on the Plans and hereinafter specified. All systems shall be electrically connected into a complete and fully operational and tested system made ready for satisfactory use. The electrical system shall include all items not specifically mentioned in these Specifications or indicated on the Drawings or accepted Shop Drawings, but which are obviously necessary to make a complete working installation, at no additional cost to the Owner
- C. The electrical plans are diagrammatic, approximately to scale. However, they shall not be used for exact locations. The Contractor shall verify all dimensions from the detailed drawings and approved shop drawings and shall coordinate these dimensions with the actual field conditions. Actual distances, locations, and elevations shall be governed by field conditions.

1.02 SUBMITTALS

- A. Complete fabrication, assembly, and installation drawings; wiring and schematic diagrams; and details, specifications, and data covering the materials used and the parts, devices, and accessories forming a part of the equipment furnished shall be submitted in accordance with the submittal section.
- B. Submittal data shall be grouped and submitted in three separate stages. The submittal for each stage shall be substantially complete. Individual drawings and data sheets submitted at random intervals will not be accepted for review. Equipment tag numbers indicated on the contract drawings shall be referenced in submittals where applicable. Submittal data for multifunctional instruments shall include complete descriptions of the intended functions and configurations of the instruments.
 - 1. First-Stage Submittal:
 - a. Product catalog cut sheets clearly marked to show the model number, optional features, and intended service of the device; and
 - b. A detailed list of any exceptions, functional differences, or discrepancies between the supplier's proposed system and the contract requirements.
 - 2. Second-Stage Submittal:
 - a. Complete panel fabrication drawings and details of panel wiring, piping, and painting. Panel and subpanels drawings shall include overall dimensions, metal thickness, door swing, mounting details, and front of panel

arrangement to show general appearance, with spacing and mounting height of instruments and control devices.

- b. System wiring and installation drawings for all interconnection wiring between components of the systems furnished and for all interconnecting wiring between the related equipment and the equipment furnished under this section. Wiring diagrams shall show complete circuits and indicate all connections.
- c. If panel terminal designations, device interconnections, device features and options, or other features are modified as a result of the fabrication process or factory testing, revised drawings shall be resubmitted.
- d. At the supplier's option and for projects with very few fabrication drawings, the first-stage and second-stage submittals may be combined.

3. Third-Stage Submittal:

- a. Complete system documentation, in the form of operation and maintenance manuals, shall be provided. Manuals shall include complete product instruction books for each item of equipment furnished.
- b. Where instruction booklets cover more than one specific model or range of instrument, product data sheets shall be included which indicate the instrument model number, calibrated range, and all other special features. A complete set of "as-built" wiring, fabrication, and interconnection drawings shall be included with the manuals.

C. Submit AutoCAD (latest version) format digital drawing files for all shop drawings in addition to hard copy requirements.

D. Short Circuit, Coordination and Arc Flash Study Report

1.03 REGULATORY AGENCIES AND STANDARDS

A. Regulatory Agencies: Installations, materials, equipment, and workmanship shall conform to the applicable provisions of the following agencies (latest version):

- 1. American National Standards Institute (ANSI)
- 2. American Society of Testing and Materials (ASTM)
- 3. Institute of Electrical and Electronics Engineers (IEEE)
- 4. Insulated Cable Engineers Association (ICEA)
- 5. International Electrical Testing Association (NETA)
- 6. National Electrical Contractors Association (NECA)
- 7. National Electrical Manufacturers Association (NEMA)
- 8. National Fire Protection Association (NFPA)
- 9. State Department of Industrial Safety (CAL/OSHA)

10. Underwriters' Laboratories (UL)
 - a. Materials, appliances, equipment, and devices shall conform to the applicable UL standards. The label of, or listing by UL is required wherever applicable.
 11. Local authorities having lawful jurisdiction pertaining to the work required.
- B. Standards: Where referenced in these specifications or on the drawings, the latest publications and standards shall apply:
1. NFPA 70 National Electrical Code (NEC)
 2. California Building Code (CBC)
- C. In case of difference between the building codes, Drawings, Specifications, state law, local ordinances, industry standards, utility company regulations, fire insurance carrier's requirements, and the Contract Documents, the most stringent shall govern. The Contractor shall promptly notify the Engineer in writing of such differences.

1.04 QUALITY ASSURANCE

- A. Materials, appliances, equipment, and devices shall conform to the applicable Underwriters' Laboratories, Inc. (UL) standards. The label of, or listing by, UL is required for all electrical equipment.
- B. Installation of all electrical work shall be in conformance with the requirements specified herein and the latest edition, at the time of bid, of the following:
1. NFPA 70, National Electrical Code (NEC)
 2. State of California Construction Safety Order (CAL/OSHA)
 3. ANSI C2, National Electrical Safety Code (NESC)
 4. Applicable codes of local authorities having lawful jurisdiction pertaining to the work required.

1.05 WARRANTIES

- A. Prior to final payment, compile manufacturer's written warranties for each major piece of equipment and develop a summary table identifying the date the piece of equipment were turned over to the Owner and the date the warranty expires. Include warranties and summary table with warranty letter to the Owner.

PART 2 - PRODUCTS

2.01 GENERAL

- A. All materials and equipment shall be suitable for the location for which they are installed in.
- B. Similar materials and equipment shall be the product of a single manufacturer.
- C. Provide only products which are new, undamaged, and in the original cartons or containers.

- D. Materials and equipment shall be the standard products of manufacturers regularly engaged in the production of such materials and shall be the manufacturer's current design.
- E. Materials and equipment shall be suitable for storage, installation, and operation in an ambient of 0°C to 50°C except where more stringent conditions are stated in individual equipment specifications.
- F. Electrical equipment and panels shall be factory finished with manufacturer's standard primer and enamel topcoats, unless stated otherwise in the individual equipment specifications. Provide 1 pint of the equipment manufacturer's touchup paint per 500 square feet of painted surface for repair of damaged enamel topcoats.

2.02 OPERATION, MAINTENANCE, AND REPAIR MANUALS

- A. The organization of the initial submittals as required by these contract documents shall be compatible to eventual inclusion as one volume of the operation, maintenance, and repair manuals.
- B. Prepare and submit to the Engineer six copies of operation manuals for preliminary review. When the Engineer is satisfied that these are complete and properly prepared, six final sets shall be delivered to the Owner.
- C. The complete operation manual shall contain all the information included in the preliminary equipment submittal, the detailed installation submittal, programming instructions, instructions for ordering replacement parts, and the additional information required herein, all bound in hard-cover binders and arranged for convenient use including tab sheets, all indexed and cross referenced, and all final as-built drawings.
- D. The operation manuals shall contain:
 1. Operating instructions written for the benefit of plant operating personnel for normal operational conditions;
 2. Calibration and maintenance instructions;
 3. Troubleshooting instructions; and
 4. Instructions for ordering replacement parts.

2.03 AS-BUILT DRAWINGS

- A. As-built drawings shall be submitted at the completion of work, which depict the final configuration of all installed equipment. All shop drawings shall be updated by the originator to "as-built" status. As-built drawings shall be provided to the Owner in both hard copy and digital formats. Digital format shall be AutoCAD (latest edition).
- B. The Contractor shall clearly indicate on as-built plans the following information:
 1. Locations and routing of all underground conduits exactly as installed.
 2. Forming, cabling, and identification of all power and control circuits within pull boxes and terminal boxes.
 3. All changes and/or deviations in locations, routing, or dimensions or additions to any part of the electrical work.

4. Interior views of each pull box identifying each conduit entrance by conduit number.
5. Complete and accurate wiring, schematic, and interconnecting wiring diagrams for all equipment supplied and all work performed.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. The drawings indicate connections for typical equipment only. If the equipment furnished is different from what is shown, provide the modifications necessary for a safe and properly operating installation in accordance with the equipment manufacturer's recommendations.
- B. The drawings indicate diagrammatically the desired location and arrangement of outlets, conduit runs, equipment, and other items. Field determine exact location based on physical size and arrangement of equipment, finished elevations, and obstructions.
- C. Work or equipment not indicated or specified which is necessary for the complete and proper operation of the electrical systems shall be accomplished without additional cost to the Owner.

3.02 PERFORMANCE TESTS

After the electrical installation is complete, test it to demonstrate that the entire system is in proper working order and in accordance with the drawings and specifications.

- Equipment start-up and performance test requirements are provided in the Special Provisions.

END OF SECTION

SECTION 16050

BASIC ELECTRICAL MATERIALS AND METHODS

PART 1 - GENERAL

1.01 SUMMARY

Includes conduit and equipment supports, nameplates, anchors, fasteners, wire markers, wall switches, and wall plates.

1.02 SYSTEM DESCRIPTION

- A. Identify Electrical components as follows:
 - 1. Nameplate for each electrical distribution and control equipment enclosure.
 - 2. Wire marker on both ends of each conductor at panelboard gutters, pull boxes, and outlet and junction boxes.

1.03 SUBMITTALS

- A. Product Data: Submit manufacturer's catalog information for each wiring device.
- B. Product Data: Submit catalog data showing products with specified features.
- C. Product Data: Submit dimensions, ratings, and performance data.

PART 2 - PRODUCTS (not used)

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Drawings are diagrammatic only. Do not scale the electrical drawings for locations of any electrical, architectural, structural, civil, or mechanical items or features.
- B. Locate and install anchors, fasteners, and supports in accordance with NECA-1 "Standard Practice of Good Workmanship in Electrical Construction."
- C. Fabricate supports from nonmetallic members whenever possible. If loads warrant steel support, corrosion resistant stainless-steel members shall be used.

END OF SECTION

SECTION 16073
HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes:

1. Hangers and supports for electrical equipment and systems.
2. Construction requirements for concrete bases and equipment pads.

1.02 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Design supports for multiple raceways, including comprehensive engineering analysis by a qualified Professional Engineer, using performance requirements and design criteria indicated.
- B. Design supports for multiple raceways capable of supporting combined weight of supported systems and its contents.
- C. Design equipment supports capable of supporting combined operating weight of supported equipment and connected systems and components.
- D. Rated Strength: Adequate in tension, shear, and pullout force to resist maximum loads calculated or imposed for this Project, with a minimum structural safety factor of five times the applied force.

1.03 ACTION SUBMITTALS

- A. Product Data: For steel slotted support systems.
- B. Shop Drawings: Show fabrication and installation details and include calculations for the following:
 1. Trapeze hangers: Include Product Data for components.
 2. Steel slotted channel systems: Include Product Data for components.
 3. Equipment supports.

1.04 INFORMATIONAL SUBMITTALS

- A. Welding certificates

1.05 **QUALITY ASSURANCE**

- A. Welding: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."
- B. Comply with NFPA 70.
- C. Seismic-Restraint to comply with latest IBC.

PART 2 - PRODUCTS

1.01 **SUPPORT, ANCHORAGE, AND ATTACHMENT COMPONENTS**

- A. Steel Slotted Support Systems: Comply with MFMA-4, factory-fabricated components for field assembly.
 - 1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 2. Manufacturers: Subject to compliance with requirements, provide products by one of the following or equal:
 - a. Allied Tube & Conduit
 - b. Cooper B-Line, Inc.; a division of Cooper Industries
 - c. Thomas & Betts Corporation
 - d. Unistrut; Tyco International, Ltd.
 - 3. Metallic Coatings: Hot-dip galvanized after fabrication and applied according to MFMA-4.
 - 4. Nonmetallic Coatings: Manufacturer's standard PVC, polyurethane, or polyester coating applied according to MFMA-4.
 - 5. Painted Coatings: Manufacturer's standard painted coating applied according to MFMA-4.
 - 6. Channel Dimensions: Selected for applicable load criteria.
- B. Raceway and Cable Supports: As described in NECA 1 and NECA 101.
- C. Conduit and Cable Support Devices: Steel and malleable-iron hangers, clamps, and associated fittings, designed for types and sizes of raceway or cable to be supported.
- D. Support for Conductors in Vertical Conduit: Factory-fabricated assembly consisting of threaded body and insulating wedging plug or plugs for non-

armored electrical conductors or cables in riser conduits. Plugs shall have number, size, and shape of conductor gripping pieces as required to suit individual conductors or cables supported. Body shall be malleable iron.

- E. Structural Steel for Fabricated Supports and Restraints: ASTM A 36/A 36M, steel plates, shapes, and bars; black and galvanized.
- F. Mounting, Anchoring, and Attachment Components: Items for fastening electrical items or their supports to building surfaces include the following:
- G. Powder-Actuated Fasteners: Threaded-steel stud, for use in hardened concrete, steel, or wood, with tension, shear, and pullout capacities appropriate for supported loads and building materials where used.
 - 1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Hilti Inc.
 - b. ITW Ramset/Red Head; a division of Illinois Tool Works, Inc.
 - c. MKT Fastening, LLC.
 - d. Simpson Strong-Tie Co., Inc.; Masterset Fastening Systems Unit
- H. Mechanical-Expansion Anchors: Insert-wedge-type, stainless steel, for use in hardened concrete with tension, shear, and pullout capacities appropriate for supported loads and building materials in which used.
 - 1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Cooper B-Line, Inc.; a division of Cooper Industries
 - b. Hilti Inc.
 - c. ITW Ramset/Red Head; a division of Illinois Tool Works, Inc.
 - d. MKT Fastening, LLC.
- I. Concrete Inserts: Steel or malleable-iron, slotted support system units similar to MSS Type 18; complying with MFMA-4 or MSS SP-58.
- J. Clamps for Attachment to Steel Structural Elements: MSS SP-58, type suitable for attached structural element.
- K. Through Bolts: Structural type, hex head, and high strength. Comply with ASTM A 325.

L. Toggle Bolts: All-steel springhead type.

M. Hanger Rods: Threaded steel.

1.02 **FABRICATED METAL EQUIPMENT SUPPORT ASSEMBLIES**

A. Description: Welded or bolted, structural-steel shapes, shop or field fabricated to fit dimensions of supported equipment.

PART 3 - EXECUTION

1.01 **APPLICATION**

A. Comply with NECA 1 and NECA 101 for application of hangers and supports for electrical equipment and systems except if requirements in this Section are stricter.

B. Maximum Support Spacing and Minimum Hanger Rod Size for Raceway: Space supports for RMC as required by NFPA 70. Minimum rod size shall be 1/4 inch in diameter.

C. Multiple Raceways or Cables: Install trapeze-type supports fabricated with steel slotted support system, sized so capacity can be increased by at least 25 percent in future without exceeding specified design load limits.

1. Secure raceways and cables to these supports with two-bolt conduit.

1.02 **SUPPORT INSTALLATION**

A. Comply with NECA 1 and NECA 101 for installation requirements except as specified in this Article.

B. Strength of Support Assemblies: Where not indicated, select sizes of components so strength will be adequate to carry present and future static loads within specified loading limits. Minimum static design load used for strength determination shall be weight of supported components plus 200 lb.

C. Mounting and Anchorage of Surface-Mounted Equipment and Components: Anchor and fasten electrical items and their supports to building structural elements by the following methods unless otherwise indicated by code:

1. To Wood: Fasten with lag screws or through bolts.

2. To New Concrete: Bolt to concrete inserts.

3. To Masonry: Approved toggle-type bolts on hollow masonry units and expansion anchor fasteners on solid masonry units.

4. To Existing Concrete: Expansion anchor fasteners.

5. Instead of expansion anchors, powder-actuated driven threaded studs provided with lock washers and nuts may be used in existing standard-weight concrete 4 inches thick or greater. Do not use for anchorage to lightweight-aggregate concrete or for slabs less than 4 inches thick.
 6. To Steel: Welded threaded studs complying with AWS D1.1/D1.1M, with lock washers and nuts.
 7. To Light Steel: Sheet metal screws.
 8. Items Mounted on Hollow Walls and Nonstructural Building Surfaces: Mount cabinets, panelboards, disconnect switches, control enclosures, pull and junction boxes, transformers, and other devices on slotted-channel racks attached to substrate by means that meet seismic-restraint strength and anchorage requirements.
- D. Drill holes for expansion anchors in concrete at locations and to depths that avoid reinforcing bars.

1.03 **INSTALLATION OF FABRICATED METAL SUPPORTS**

- A. Cut, fit, and place miscellaneous metal supports accurately in location, alignment, and elevation to support and anchor electrical materials and equipment.
- B. Field Welding: Comply with AWS D1.1/D1.1M.

1.04 **PAINTING**

- A. Touchup: Clean field welds and abraded areas of shop paint. Paint exposed areas immediately after erecting hangers and supports. Use same materials as used for shop painting. Comply with SSPC-PA 1 requirements for touching up field-painted surfaces.
 1. Apply paint by brush or spray to provide minimum dry film thickness of 2.0 mils.
- B. Galvanized Surfaces: Clean welds, bolted connections, and abraded areas and apply galvanizing-repair paint to comply with ASTM A 780.

END OF SECTION

SECTION 16075 ELECTRICAL IDENTIFICATION

PART 1 - GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Identification for raceways
 - 2. Identification of conductors and cables
 - 3. Underground-line warning tape
 - 4. Warning labels and signs
 - 5. Instruction signs
 - 6. Equipment identification labels
 - 7. Miscellaneous identification products

1.02 SYSTEM DESCRIPTION

- A. Identify Electrical components as follows:
 - 1. Nameplate for each electrical distribution and control equipment enclosure.
 - 2. Wire marker on both ends of each conductor at panelboard gutters, pull boxes, and outlet and junction boxes.

1.03 REFERENCES

- 29 CFR 1910.144 Safety Color Code for Marking Physical Hazards
- 29 CFR 1910.145 Specifications for Accident Prevention Signs and Tags
- ANSI A13.1 Scheme for the Identification of Piping Systems
- ANSI Z535.1 Safety Colors
- ANSI Z535.2 Environmental and Facility Safety Signs
- ANSI Z535.3 Criteria for Safety Symbols
- ANSI Z535.4 Product Safety Signs and Labels
- ANSI Z535.5 Safety Tags and Barricade Tapes (for Temporary Hazards)

1.04 **ACTION SUBMITTALS**

Product Data: For each electrical identification product indicated.

1.05 **QUALITY ASSURANCE**

- A. Comply with ANSI A13.1.
- B. Comply with NFPA 70.
- C. Comply with 29 CFR 1910.144 and 29 CFR 1910.145.
- D. Comply with ANSI Z535.4 for safety signs and labels.
- E. Adhesive-attached labeling materials, including label stocks, laminating adhesives, and inks used by label printers, shall comply with UL 969.

PART 2 - PRODUCTS

2.01 **NAMEPLATES**

- A. Product Description: Engraved three-layer laminated plastic nameplate, white letters on black background.
- B. Letter Size:
 - 1. 1/8 inch letters for identifying individual equipment and loads.
 - 2. 1/4 inch letters for identifying grouped equipment and loads.

2.02 **POWER RACEWAY IDENTIFICATION MATERIALS**

- A. Comply with ANSI A13.1 for minimum size of letters for legend and for minimum length of color field for each raceway size.
- B. Colors for Raceways Carrying Circuits at 600 V or Less:
 - 1. Black letters on an orange field.
 - 2. Legend: Indicate voltage and system or service type.
- C. Self-Adhesive Vinyl Labels for Raceways Carrying Circuits at 600 V or Less: Pre-printed, flexible label laminated with a clear, weather- and chemical-resistant coating and matching wraparound adhesive tape for securing ends of legend label.
- D. Snap-Around Labels for Raceways Carrying Circuits at 600 V or Less: Slit, pre-tensioned, flexible, preprinted, color-coded acrylic sleeve, with diameter sized to suit diameter of raceway or cable it identifies and to stay in place by gripping action.

- E. Snap-Around, Color-Coding Bands for Raceways Carrying Circuits at 600 V or Less: Slit, pretensioned, flexible, solid-colored acrylic sleeve, 2 inches long, with diameter sized to suit diameter of raceway or cable it identifies and to stay in place by gripping action.
- F. Write-On Tags: Polyester tag, 0.015 inch thick, with corrosion-resistant grommet and cable tie for attachment to conductor or cable.
 - 1. Marker for Tags: Permanent, waterproof, black ink marker recommended by tag manufacturer.
 - 2. Marker for Tags: Machine-printed, permanent, waterproof, black ink marker recommended by printer manufacturer.

2.03 **ARMORED AND METAL-CLAD CABLE IDENTIFICATION MATERIALS**

- A. Comply with ANSI A13.1 for minimum size of letters for legend and for minimum length of color field for each raceway and cable size.
- B. Cable identification shall be placed at each end of the cable.
- C. Colors for Raceways Carrying Circuits at 600 V and Less:
 - 1. Black letters on an orange field.
 - 2. Legend: Indicate voltage and system or service type.
- D. Self-Adhesive Vinyl Labels: Preprinted, flexible label laminated with a clear, weather- and chemical-resistant coating and matching wraparound adhesive tape for securing ends of legend label.
- E. Self-Adhesive Vinyl Tape: Colored, heavy duty, waterproof, fade resistant; 2 inches wide; compounded for outdoor use.

2.04 **POWER AND CONTROL CABLE IDENTIFICATION MATERIALS**

- A. Comply with ANSI A13.1 for minimum size of letters for legend and for minimum length of color field for each raceway and cable size.
- B. Cable identification shall be placed at each end of the cable.
- C. Self-Adhesive Vinyl Labels: Preprinted, flexible label laminated with a clear, weather- and chemical-resistant coating and matching wraparound adhesive tape for securing ends of legend label.
- D. Write-On Tags: Polyester tag, 0.015 inch thick, with corrosion-resistant grommet and cable tie for attachment to conductor or cable.
 - 1. Marker for Tags: Permanent, waterproof, black ink marker recommended by tag manufacturer.
 - 2. Marker for Tags: Machine-printed, permanent, waterproof, black ink marker recommended by printer manufacturer.

- E. Snap-Around Labels: Slit, pretensioned, flexible, preprinted, color-coded acrylic sleeve, with diameter sized to suit diameter of raceway or cable it identifies and to stay in place by gripping action.
- F. Snap-Around, Color-Coding Bands: Slit, pretensioned, flexible, solid-colored acrylic sleeve, 2 inches long, with diameter sized to suit diameter of raceway or cable it identifies and to stay in place by gripping action.

2.05 CONDUCTOR IDENTIFICATION MATERIALS

- A. Color-Coding Conductor Tape: Colored, self-adhesive vinyl tape not less than 3 mils thick by 1 to 2 inches wide.
- B. Self-Adhesive Vinyl Labels: Preprinted, flexible label laminated with a clear, weather- and chemical-resistant coating and matching wraparound adhesive tape for securing ends of legend label.
- C. Marker Tapes: Vinyl or vinyl-cloth, self-adhesive wraparound type, with circuit identification legend machine printed by thermal transfer or equivalent process.
- D. Wire Markers: Tubing type wire markers with circuit or control wire number permanently stamped or printed.
- E. Write-On Tags: Polyester tag, 0.015 inch thick, with corrosion-resistant grommet and cable tie for attachment to conductor or cable.
 - 1. Marker for Tags: Permanent, waterproof, black ink marker recommended by tag manufacturer.
 - 2. Marker for Tags: Machine-printed, permanent, waterproof, black ink marker recommended by printer manufacturer.

2.06 FLOOR MARKING TAPE

2-inch wide, 5-mil pressure-sensitive vinyl tape, with black and white stripes and clear vinyl overlay.

2.07 UNDERGROUND-LINE WARNING TAPE (NOT APPLICABLE)

2.08 WARNING LABELS AND SIGNS

- A. Comply with NFPA 70 and 29 CFR 1910.145.
- B. Self-Adhesive Warning Labels: Factory-printed, multicolor, pressure-sensitive adhesive labels, configured for display on front cover, door, or other access to equipment unless otherwise indicated.
- C. Baked-Enamel Warning Signs:
 - 1. Preprinted aluminum signs, punched or drilled for fasteners, with colors, legend, and size required for application.
 - 2. 1/4-inch grommets in corners for mounting.

3. Nominal size, 7 by 10 inches.
- D. Metal-Backed, Butyrate Warning Signs:
1. Weather-resistant, nonfading, preprinted, cellulose-acetate butyrate signs with 0.0396-inch galvanized-steel backing; and with colors, legend, and size required for application.
 2. 1/4-inch grommets in corners for mounting.
 3. Nominal size, 10 by 14 inches.
- E. Warning label and sign shall include, but are not limited to, the following legends:
1. Multiple Power Source Warning: "DANGER - ELECTRICAL SHOCK HAZARD - EQUIPMENT HAS MULTIPLE POWER SOURCES."
 2. Workspace Clearance Warning: "WARNING - OSHA REGULATION - AREA IN FRONT OF ELECTRICAL EQUIPMENT MUST BE KEPT CLEAR FOR 36 INCHES."
 3. Arc-flash warning signs and protective PPE requirement if any.

2.09 **INSTRUCTION SIGNS**

- A. Coordinate this article with Drawings.
- B. Engraved, laminated acrylic or melamine plastic, minimum 1/16 inch thick for signs up to 20 sq. inches and 1/8 inch thick for larger sizes.
1. Engraved legend with black letters on white face.
 2. Punched or drilled for mechanical fasteners.
 3. Framed with mitered acrylic molding and arranged for attachment at applicable equipment.
- C. Adhesive Film Label: Machine printed, in black, by thermal transfer or equivalent process. Minimum letter height shall be 3/8 inch.
- D. Adhesive Film Label with Clear Protective Overlay: Machine printed, in black, by thermal transfer or equivalent process. Minimum letter height shall be 3/8 inch. Overlay shall provide a weatherproof and UV-resistant seal for label.

2.10 **EQUIPMENT IDENTIFICATION LABELS**

- A. Adhesive Film Label with Clear Protective Overlay: Machine printed, in black, by thermal transfer or equivalent process. Minimum letter height shall be 3/8 inch. Overlay shall provide a weatherproof and UV-resistant seal for label.
- B. Self-Adhesive, Engraved, Laminated Acrylic or Melamine Label: Adhesive backed, with white letters on a dark-gray background. Minimum letter height shall be 3/8 inch.

- C. Stenciled Legend: In nonfading, waterproof, black ink or paint. Minimum letter height shall be 1 inch.

2.11 MISCELLANEOUS IDENTIFICATION PRODUCTS

- A. Paint: Comply with requirements in painting Sections for paint materials and application requirements. Select paint system applicable for surface material and location (exterior or interior).
- B. Fasteners for Labels and Signs: Self-tapping, stainless-steel screws or stainless-steel machine screws with nuts and flat and lock washers.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Location: Install identification materials and devices at locations for most convenient viewing without interference with operation and maintenance of equipment.
- B. Cable and wire identification shall be placed at each end for each section of the cable or wire.
- C. Apply identification devices to surfaces that require finish after completing finish work.
- D. Self-Adhesive Identification Products: Clean surfaces before application, using materials and methods recommended by manufacturer of identification device.
- E. Attach signs and plastic labels that are not self-adhesive type with mechanical fasteners appropriate to the location and substrate.
- F. System Identification Color-Coding Bands for Raceways and Cables: Each color-coding band shall completely encircle cable or conduit. Place adjacent bands of two-color markings in contact, side by side. Locate bands at changes in direction, at penetrations of walls and floors, at 50-foot maximum intervals in straight runs, and at 25-foot maximum intervals in congested areas.
- G. Underground-Line Warning Tape: During backfilling of trenches install continuous underground-line warning tape directly above line at 6 to 8 inches below finished grade. Use multiple tapes where width of multiple lines installed in a common trench exceeds 16 inches overall.
- H. Painted Identification: Comply with requirements in painting Sections for surface preparation and paint application.

3.02 IDENTIFICATION SCHEDULE

- A. Accessible Raceways and Metal-Clad Cables, 600 V or Less, for Service, Feeder, and Branch Circuits More Than 30 A, and 120V to ground: Install labels at 10-foot maximum intervals.

- B. Accessible Raceways and Cables within Buildings: Identify the covers of each junction and pull box of the following systems with self-adhesive vinyl labels with the wiring system legend and system voltage. System legends shall be as follows:
 - 1. Emergency Power.
 - 2. Power.
 - 3. UPS.

- C. Power-Circuit Conductor Identification, 600 V or Less: For conductors in vaults, pull and junction boxes, manholes, and handholes, use color-coding conductor tape to identify the phase.
 - 1. Color-Coding for Phase and Voltage Level Identification, 600 V or Less: Use colors listed below for ungrounded feeder and branch-circuit conductors.
 - a. Colors for 208-240/120V Circuits:
 - i. Phase A: Black.
 - ii. Phase B: Red.
 - iii. Neutral: White.
 - b. Colors for 208/120V Circuits:
 - i. Phase A: Black.
 - ii. Phase B: Red.
 - iii. Phase C: Blue.
 - iv. Neutral: White.
 - c. Color shall be factory applied for size 8 AWG and smaller. Color shall be factory applied or field applied for sizes larger than 8 AWG.
 - d. Field-Applied, Color-Coding Conductor Tape: Apply in half-lapped turns for a minimum distance of 6 inches from terminal points and in boxes where splices or taps are made. Apply last two turns of tape with no tension to prevent possible unwinding. Locate bands to avoid obscuring factory cable markings.

- D. Install instructional sign including the color code for grounded and ungrounded conductors using adhesive-film-type labels.

- E. Auxiliary Electrical Systems Conductor Identification: Identify field-installed alarm, control, and signal connections.
 - 1. Identify conductors, cables, and terminals in enclosures and at junctions, terminals, and pull points. Identify by system and circuit designation.

2. Use system of marker tape designations that is uniform and consistent with system used by manufacturer for factory-installed connections.
 3. Coordinate identification with Project Drawings, manufacturer's wiring diagrams, and the Operation and Maintenance Manual.
- F. Workspace Indication: Install floor marking tape to show working clearances in the direction of access to live parts. Workspace shall be as required by NFPA 70 and 29 CFR 1926.403 unless otherwise indicated. Do not install at flush-mounted panelboards and similar equipment in finished spaces.
- G. Warning Labels for Indoor Cabinets, Boxes, and Enclosures for Power and Lighting: Self-adhesive warning labels or Baked-enamel warning signs.
1. Comply with 29 CFR 1910.145.
 2. Identify system voltage with black letters on an orange background.
 3. Apply to exterior of door, cover, or other access.
 4. For equipment with multiple power or control sources, apply to door or cover of equipment including, but not limited to, the following:
 - a. Power transfer switches.
 - b. Controls with external control power connections.
- H. Operating Instruction Signs: Install instruction signs to facilitate proper operation and maintenance of electrical systems and items to which they connect. Install instruction signs with approved legend where instructions are needed for system or equipment operation.
- I. Emergency Operating Instruction Signs: Install instruction signs with white legend on a red background with minimum 3/8-inch high letters for emergency instructions at equipment used for power transfer.
- J. Equipment Identification Labels: On each unit of equipment, install unique designation label that is consistent with wiring diagrams, schedules, and the Operation and Maintenance Manual. Apply labels to disconnect switches and protection equipment, central or master units, control panels, control stations, terminal cabinets, and racks of each system. Systems include power, lighting, control, communication, signal, monitoring, and alarm systems unless equipment is provided with its own identification.
1. Labeling Instructions:
 - a. Indoor Equipment: Self-adhesive, engraved, laminated acrylic or melamine label. Unless otherwise indicated, provide a single line of text with 1/2-inch high letters on 1-1/2-inch high label; where two lines of text are required, use labels 2 inches high.
 - b. Outdoor Equipment: Engraved, laminated acrylic or melamine label or stenciled legend 4 inches high.

- c. Elevated Components: Increase sizes of labels and letters to those appropriate for viewing from the floor.
- d. Unless provided with self-adhesive means of attachment, fasten labels with appropriate mechanical fasteners that do not change the NEMA or NRTL rating of the enclosure.

END OF SECTION

SECTION 16120 LOW VOLTAGE WIRE AND CABLE

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

1. Building wires and cables rated 600 volts and less.
2. Connectors, splices, and terminations rated 600 volts and less.
3. Low voltage control cabling.
4. Control circuit conductors.
5. Shielded VFD power cable.

1.02 RELATED SECTIONS

Section 16010	General Electrical Requirements
Section 16130	Raceways and Boxes
Section 17010	Instrumentation and Controls Systems

1.03 REFERENCES

ANSI/UL 62	Flexible Cord and Fixture Wire
ANSI/UL 510	Insulating Tape
ASTM B3	Soft or Annealed Copper Wire
ASTM B8	Concentric-Lay-Stranded Copper Conductors, Hard, Medium-Hard or Soft
NECA 1	Standard Practice of Good Workmanship in Electrical Construction
NEMA WC 5	Thermoplastic Insulated Wire and Cable for the Transmission and Distribution of Electrical Energy
NEMA WC 55	Instrumentation Cables and Thermocouple Wire
NEMA WC 57	Control Cables
NEMA WC 70	Power Cables Rated 2000 Volts or Less for the Distribution of Electrical Energy
UL 83	Thermoplastic-Insulated Wires and Cables

UL 486A-486B Wire Connectors

UL 486D Sealed Wire Connector Systems

1.04 ACTION SUBMITTALS

Product Data: For each conductor or cable type, indicate insulation material, conductor material, voltage rating, manufacturer and other data pertinent to the specific cable, such as type of shielding, number of conductors, and applicable standards.

1.05 INFORMATIONAL SUBMITTALS

- A. Source quality-control reports.
- B. Field quality control reports

1.06 CONDUCTOR APPLICATION

- A. Unless otherwise indicated, all conductors shall be stranded copper.
- B. Minimum Conductor Sizes:
 - 1. Power and Lighting Circuit Conductors: 12 AWG.
 - 2. Control Circuit Conductors:
 - a. Class 1 remote-control and signal circuits: 14 AWG.
 - b. Class 2 low-energy, remote-control, and signal circuits: 16 AWG.
 - c. Class 3 low-energy, remote-control, alarm, and signal circuits: 12 AWG.
- C. Feeders and Branch Circuits in Underground Conduit or concealed in ceilings, walls, partitions, and crawlspaces: Type THHN-2/THWN-2, single conductors in raceway.
- D. Exposed Feeders and Branch Circuits: Type XHHW-2, single conductors in raceway, Armored cable (Type AC), Metal-clad cable (Type MC), and Nonmetallic-sheathed cable (Type NM).
- E. Cord Drops and Portable Appliance Connections: Type SO, hard service cord with stainless-steel, wire-mesh, strain relief device at terminations to suit application.
- F. GROUNDING: COMPLY WITH REQUIREMENTS IN SECTION 16060 "GROUNDING AND BONDING."

1.07 QUALIFICATIONS

- A. Company specializing in manufacturing products specified in this section with a minimum of 3 years documented experience.

PART 2 - PRODUCTS

2.01 POWER CIRCUIT WIRE AND CABLE

- A. Wire and cable shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. Copper Conductors: Comply with NEMA WC 70/ICEA S-95-658.
- C. Conductor Insulation: Comply with NEMA WC 70/ICEA S-95-658 and UL 83 for Type THHN-2/THWN-2.
- D. Multiconductor Cable: Comply with NEMA WC 70/ICEA S-95-658 for armored cable, metal-clad cable, and nonmetallic-sheathed cable with ground wire.
- E. Acceptable Manufacturers: Subject to compliance with requirements, provide power circuit wire and cable by one of the following, or approved equal:
 - 1. General Cable
 - 2. Houston Wire & Cable Company
 - 3. Okonite
 - 4. Southwire

2.02 CONTROL CIRCUIT CONDUCTORS

- A. General: Control Circuit Conductors shall be stranded copper, 600 volts, Type TC rated for cable tray use. Cable shall be UL listed.
- B. Multi-Conductor Control Cable: Cable shall consist of multi-conductor 14 AWG color-coded copper conductors, type MC, cross-linked polyethylene (XLPE) insulation, listed for cable tray use, 90°C continuous rating, 130°C emergency rating, rated 600 volts, aluminum sheath, sunlight resistant, for cable tray use.
- C. Comply with UL 44.
- D. Acceptable Manufacturers: Subject to compliance with requirements, provide control circuit conductors by one of the following, or approved equal:
 - 1. Okonite, C-L-X Okoseal
 - 2. Belden CDT

2.03 LOW VOLTAGE SIGNAL CABLE

- A. Signal cable shall be provided for instrument signal transmission, alarm, communication and any circuit operating at less than 100 volts. Cables shall be color coded black and white (or clear) for pairs or black, white and red for triads. Circuit shielding shall be provided in addition to cable shielding. Circuits for type a and b signals as specified in Section 17010, shall be provided in compliance with the instrument manufacturer's recommendations.
- B. Single Analog Signal Cable: Cable shall consist of one pair or triad, 16 AWG conductors with 15 mils of 90 degree C polyvinylchloride (PVC) insulation, 4 mils

nylon conduit or jacket, twisted on a 2-inch lay, and covered with a 100 percent 1.35 mil aluminum-Mylar tape shield with 20 AWG 7-strand tinned copper drain wire and a 45 mil PVC jacket overall. Cable shall have corrugated aluminum sheath, be UL listed, Type TC, rated 300 volts.

- C. Multiple Analog Signal Cable: Cable shall consist of four or more pairs or triads which are made up of 16 AWG conductors with 15 mils of 90 degree C PVC insulation, 4 mils nylon jacket, twisted on a staggered lay 1-1/2 to 2-1/2 inches, and covered with a 100 percent 1.35 mil aluminum-Mylar tape shield with 22 AWG 7-strand tinned copper drain wire. Overall cable shield shall be 2.35 mil aluminum-Mylar tape with a 20 AWG 7-strand tinned copper drain wire. Cable shall have corrugated aluminum sheath, be UL listed, Type TC, 300 volts.
- D. Acceptable Manufacturers: Subject to compliance with requirements, provide low voltage signal cable by one of the following, or approved equal:
 - 1. Okonite, C-L-X Okoseal, TYPE P-OS/SP-OS rated 105C for CT
 - 2. Belden CDT

2.04 SHIELDED VFD POWER CABLE (N/A)

2.05 CONNECTORS AND SPLICES

- A. Description: Factory-fabricated connectors and splices of size, ampacity rating, material, type, and class for application and service indicated.
- B. Solid Conductors: use 3M "Scotchlok", Ideal "Super Nut," Buchanan B-Cap, or equal.
- C. Stranded Conductors No. 8 and Larger: Use T & B "Lock-Tie" connectors, Burndy Versitaps and heavy-duty connectors, O.Z. solderless connectors, or equal.
- D. Control Wiring: Use crimp connectors with tools by same manufacturer and/or UL listed for connectors of all stranded conductors.
- E. Retighten bolt-type connectors 24 to 48 hours after initial installation and before taping. Tape connections made with noninsulated-type connectors with rubber type tape, one and one-half times the thickness of the conductor insulation, then cover with Scotch 33 tape.

PART 3 - EXECUTION

3.01 EXAMINATION

According to BICSI ITSIMM, telecommunications cables should be tested on receipt. Low-voltage wires and cables do not normally require testing before installation.

- A. Test cables on receipt at Project site.

3.02 PREPARATION

- A. Remove debris and moisture from the conduits, boxes, and cabinets prior to cable installation.
- B. Use manufacturer-approved pulling compound or lubricant where necessary; compound used must not deteriorate conductor or insulation. Do not exceed manufacturer's recommended maximum pulling tensions and sidewall pressure values.

3.03 INSTALLATION

- A. Comply with NECA 1 and NFPA 70.
- B. All wire and cable shall be installed in raceway unless otherwise noted. Complete raceway installation between conductor and cable termination points according to Section 16130 "Raceways and Boxes" prior to pulling wire and cable.
- C. Conceal cables not installed in raceway in finished walls, ceilings, and floors unless otherwise indicated.
- D. Use pulling means, including fish tape, cable, rope, and basket-weave wire/cable grips, that will not damage cables or raceway.
- E. Install exposed cables parallel and perpendicular to surfaces of exposed structural members, and follow surface contours where possible.
- F. Support cables according to Section 16073 "Hangers and Supports for Electrical Systems."
 - 1. Terminate all conductors; no cable shall contain unterminated elements. Make terminations only at indicated outlets and terminals.
 - 2. Secure and support cables at intervals not exceeding 30 inches and not more than 6 inches from cabinets, boxes, fittings, outlets, racks, frames, and terminals.
 - 3. Bundle, lace, and train conductors to terminal points without exceeding manufacturer's limitations on bending radii.
 - 4. Do not install bruised, kinked, scored, deformed, or abraded cable. Do not splice cable between termination, tap, or junction points. Remove and discard cable if damaged during installation and replace it with new cable.
 - 5. Pulling Cable: Comply with BICSI ITSIMM, Ch. 5, "Copper Structured Cabling Systems. Monitor cable pull tensions.
 - 6. Secure: Fasten securely in place with hardware specifically designed and installed so as to not damage cables.

3.04 REMOVAL OF WIRE AND CABLE

Remove abandoned wire and cable. Abandoned wires and cables are those installed that are not terminated at equipment and are not identified for future use with a tag.

3.05 CONNECTIONS

- A. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A-486B.
- B. Make splices, terminations, and taps that are compatible with conductor material and that possess equivalent or better mechanical strength and insulation ratings than unspliced conductors.
- C. Wiring at Outlets: Install conductor at each outlet, with at least 6 inches of slack.

3.06 IDENTIFICATION

- A. Identify and color-code wires and cables according to Section 16075 "Electrical Identification."
- B. Identify each spare conductor at each end with identity number and location of other end of conductor, and identify as spare conductor.

3.07 SLEEVE AND SLEEVE-SEAL INSTALLATION FOR ELECTRICAL PENETRATIONS

Install sleeves and sleeve seals at penetrations of exterior floor and wall assemblies. Comply with requirements in Section 16130 "Raceways and Boxes."

3.08 FIELD QUALITY CONTROL

- A. After installing wires and cables and before electrical circuitry has been energized, test service entrance and feeder conductors for compliance with requirements.
- B. Perform each visual and mechanical inspection and electrical test stated in NETA Acceptance Testing Specification. Certify compliance with test parameters.
- C. Test and Inspection Reports: Prepare a written report to record the following:
 - 1. Procedures used.
 - 2. Results that comply with requirements.
 - 3. Results that do not comply with requirements and corrective action taken to achieve compliance with requirements.

3.09 SOURCE QUALITY CONTROL

- A. Cable will be considered defective if it does not pass tests and inspections.
- B. Prepare test and inspection reports.

END OF SECTION

SECTION 16130 RACEWAYS AND BOXES

PART 1: GENERAL

1.01 SUMMARY

A. Section Includes:

1. Conduit, tubing, and fittings
2. Wireways and auxiliary gutters
3. Surface raceways
4. Pull and junction boxes

1.02 RELATED SECTIONS

Section 16010 General Electrical Requirements

Section 16120 Low Voltage Wire and Cable

1.03 REFERENCES

ANSI C80.3 Electrical Metallic Tubing – Steel

ANSI C80.1 Electrical Rigid Steel Conduit

ANSI/SCTE 77 Specification for Underground Enclosure Integrity

NECA 1 Standard Practice of Good Workmanship in Electrical Construction

NECA 101 Standard for Installing Steel Conduits

NEMA FB 1 Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit and Cable Assemblies.

NEMA OS 1 Sheet-Steel Outlet Boxes, Device Boxes, Covers, and Box Supports.

NEMA OS 2 Nonmetallic Outlet Boxes, Device Boxes, Covers and Box Supports.

NEMA 250 Enclosures for Electrical Equipment (1000 Volts Maximum)

NEMA RN 1 Polyvinyl Chloride (PVC) Externally Coated Galvanized Rigid Steel Conduit and Intermediate Metal Conduit.

NEMA RV 3 Application and Installation Guidelines for Flexible and Liquidtight Flexible Metal Conduits

NEMA TC 2 Electrical Plastic Tubing and Conduit (EPC-40 and EPC-80)

NEMA TC 3 PVC Fittings for Use with Rigid PVC Conduit and Tubing

UL 5	Surface Metal Raceways and Fittings
UL 5A	Nonmetallic Surface Raceways and Fittings
UL 6	Electrical Rigid Metal Conduit – Steel
UL 50	Enclosures for Electrical Equipment, Non-Environmental Considerations
UL 94	Tests for Flammability of Plastic Materials for Parts in Devices and Appliances
UL 360	Liquid-Tight Flexible Metal Conduit
UL 514A	Metallic Outlet Boxes
UL 514B	Conduit, Tubing, and Cable Fittings
UL 514C	Nonmetallic Outlet Boxes, Flush-Device Boxes, and Covers
UL 651	Standard for Schedule 40, 80, Type EB and A Rigid PVC Conduit and Fittings
UL 797	Electrical Metallic Tubing – Steel
UL 1773	Termination Boxes

1.04 **ACTION SUBMITTALS**

Product Data: For conduits, surface raceways, wireways, fittings, boxes, and hinged-cover enclosures.

1.05 **INFORMATIONAL SUBMITTALS**

- A. Coordination Drawings: Conduit routing plans, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of items involved:
 - 1. Structural members in paths of conduit groups with common supports.
 - 2. HVAC and plumbing items and architectural features in paths of conduit groups with common supports.
- B. Seismic Qualification Certificates: For enclosures, cabinets, and conduit racks and their mounting provisions, including those for internal components, from manufacturer.

1.06 **ABBREVIATIONS**

Abbreviations of conduit types used in this Section and on the Drawings are listed below.

GRS	Galvanized rigid steel conduit
EMT	Electrical metallic tubing

EPC-40-PVC	Electrical plastic conduit, schedule 40 PVC
FMC	Flexible metal conduit
LFMC	Liquid-tight flexible metal conduit
PCS	PVC coated rigid steel conduit
PVC	Polyvinyl chloride
RNC	Rigid nonmetallic conduit

1.07 **DELIVERY, STORAGE, AND HANDLING**

- A. Protect conduit from corrosion and entrance of debris by storing above grade. Provide appropriate covering.
- B. Protect PVC and PCS conduit from sunlight.

1.08 **RACEWAY APPLICATION**

Apply raceway products as specified below unless otherwise indicated:

- A. Outdoors:
 - a. Exposed Conduit: GRS, PCS.
 - b. Connection to vibrating equipment, including transformers and hydraulic, pneumatic, electric solenoid, or motor driven equipment: LFMC.
 - c. Cabinets, Boxes, and Enclosures, above ground: NEMA 250, Type 3R.
- B. Indoors:
 - 1. Exposed, Not Subject to Physical Damage: PCS, GRS, EMT (for lighting only)
 - 2. Exposed and Subject to Physical Damage: PCS, GRS
 - 3. Concealed in Ceilings and Interior Walls and Partitions: GRS, EMT
 - 4. Connection to Vibrating Equipment, including transformers and hydraulic, pneumatic, electric solenoid, or motor driven equipment: LFMC.
 - 5. Damp or Wet Locations: PCS.
 - 6. Cabinets, Boxes, and Enclosures, above ground: NEMA 250, Type 1 for general indoor locations, Type 4 for damp or wet locations.
- C. Corrosive Locations, Indoors or Outdoors:
 - 1. Raceway: PCS
 - 2. Cabinets, Boxes, and Enclosures, above ground: NEMA 250, Type 4X stainless steel.
- D. Minimum Raceway Size: 3/4-inch.
- E. Raceway Fittings: Compatible with raceways and suitable for use and location.

1. Rigid and Intermediate Steel Conduit: Use threaded rigid steel conduit fittings unless otherwise indicated. Comply with NEMA FB 2.10.
2. PVC Externally Coated, Rigid Steel Conduits: Use only fittings listed for use with this type of conduit. Patch and seal all joints, nicks, and scrapes in PVC coating after installing conduits and fittings. Use sealant recommended by fitting manufacturer and apply in thickness and number of coats recommended by manufacturer.
3. EMT: Use setscrew, compression or steel cast-metal fittings. Comply with NEMA FB 2.10.
4. Flexible Conduit: Use only fittings listed for use with flexible conduit. Comply with NEMA FB 2.20.

F. Do not install aluminum conduits, boxes, or fittings in contact with concrete or earth.

G. Install surface raceways only where indicated on Drawings.

H. Do not use nonmetallic conduits for above ground installations.

I. Use PCS conduits for exposed conduits in vaults.

PART 2: PRODUCTS

2.01 METAL CONDUITS, TUBING, AND FITTINGS

- A. Listing and Labeling: Metal conduits, tubing, and fittings shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. GRS: Comply with ANSI C80.1 and UL 6.

Manufacturers: Subject to compliance with requirements, provide products by one of the following, or approved equal:

- Allied Tube and Conduit
- Western Tube and Conduit
- Wheatland Tube Company

C. PCS:

1. Comply with NEMA RN 1.
2. Exterior Conduit Coating Thickness: 0.040 inch.
3. Interior Conduit Coating Thickness: 0.002 inch.
4. Manufacturers: Subject to compliance with requirements, provide products by one of the following, or approved equal:
 - a. Perma-Cote
 - b. Robroy Industries
 - c. Thomas & Betts Ocal

D. Electrical metallic tubing (EMT) (For lighting):

1. Comply with UL 797, UL 5, and ANSI C80.3 and is zinc coated steel.

- E. Flexible metal conduit (FMC) (Not Applicable):
- F. LFMC: Flexible steel conduit with PVC jacket and complying with UL 360.

Manufacturers: Subject to compliance with requirements, provide products by one of the following, or approved equal:
 - AFC Cable Systems
 - Electriflex
 - Southwire
- G. Fittings for metal conduit: Comply with NEMA FB 1 and UL 514B.
 - 1. Fittings for EMT:
 - a. Material: Steel or die cast.
 - b. Type: Setscrew or compression.
 - 2. Expansion Fittings: PVC or steel to match conduit type, complying with UL 651, rated for environmental conditions where installed, and including flexible external bonding jumper.
 - 3. Coating for PCS conduit fittings: Minimum thickness of 0.040 inch, with overlapping sleeves protecting threaded joints.
- H. Joint Compound for GRS: Approved, as defined in NFPA 70, by authorities having jurisdiction for use in conduit assemblies, and compounded for use to lubricate and protect threaded conduit joints from corrosion and to enhance their conductivity.

2.02 METAL WIREWAYS AND AUXILIARY GUTTERS

- A. Description: Sheet metal, complying with UL 870 and NEMA 250, Type 1, Type 3R, Type 4 and Type 12 unless otherwise indicated, and sized according to NFPA 70.
- B. Fittings and Accessories: Include covers, couplings, offsets, elbows, expansion joints, adapters, hold-down straps, end caps, and other fittings to match and mate with wireways as required for complete system.
- C. Solvent cements and adhesive primers shall have a VOC content of 510 and 550 g/L or less, respectively, when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
- D. Solvent cements and adhesive primers shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

2.03 SURFACE RACEWAYS

- A. Listing and Labeling: Surface raceways and tele-power poles shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

- B. Surface Metal Raceways: PCS with snap-on covers complying with UL 5.
- C. Surface Nonmetallic Raceways: Two- or three-piece construction, complying with UL 5A, and manufactured of rigid PVC. Product shall comply with UL 94 V-0 requirements for self-extinguishing characteristics.

2.04 **BOXES**

- A. Cast-Metal Outlet and Device Boxes: Comply with NEMA FB 1, ferrous alloy, Type FD, with gasketed cover.
- B. Nonmetallic Outlet and Device Boxes: Comply with NEMA OS 2 and UL 514C.
- C. Luminaire Outlet Boxes: Nonadjustable, designed for attachment of luminaire weighing 50 pounds Outlet boxes designed for attachment of luminaires weighing more than 50 pounds shall be listed and marked for the maximum allowable weight.
- D. Cast-Metal Access, Pull, and Junction Boxes: Comply with NEMA FB 1 and UL 1773, galvanized, cast iron with gasketed cover.
- E. Box extensions used to accommodate new building finishes shall be of same material as recessed box.
- F. Device Box Dimensions: 4 inches square by 2-1/8 inches deep.
- G. Hinged-Cover Enclosures: Comply with UL 50 and NEMA 250, Type 1, Type 3R, Type 4 and Type 12 with continuous-hinge cover with flush latch unless otherwise indicated.
 - 1. Metal Enclosures: Steel, finished inside and out with manufacturer's standard enamel.
 - 2. Interior Panels: Steel; all sides finished with manufacturer's standard enamel.
- H. Hinged door in front cover with flush latch and concealed hinge.
- I. Key latch to match panelboards.
- J. Metal barriers to separate wiring of different systems and voltage.

PART 3: EXECUTION

3.01 **EXAMINATION AND PREPARATION**

- A. Verify outlet locations and routing and termination locations of raceway prior to rough-in.
- B. Coordinate mounting heights, orientation and locations of outlets mounted above counters, benches, and backsplashes.
- C. Arrange conduit stub-ups so curved portions of bends are not visible above finished floor or grade.

3.02 GENERAL RACEWAY INSTALLATION

- A. Install work in accordance with state and municipality standards. Comply with NECA 1 and NECA 101 for installation requirements except where requirements on Drawings or in this Section are more stringent. Comply with NFPA 70 limitations for types of raceways allowed in specific occupancies and number of floors.
- B. Ground and bond raceway and boxes in accordance with Section 16060 "Grounding and Bonding."
- C. Keep raceways at least 6 inches away from parallel runs of flues and steam or hot-water pipes. Install horizontal raceway runs above water and steam piping.
- D. Comply with requirements in Section 16073 "Hangers and Supports for Electrical Systems" for hangers and supports.
- E. Install no more than the equivalent of three 90-degree bends in any conduit run except for control wiring conduits, for which fewer bends are allowed.
- F. Support conduit within 12 inches of changes in direction. Support conduit within 12 inches of enclosures to which attached.
- G. Conceal conduit within finished walls, ceilings, and floors unless otherwise indicated. Install conduits parallel or perpendicular to building lines.
- H. Raceways Embedded in Slabs:
 - 1. Run conduit larger than 1-inch trade size, parallel or at right angles to main reinforcement. Where at right angles to reinforcement, place conduit close to slab support. Secure raceways to reinforcement at maximum 10-foot intervals.
 - 2. Arrange raceways to cross building expansion joints at right angles with expansion fittings.
 - 3. Do not embed threadless fittings in concrete.
 - 4. Change from Type EPC-40-PVC to PCS before rising above floor. Conduit risers out of slabs to be PCS.
- I. Stub-ups to Above Recessed Ceilings:
 - 1. Use PCS for raceways.
 - 2. Use a conduit bushing or insulated fitting to terminate stub-ups not terminated in hubs or in an enclosure.
- J. Threaded Conduit Joints, Exposed to Wet, Damp, Corrosive, or Outdoor Conditions: Apply listed compound to threads of raceway and fittings before making up joints. Follow compound manufacturer's written instructions.
- K. Coat field-cut threads on PVC-coated raceway with a corrosion-preventing conductive compound prior to assembly.

- L. Raceway Terminations at Locations Subject to Moisture or Vibration: Use insulating bushings to protect conductors including conductors smaller than 4 AWG.
- M. Terminate threaded conduits into threaded hubs or with locknuts on inside and outside of boxes or cabinets. Install bushings on conduits up to 1-1/4-inch trade size and insulated throat metal bushings on 1-1/2-inch trade size and larger conduits terminated with locknuts. Install insulated throat metal grounding bushings on service conduits.
- N. Install pull wires in empty raceways. Use polypropylene or monofilament plastic line with not less than 200-lb tensile strength. Leave at least 12 inches of slack at each end of pull wire.
- O. Surface Raceways:
 - 1. Install surface raceway with a minimum 2-inch radius control at bend points.
 - 2. Secure surface raceway with screws or other anchor-type devices at intervals not exceeding 48 inches and with no less than two supports per straight raceway section. Support surface raceway according to manufacturer's written instructions. Tape and glue are not acceptable support methods.
- P. Install raceway sealing fittings at accessible locations according to NFPA 70 and fill them with listed sealing compound. For concealed raceways, install each fitting in a flush steel box with a blank cover plate having a finish similar to that of adjacent plates or surfaces.
- Q. Install devices to seal raceway interiors at accessible locations. Locate seals so no fittings or boxes are between the seal and the following changes of environments. Seal the interior of all raceways at the following points:
 - 1. Where conduits pass from warm to cold locations, such as boundaries of refrigerated spaces.
 - 2. Where otherwise required by NFPA 70.
- R. Expansion-Joint Fittings:
 - 1. Install in each run of above ground conduit that is located where environmental temperature change may exceed 30 degrees and that has straight-run length that exceeds 25 feet.
 - 2. Install type and quantity of fittings that accommodate temperature change listed for each of the following locations:
 - a. Outdoor Locations Not Exposed to Direct Sunlight: 125°F temperature change.
 - b. Indoor Spaces Connected with Outdoors without Physical Separation: 125°F temperature change.
 - c. Attics: 135°F temperature change.
 - 3. Install fittings that provide expansion and contraction for at least 0.00041 inch per foot of length of straight run per degree F of temperature change for PVC conduits.

4. Install expansion fittings at all locations where conduits cross building or structure expansion joints.
 5. Install each expansion-joint fitting with position, mounting, and piston setting selected according to manufacturer's written instructions for conditions at specific location at time of installation. Install conduit supports to allow for expansion movement.
- S. Flexible Conduit Connections: Comply with NEMA RV 3. Use a maximum of 72 inches of flexible conduit for recessed and semi-recessed luminaires, equipment subject to vibration, noise transmission, or movement; and for transformers and motors.

3.03 **INSTALLATION OF ABOVE GRADE BOXES**

- A. Mount boxes at heights indicated on Drawings. Install boxes with height measured from finished floor or finished grade to bottom of box unless otherwise indicated. If mounting heights of boxes are not individually indicated, give priority to ADA requirements.
- B. Recessed Boxes in Masonry Walls: Saw-cut opening for box in center of cell of masonry block and install box flush with surface of wall. Prepare block surfaces to provide a flat surface for a raintight connection between the box and cover plate or the supported equipment and box.
- C. Horizontally separate boxes mounted on opposite sides of walls so they are not in the same vertical channel.
- D. Locate boxes so that cover or plate will not span different building finishes.
- E. Support boxes of three gangs or more from more than one side by spanning two framing members or mounting on brackets specifically designed for the purpose.
- F. Fasten junction and pull boxes to or support from building structure or stanchion. Do not support boxes by conduits.

3.04 **SLEEVE AND SLEEVE-SEAL INSTALLATION FOR ELECTRICAL PENETRATIONS**

Install sleeves and sleeve seals at penetrations of exterior floor and wall assemblies.

3.05 **PROTECTION**

Protect coatings, finishes, and cabinets from damage and deterioration.

- Repair damage to galvanized finishes with zinc-rich paint recommended by manufacturer.
- Repair damage to PVC coatings or paint finishes with matching touchup coating recommended by manufacturer.

END OF SECTION

SECTION 16511 INTERIOR LIGHTING

PART 1 - GENERAL

1.01 SUMMARY

Section Includes:

1. Interior luminaires, lamps, and ballasts.
2. Emergency lights.
3. Exit signs.
4. Luminaire supports.
5. Luminaire-mounted photoelectric relays

1.02 RELATED SECTIONS

Section 16521 Exterior Lighting

1.03 REFERENCES

UL 924 Standard for Emergency Lighting and Power Equipment

UL 935 Standard for Fluorescent-Lamp Ballasts

1.04 ACTION SUBMITTALS

- A. Product Data: For each type of luminaire, arranged in order of luminaire designation. Include data on features, accessories, and finishes.
- B. Shop Drawings: Show details of nonstandard or custom luminaires. Indicate dimensions, weights, methods of field assembly, components, features, and accessories. Product Certificates: For each type of ballast for bi-level and dimmer-controlled luminaires, from manufacturer.

1.05 INFORMATIONAL SUBMITTALS

Field quality-control reports.

1.06 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. Comply with NFPA 70.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

- A. Subject to compliance with requirements, provide product indicated on Drawings, or approved equal.

2.02 GENERAL REQUIREMENTS FOR LUMINAIRES AND COMPONENTS

- A. Recessed Luminaires: Comply with NEMA LE 4 for ceiling compatibility for recessed luminaires.
- B. Metal Parts: Free of burrs and sharp corners and edges.
- C. Sheet Metal Components: Steel unless otherwise indicated. Form and support to prevent warping and sagging.
- D. Doors, Frames, and Other Internal Access: Smooth operating, free of light leakage under operating conditions, and designed to permit relamping without use of tools. Designed to prevent doors, frames, lenses, diffusers, and other components from falling accidentally during relamping and when secured in operating position.

2.03 LED EMERGENCY LIGHTS

- A. Twin LED lamp indoor emergency light with self-contained, modular, battery-inverter unit, factory mounted within luminaire body. Comply with UL 924.
- B. Housing: Impact-resistant, scratch-resistant, corrosion-proof thermoplastic. Full perimeter gasket seal between front and rear housing.
- C. Unit shall be rated for 50°C ambient operating temperature and UL listed for use in wet locations.
- D. Battery: Sealed, maintenance-free, nickel-cadmium.
- E. Charger: Fully automatic, solid-state type with sealed transfer relay.
- F. Operation: Relay automatically turns lamp on when power-supply circuit voltage drops to 80 percent of nominal voltage or below. Lamp automatically disconnects from battery when voltage approaches deep-discharge level. When normal voltage is restored, relay disconnects lamps from battery, and battery is automatically recharged and floated on charger.
- G. Test Push Button and Indicator Light: Visible and accessible without opening luminaire or entering ceiling space.

2.04 EXIT SIGNS (N/A)

2.05 LUMINAIRE SUPPORT COMPONENTS

- A. Comply with Section 16073 "Hangers and Supports for Electrical Systems" for channel- and angle-iron supports and nonmetallic channel and angle supports.

- B. Single-Stem Hangers: 1/2-inch steel tubing with swivel ball fittings and ceiling canopy. Finish same as luminaire.
- C. Twin-Stem Hangers: Two, 1/2-inch steel tubes with single canopy designed to mount a single luminaire. Finish same as luminaire.
- D. Rod Hangers: 3/16-inch minimum diameter, cadmium-plated, threaded steel rod.
- E. Hook Hangers: Integrated assembly matched to luminaire and line voltage and equipped with threaded attachment, cord, and locking-type plug.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Luminaires: Set level, plumb, and square with ceilings and walls. Install lamps in each luminaire.
- B. Comply with NFPA 70 for minimum luminaire supports.
- C. Suspended Luminaire Support:
 - 1. Pendants and Rods: Where longer than 48 inches, brace to limit swinging.
 - 2. Stem-Mounted, Single-Unit Luminaires: Suspend with twin-stem hangers.
 - 3. Continuous Rows: Use tubing or stem for wiring at one point and tubing or rod for suspension for each unit length of luminaire chassis, including one at each end.
- D. Air-Handling Luminaires: Install with dampers closed and ready for adjustment.
- E. Adjust aimable luminaires to provide required light intensities.
- F. Connect wiring according to Section 16120 "Low Voltage Wire and Cable."

3.02 FIELD QUALITY CONTROL

- A. Test for Emergency Lighting: Interrupt power supply to demonstrate proper operation. Verify transfer from normal power to battery and retransfer to normal.
- B. Prepare a written report of tests, inspections, observations, and verifications indicating and interpreting results. If adjustments are made to lighting system, retest to demonstrate compliance with standards.

END OF SECTION

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SECTION 16521 EXTERIOR LIGHTING

PART 1 - GENERAL

1.01 SUMMARY

Section Includes:

1. Exterior luminaires with lamps and ballasts.
2. Luminaire-mounted photoelectric relays.
3. Poles and accessories.

1.02 RELATED SECTIONS

Section 16511 Interior Lighting

1.03 REFERENCES

AAMA 611 Voluntary Specification for Anodized Architectural Aluminum

ANSI C78.42 Electric Lamps – High Pressure Sodium Lamps

ANSI C78.43 Electric Lamps – Single-Ended Metal Halide Lamps

IEEE C62.41.1 Guide on the Surge Environment in Low-Voltage (1000 V and Less) AC Power Circuits

IEEE C62.41.2 Recommended Practice on Characterization of Surges in Low-Voltage (1000 V and Less) AC Power Circuits

NFPA 70 National Electrical Code (NEC)

UL 773 Plug-In Locking Type Photocontrols for Use with Area Lighting

UL 773A Nonindustrial Photoelectric Switches for Lighting Control

UL 924 Standard for Emergency Lighting and Power Equipment

UL 1598 Luminaires

1.04 **STRUCTURAL ANALYSIS CRITERIA FOR POLE SELECTION**

- A. Dead Load: Weight of luminaire and its horizontal and vertical supports, lowering devices, and supporting structure, applied as stated in AASHTO LTS-4-M.
- B. Live Load: Single load of 500 lbf, distributed as stated in AASHTO LTS-4-M.
- C. Ice Load: Load of 3 lbf/sq. ft., applied as stated in AASHTO LTS-4-M Ice Load Map.
- D. Wind Load: Pressure of wind on pole and luminaire and banners and banner arms, calculated and applied as stated in AASHTO LTS-4-M.
 - 1. Basic wind speed for calculating wind load for poles 50 feet high or less is 100 mph.
 - a. Wind Importance Factor: 1.0.
 - b. Minimum Design Life: 50 years.
 - c. Velocity Conversion Factors: 1.0.

1.05 **ACTION SUBMITTALS**

- A. Product Data: For each luminaire, pole, and support component, arranged in order of lighting unit designation. Include data on features, accessories, and finishes.
- B. Shop Drawings: Anchor-bolt templates keyed to specific poles and certified by manufacturer.

1.06 **QUALITY ASSURANCE**

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. Comply with IEEE C2, "National Electrical Safety Code."
- C. Comply with NFPA 70.

PART 2 - PRODUCTS

2.01 **ACCEPTABLE MANUFACTURERS**

- A. Subject to compliance with requirements, provide product indicated on Drawings, or approved equal.

2.02 **GENERAL REQUIREMENTS FOR LUMINAIRES**

- A. Luminaires shall comply with UL 1598 and be listed and labeled for installation in wet locations by an NRTL acceptable to authorities having jurisdiction.

1. LER Tests Incandescent Fixtures: Where LER is specified, test according to NEMA LE 5A.
 2. LER Tests HID Fixtures: Where LER is specified, test according to NEMA LE 5B.
- B. Lateral Light Distribution Patterns: Comply with IESNA RP-8 for parameters of lateral light distribution patterns indicated for luminaires.
 - C. Metal Parts: Free of burrs and sharp corners and edges.
 - D. Sheet Metal Components: Corrosion-resistant aluminum unless otherwise indicated. Form and support to prevent warping and sagging.
 - E. Housings: Rigidly formed, weather- and light-tight enclosures that will not warp, sag, or deform in use. Provide filter/breather for enclosed luminaires.
 - F. Doors, Frames, and Other Internal Access: Smooth operating, free of light leakage under operating conditions, and designed to permit relamping without use of tools. Designed to prevent doors, frames, lenses, diffusers, and other components from falling accidentally during relamping and when secured in operating position. Doors shall be removable for cleaning or replacing lenses. Designed to disconnect ballast when door opens.
 - G. Exposed Hardware Material: Stainless steel.
 - H. Plastic Parts: High resistance to yellowing and other changes due to aging, exposure to heat, and UV radiation.
 - I. Light Shields: Metal baffles, factory installed and field adjustable, arranged to block light distribution to indicated portion of normally illuminated area or field.
 - J. Reflecting surfaces shall have minimum reflectance as follows unless otherwise indicated:
 1. White Surfaces: 85 percent.
 2. Specular Surfaces: 83 percent.
 3. Diffusing Specular Surfaces: 75 percent.
 - K. Lenses and Refractors Gaskets: Use heat- and aging-resistant resilient gaskets to seal and cushion lenses and refractors in luminaire doors.
 - L. Luminaire Finish: Manufacturer's standard paint applied to factory-assembled and -tested luminaire before shipping. Where indicated, match finish process and color of pole or support materials.
 - M. Factory-Applied Finish for Steel Luminaires: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

1. Surface Preparation: Clean surfaces to comply with SSPC-SP 1, "Solvent Cleaning," to remove dirt, oil, grease, and other contaminants that could impair paint bond. Grind welds and polish surfaces to a smooth, even finish. Remove mill scale and rust, if present, from uncoated steel, complying with SSPC-SP 5/NACE No. 1, "White Metal Blast Cleaning," or SSPC-SP 8, "Pickling."
 2. Exterior Surfaces: Manufacturer's standard finish consisting of one or more coats of primer and two finish coats of high-gloss, high-build polyurethane enamel.
 - a. Color: As selected from manufacturer's standard catalog of colors.
- N. Factory-Applied Finish for Aluminum Luminaires: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
1. Finish designations prefixed by AA comply with the system established by the Aluminum Association for designating aluminum finishes.
 2. Natural Satin Finish: Provide fine, directional, medium satin polish (AA-M32); buff complying with AA-M20; and seal aluminum surfaces with clear, hard-coat wax.
 3. Class I, Clear Anodic Finish: AA-M32C22A41 (Mechanical Finish: medium satin; Chemical Finish: etched, medium matte; Anodic Coating: Architectural Class I, clear coating 0.018 mm or thicker) complying with AAMA 611.
 4. Class I, Color Anodic Finish: AA-M32C22A42/A44 (Mechanical Finish: medium satin; Chemical Finish: etched, medium matte; Anodic Coating: Architectural Class I, integrally colored or electrolytically deposited color coating 0.018 mm or thicker) complying with AAMA 611.
 - a. Color: Dark bronze.
- O. Factory-Applied Labels: Comply with UL 1598. Include recommended lamps and ballasts. Labels shall be located where they will be readily visible to service personnel, but not seen from normal viewing angles when lamps are in place.
1. Label shall include the following lamp and ballast characteristics:
 - a. "USES ONLY" and include specific lamp type.
 - b. Lamp tube configuration (twin, quad, triple), base type, and nominal wattage for compact fluorescent luminaires.
 - c. Lamp type, wattage, bulb type (ED17, BD56, etc.) and coating (clear or coated) for HID luminaires.
 - d. Start type (preheat, rapid start, instant start) compact fluorescent luminaires.
 - e. ANSI ballast type (M98, M57, etc.) for HID luminaires.
 - f. CCT and CRI for all luminaires.

2.03 **LUMINAIRE-MOUNTED PHOTOELECTRIC RELAYS**

- A. Comply with UL 773 or UL 773A.
- B. Contact Relays: Factory mounted, single throw, designed to fail in the on position, and factory set to turn light unit on at 1.5 to 3 fc and off at 4.5 to 10 fc with 15-second minimum time delay.
 - 1. Relay with locking-type receptacle shall comply with ANSI C136.10.
 - 2. Adjustable window slide for adjusting on-off set points.

2.04 **FLUORESCENT BALLASTS AND LAMPS (N/A)**

2.05 **BALLASTS FOR HID LAMPS (N/A)**

2.06 **HID LAMPS (N/A)**

2.07 **GENERAL REQUIREMENTS FOR POLES AND SUPPORT COMPONENTS**

- A. Structural Characteristics: Comply with AASHTO LTS-4-M.
 - 1. Wind-Load Strength of Poles: Adequate at indicated heights above grade without failure, permanent deflection, or whipping in steady winds of speed indicated in "Structural Analysis Criteria for Pole Selection" Article.
 - 2. Strength Analysis: For each pole, multiply the actual equivalent projected area of luminaires and brackets by a factor of 1.1 to obtain the equivalent projected area to be used in pole selection strength analysis.
- B. Luminaire Attachment Provisions: Comply with luminaire manufacturers' mounting requirements. Use stainless-steel fasteners and mounting bolts unless otherwise indicated.
- C. Mountings, Fasteners, and Appurtenances: Corrosion-resistant items compatible with support components.
 - 1. Materials: Shall not cause galvanic action at contact points.
 - 2. Anchor Bolts, Leveling Nuts, Bolt Caps, and Washers: Hot-dip galvanized after fabrication unless otherwise indicated.
 - 3. Anchor-Bolt Template: Plywood or steel.
- D. Handhole: Oval-shaped, with minimum clear opening of 2-1/2 by 5 inches, with cover secured by stainless-steel captive screws.
- E. Concrete Pole Foundations: Cast in place, with anchor bolts to match pole-base flange. Concrete, reinforcement, and formwork are specified in Section 03300 "Cast-In-Place Concrete."
- F. Power-Installed Screw Foundations: Factory fabricated by pole manufacturer, with structural steel complying with ASTM A 36/A 36M and hot-dip galvanized according

to ASTM A 123/A 123M; and with top-plate and mounting bolts to match pole base flange and strength required to support pole, luminaire, and accessories.

- G. Breakaway Supports: Frangible breakaway supports, tested by an independent testing agency acceptable to authorities having jurisdiction, according to AASHTO LTS-4-M.

2.08 **STEEL POLES (N/A)**

2.09 **ALUMINUM POLES (N/A)**

PART 3 - EXECUTION

3.01 **LUMINAIRE INSTALLATION**

- A. Install lamps in each luminaire.
- B. Fasten luminaire to indicated structural supports.
 - 1. Use fastening methods and materials selected to resist seismic forces defined for the application and approved by manufacturer.
- C. Adjust luminaires that require field adjustment or aiming.

3.02 **POLE INSTALLATION (N/A)**

3.03 **BOLLARD LUMINAIRE INSTALLATION (N/A)**

3.04 **INSTALLATION OF INDIVIDUAL GROUND-MOUNTING LUMINAIRES**

- A. Install on concrete base with top 4 inches above finished grade or surface at luminaire location. Cast conduit into base, and finish by troweling and rubbing smooth. Concrete materials, installation, and finishing are specified in Section 03300 "Cast-In-Place Concrete."

3.05 **CORROSION PREVENTION**

- A. Aluminum: Do not use in contact with earth or concrete. When in direct contact with a dissimilar metal, protect aluminum by insulating fittings or treatment.
- B. Steel Conduits: Comply with Section 16130 "Raceways and Boxes." In concrete foundations, wrap conduit with 0.010-inch- thick, pipe-wrapping plastic tape applied with a 50 percent overlap.

3.06 **GROUNDING**

- A. Ground metal poles and support structures according to Section 16060 "Grounding and Bonding."
 - 1. Install grounding electrode for each pole unless otherwise indicated.
 - 2. Install grounding conductor pigtail in the base for connecting luminaire to grounding system.

- B. Ground nonmetallic poles and support structures according to Section 16060 "Grounding and Bonding."
1. Install grounding electrode for each pole.
 2. Install grounding conductor and conductor protector.
 3. Ground metallic components of pole accessories and foundations.

END OF SECTION

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SECTION F
GENERAL PROVISIONS

GENERAL PROVISIONS

SECTION 1 - GENERAL, TERMS, DEFINITIONS, ABBREVIATIONS, UNITS OF MEASURE, AND SYMBOLS

1-2 TERMS AND DEFINITIONS.

AGENCY – The City of Lomita, herein referred to as City.

BOARD – The City Council of the City of Lomita, herein referred to as City Council.

ENGINEER –The Public Works Director/City Engineer of the City of Lomita, acting either directly or through properly authorized agents, such agents acting within the scope of the duties entrusted to them.

CLAIM -- A separate demand by the Contractor for (A) a time extension, (B) payment of money or damages arising from work done by or on behalf of the Contractor pursuant to the Contract and payment of which is not otherwise expressly provided for or the claimant is not otherwise entitled to, or (C) an amount the payment of which is disputed by the Agency.

1-7 AWARD AND EXECUTION OF THE CONTRACT.

1-7.1 General.

Within twenty-one (21) calendar days after the date of the City's award of contract, the Contractor shall execute and return all Contract Documents required by the City. The City reserves the right to terminate the award if the above requirement is not met. Such termination will result in the forfeiture of the Proposal Guaranty.

Per Lomita Municipal Code the City of Lomita reserves the right to reject any and all proposals, to waive any informality or irregularity in such bids, and determine the lowest responsible bidder.

The Contract Agreement shall not be considered binding upon the City until executed by the authorized City officials.

1-7.2 Contract Bonds.

The "Performance Bond" shall remain in effect for one year following the date specified in the Notice of Completion or, if no Notice of Completion is recorded, for one year following the date of final acceptance of the project by the City Council.

SECTION 2 - SCOPE OF THE WORK

- **WORK TO BE DONE.**

Scope of Work. The Work generally consists of furnishing all labor, materials, tools, equipment, and incidentals necessary to rehabilitate the pavement on various streets in Zone G and to upgrade designated curb ramps to current ADA Standards as specified in the Specifications and these Special Provisions, and as directed by the Engineer.

The Work also includes all necessary traffic control; preparing and updating construction schedules; posting signs for "NO PARKING" and arranging for towing of cars, if necessary; protecting all utility covers in place; and installing temporary pavement markers.

2-5.4 HAUL ROUTES.

Only designated truck routes shall be used for hauling materials away from the job site or delivering materials to the job site.

2-5.4.1 VEHICULAR ACCESS - When the Contractor begins excavation of a residential driveway, safe access shall be provided within 4 hours and not later than the end of the same workday in which excavation began.

The Contractor shall be responsible to provide at least 48-hour written notice to each affected property before closing or partially closing any driveway or pedestrian access.

At least three (3) days prior to starting work in any location or any street closure, the Contractor shall distribute written notices to all homeowners and residents within 100 feet of the project that will be impacted by the work. The written notices shall be reviewed and approved by the City before the Contractor sends them out.

- 1) The Contractor shall provide a minimum 1-inch-thick temporary asphalt surface for an access ramp or sidewalk if it is not able to install the permanent improvement within 5 working days following the removal of the existing material at any location. The offset at any transverse or longitudinal joint shall not be more than one-half (1/2) inch. On the temporary asphalt surface: the running slope shall not exceed 1:20; the cross slope shall not exceed 1:50. The Contractor shall not be allowed any additional compensation for the installation and removal of temporary asphalt.

Should any change in these requirements be necessitated by extraordinary occurrences or requirements during the execution of the Work, the Contractor shall obtain prior written approval of the Engineer.

2-8 EXTRA WORK

Payment for additional work and all expenditures more than the Contract Price must be authorized in writing by the Engineer. Such authorization shall be obtained by the Contractor prior to engaging in additional work. It shall be the Contractor's sole responsibility to obtain written approval from the Engineer for any change(s) in material or in the work proposed by suppliers or subcontractors. No payment shall be made to the Contractor for additional work which has not been approved in writing, and the Contractor hereby agrees that it shall have no right to additional compensation for any work not so authorized.

The Contractor shall be responsible for providing all data and to obtain all approvals required by the Specifications, including submittal of Daily Extra Work Reports. Disputed work claims shall comply with 2-8 as modified herein.

SECTION 3 – CONTROL OF THE WORK

3-7 CONTRACT DOCUMENTS.

3-7.1 General.

The Contractor shall maintain and control one set of Plans and Specifications on the Work site. All final locations determined in the field, and any deviations from the Plans and Specifications, shall be marked in red on this control set to show as-built conditions. Upon completion of the Work, the Contractor shall submit the control set to the Engineer for approval. Final payment will not be made until this requirement is met.

3-7.1.1 Plans. Included as part of the Contract Documents are the following, which show the location, character, dimensions, or details of the Work:

1) Project Plans

The plans and data provided with the Contract Documents are based on existing plans and documents. The plans and data are provided for information only. The City does not guarantee their accuracy and correctness. If the Bidder in preparing the Bid Proposal uses this information, the Bidder assumes all risks resulting from conditions differing from the information shown. The Bidder, in consideration for the information being provided, hereby releases the City, from any responsibility of obligation as to the accuracy of such information or for any additional compensation for work performed due to assumptions based on the use of such information.

2) Standard Plans

- a. City of Lomita Standard Plans, latest edition
- b. Standard Plans for Public Works Construction, 2021 edition, promulgated by Public Works Standards, Inc.
- c. Standard Plans of the State of California Department of Transportation (Caltrans), latest edition

3-7.1.2 Specifications. The Work shall be performed or executed in accordance with these Provisions and the following:

- 1) Standard Specifications for Public Works Construction, 2021 edition and supplements thereto, hereinafter referred to as the Greenbook, as written and promulgated by Public Works Standards, Inc. The Greenbook is published by BNi Building News, Inc., 1612 South Clementine Street, Anaheim, CA 92802, Phone: (800) 873-6397.
- 2) Sections 84, 86 and 90 of the State of California Department of Transportation (Caltrans) Standard Specifications, latest edition.

3-7.2 Precedence of the Contract Documents.

If there is a conflict between any of the Contract Documents, the document highest in precedence shall control. The order of precedence shall be as follows:

- 1) Permits issued by other agencies.
- 2) Change Orders (including Plans and Specifications attached thereto).
- 3) Public Works Agreement
- 4) Addenda
- 5) Special Provisions
- 6) General Provisions
- 7) Plans
- 8) City Standard Plans
- 9) Other Standard Plans
- 10) Greenbook
- 11) Reference Specifications

With reference to the Plans/Drawings, the order of precedence is as follows:

- 1) Change Order plans govern over Addenda and Contract plans.
- 2) Addenda plans govern over Contract plans.
- 3) Contract plans govern over standard plans.
- 4) Detail plans govern over general plans.
- 5) Figures govern over scaled dimensions.

Within the Specifications, the order of precedence is as follows:

- 1) Change Orders
- 2) Permits from other agencies/Supplemental Agreements
- 3) Special Provisions
- 4) Instruction to Bidders
- 5) Referenced Standard Plans
- 6) Referenced Standard Specifications

If the Contractor, in the course of the Work, becomes aware of any claimed errors or omissions in the Contract Documents or in the City's fieldwork, the Contractor shall immediately inform the Engineer. The Engineer shall promptly review the matter, and if the Engineer finds an error or omission has been made the Engineer shall determine the corrective actions and advise the Contractor accordingly. If the corrective work associated with an error or omission increases or decreases the amount of work called for in the Contract, the City shall issue an appropriate Change Order in accordance with subsection 2-8. After discovery of an error or omission by the Contractor, any related work performed by the Contractor shall be done at the Contractor's risk unless authorized by the Engineer.

-3-8 SUBMITTALS.

In addition to the submittal requirements laid out in the Special Provisions, the contractor shall submit the following:

Submittals are required for the following:

- Construction Schedule
- Contractor Proposed Laydown Area

All Contractor submittals shall be carefully reviewed against the contract documents by an authorized representative of the Contractor, prior to submittal to the Engineer. A letter shall be included with each submittal stating the contract documents have been reviewed and the submitted product is correct for the project application and in strict conformance with the contract documents. The letter affidavit must be dated and signed by both the Contractor and the product manufacturer or service provider. In the case of shop drawings, each sheet shall be dated and signed for approval. No consideration for review by the Engineer of any Contractor submittals will be made for any items which are not accompanied by affidavit by the Contractor. All submittals without an affidavit will be returned to the Contractor without action taken by the Engineer, and any delays caused thereby shall be the total responsibility of the Contractor.

The Engineer's review of Contractor submittals shall not relieve the Contractor of the entire responsibility for the correctness of details and dimensions. The Contractor shall assume all responsibility and risk for any misfits due to any errors in Contractor submittals. The Contractor shall be responsible for the dimensions and the design of adequate connections and details.

3-12 WORK SITE MAINTENANCE.

3-12.1 GENERAL.

3-12.1 Temporary Light, Power, and Water. The Contractor shall obtain a construction water meter from the City. An \$800 deposit is required and refundable upon return of the meter in good working condition. The Contractor shall pay for the water used, at the City's current water rates.

3-12.1.2 Graffiti Removal. The Contractor shall maintain the Work, all its equipment, and all traffic control devices, including signage, free of graffiti throughout the duration of the Contract. The Contractor shall respond to any request from the Engineer to remove graffiti within 4 hours of notification. Should the Contractor fail to respond to such a request, the City reserves the right to make other arrangements for the requested graffiti removal and deduct the cost from any monies due the Contractor.

3-12.4 STORAGE OF EQUIPMENT AND MATERIALS.

3-12.4.2 STORAGE IN PUBLIC STREETS.

Contractor's Storage Yard. The Contractor shall be responsible for obtaining a storage yard for the duration of the Work. If the proposed location of the yard is located within the

boundaries of the City, the Contractor shall obtain prior approval from the Engineer. Contractors' equipment will not be allowed to park overnight on any City Street.

3-13 COMPLETION, ACCEPTANCE AND WARRANTY.

It is the intent of the Specifications that only first-class materials and workmanship will be acceptable. The Contractor shall take all necessary measures to protect Work from damage and prevent accidents and vandalism during all phases of the work.

Until the final acceptance of the Work by the City, by written action of the Engineer, the Contractor shall have the charge and care thereof and will bear the risk of injury or damage to any part of the Work by the action of the elements, vandalism, or any other cause. The Contractor shall rebuild, repair, restore and make good all injuries or damages to any portion of the Work occasioned by any cause before its completion and acceptance and will bear the expense thereof.

If, in the Engineer's judgment, the Work has been completed and is ready for acceptance, the Engineer will be so certify and will determine the date when the Work was completed. This will be the date when the Contractor is relieved from responsibility to protect the Work. The Engineer may cause a Notice of Completion to be filed and recorded with the Los Angeles County Recorder's Office. At the Engineer's option, the Engineer may certify acceptance to the City Council who may then cause a Notice of Completion to be filed and recorded with the Los Angeles County Recorder's Office.

3-13.4 Manufacturer's Warranties. Manufacturer's warranties shall not relieve the Contractor of liability under these Specifications. Such warranties only shall supplement the Contractor's responsibility.

SECTION 4 - CONTROL OF MATERIALS

4-1 GENERAL-

The Contractor and all subcontractors, suppliers, and vendors shall guarantee that the entire Work will meet all requirements of this contract as to the quality of materials, equipment, and workmanship.

The Contractor, at no cost to the City, shall make any repairs or replacements made necessary by defects in materials, equipment, or workmanship that become evident within one year after the date of recordation of the Notice of Completion.

Within this one-year period, the Contractor shall also restore to full compliance with the requirements of this contract any portion of the Work which is found to not meet those requirements. The Contractor shall hold the City harmless from claims of any kind arising from damages due to said defects or noncompliance.

The security of this guarantee shall be in the form of a Maintenance Bond furnished to the City by the Contractor. There shall be specific wording in the Maintenance Bond, that includes the

guarantee or warranty of the labor and materials for a one-year period, commencing from the recording date of the Notice of Completion by the County Recorder. The guaranteed amount shall be 100 percent of the total amount earned to date as indicated on the final progress payment. The City reserves the right to withhold the retention until the Maintenance Bond has been accepted by the City.

The Contractor shall make all repairs, replacements, and restorations covered by the Maintenance Bond within 10 working days after the date of the Engineer's written notice. Failure to comply with such notice, will cause the City to file claim against the bond.

Excepted from the Maintenance Bond will be defects caused by acts of God, acts of the City, acts of vandals, or by acts of others outside or beyond the control of the Contractor.

If the work, or any portion thereof, shall be damaged in any way, or if any defective materials or faulty workmanship shall be discovered at any time prior to the final payment, the Contractor shall forthwith, at its own cost and expense, repair said damage, or replace such defective materials, or remedy such faulty workmanship in a manner satisfactory to the Engineer.

4-2 PROTECTION.

The Contractor shall assume all risks and expense of interference and delay in his operations, and the protection from or the repair of damage to improvements being built under the contract, as may be caused by water of whatever quantity from floods, storms, industrial waste, irrigation, underground or other sources. However, the Contractor shall be entitled to an extension of time in accordance with the provisions of Subsection 6-4. The Contractor shall also assume full responsibility and expense of protecting, or removing and returning to the site of Work, all equipment or materials under his care endangered by any action of the elements.

Furthermore, the Contractor shall indemnify and hold the City harmless from all claims or suits for damages arising from his operations in dewatering the Work and control of water.

SECTION 5 – LEGAL RELATIONS AND RESPONSIBILITIES

5-7 SAFETY.

5-7.2.4 PUBLIC SAFETY DURING NON-WORKING HOURS

Notwithstanding the Contractor's primary responsibility for safety on the job site when the Contractor is not present, the Engineer at Engineer's option after attempting to contact the Contractor may direct City Forces to perform any functions Engineer may deem necessary to ensure public safety at or in the vicinity of the job site. If such procedure is implemented, the Contractor will bear all expenses incurred by the City.

5-7.2.5 WRITTEN COMMUNICATIONS

Contractor's written communications, including letters, field memoranda, requests for substitution (RFS) and requests for information (RFI) shall be written in a clear and concise manner. RFSs and RFIs shall clearly describe the condition or issue of concern, the cause of the condition or issue and the proposed solution or specific question being posed to the Engineer. The contractor shall not be entitled to any delays or additional compensation as a result of issues that in the Engineer's opinion originated with, or were exacerbated by, poor written communications by the Contractor.

SECTION 6 – PROSECUTION AND PROGRESS OF THE WORK

6-1 CONSTRUCTION SCHEDULE AND COMMENCEMENT OF WORK.

6-1.1 General. Within ten (10) working days after the date of the City's execution of the Contract, the Contractor shall submit a proposed construction schedule to the Engineer for approval. The schedule shall be in accordance with the Specification and these Special Provisions.

Prior to issuing the Notice to Proceed, the Engineer will schedule a Pre-Construction Meeting with the Contractor to review the proposed construction schedule and delivery dates, arrange utility coordination and clarify inspection procedures.

Notwithstanding any other provisions of the Contract, the Contractor shall not be obligated to perform any work and the City will not be obligated to accept or pay for any work performed by the Contractor prior to delivery of a Notice to Proceed. The City's knowledge of work being performed prior to delivery of the Notice to Proceed shall not obligate the City to accept or pay for such work. The Contractor shall provide all required Contract bonds and evidence of insurance prior to commencing work.

6-1.2 Commencement of the Work. Construction schedules shall consider the following:

WORK HOURS.

Work shall be performed between the hours of 7:00 A.M. and 4:00 P.M. unless otherwise approved by the Engineer. The Contractor will be allowed to work on Fridays when City Hall is scheduled to be closed. No work shall occur on Sundays or holidays. The following days are holidays: Memorial Day, May 27, 2024; Independence Day, July 4, 2024; Labor Day, September 2, 2024; Veteran's Day, November 11, 2024; Thanksgiving Day, November 28, 2024; Friday following Thanksgiving Day, November 29, 2024, as well as the week between Christmas and New Year Day.

7-4.3 MARKUP AND CHANGE MANAGEMENT.

The markups mentioned hereinafter shall include, but are not limited to, all costs for the services of superintendents, project managers, timekeepers and other personnel not working directly on the change order, and pickup or yard trucks used by the above personnel. These costs shall not be reported as labor or equipment elsewhere except when performing work directly on the change order and then shall only be reported at the labor classification of the

work performed.

7-4.3.1 Work by Contractor. The following percentages shall be added to the Contractor's costs and shall constitute the mark-up for all overhead and profit, which shall be deemed to include all items of expense not specifically designated as cost or equipment.

Labor	20
Materials	15
Equipment Rental	15
Other Expenditures	15

To the sum of the costs and markups provided for in this subsection, one (1) percent shall be added as compensation for bonding.

7-4.3.2 Work by Subcontractor. When any part of the extra work is performed by a subcontractor, the markup established in 7-4.3.1 shall be applied to the subcontractor's actual cost of such work. A mark-up of ten (10) percent on the first \$5,000 of the subcontracted portion of the extra work and a mark-up of 5 percent on work added more than \$5,000 of the subcontracted portion of the extra work may be added by the Contractor.

The markups specified in parts (a) and (b) above shall be considered as including, but not limited to, the Contractor's labor costs for personnel not working directly on the extra work, including the cost of any tools and equipment that they may use. Such costs shall not be reported as labor or equipment costs elsewhere except when they are used in the performance of the extra work. Labor costs shall in that case be reported for the labor classification corresponding to the type and nature of extra work performed.

SECTION G
CONTRACT PLANS

BUILDING AND SAFETY DIVISION
 Department of Public Works
APPROVED
 UNDER LOS ANGELES COUNTY CODE
TITLES 26, 30 AND 31
 M.D.O.R.T.A.
PUBLIC WORKS
 02/01/2024 1:02:04 PM

This set of plans and specifications must be kept at the job site at all times and it is unlawful to make any changes, modifications or alterations to these plans or specifications without the prior written permission of the Building Official. The stamping of this set of plans and specifications SHALL NOT, under any circumstances, be deemed to permit or to be an approval of any work or activity that violates any provisions of any County Ordinance or State Law.

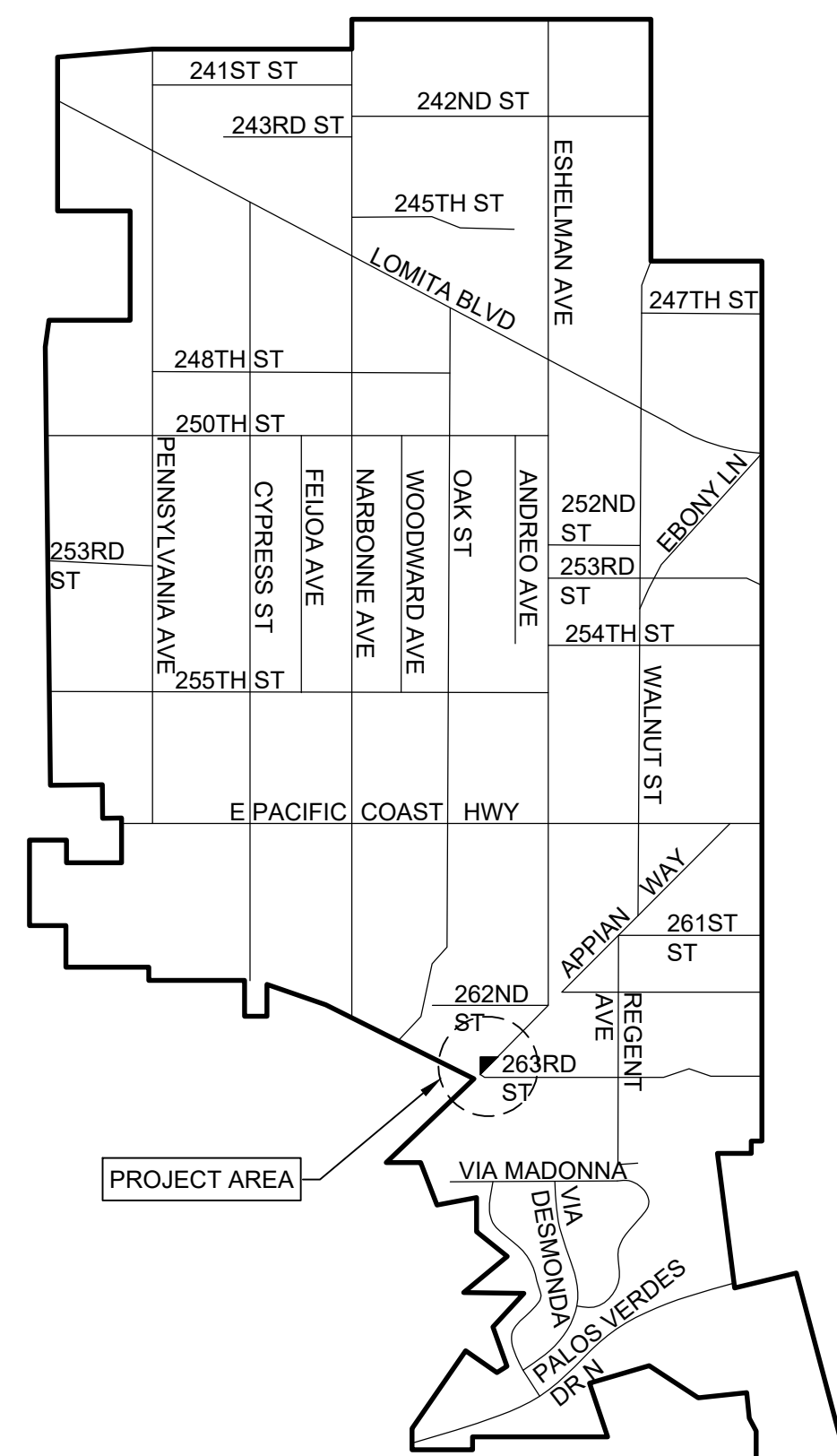
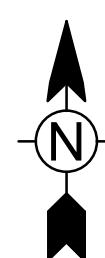
CONSTRUCTION PLANS FOR CITY OF LOMITA NEW ROOF DESIGN FOR APPIAN WAY PUMP STATION

NOTICE TO THE CONTRACTOR

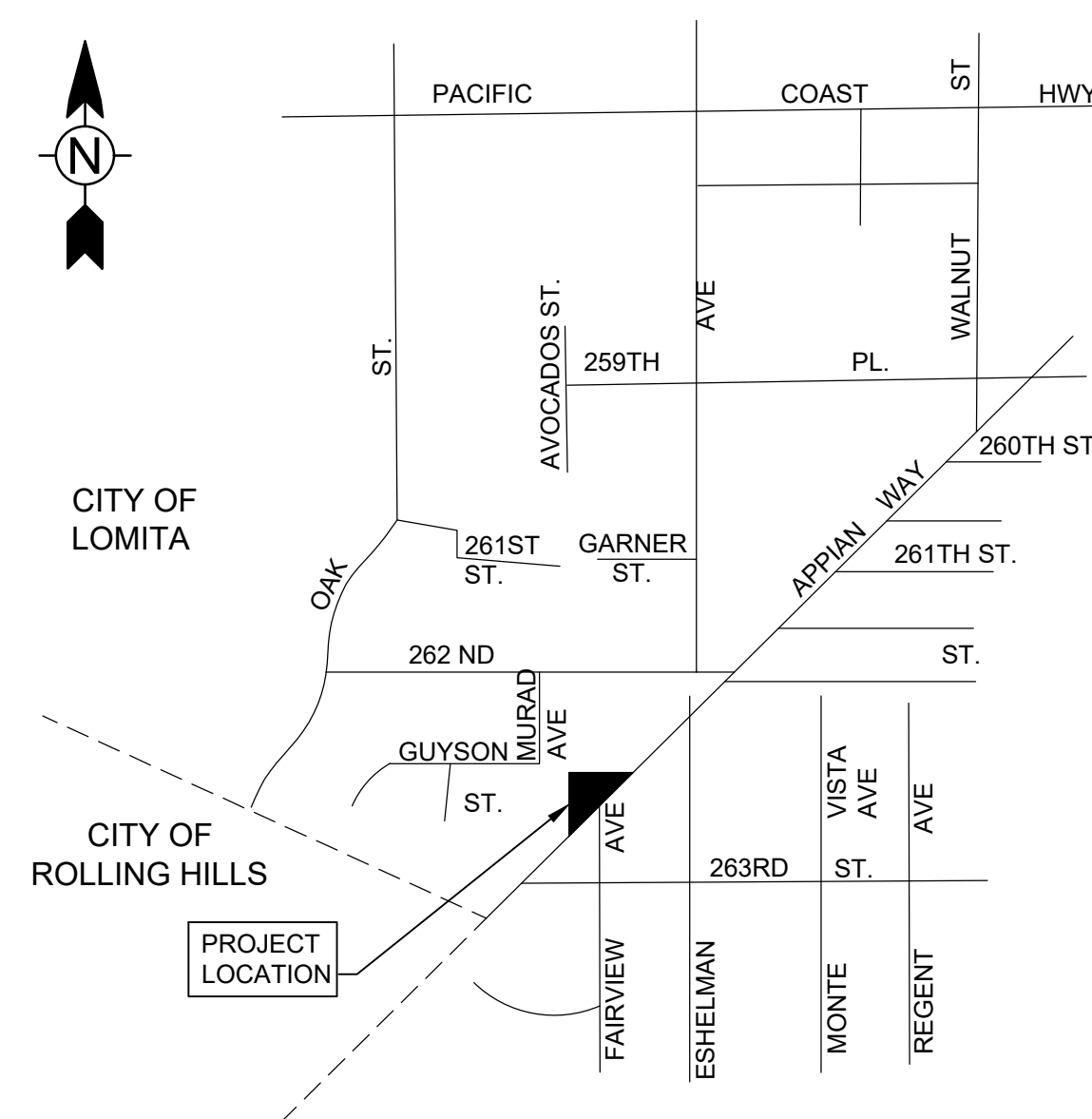
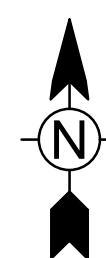
CONTRACTOR AGREES TO ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THIS PROJECT, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY; THAT THIS REQUIREMENT SHALL APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS.

ABBREVIATIONS

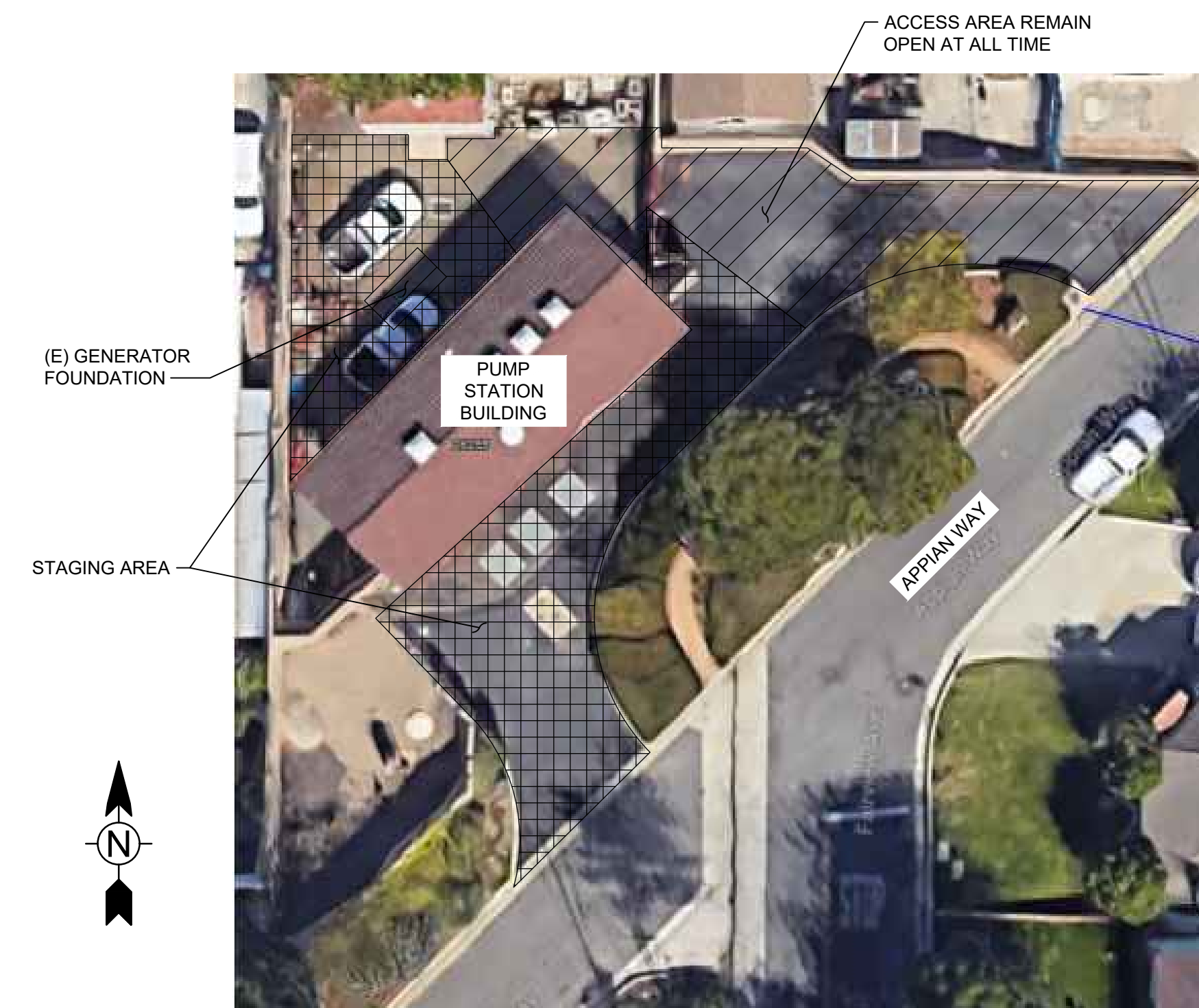
AMERICAN CONCRETE INSTITUTE	ACI
AMERICAN STANDARD TESTING AND MATERIALS	ASTM
AMERICAN SOCIETY OF CIVIL ENGINEERS	ASCE
AMERICAN INSTITUTE OF STEEL CONSTRUCTION	AISC
CONCRETE	CONC
CONCRETE MASONRY BLOCK	CMU
CLEAR	CLR.
DRAWING	DWG
DIAMETER	DIA.
ELEVATION	ELEV.
EQUAL	EQ.
EXISTING	(E) EXIST
FINISHED FLOOR	F.F.
GALVANIZED	GALV.
INTERNATIONAL CODE COUNCIL	ICC
LATITUDE	LAT.
LONGITUDE	LONG.
MASONRY OPENING	M.O.
MAXIMUM	MAX.
MILES PER HOUR	MPH
MINIMUM	MIN.
NOT APPLICABLE	N/A
ON CENTER	O.C.
PORTLAND CEMENT CONCRETE	PCC
POUND PER CUBIC YARD	PCF
POUND PER SQUARED INCH	PSI
POLYVINYL CHLORIDE	PVC
STAINLESS STEEL	S.S.
SANITARY SEWER CLEAN-OUT	CO
SANITARY SEWER MANHOLE	SMH
STANDARD	STD
SOLAR REFLECTANCE INDEX	SRI
TOP OF FOOTING	T.O.F
TOP OF STEEL	T.O.S.
TOP OF WALL	T.O.W.
TYPICAL	TYP.
UNLESS OTHERWISE NOTED	U.N.O.



VICINITY MAP
 SCALE: N.T.S.



LOCATION MAP
 SCALE: N.T.S.



SITE PLAN
 SCALE: N.T.S.

SHEET INDEX		
SHEET NO.	DWG NO.	DESCRIPTION
1	G-001	TITLE SHEET, VICINITY / LOCATION MAP, SHEET INDEX, AND NOTICE TO CONTRACTOR
2	D-101	ROOF DEMOLITION PLAN
3	D-301	ROOF DEMOLITION SECTION
4	S-001	GENERAL STRUCTURAL NOTES
5	S-002	SPECIAL INSPECTIONS AND STRUCTURAL OBSERVATIONS
6	S-101	FLOOR PLAN
7	S-102	NEW ROOF FRAMING PLAN
8	S-301	NEW ROOF FRAMING SECTION
9	S-501	STRUCTURAL DETAILS 1
10	S-502	STRUCTURAL DETAILS 2
11	M-101	MECHANICAL PLAN
12	E-1	ELECTRICAL SYMBOLS AND ABBREVIATIONS
13	E-2	ELECTRICAL DEMOLITION PLAN
14	E-3	ELECTRICAL SITE PLAN

NO WORK SHALL BE DONE ON THIS SITE UNTIL BELOW AGENCY IS NOTIFIED OF INTENTION TO GRADE OR EXCAVATE.

811
 Know what's below.
 Call before you dig.
 TWO WORKING DAYS BEFORE YOU DIG



City of Lomita
 PUBLIC WORKS DEPARTMENT
 24300 NARBONNE AVENUE, LOMITA, CA 90717
 TEL. (310) 325-7110 FAX. (310) 325-4024

NO.	DATE	BY	DESCRIPTION	APPROVED
REVISIONS				



SUBMITTED BY: _____ DATE: _____

APPROVED BY CITY: _____ DATE: _____

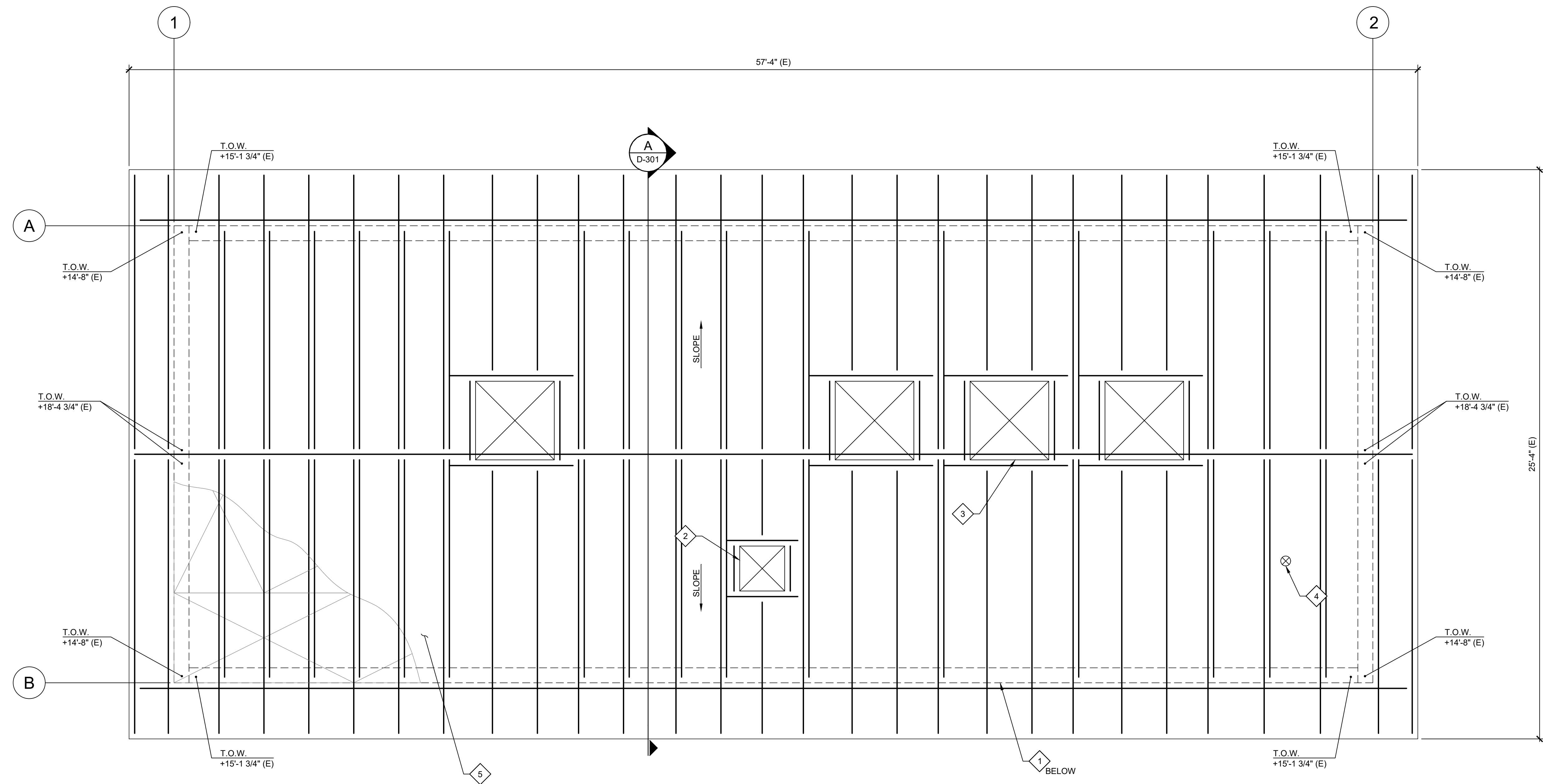
02/9/2024

NEW ROOF DESIGN FOR APPIAN WAY
 PUMP STATION
 TITLE SHEET

DRAWING NO. **G-001**
 DESIGNED BY: JQ
 DRAWN BY: EJH
 CHECKED BY: EY
 PROJECT NO. 200-09353-23001
 SHEET 1 OF 14 SHEETS

BUILDING AND SAFETY DIVISION
 Department of Public Works
APPROVED
 UNDER LOS ANGELES COUNTY CODE
 TITLES 26, 30 AND 31
 M.D.O.R.T.A.
 PUBLIC WORKS
 02/01/2024 1:02:04 PM

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KEYNOTES:

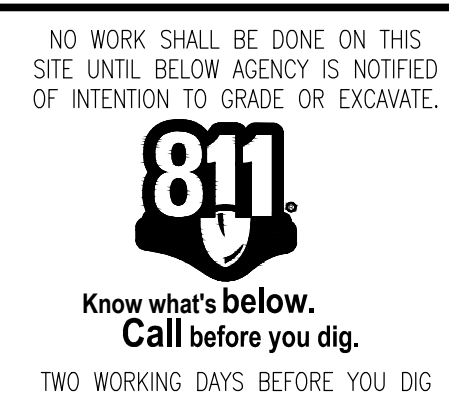
1. PROTECT EXISTING CMU WALL IN PLACE
2. REMOVE AND DISPOSE OF EXISTING EXHAUST FAN
3. REMOVE AND DISPOSE OF EXISTING SKYLIGHTS
4. REMOVE AND REPLACE THE EXISITNG RESTROOM VENT PIPE
5. REMOVE AND DISPOSE OF EXISTING ROOFING AND ROOF FRAMING - SEE SECTION ON SHEET D-301 FOR LIMITS OF DEMOLITION. THE EXISTING ROOF SYSTEM CONSISTS OF CAL-SHAKE ROOFING OVER 30# FELT, 5/8" THICK CDX PLYWOOD ROOF SHEATING WITH 3x BLOCKING, PREFABRICATED WOOD TRUSSES WITH 2x WOOD TRUSS BRIDGING, 2x8 WOOD ROOF RAFTERS, 6X12 WOOD RIDGE BEAM, 2x AND 3x WOOD FASCIA BOARDS, 6x4 WOOD ROOF OPENING FRAMING, AND 4x8 TOP PLATES.

DEMOLITION PLAN
 SCALE: 3/8"=1'-0"

DATUM:
 TOP OF EXISTING FINISH FLOOR AT THE INTERIOR PERIMETER OF THE BUILDING IS SET AT 0'-0"

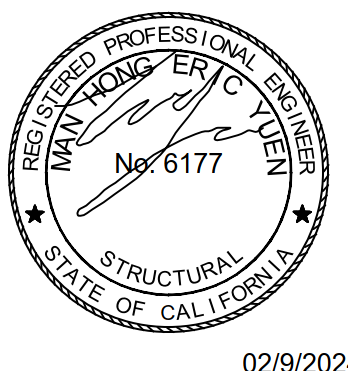
NOTES TO CONTRACTOR:

1. THE PUMP STATION SHALL REMAIN IN OPERATION AT ALL TIME DURING CONSTRUCTION.
2. CONTRACTOR SHALL CONTACT THE CITY A MINIMUM OF 48 HOURS IN ADVANCE TO SALVAGE ANY EQUIPMENT PRIOR TO ANY DEMOLITION WORK.
3. CONTRACTOR SHALL PROTECT IN PLACE ALL EXISTING FACILITIES DURING DEMOLITION AND CONSTRUCTION UNLESS NOTED OTHERWISE ON THE PLANS.
4. CONTRACTOR SHALL PROTECT ALL EXISTING MECHANICAL AND ELECTRICAL COMPONENTS NOT DESIGNATED FOR DEMOLITION OR REMOVAL AND REPLACEMENT. ALL DAMAGED EXISTING MECHANICAL AND ELECTRICAL COMPONENTS AND THOSE ELECTRICAL COMPONENTS WHICH HAVE BEEN TEMPORARILY RELOCATED DURING CONSTRUCTION, WITH THE CITY'S APPROVAL, SHALL BE RESTORED BY THE CONTRACTOR.
5. CONTRACTOR SHALL PROVIDE A PRE-CONSTRUCTION VIDEO TO DOCUMENT THE CONDITION OF THE PUMP STATION BUILDING AND THE EQUIPMENT INSIDE THE BUILDING. A COPY OF THE VIDEO SHALL BE SUBMITTED TO THE CITY AT LEAST 48 HOURS PRIOR TO THE BEGINNING OF THE CONSTRUCTION.
6. THE CONTRACTOR SHALL REPAIR ANY DAMAGE TO THE EXISTING BUILDING TO THE CITY'S SATISFACTION.



CITY OF LOMITA CALIFORNIA
 City of Lomita
 PUBLIC WORKS DEPARTMENT
 24300 NARBONNE AVENUE, LOMITA, CA 90717
 TEL. (310) 325-7110 FAX. (310) 325-4024

NO.	DATE	BY	DESCRIPTION	APPROVED



SUBMITTED BY: _____ DATE: _____

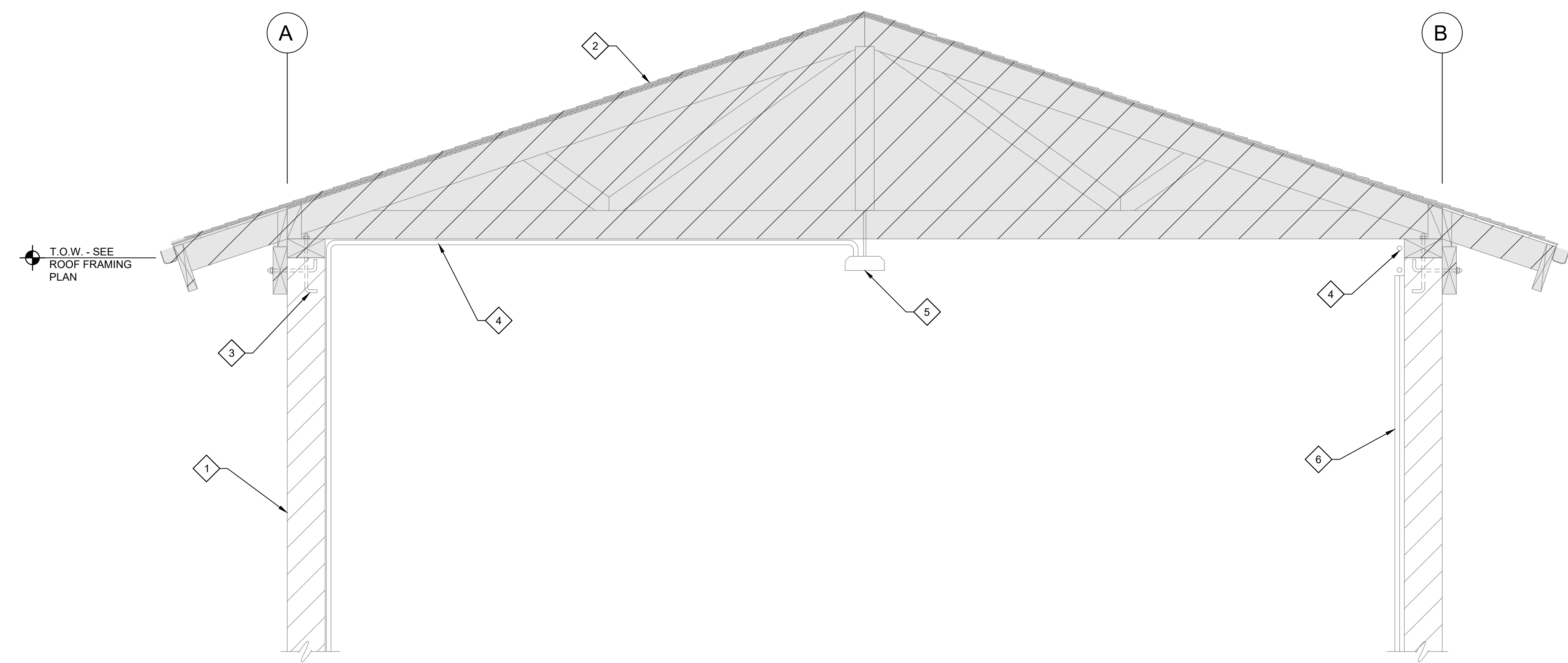
APPROVED BY CITY: _____ DATE: _____

NEW ROOF DESIGN FOR APPIAN WAY PUMP STATION
 ROOF DEMOLITION PLAN

DRAWING NO. D-101
DESIGNED BY: JQ
DRAWN BY: EJH
CHECKED BY: EY
PROJECT NO. 200-09353-23001
SHT 2 OF 14 SHTS

BUILDING AND SAFETY DIVISION
 Department of Public Works
APPROVED
 UNDER LOS ANGELES COUNTY CODE
 TITLES 26, 30 AND 31
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A DEMOLITION SECTION
 SCALE: 3/4"=1'-0"

KEYNOTES: ◊

1. PROTECT EXISTING CMU IN PLACE
2. REMOVE AND DISPOSE OF EXISTING ROOFING AND ROOF FRAMING - SEE DEMOLITION PLAN ON SHEET S-101
3. REMOVE ANCHORS IN CMU PER DETAIL 8 ON SHEET S-502
4. TEMPORARILY REMOVE AND REPLACE EXISTING CONDUITS. REFER TO THE ELECTRICAL DRAWINGS FOR CONDUIT LOCATIONS.
5. REMOVE AND REPLACE EXISTING INTERIOR LIGHTS. REFER TO THE ELECTRICAL DRAWINGS FOR LIGHTING LOCATIONS.
6. PROTECT IN PLACE THE ACOUSTICAL PANELS

DEMOLITION NOTES:

1. REFER TO THE NOTES TO CONTRACTOR ON SHEET S-101

NO WORK SHALL BE DONE ON THIS SITE UNTIL BELOW AGENCY IS NOTIFIED OF INTENTION TO GRADE OR EXCAVATE.

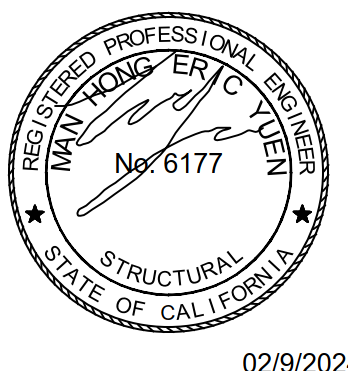
811

Know what's below.
 Call before you dig.
 TWO WORKING DAYS BEFORE YOU DIG

City of Lomita
PUBLIC WORKS DEPARTMENT

24300 NARBONNE AVENUE, LOMITA, CA 90717
 TEL. (310) 325-7110 FAX. (310) 325-4024

NO.	DATE	BY	DESCRIPTION	APPROVED



SUBMITTED BY : _____ DATE _____

APPROVED BY CITY : _____ DATE _____

**NEW ROOF DESIGN FOR APPIAN WAY
 PUMP STATION**

ROOF DEMOLITION SECTION

DRAWING NO.	D-301
DESIGNED BY :	JQ
DRAWN BY :	EJH
CHECKED BY :	EY
PROJECT NO.	200-09353-23001
SHT	3 OF 14 SHTS

GENERAL STRUCTURAL NOTES
 THESE NOTES SHALL APPLY UNLESS SHOWN/INDICATED OTHERWISE ELSEWHERE
 IN THE STRUCTURAL DRAWINGS.

GENERAL

- ALL MATERIALS AND CONSTRUCTION SHALL CONFORM TO THE 2022 CALIFORNIA BUILDING CODE (C.B.C.) BASED UPON THE 2021 EDITION OF THE INTERNATIONAL BUILDING CODE (I.B.C.).
- THE CONTRACTOR ACKNOWLEDGES RESPONSIBILITY FOR JOBSITE SAFETY AND ACKNOWLEDGES THAT THE ENGINEER WILL NOT HAVE SUCH RESPONSIBILITY. IF A LAWSUIT IS FILED BY ONE OF THE CONTRACTOR'S OR SUBCONTRACTOR'S EMPLOYEES, OR ANY ONE ELSE, THE CONTRACTOR WILL INDEMNIFY, DEFEND AND HOLD THE OWNER AND TETRA TECH, THEIR PARENT AND SUBSIDIARY COMPANIES HARMLESS OF ANY AND ALL SUCH CLAIMS.
- CONTRACTOR SHALL VERIFY ALL EXISTING CONDITIONS AND DIMENSIONS BEFORE STARTING WORK. DIMENSIONS OF (E) CONSTRUCTION WHERE SHOWN ON THESE DRAWINGS ARE NOMINAL AND SHOULD BE FIELD VERIFIED. SHOULD CONDITIONS EXIST WHICH ARE CONTRARY TO THOSE SHOWN ON PLANS, THE ENGINEER SHALL BE NOTIFIED IN WRITING BEFORE PROCEEDING WITH WORK.
- IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO ENSURE THAT ALL WALLS, TRUSSES, ETC. ARE ADEQUATELY BRACED AND SHORED DURING CONSTRUCTION. ALL BRACING/SHORING SHALL BE DESIGNED BY A REGISTERED ENGINEER HIRED BY THE CONTRACTOR. BRACING OF MASONRY WALLS SHALL REMAIN IN PLACE UNTIL ROOF DIAPHRAGM IS COMPLETELY INSTALLED AND ATTACHED TO ITS FRAMING SUPPORTS.
- UNLESS DETAILED, SPECIFIED, OR INDICATED OTHERWISE, CONSTRUCTION SHALL BE AS INDICATED IN THE APPLICABLE TYPICAL DETAILS AND THESE GENERAL NOTES. TYPICAL DETAILS ARE MEANT TO APPLY EVEN THOUGH NOT REFERENCED AT SPECIFIC LOCATIONS ON DRAWINGS WHERE THEY OCCUR.
- THE CONTRACT DRAWINGS AND SPECIFICATIONS REPRESENT THE FINISHED STRUCTURE. THEY DO NOT INDICATE THE METHOD OF CONSTRUCTION. THE CONTRACTOR SHALL PROVIDE ALL MEASURES NECESSARY TO PROTECT THE STRUCTURE, EXISTING MECHANICAL AND ELECTRICAL COMPONENTS, WORKERS AND PEDESTRIANS DURING CONSTRUCTION. SUCH MEASURES SHALL INCLUDE, BUT NOT BE LIMITED TO BRACING, SHORING FOR LOADS DUE TO CONSTRUCTION EQUIPMENT, TEMPORARY PROTECTION STRUCTURES, AND PARTIALLY COMPLETED WORK, ETC. OBSERVATION VISITS TO THE SITE BY THE ENGINEER SHALL NOT BE CONSIDERED AS INSPECTION OF SUCH ITEMS.
- DIMENSIONS SHALL TAKE PRECEDENCE OVER SCALES SHOWN ON DRAWINGS.
- ALL ITEMS REMOVED DURING CONSTRUCTION WORK SHALL BE REPLACED TO MATCH EXISTING.
- ALL WORK SHALL CONFORM TO THE PLANS AND SPECIFICATIONS IN ALL RESPECTS AND SHALL BE SUBJECT TO APPROVAL BY THE ENGINEER.
- CONTRACTOR SHALL VERIFY LOCATION OF ALL SITE UTILITIES PRIOR TO STARTING WORK, BOTH ABOVE GROUND AND BELOW GROUND, WHICH MAY BE IMPACTED BY THE WORK SHOWN ON THESE DRAWINGS. ANY CONFLICTS SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER.
- ALL ITEMS SHOWN ON THESE PLANS ARE NEW UNLESS NOTED (E), EXIST, OR EXISTING.

STEEL NOTES

- ALL WIDE FLANGE MEMBERS SHALL BE IN ACCORDANCE WITH A.S.T.M. A-992. ALL OTHER STRUCTURAL AND MISCELLANEOUS STEEL SHALL BE ASTM A36 UNLESS NOTED OTHERWISE. STRUCTURAL STEEL SHALL BE FABRICATED AND ERRECTED IN ACCORDANCE WITH THE AISC SPECIFICATION FOR THE DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL FOR BUILDINGS. SPECIAL INSPECTION SHALL BE PROVIDED FOR ALL STRUCTURAL STEEL IN ACCORDANCE WITH CBC SECTION 1705.2.1, UNLESS FABRICATION IS PERFORMED ON THE PREMISES OF A FABRICATOR REGISTERED AND APPROVED TO PERFORM SUCH WORK WITHOUT SPECIAL INSPECTION, IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS AND SECTION 1704.2.5 OF THE 2019 CBC. AT THE COMPLETION OF FABRICATION, THE APPROVED FABRICATOR SHALL SUBMIT A CERTIFICATE OF COMPLIANCE TO THE CITY BUILDING OFFICIAL (OR OWNER IF THE PROJECT IS NOT UNDER THE JURISDICTION OF A BUILDING DEPARTMENT) AND TO THE ENGINEER STATING THAT THE WORK WAS PERFORMED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
- STEEL TUBES SHALL CONFORM TO A.S.T.M. A500, GRADE B OR BETTER, UNLESS NOTED OTHERWISE.
- STEEL PIPES SHALL CONFORM TO A.S.T.M. A53, GRADE B.
- BOLTS SHALL CONFORM TO A.S.T.M. A307 OR BETTER, UNLESS NOTED OTHERWISE.
- HOLES FOR BOLTS IN STEEL SHALL BE OF SAME DIAMETER AS BOLT +1/16" MAXIMUM.
- ALL WELDING SHALL BE SHIELDED ARC TYPE AND SHALL BE PERFORMED BY A CERTIFIED WELDER IN A FABRICATION SHOP REGISTERED AND APPROVED IN ACCORDANCE WITH NOTE 1 ABOVE. CONTINUOUS INSPECTION IS REQUIRED OF ALL FIELD WELDING IN ACCORDANCE WITH AWS D1.1.
- NO STRUCTURAL STEEL MEMBER SHALL BE CUT FOR PIPES, DUCTS, ETC. UNLESS SPECIFICALLY DETAILED AND APPROVED BY STRUCTURAL ENGINEER.
- STAINLESS STEEL SHALL CONFORM TO A.S.T.M. A276/A.I.S.I. 316. STAINLESS STEEL BOLTS SHALL CONFORM TO A.S.T.M. F593. STAINLESS STEEL NUTS SHALL CONFORM TO A.S.T.M. F594.
- WELDING OF STAINLESS STEEL SHALL CONFORM TO STRUCTURAL WELDING CODE - STAINLESS STEEL, ANSIIAWS D1.8-07.
- WHERE SPECIFIED, USE OF HIGH-STRENGTH BOLTS SHALL CONFORM TO THE PROVISIONS OF THE "SPECIFICATION FOR STRUCTURAL JOINTS USING A.S.T.M. A325 OR A490 BOLTS" APPROVED BY THE RESEARCH COUNCIL ON STRUCTURAL CONNECTIONS OF THE ENGINEERING FOUNDATION (RCSC). SPECIAL INSPECTION OF HIGH-STRENGTH BOLT CONNECTIONS IS REQUIRED.

- ALL NON-STAINLESS STEEL EXPOSED TO WEATHER SHALL BE HOT-DIP GALVANIZED IN ACCORDANCE WITH ASTM A123 OR A153, AS APPLICABLE. REPAIR OF DAMAGED GALVANIZED COATING SHALL BE IN ACCORDANCE WITH ASTM A780. ALL OTHER NON-STAINLESS STEEL SHALL BE COATED WITH TWO COATS OF SHOP APPLIED PRIMER.
- WELDING EQUIPMENT SHALL BE CHECKED PRIOR TO WELDING AS REQUIRED BY AISC 360-16 TABLE N5.4-1.

STEEL DECK NOTES

- REFER TO STEEL DECK SPECIFICATIONS FOR ADDITIONAL INFORMATION.
- DECK ERECTION CONTRACTOR SHALL CUT DECK TO SUIT DETAILS AT ALL FRAMED OPENINGS AS INDICATED ON THE DRAWINGS.
- THE OPENINGS SHOWN ON THE FRAMING PLANS INDICATE THE GENERAL ARRANGEMENT AND LOCATION ONLY. VERIFY OUTING LENGTH OF DECK WITH THE ELECTRICAL AND MECHANICAL DRAWINGS.
- ALL LIGHT GAGE STEEL DECKING AND FLASHING SHALL BE FABRICATED OF SHEET METAL CONFORMING TO A.S.T.M. A-446.
- DECKING SHALL BE GALVANIZED PER COATING DESIGNATION G90 IN ACCORDANCE WITH ASTM A653, UNLESS NOTED OTHERWISE.
- EDGE OF PERIMETER CLOSURE SHALL BE HELD WITHIN ±1/2" OF THE DIMENSIONS REQUIRED ON THE ARCHITECTURAL DRAWINGS. CONFIRM THE LOCATION OF THE BEAM AND COLUMN CENTER LINES FROM FIXED REFERENCE EDGE LINES.
- MINIMUM DECK SECTION PROPERTIES SHALL BE AS FOLLOWS:

GAUGE	DEPTH	I (IN ⁴)	+S(IN ⁴)	-S(IN ⁴)
16	1 1/2"	0.381	0.399	0.410

ADHESIVE ANCHORS (SIMPSON)

- ADHESIVE ANCHORS SHALL BE "SIMPSON SET-XP" ADHESIVE ANCHORS, MANUFACTURED BY SIMPSON STRONG-TIE.
- ANCHORS SHALL BE INSTALLED IN ACCORDANCE WITH I.C.C. EVALUATION REPORT No. 2508. FOR ANCHORS IN CONCRETE AND I.C.C. REPORT No. 265 FOR ANCHORS IN MASONRY.
- AN ALTERNATIVE ADHESIVE ANCHOR PRODUCT MAY BE SUBMITTED TO THE ENGINEER FOR APPROVAL, PROVIDED THAT IT HAS A CURRENT I.C.C. EVALUATION REPORT APPROVAL.
- ALL ABANDONED HOLES SHALL BE FILLED WITH A DRYPACK GROUT A MINIMUM 28-DAY COMPRESSIVE STRENGTH OF 5,000 PSI. THE FILLED HOLE(S) SHALL BE PREPARED AND CLEANED AS REQUIRED BY THE GROUT MANUFACTURER.
- LOCATE EXISTING REINFORCING USING A NON-DESTRUCTIVE METHOD (PACHOMETER OR OTHER), PRIOR TO STEEL FABRICATION OF THE AFFECTED COMPONENTS AND PRIOR TO DRILLING HOLES FOR ANCHORS. MAINTAIN A MINIMUM CLEARANCE OF 1" BETWEEN THE REINFORCEMENT AND THE ANCHOR. NOTIFY ENGINEER IF ADHESIVE ANCHORS CANNOT BE INSTALLED DUE TO REBAR INTERFERENCE(S) SO STRUCTURAL STEEL DETAILING SHOWN HEREON CAN BE MODIFIED TO ACCOMMODATE.

DESIGN CRITERIA

DESIGN CODES AND REFERENCES:

- CALIFORNIA BUILDING CODE, 2022 EDITION
- ASCE/SEI 7-16 MINIMUM DESIGN LOADS FOR BUILDINGS & OTHER STRUCTURES
- AISC STEEL CONSTRUCTION MANUAL, 15TH EDITION - ANSIIAISC 360-16

BUILDING LOADING:

BLDG. ROOF DL = 16 PSF
 BUILDING ROOF LL = 20 PSF

MATERIAL PROPERTIES:

STEEL TUBES fy = 42 KSI MINIMUM
 STEEL CHANNELS AND ANGLES fy = 36 KSI MINIMUM
 STEEL BOLTS fy = 36 KSI, A307 UNLESS NOTE OTHERWISE
 SPECIAL INSPECTION YES (SEE SHEET S-002)

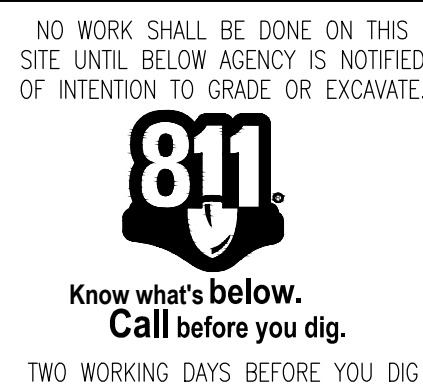
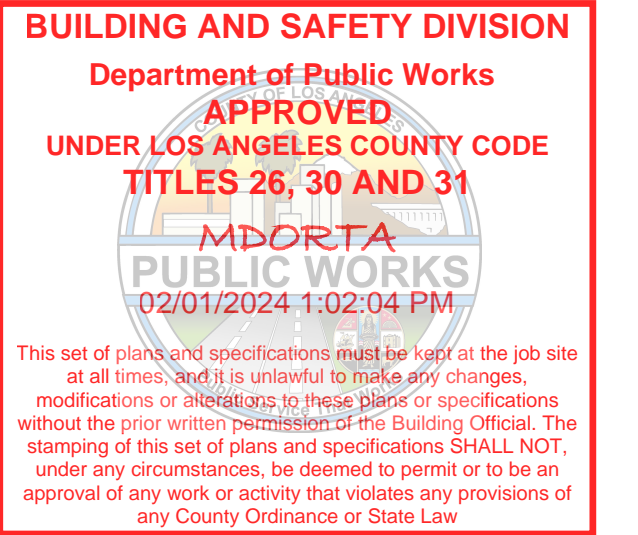
SEISMIC DESIGN PARAMETERS:

ANALYSIS PROCEDURE USED: EQUIVALENT LATERAL FORCE PROCEDURE
 LOCATION: LAT. 33.784495 N, LONG. 118.315827 W
 OCCUPANCY CATEGORY: IV
 SITE CLASS: D
 SEISMIC DESIGN CATEGORY: D

Ss = 1.743 S1 = 0.637
 Fa = 1.200 Fv = 1.7
 SDS = 1.394 SD1 = 0.722
 IE = 1.5
 R = 5 (SPECIAL REINFORCED MASONRY SHEAR WALLS)

WIND LOAD DESIGN PARAMETERS:

BASIC WIND SPEED: 105 MPH
 EXPOSURE CATEGORY: B
 WIND DIRECTIONAL FACTOR, Kd = 0.85
 Iw = 1.0



City of Lomita
 PUBLIC WORKS DEPARTMENT

24300 NARBONNE AVENUE, LOMITA, CA 90717
 TEL. (310) 325-7110 FAX. (310) 325-4024

NO.	DATE	BY	DESCRIPTION	APPROVED



SUBMITTED BY : _____ DATE _____

APPROVED BY CITY : _____ DATE _____

ENGINEERING DIVISION

NEW ROOF DESIGN FOR APPIAN WAY
 PUMP STATION
 GENERAL STRUCTURAL NOTES

DRAWING NO.	S-001
DESIGNED BY :	JQ
DRAWN BY :	EJH
CHECKED BY :	EY
PROJECT NO.	200-09353-23001
SHT	4 OF 14 SHITS

02/9/2024

PROJECT AND SHEET TITLE

SPECIAL INSPECTIONS REQUIRED

SPECIAL INSPECTIONS REQUIRED FOR THIS PROJECT SHALL BE PERFORMED IN ACCORDANCE WITH C.B.C. CHAPTER 17. SPECIAL INSPECTIONS SHALL BE PERFORMED BY AN APPROVED INSPECTION AGENCY U.N.O. EMPLOYED BY THE OWNER.

THE SPECIAL INSPECTOR SHALL BE CERTIFIED BY THE INTERNATIONAL CODE COUNCIL (I.C.C.) TO PERFORM INSPECTION FOR THE PARTICULAR TYPE OF CONSTRUCTION OR OPERATION REQUIRING SPECIAL INSPECTION PRIOR TO THE COMPLETION OF THAT PHASE OF THE WORK.

THE SPECIAL INSPECTOR SHALL FURNISH INSPECTION REPORTS TO THE BUILDING OFFICIAL AND/OR THE ENGINEER. ALL DISCREPANCIES SHALL BE BROUGHT TO THE IMMEDIATE ATTENTION OF THE CONTRACTOR FOR CORRECTION. THEN, IF UNCORRECTED, TO THE STRUCTURAL ENGINEER AND TO THE BUILDING OFFICIAL.

THE SPECIAL INSPECTOR SHALL SUBMIT A FINAL SIGNED REPORT STATING WHETHER THE WORK REQUIRING SPECIAL INSPECTION WAS, TO THE BEST OF THE INSPECTOR'S KNOWLEDGE, IN CONFORMANCE WITH THE APPROVED PLANS AND SPECIFICATIONS AND THE APPLICABLE WORKMANSHIP PROVISIONS OF THIS CODE.

IT SHALL BE THE CONTRACTOR'S SOLE RESPONSIBILITY TO PROVIDE AT LEAST 48 HOURS ADVANCE NOTICE TO THE OWNER/OWNER'S REPRESENTATIVE WHEN HIS WORK IS READY FOR ANY REQUIRED SPECIAL INSPECTIONS.

SHOP INSPECTION OF STEEL CONSTRUCTION IS NOT REQUIRED WHEN THE WORK IS DONE ON THE PREMISES OF A FABRICATOR REGISTERED AND APPROVED TO PERFORM SUCH WORK WITHOUT SPECIAL INSPECTION. APPROVAL SHALL BE BASED UPON REVIEW OF THE FABRICATOR'S WRITTEN PROCEDURAL AND QUALITY CONTROL MANUALS AND PERIODIC AUDITING OF FABRICATION PRACTICES BY AN APPROVED SPECIAL INSPECTION AGENCY. AT COMPLETION OF FABRICATION, THE APPROVED FABRICATOR SHALL SUBMIT A CERTIFICATE OF COMPLIANCE TO THE BUILDING OFFICIAL STATING THAT THE WORK WAS PERFORMED IN ACCORDANCE WITH THE APPROVED CONSTRUCTION DOCUMENTS.

CONTRACTOR RESPONSIBILITY

EACH CONTRACTOR RESPONSIBLE FOR THE CONSTRUCTION OF A MAIN WIND- OR SEISMIC-FORCE-RESISTING SYSTEM, DESIGNATED SEISMIC SYSTEM OR A WIND- OR SEISMIC-RESISTING COMPONENT LISTED IN THE STATEMENT OF SPECIAL INSPECTIONS SHALL SUBMIT A WRITTEN STATEMENT OF RESPONSIBILITY TO THE BUILDING OFFICIAL AND THE OWNER PRIOR TO THE COMMENCEMENT OF WORK ON THE SYSTEM OR COMPONENT. THE CONTRACTOR'S STATEMENT OF RESPONSIBILITY SHALL CONTAIN ACKNOWLEDGMENT OF AWARENESS OF THE SPECIAL REQUIREMENTS CONTAINED IN THE STATEMENT OF SPECIAL INSPECTION.

OWNER OR OWNER'S REPRESENTATIVE SHALL BE SYNONYMOUS WITH 'BUILDING OFFICIAL' IN THE FOREGOING IF THE PROJECT IS NOT UNDER THE JURISDICTION OF A BUILDING DEPARTMENT

SPECIAL INSPECTION SHALL BE PROVIDED FOR THE FOLLOWING TYPES OF WORK PERFORMED IN THE FIELD, OR NOT PERFORMED IN AN APPROVED FABRICATION SHOP AS DEFINED ABOVE, UNLESS NOTED AS 'N/A'.

REQUIREMENTS FOR LOS ANGELES COUNTY, DEPARTMENT OF PUBLIC WORKS, DIVISION OF BUILDING AND SAFETY

LOS ANGELES COUNTY BUILDING & SAFETY PERMIT

THE CONTRACTOR SHALL APPLY FOR A CONSTRUCTION PERMIT FROM LOS ANGELES COUNTY, DEPARTMENT OF PUBLIC WORKS, DIVISION OF BUILDING AND SAFETY LOCATED AT 24320 SOUTH NARBONNE AVENUE LOMITA, CA 90717. HOURS OF OPERATION MONDAY TO FRIDAY 8:00 AM - 4:30 PM.

UPON RECEIPT OF PERMIT, THE CONTRACTOR WILL BE GIVEN A JOB CARD FOR THIS PROJECT.

LOS ANGELES COUNTY BUILDING & SAFETY INSPECTION

THE CONTRACTOR SHALL REQUEST INSPECTION FROM THE LOS ANGELES DIVISION OF BUILDING AND SAFETY AT THREE DIFFERENT OCCASIONS AS OUTLINED BELOW:

- UPON COMPLETION OF ERECTION OF THE TRUSS FRAME OF THE ROOF AND BEFORE INSTALLING ANY OTHER ROOF COMPONENTS.
- UPON COMPLETION OF INSTALLATION OF THE ROOF DECKING (FINAL ROOF INSPECTION).
- UPON COMPLETION OF ELECTRICAL WORK (FINAL ELECTRICAL INSPECTION).

REQUEST FOR INSPECTION SHALL BE MADE BY CALLING THE PHONE NUMBER ON THE JOB CARD AT LEAST 48 HOURS IN ADVANCE.

ADDITIONAL INSPECTIONS MAY BE NEEDED AS DEEMED NECESSARY BY THE ENGINEER OR COUNTY.

STEEL CONSTRUCTION (STRUCTURAL STEEL):
R- INSPECT THESE ITEMS ON A RANDOM BASIS. OPERATIONS NEED NOT BE DELAYED PENDING THESE INSPECTIONS
C- INSPECT THESE ITEMS ON A CONTINUOUS BASIS

	C	R	N/A
1. INSPECTION TASKS PRIOR TO WELDING			
A. WELDER QUALIFICATION RECORDS AND CONTINUITY RECORDS	■	□	□
B. WELDING PROCEDURE SPECIFICATIONS (WPS) AVAILABLE	■	□	□
C. MANUFACTURER'S CERTIFICATIONS FOR WELDING CONSUMABLES AVAILABLE	■	□	□
D. MATERIAL IDENTIFICATION (TYPE/GRADE)	■	□	□
E. WELDER IDENTIFICATION SYSTEM	■	□	□
F. FIT-UP OF GROOVE WELDS (INCLUDING JOINT GEOMETRY)	■	□	□
- JOINT PREPARATION			
- DIMENSIONS (ALIGNMENT, ROOT OPENING, ROOT FACE, BEVEL)			
- CLEANLINESS (CONDITION OF STEEL SURFACES)			
- TACKING (TACK WELD QUALITY AND LOCATION)			
- BACKING TYPE AND FIT (IF APPLICABLE)			
G. FIT-UP OF CJP GROOVE WELDS OF HSS T-, Y- AND K- JOINTS WITHOUT BACKING (INCLUDING JOINT GEOMETRY)	□	■	□
- JOINT PREPARATIONS			
- DIMENSIONS (ALIGNMENT, ROOT OPENING, ROOT FACE, BEVEL)			
- CLEANLINESS (CONDITION OF STEEL SURFACES)			
- TACKING (TACK WELD QUALITY AND LOCATION)			
H. CONFIGURATION AND FINISH OF ACCESS HOLES	□	■	□
I. FIT-UP OF FILLET WELDS	□	■	□
- DIMENSIONS (ALIGNMENT, GAPS AT ROOT)			
- CLEANLINESS (CONDITION OF STEEL SURFACES)			
- TACKING (TACK WELD QUALITY AND LOCATION)			
2. INSPECTION TASKS DURING WELDING			
A. CONTROL AND HANDLING OF WELDING CONSUMABLES	□	■	□
- PACKAGING			
- EXPOSURE CONTROL			
B. NO WELDING OVER CRACKED TACK WELDS	□	■	□
C. ENVIRONMENTAL CONDITIONS	□	■	□
- WIND SPEED WITHIN LIMITS			
- PRECIPITATION AND TEMPERATURE			
D. WPS FOLLOWED	□	■	□
- SETTINGS ON WELDING EQUIPMENT			
- TRAVEL SPEED			
- SELECTED WELDING MATERIALS			
- SHIELDING GAS TYPE/FLOW RATE			
- PREHEAT APPLIED			
- INTERPASS TEMPERATURE MAINTAINED (MIN./MAX.)			
- PROPER POSITION (F, V, H, OH)			
E. WELDING TECHNIQUES	□	■	□
- INTERPASS AND FINAL CLEANING			
- EACH PASS WITHIN PROFILE LIMITATIONS			
- EACH PASS MEETS QUALITY REQUIREMENTS			
F. PLACEMENT AND INSTALLATION OF STEEL HEADED STUD ANCHORS	■	□	□
3. INSPECTION TASKS AFTER WELDING			
A. WELDS CLEANED	□	■	□
B. SIZE, LENGTH AND LOCATION OF WELDS	□	■	□
C. WELDS MEET VISUAL ACCEPTANCE CRITERIA	□	■	□
- CRACK PROHIBITION			
- WELD/BASE-METAL FUSION			
- CRATER CROSS SECTION			
- WELD PROFILES			
- WELD SIZE			
- UNDERCUT			
- POROSITY			
D. ARC STRIKES	■	□	□
E. K-AREA	■	□	□
- WHEN WELDING OF DOUBLER PLATES, CONTINUITY PLATES OR STIFFENERS HAS BEEN PERFORMED IN THE K-AREA, VISUALLY INSPECT THE WEB K-AREA FOR CRACKS WITHIN 9 IN. (75 MM) OF THE WELD			
F. WELD ACCESS HOLES IN ROLLED HEAVY SHAPES AND BUILT-UP HEAVY SHAPES	■	□	□
- AFTER ROLLED HEAVY SHAPES (SEE AISC SECTION A3.1C) AND BUILT-UP SHAPES (SEE AISC SECTION A3.1D) ARE WELDED, VISUALLY INSPECT THE WELD ACCESS HOLE FOR CRACKS			
G. BACKING REMOVED AND WELD TABS REMOVED (IF REQUIRED)	■	□	□
H. REPAIR ACTIVITIES	■	□	□
I. DOCUMENT ACCEPTANCE OR REJECTION OF WELDED JOINT OR MEMBER	■	□	□
J. NO PROHIBITED WELDS HAVE BEEN ADDED WITHOUT THE APPROVAL OF THE EOR	□	■	□

STEEL CONSTRUCTION (STRUCTURAL STEEL CONT.):

	C	R	N/A
4. INSPECTION TASKS PRIOR TO BOLTING			
A. MANUFACTURER'S CERTIFICATION AVAILABLE FOR FASTENER MATERIALS	■	□	□
B. FASTENERS MARKED IN ACCORDANCE WITH ASTM REQUIREMENTS	□	■	□
C. CORRECT FASTENERS SELECTED FOR THE JOINT DETAIL (GRADE, TYPE, BOLT LENGTH IF THREADS ARE TO BE EXCLUDED FROM SHEAR PLANE)	□	■	□
D. CORRECT BOLTING PROCEDURE SELECTED FOR JOINT DETAIL	□	■	□
E. CONNECTING ELEMENTS, INCLUDING THE APPROPRIATE FAYING SURFACE CONDITION AND HOLE PREPARATION, IF SPECIFIED, MEET APPLICABLE REQUIREMENTS	□	■	□
F. PRE-INSTALLATION VERIFICATION TESTING BY INSTALLATION PERSONNEL OBSERVED AND DOCUMENTED FOR FASTENER ASSEMBLIES AND METHODS USED	□	■	□
G. PROTECTED STORAGE PROVIDED FOR BOLTS, NUTS, WASHERS AND OTHER FASTENER COMPONENTS	□	■	□
5. INSPECTION TASKS DURING BOLTING			
A. FASTENER ASSEMBLIES, OF SUITABLE CONDITION, PLACED IN ALL HOLES AND WASHERS ARE POSITIONED AS REQUIRED	□	■	□
B. JOINT BROUGHT TO THE SNUG-TIGHT CONDITION PRIOR TO THE PRETENSIONING OPERATION	□	■	□
C. FASTENER COMPONENT NOT TURNED BY THE WRENCH PREVENTED FOR ROTATING	□	■	□
D. FASTENERS ARE PRETENSIONED IN ACCORDANCE WITH THE RCSC SPECIFICATION, PROGRESSING SYSTEMATICALLY FROM THE MOST RIGID POINT TOWARD THE FREE EDGES	□	■	□
6. INSPECTION TASKS AFTER BOLTING			
A. DOCUMENT ACCEPTANCE OR REJECTION OF BOLTED CONNECTIONS	■	□	□
7. INSPECTION OF STEEL ELEMENTS OF COMPOSITE CONSTRUCTION PRIOR TO CONCRETE PLACEMENT			
A. PLACEMENT AND INSTALLATION OF STEEL DECK	■	□	□
B. PLACEMENT AND INSTALLATION OF STEEL HEADED STUD ANCHORS	■	□	□
C. DOCUMENT ACCEPTANCE OR REJECTION OF STEEL ELEMENTS	■	□	□

STEEL CONSTRUCTION (OTHER THAN STRUCTURAL STEEL):

	C	R	N/A
1. INSPECTION OR EXECUTION TASKS PRIOR TO DECK PLACEMENT			
A. VERIFY COMPLIANCE OF MATERIALS (DECK AND ALL DECK ACCESSORIES) WITH CONSTRUCTION DOCUMENTS, INCLUDING PROFILES MATERIAL PROPERTIES, AND BASE METAL THICKNESS	■	□	□
B. DOCUMENT ACCEPTANCE OR REJECTION OF DECK AND DECK ACCESSORIES	■	□	□
2. INSPECTION OR EXECUTION TASKS AFTER TO DECK PLACEMENT			
A. VERIFY COMPLIANCE OF DECK AND ALL DECK ACCESSORIES INSTALLATION WITH CONSTRUCTION DOCUMENTS	■	□	□
B. VERIFY DECK MATERIALS ARE REPRESENTED BY THE MILL CERTIFICATIONS THAT COMPLY WITH THE CONSTRUCTION DOCUMENTS	■	□	□
C. DOCUMENT ACCEPTANCE OR REJECTION OF INSTALLATION OF DECK AND DECK ACCESSORIES	■	□	□
3. INSPECTION OR EXECUTION TASKS PRIOR TO WELDING			
A. WELDING PROCEDURE SPECIFICATIONS (WPS) AVAILABLE	□	□	■
B. MANUFACTURER CERTIFICATIONS FOR WELDING CONSUMABLES AVAILABLE	□	□	■
C. MATERIAL IDENTIFICATION (TYPE/GRADE)	□	□	■
D. CHECK WELDING EQUIPMENT	□	□	■
4. INSPECTION OR EXECUTION TASKS DURING WELDING			
A. USE OF QUALIFIED WELDERS	□	□	■
B. CONTROL AND HANDLING OF WELDING CONSUMABLES	□	□	■
C. ENVIRONMENTAL CONDITIONS (WIND SPEED, MOISTURE, TEMPERATURE)	□	□	■
D. WPS FOLLOWED	□	□	■
5. INSPECTION OR EXECUTION TASKS AFTER WELDING			
A. VERIFY SIZE LOCATION OF WELDS, INCLUDING SUPPORT, SIDELAP, AND PERIMETER WELDS	□	□	■
B. WELDS MEET VISUAL ACCEPTANCE CRITERIA	□	□	■
C. VERIFY REPAIR ACTIVITIES	□	□	■
D. DOCUMENT ACCEPTANCE OR REJECTION OF WELDS	□	□	■
6. INSPECTION OR EXECUTION TASKS PRIOR TO MECHANICAL FASTENING			
A. MANUFACTURER INSTALLATION INSTRUCTIONS AVAILABLE FOR MECHANICAL FASTENERS	□	■	□
B. PROPER TOOLS AVAILABLE FOR FASTENER INSTALLATION	□	■	□
C. PROPER STORAGE FOR MECHANICAL FASTENERS	□	■	□
7. INSPECTION OR EXECUTION TASKS DURING MECHANICAL FASTENING			
A. FASTENERS ARE POSITIONED AS REQUIRED	□	■	□
B. FASTENERS ARE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS	□	■	□
8. INSPECTION OR EXECUTION TASKS AFTER MECHANICAL FASTENING			
A. CHECK SPACING, TYPE, AND INSTALLATION OF SUPPORT FASTENERS	■	□	□
B. CHECK SPACING, TYPE, AND INSTALLATION OF SIDELAP FASTENERS	■	□	□
C. CHECK SPACING, TYPE, AND INSTALLATION OF PERIMETER FASTENERS	■	□	□
D. VERIFY REPAIR ACTIVITIES	■	□	□
E. DOCUMENT ACCEPTANCE OR REJECTION OF MECHANICAL FASTENERS	■	□	□

CONT PERIODIC N/A

	CONT	PERIODIC	N/A
ADHESIVE ANCHORS:			
1. VERIFY ANCHOR TYPE	□	■	□
2. VERIFY ADHESIVE IDENTIFICATION AND EXPIRATION DATE	□	■	□
3. VERIFY ANCHOR DIMENSIONS	□	■	□
4. VERIFY CONCRETE TYPE	□	■	□
5. VERIFY CONCRETE COMPRESSIVE STRENGTH	□	■	□
6. VERIFY HOLE DRILLING METHOD	□	■	□
7. VERIFY HOLE DIMENSIONS	□	■	□
8. VERIFY HOLE CLEANING PROCEDURES	□	■	□
9. VERIFY ANCHOR SPACING	□	■	□
10. VERIFY EDGE DISTANCES	□	■	□
11. VERIFY CONCRETE THICKNESS	□	■	□
12. VERIFY ANCHOR EMBEDMENT	□	■	□
13. VERIFY TIGHTENING TORQUE	□	■	□
14. VERIFY ADHERENCE TO THE MANUFACTURER'S PRINTED INSTALLATION INSTRUCTIONS	□	■	□

THE SPECIAL INSPECTOR MUST VERIFY THE INITIAL INSTALLATIONS OF EACH TYPE AND SIZE OF ADHESIVE ANCHOR INSTALLED BY THE CONSTRUCTION PERSONNEL ON SITE. SUBSEQUENT INSTALLATIONS OF THE SAME ANCHOR TYPE AND SIZE BY THE SAME CONSTRUCTION PERSONNEL MAY BE PERMITTED, WITH THE APPROVAL OF THE ENGINEER AND THE SPECIAL INSPECTOR, TO BE PERFORMED IN THE ABSENCE OF THE SPECIAL INSPECTOR. ANY CHANGE IN THE ANCHOR PRODUCT BEING INSTALLED OR THE PERSONNEL PERFORMING THE INSTALLATION REQUIRES AN INITIAL INSPECTION. FOR ONGOING INSTALLATIONS OVER AN EXTENDED PERIOD, THE SPECIAL INSPECTOR MUST MAKE REGULAR INSPECTIONS TO CONFIRM CORRECT HANDLING AND INSTALLATION OF THE PRODUCT. THE SPECIAL INSPECTOR SHALL INFORM THE ENGINEER OF THE FREQUENCY OF THE PERIODIC ANCHOR INSPECTIONS. THE ENGINEER MAY REQUEST ADDITIONAL INSPECTIONS AT ANY TIME.

STRUCTURAL OBSERVATION

THE STRUCTURAL ENGINEER, OR ANOTHER ENGINEER DESIGNATED BY THE STRUCTURAL ENGINEER SHALL BE RETAINED BY THE OWNER TO PERFORM STRUCTURAL OBSERVATION AS REQUIRED BY C.B.C. CHAPTER 17. STRUCTURAL OBSERVATION SHALL BE PROVIDED DURING THE STAGES OF CONSTRUCTION LISTED BELOW. IT SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR TO PROVIDE AT LEAST 48 HOURS ADVANCE NOTICE TO THE STRUCTURAL ENGINEER WHEN HIS WORK IS READY FOR STRUCTURAL OBSERVATION FOR EACH OF THESE STAGES.

	STRUCTURAL OBSERVATIONS REQUIRED (■ YES □ NO)
1. CONCRETE:	
A. REINFORCING STEEL AND EMBEDDED STRUCTURAL ANCHORAGES PRIOR TO PLACEMENT OF CONCRETE FOR THE FOLLOWING:	
A. FOUNDATIONS	□ N/A
B. SLABS-ON-GRADE (EXCEPT SITE PAVING AND FLATWORK)	□ N/A
C. WALLS	□ N/A
D. STRUCTURAL FLOOR SLABS AND BEAMS NOT SUPPORTED ON-GRADE	□ N/A
E. ROOF SLABS AND BEAMS	□ N/A
2. MASONRY:	
A. REINFORCING STEEL AND EMBEDDED STRUCTURAL ANCHORAGES PRIOR TO GROUTING OF MASONRY WALLS	□ N/A
3. STRUCTURAL STEEL:	
A. ERECTED COLUMN, BEAMS AND GIRDERS, PRIOR TO INSTALLATION OF ROOF AND FLOOR JOISTS, TRUSSES AND DECKING	■
4. WOOD FRAMING:	
A. ROOF, FLOOR AND WALL FRAMING AND MEMBER CONNECTIONS, AND STRUTS AND CHORDS, PRIOR TO INSTALLATION OF SHEATHING OR ANY COVERING THAT WOULD CONCEAL THE STRUCTURAL FRAME	□ N/A
B. PLYWOOD ROOF, FLOOR AND WALL SHEATHING PRIOR TO INSTALLATION OF ROOFING AND ANY OTHER BUILDING MATERIALS THAT WOULD CONCEAL THE NAILING	□ N/A

DEFERRED SUBMITTALS/CERTIFICATIONS

	SUBMITTALS REQUIRED (■ YES □ NO)
1. OFF-SITE FABRICATION: FABRICATORS SHALL BE CITY, COUNTY AND/OR C.B.C. APPROVED FABRICATORS. FABRICATORS FOR ALL OFFSITE FABRICATION OF THE ITEMS LISTED BELOW:	
A. TRUSSES	□ N/A
B. GLU-LAMINATED MEMBERS	□ N/A
C. PRECAST CONCRETE	□ N/A
D. STRUCTURAL STEEL (MILL REPORTS AND IDENTIFICATION OF STEEL, AFFIDAVIT OF COMPLIANCE)	□ N/A
E. OTHER:	□
2. DEFERRED SUBMITTALS: SUBMITTAL DOCUMENTS FOR THE DEFERRED SUBMITTAL ITEMS LISTED BELOW SHALL BE DESIGNED BY A LICENSED PE OR SE AND SUBMITTED BY THE CONTRACTOR TO THE BUILDING DEPARTMENT/APPROVAL AGENCY AND STRUCTURAL ENGINEER FOR REVIEW AND APPROVAL. THE DEFERRED SUBMITTAL ITEMS SHALL NOT BE INSTALLED UNTIL THEIR DESIGN AND SUBMITTAL DOCUMENTS HAVE BEEN APPROVED BY THE BUILDING OFFICIAL.	
A. CONCRETE MIX	□ N/A
B. OTHER:	□



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City of Lomita
PUBLIC WORKS DEPARTMENT
24300 NARBONNE AVENUE, LOMITA, CA 90717
TEL. (310) 325-7110 FAX. (310) 325-4024

NO.	DATE	BY	DESCRIPTION	APPROVED

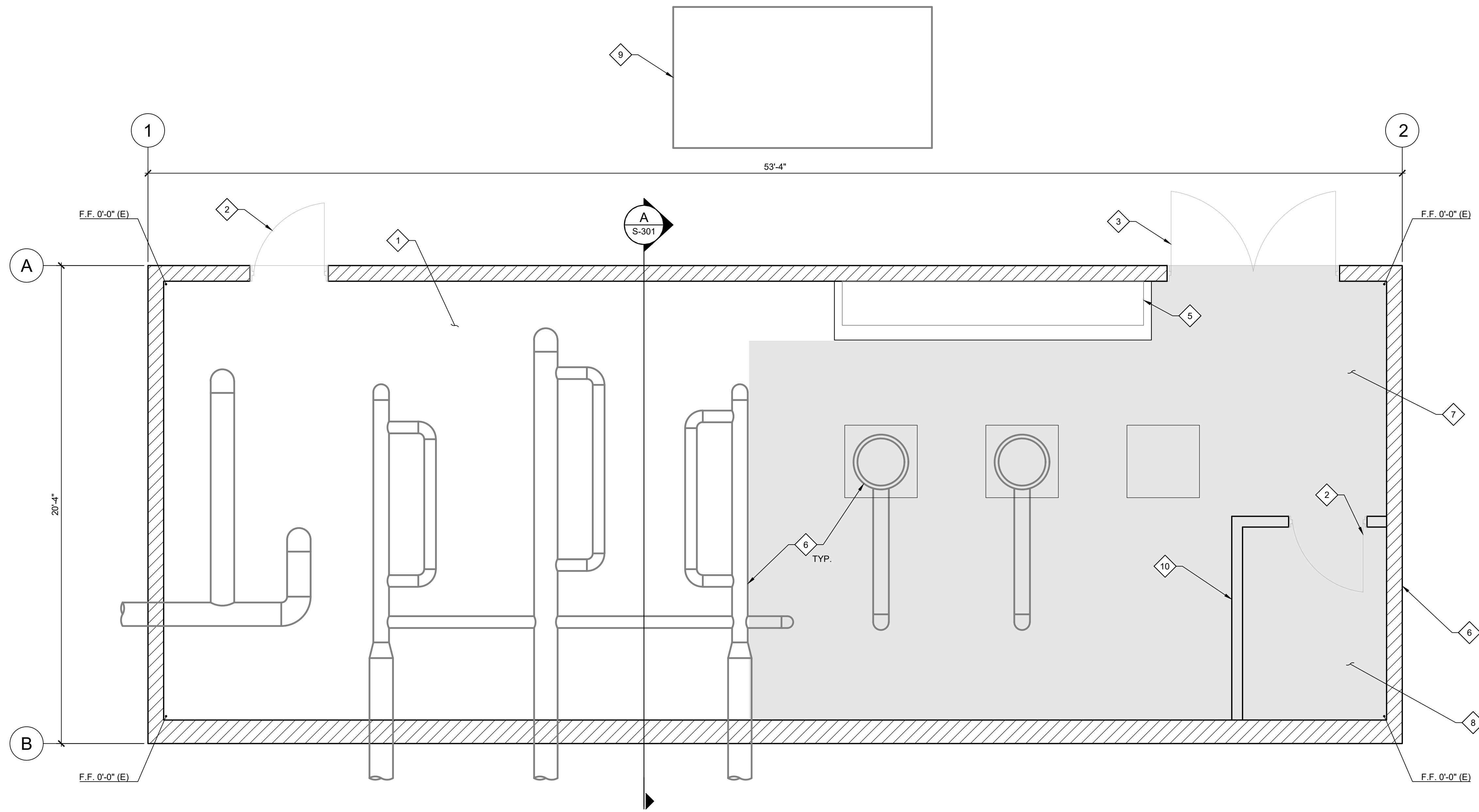
02/9/2024

ENGINEERING DIVISION

NEW ROOF DESIGN FOR APPIAN WAY PUMP STATION

SPECIAL INSPECTIONS AND STRUCTURAL OBSERVATIONS

DRAWING NO.	S-002
DESIGNED BY :	JQ
DRAWN BY :	EJH
CHECKED BY :	EY
PROJECT NO.	200-09353-23001
SHEET	5 OF 14 SHEETS



KEYNOTES: ◆

1. (E) CONCRETE FLOOR SLAB (PROTECT IN PLACE)
2. (E) SINGLE DOOR (PROTECT IN PLACE)
3. (E) DOUBLE DOOR (PROTECT IN PLACE)
4. (E) PUMP AND PIPING (PROTECT IN PLACE), TYP.
5. (E) ELECTRICAL CABINET (PROTECT IN PLACE)
6. (E) CMU WALL (PROTECT IN PLACE), TYP.
7. AREA TO MAINTAIN CLEAR AND ACCESSIBLE FOR OPERATION CREWS AT ALL TIME DURING CONSTRUCTION (SHADED)
8. (E) RESTROOM (PROTECT IN PLACE)
9. (E) GENERATOR FOUNDATION (PROTECT IN PLACE)
10. EXISTING STUD WALL ON CONCRETE CURB (PROTECT IN PLACE)

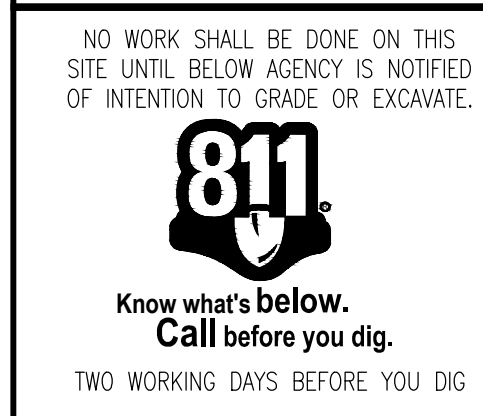
FLOOR PLAN

SCALE: 3/8"=1'-0"

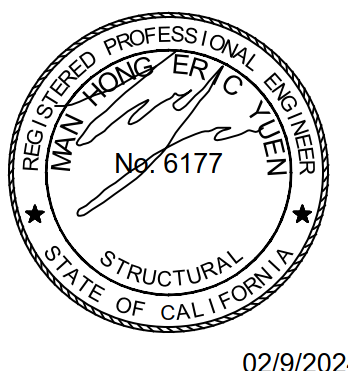
NOTES TO CONTRACTOR:

1. THE PUMP STATION SHALL REMAIN IN OPERATION AT ALL TIME DURING CONSTRUCTION. DESIGNATED ACCESS AREA SHALL KEEP OPEN FOR OPERATION CREWS AT ALL TIME.
2. THE CONTRACTOR IS ALLOWED 2 SHUTDOWNS TOTAL. THE FIRST SHUTDOWN SHOULD BE DURING THE TEMPORARY ELECTRICAL WIRING TRANSITION, AND THE SECOND SHUTDOWN SHOULD BE DURING THE FINAL ELECTRICAL SYSTEM TRANSITION. THE ALLOWABLE SHUTDOWN TIME SHALL BE 8-HRS MAXIMUM FOR EACH ELECTRICAL WIRING SYSTEM TRANSITION. THE CONTRACTOR SHALL NOTIFY AND GET APPROVAL FROM THE CITY 48-HOURS PRIOR TO EACH SHUTDOWN.
3. CONTRACTOR TO PROVIDE TEMPORARY PROTECTION SUCH AS PROTECTIVE SCAFFOLDING OR OTHER MEANS FOR ALL EXISTING MECHANICAL AND ELECTRICAL COMPONENTS DURING THE ROOF DEMOLITION AND REPLACEMENT PROCESS.

DATUM:
 TOP OF EXISTING FINISH FLOOR AT THE
 INTERIOR PERIMETER OF THE BUILDING IS
 SET AT 0'-0"



NO.	DATE	BY	DESCRIPTION	APPROVED



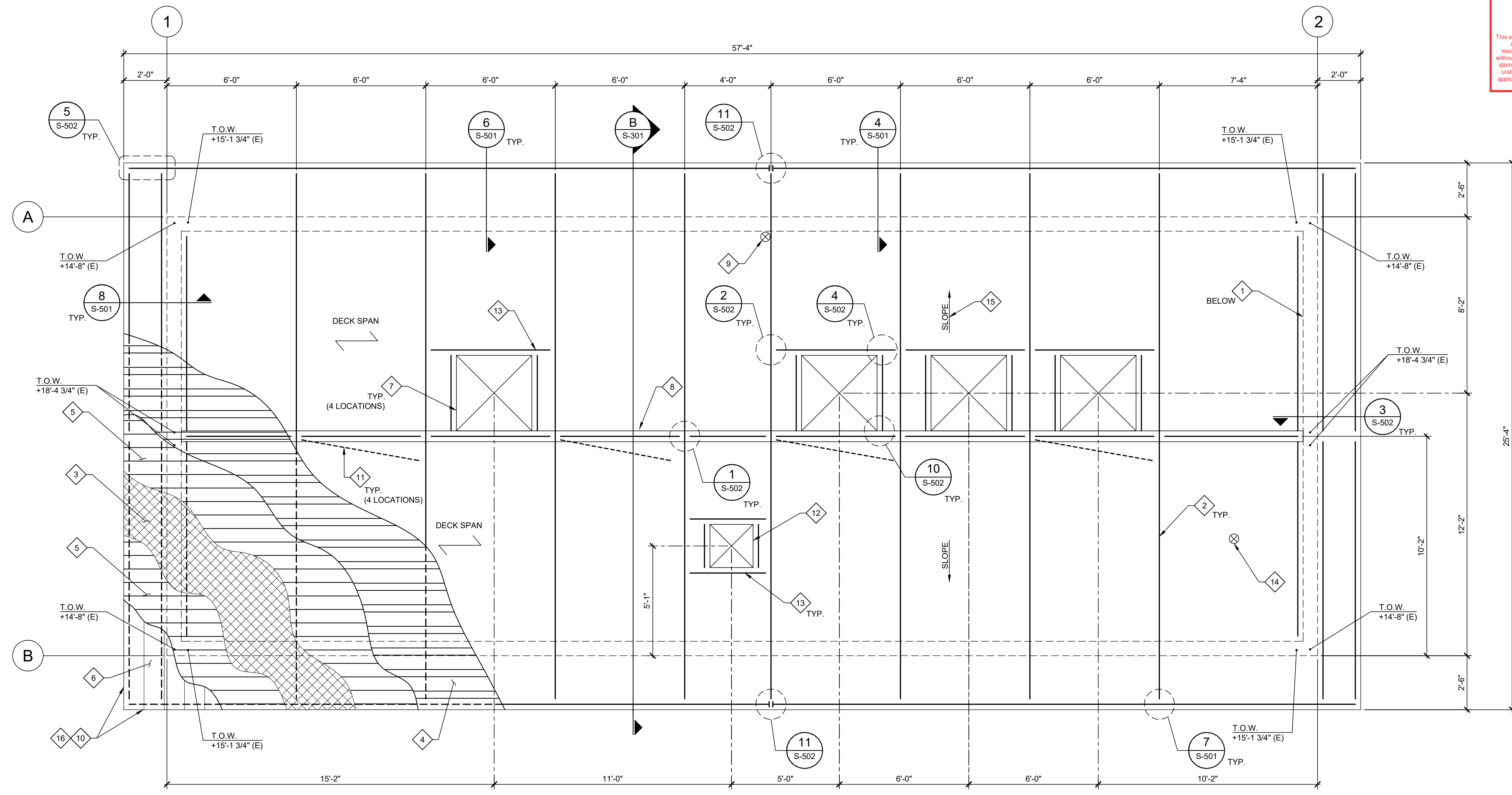
SUBMITTED BY: _____ DATE: _____

APPROVED BY CITY: _____ DATE: _____

**NEW ROOF DESIGN FOR APPIAN WAY
 PUMP STATION**

FLOOR PLAN

DRAWING NO.	S-101
DESIGNED BY:	JQ
DRAWN BY:	EJH
CHECKED BY:	EY
PROJECT NO.	200-09353-23001
SHT	6 OF 14 SHTS



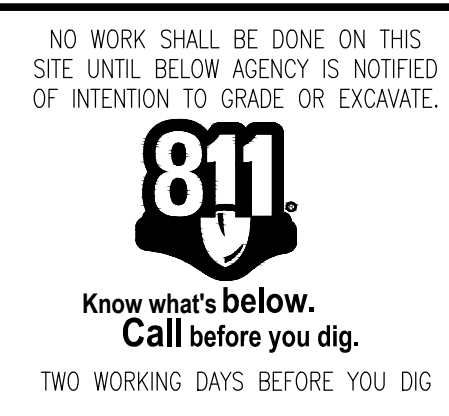
ROOF FRAMING PLAN

SCALE: 3/8"=1'-0"

KEYNOTES:

- 1. EXISTING CMU BLOCK WALL
- 2. STRUCTURAL STEEL TUBE TRUSS - SEE DETAIL 9 ON SHEET S-501
- 3. 2" THICK RIGID INSULATION (EXPANDED POLYSTYRENE) SCREWS CONNECTING THE INSULATION TO THE METAL DECK SHALL ONLY PROTRUDE 1/2" BEYOND THE METAL DECK. THE SCREW PLACEMENT SHALL BE IN CONTINUOUS STRAIGHT LINES
- 4. 1 1/2" DEEP 16 GAUGE GALVANIZED STEEL DECK VERCO PLB OR APPROVED EQUAL - SEE DETAIL 1 ON SHEET S-501 FOR DECK ATTACHMENT
- 5. 5/8" THICK FIBERGLASS REINF. GYPSUM ROOF BOARD
- 6. METAL ROOFING PANELS 24 GAUGE MEDALLION-LOK BY MCELROY METALS (OR APPROVED EQUAL)
- 7. 42" SQUARE ALUMINUM FRAMED, ACRYLIC DOMED, SELF-FLASHING SKYLIGHT WITH INTEGRAL SECURITY BARS. BRISTOLITE AL-4646 OR APPROVED EQUAL.
- 8. HSS 3x3x3/16" RIDGE BEAM
- 9. OPENING IN ROOF FOR ANTENNA. PROVIDE PENETRATION FLASHING PER ROOFING MANUFACTURERS RECOMMENDATIONS.
- 10. ROOF FASCIA
- 11. TRUSS BRACING - DETAIL 6 ON SHEET S-502
- 12. 24" SQUARE OPENING IN ROOF DECK FOR EXHAUST FAN - SEE MECHANICAL DRAWINGS
- 13. L4X4X1/4 FRAMING FOR ROOF OPENINGS
- 14. OPENING IN ROOF FOR RESTROOM VENT PIPE. PROVIDE PENETRATION FLASHING PER ROOFING MANUFACTURERS RECOMMENDATIONS.
- 15. ROOF SLOPE TO MATCH EXISTING
- 16. COOL ROOF SRI RATING OF ROOFING PANELS SHALL BE 20 OR GREATER

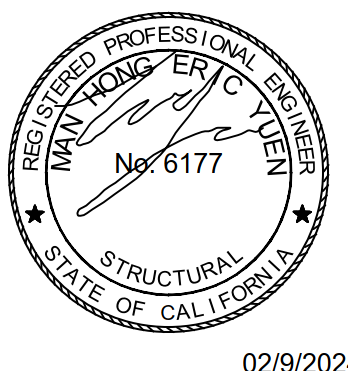
DATUM:
 TOP OF EXISTING FINISH FLOOR AT THE
 INTERIOR PERIMETER OF THE BUILDING IS
 SET AT 0'-0"



CITY OF LOMITA
 PUBLIC WORKS DEPARTMENT

24300 NARBONNE AVENUE, LOMITA, CA 90717
 TEL. (310) 325-7110 FAX. (310) 325-4024

NO.	DATE	BY	DESCRIPTION	APPROVED



SUBMITTED BY: _____ DATE: _____

APPROVED BY CITY: _____ DATE: _____

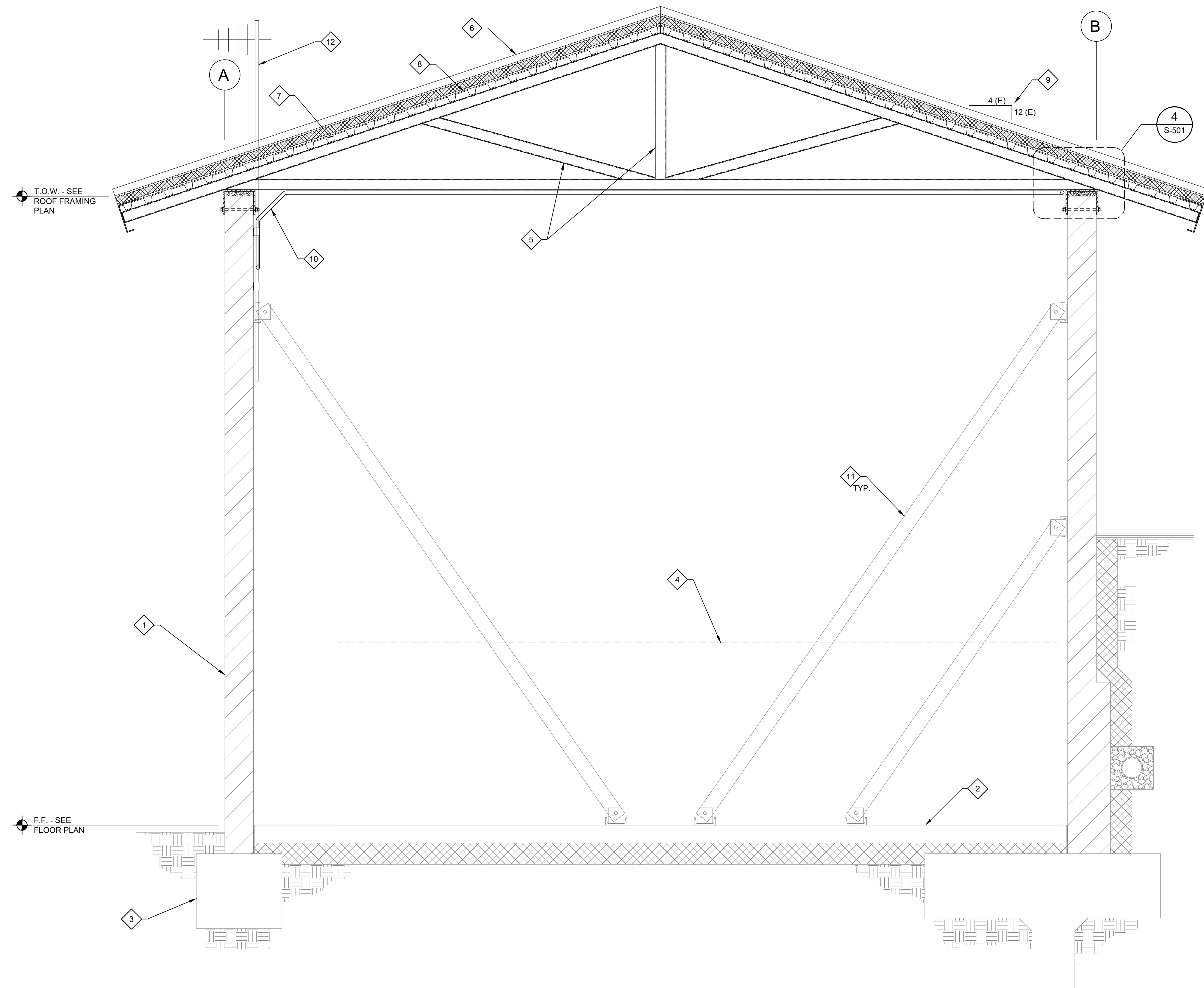
NEW ROOF DESIGN FOR APPIAN WAY PUMP STATION

ROOF FRAMING PLAN

DRAWING NO.	S-102
DESIGNED BY:	JQ
DRAWN BY:	EJH
CHECKED BY:	EY
PROJECT NO.	200-09353-23001
SHT	7 OF 14 SHTS

BUILDING AND SAFETY DIVISION
 Department of Public Works
APPROVED
 UNDER LOS ANGELES COUNTY CODE
 TITLES 26, 30 AND 31
 M.D.O.R.T.A.
 PUBLIC WORKS
 02/01/2024 1:02:04 PM

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- KEYNOTES:** ◊
1. EXISTING CMU WALLS
 2. EXISTING CONCRETE FLOOR SLAB
 3. EXISTING CONCRETE WALL FOOTING
 4. EXISTING PUMP EQUIPMENT (PROTECT IN PLACE)
 5. STRUCTURAL STEEL TUBE ROOF TRUSS
 6. METAL ROOFING PANELS 24 GAUGE MEDALLION-LOK BY MCELROY METALS (OR APPROVED EQUAL). COOL ROOF SRI RATING OF ROOFING SHALL BE 20 OR GREATER
 7. RIGID INSULATION
 8. METAL ROOF DECK
 9. ROOF SLOPE TO MATCH EXISTING. CONTRACTOR TO FIELD VERIFY ROOF SLOPE PRIOR TO ROOF FRAMING FABRICATION
 10. ELECTRIC CONDUIT AND WIRE - SEE ELECTRICAL DRAWINGS
 11. THE CONTRACTOR SHALL BRACE THE EXISTING WALLS PRIOR TO THE REMOVAL OF THE EXISTING ROOF. THE BRACING SHALL REMAIN IN PLACE UNTIL THE NEW ROOF STRUCTURE AND DIAPHRAGM ARE COMPLETELY INSTALLED. THE DESIGN, CONFIGURATION, INSTALLATION AND MAINTENANCE OF THE BRACING IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR. THE BRACING SHALL KEEP THE EXISTING WALLS IN THEIR "AS CONSTRUCTED" POSITIONS. THE CONTRACTOR SHALL DOCUMENT THE CONDITION OF THE EXISTING WALLS PRIOR TO BEGINNING CONSTRUCTION AND SHALL MONITOR THE CONDITION AND POSITIONS OF THE WALLS DURING AND AFTER CONSTRUCTION.
 12. REINSTALL ANTENNA AND ANTENNA CONDUIT/POST TO MATCH THE EXISTING CONDITION, ATTACHMENT AND DIMENSIONS

A SECTION
 SCALE: 3/4"=1'-0"

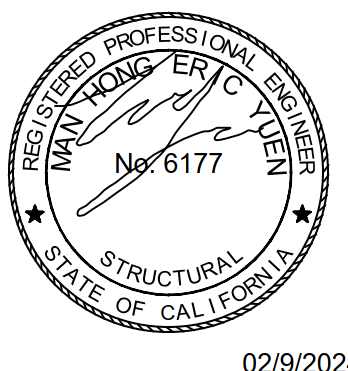
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 TWO WORKING DAYS BEFORE YOU DIG

CITY OF LOMITA CALIFORNIA
 FOUNDED 1907
 INCORPORATED JUNE 30, 1964

City of Lomita
PUBLIC WORKS DEPARTMENT
 24300 NARBONNE AVENUE, LOMITA, CA 90717
 TEL. (310) 325-7110 FAX. (310) 325-4024

NO.	DATE	BY	DESCRIPTION	APPROVED



SUBMITTED BY : _____ DATE _____

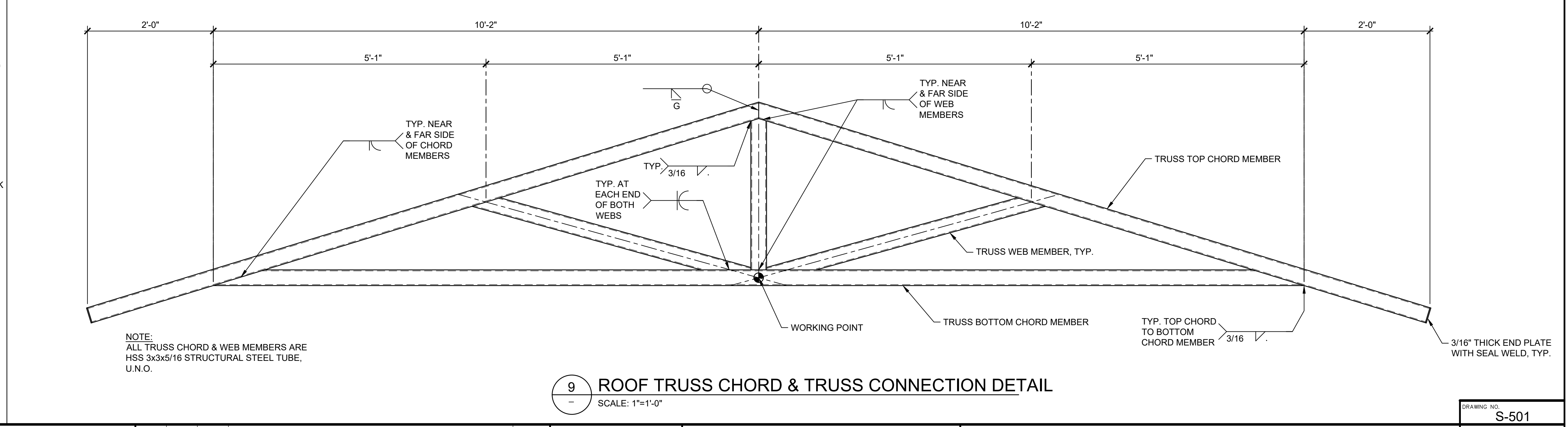
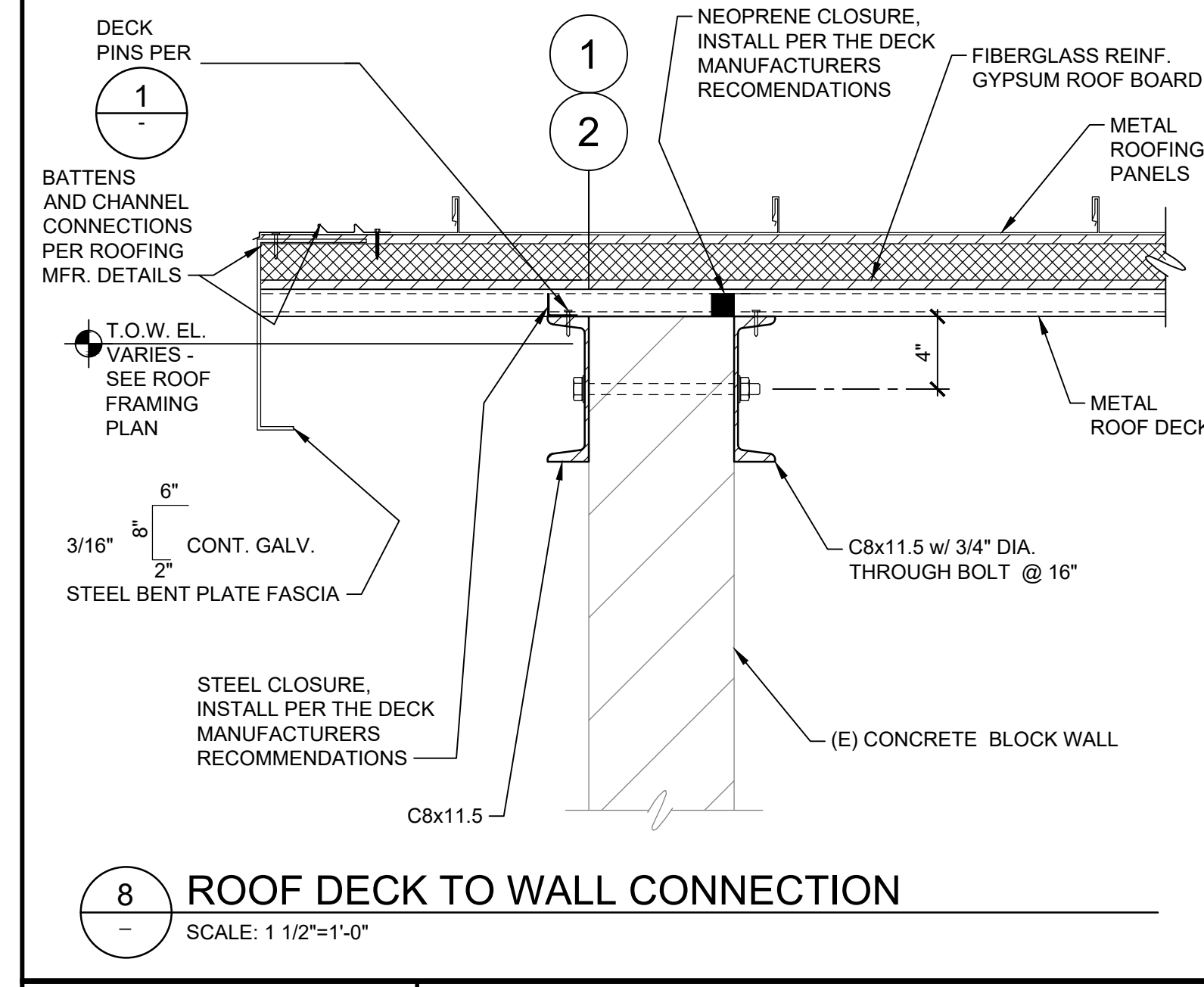
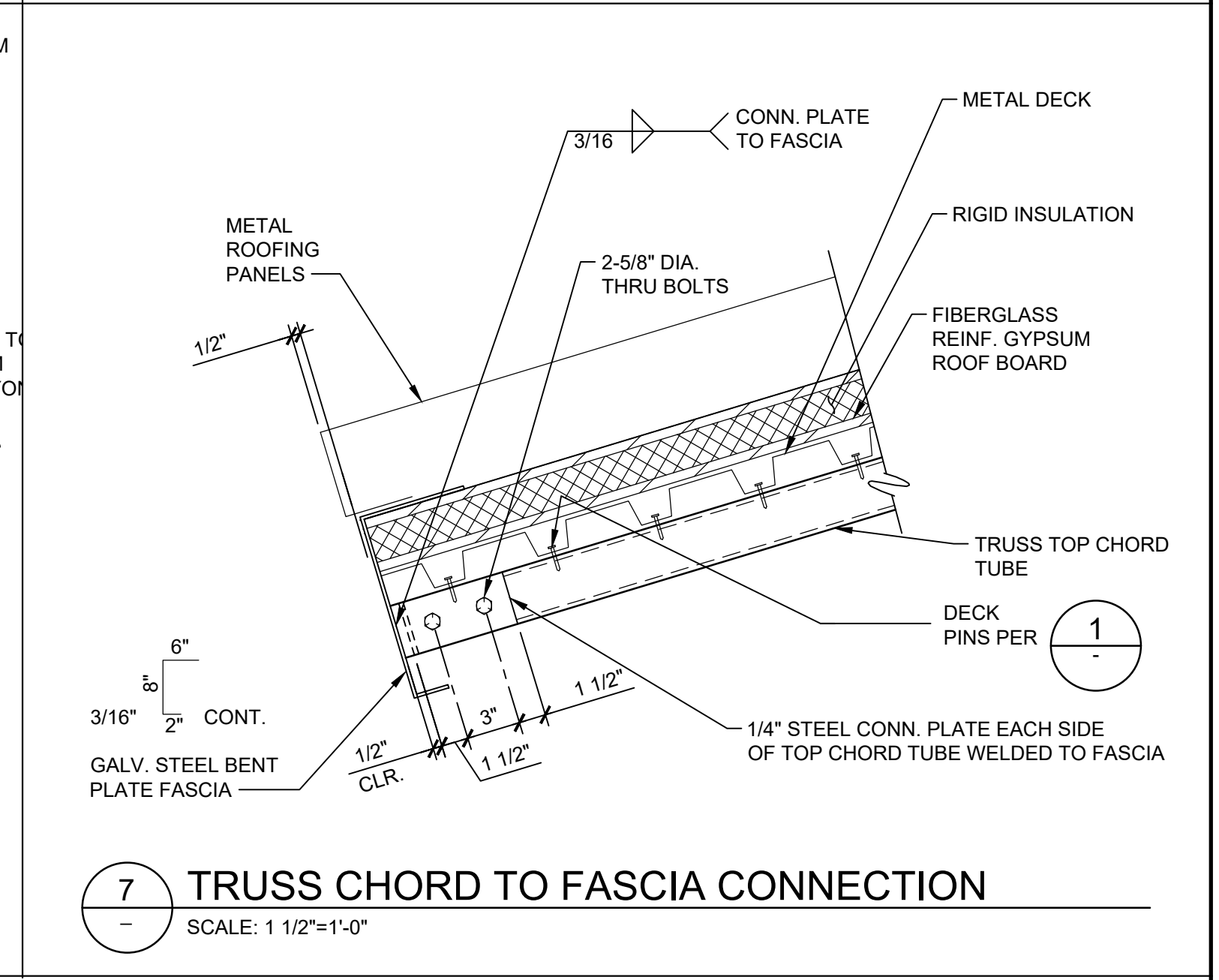
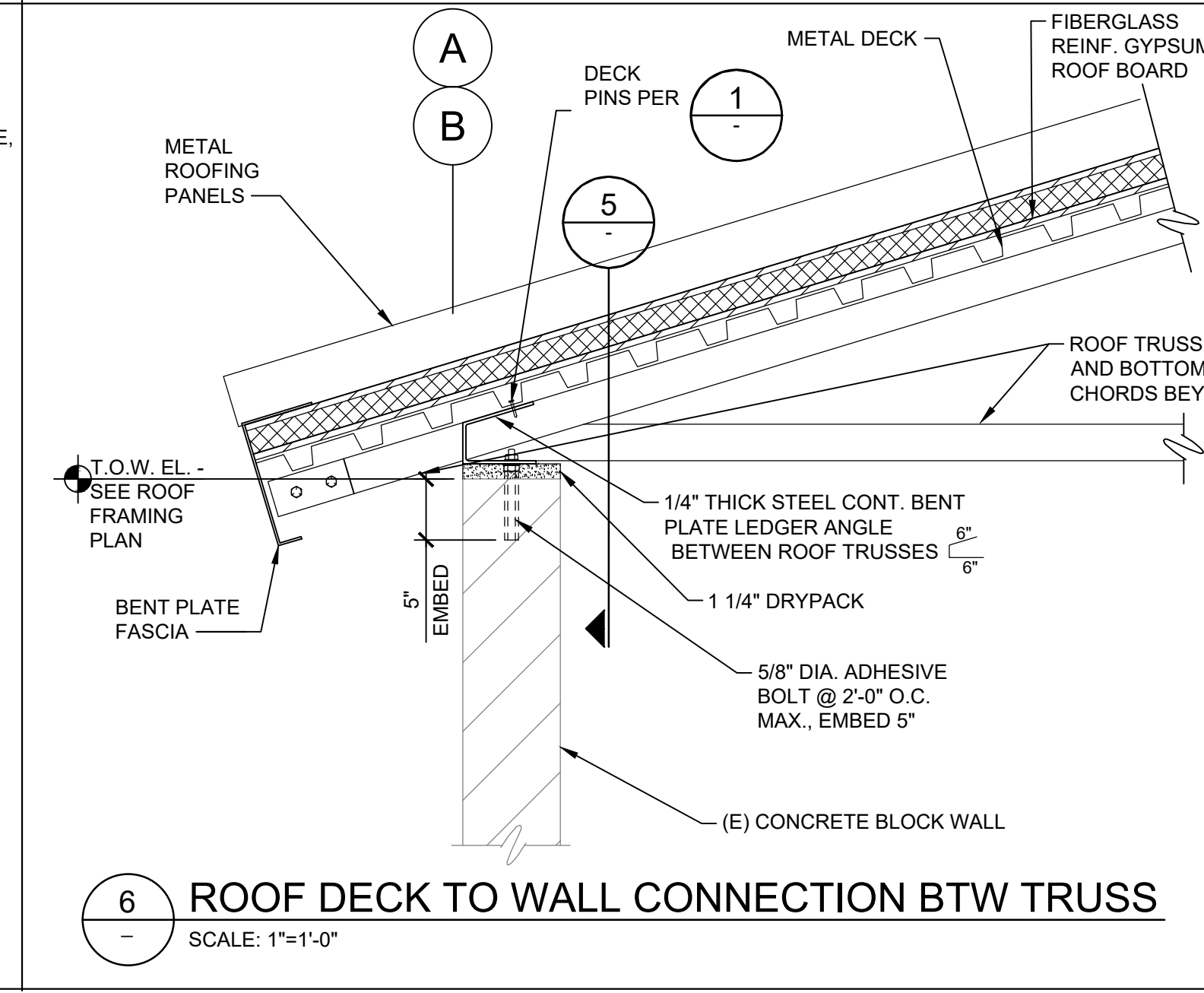
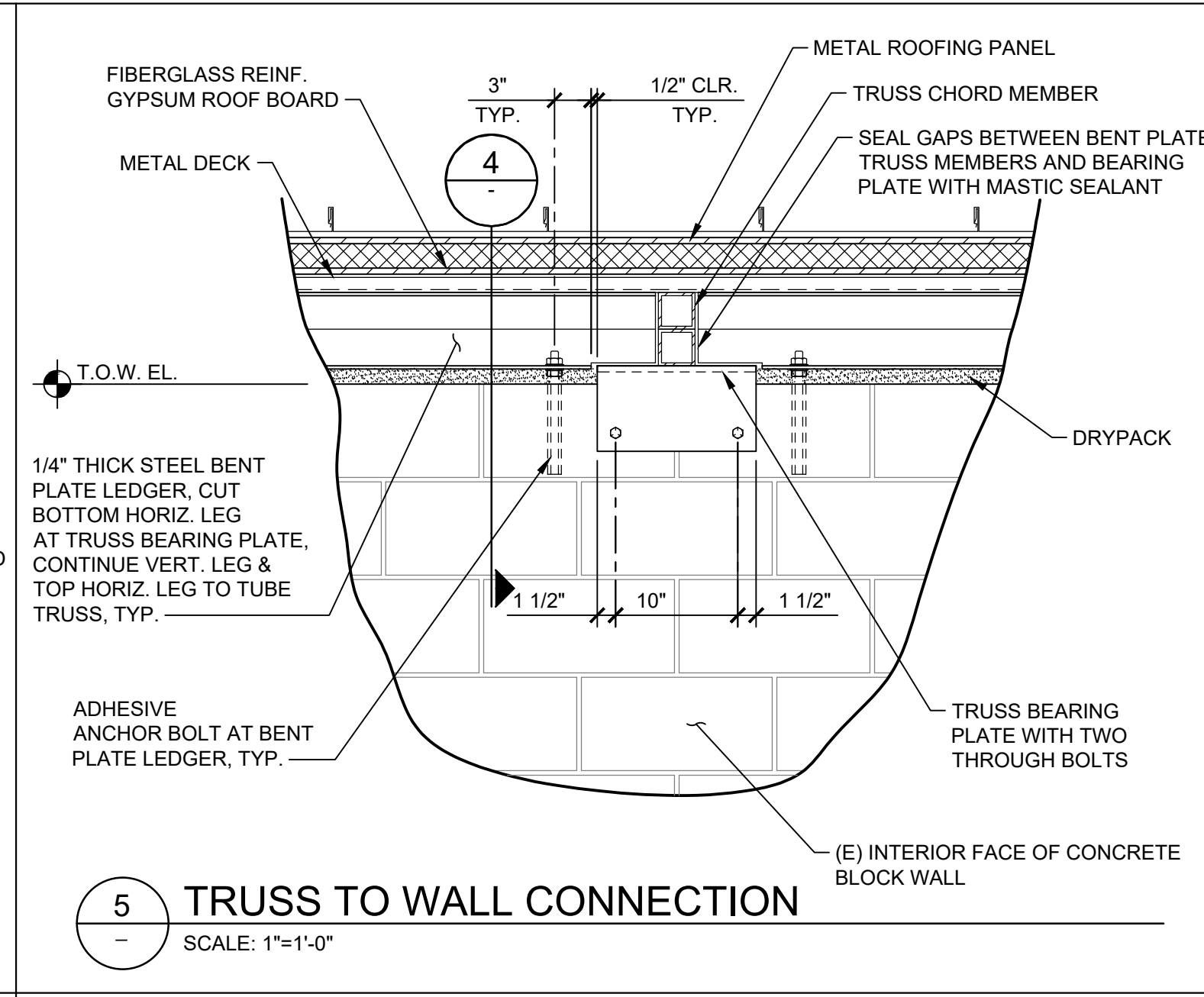
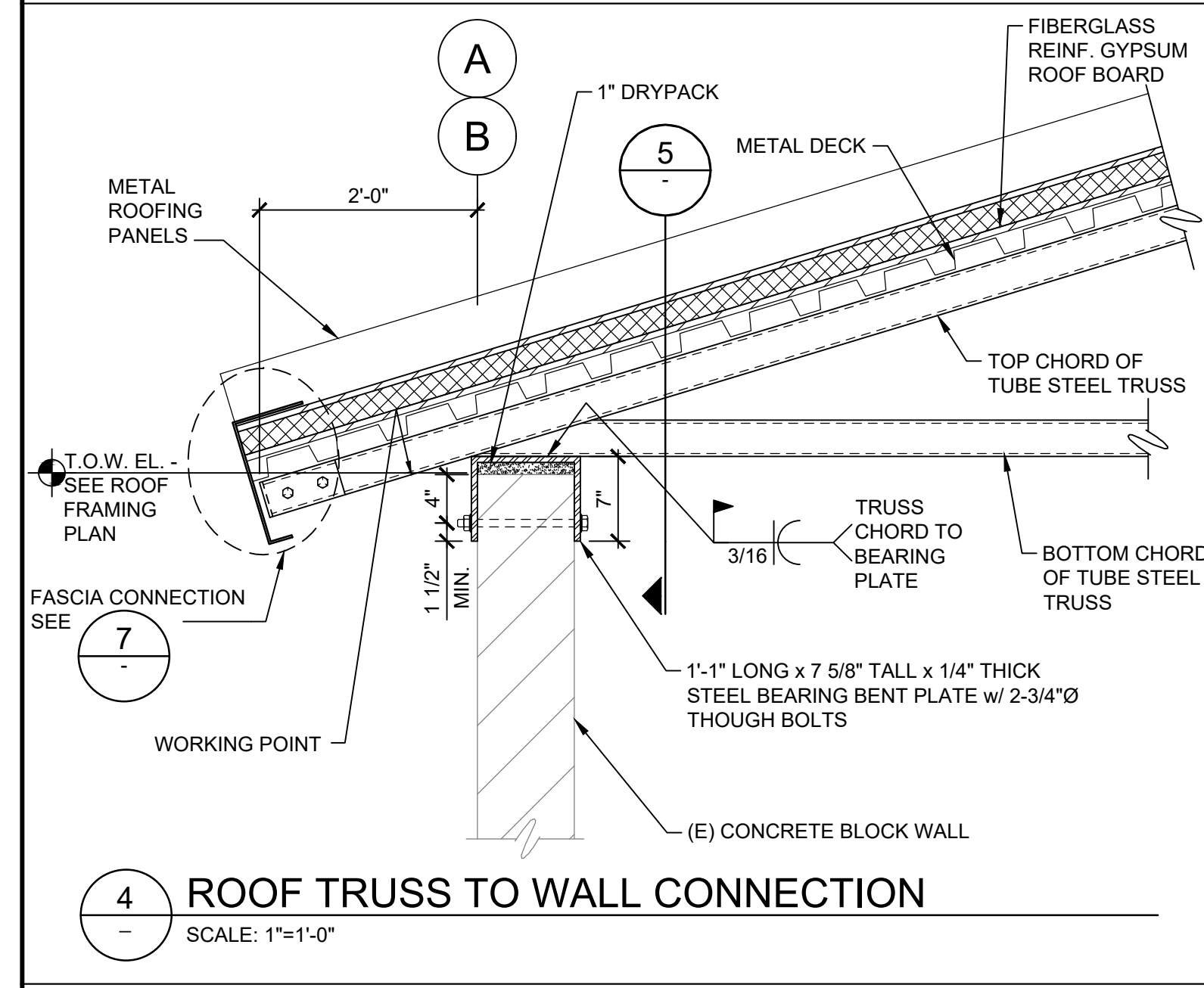
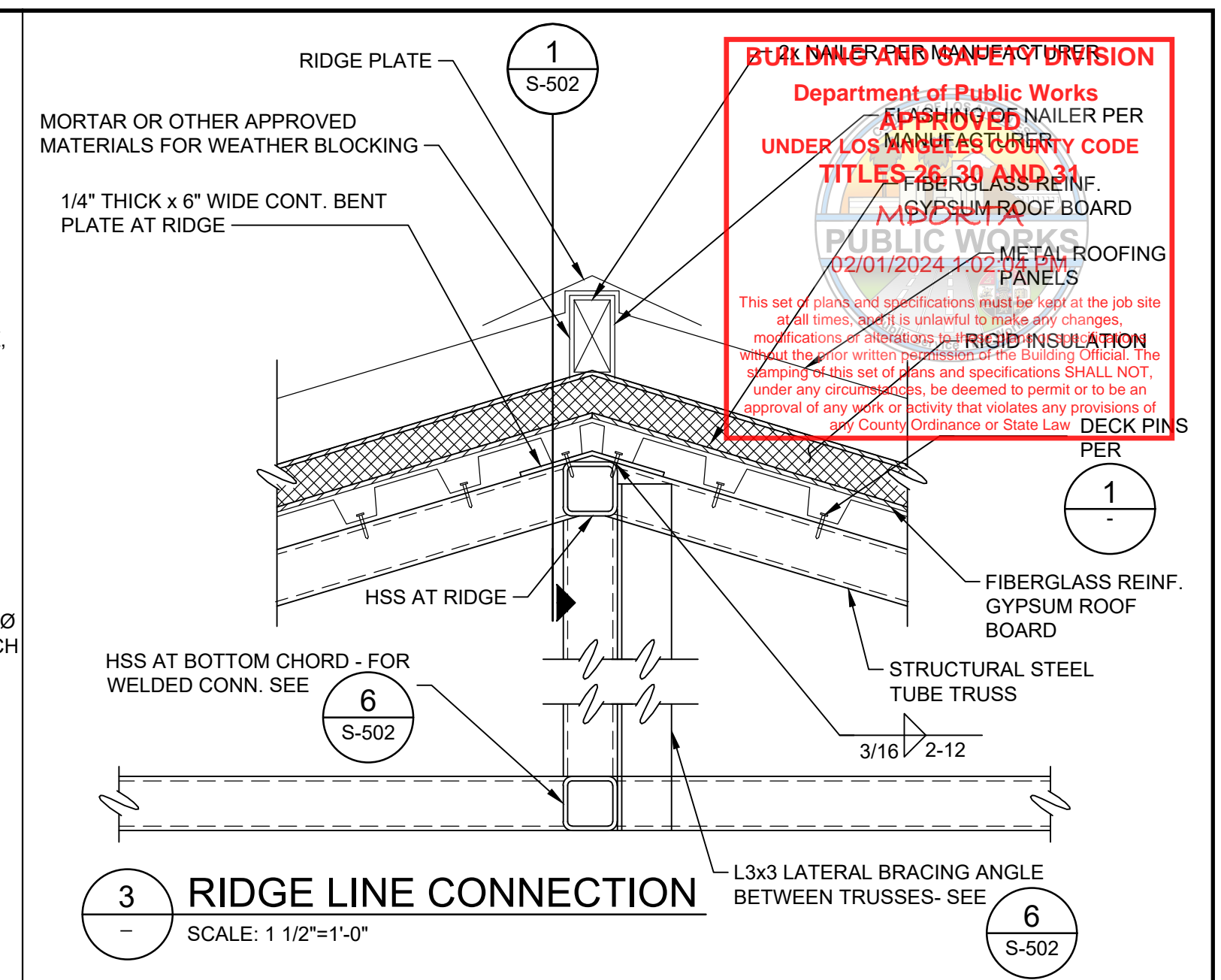
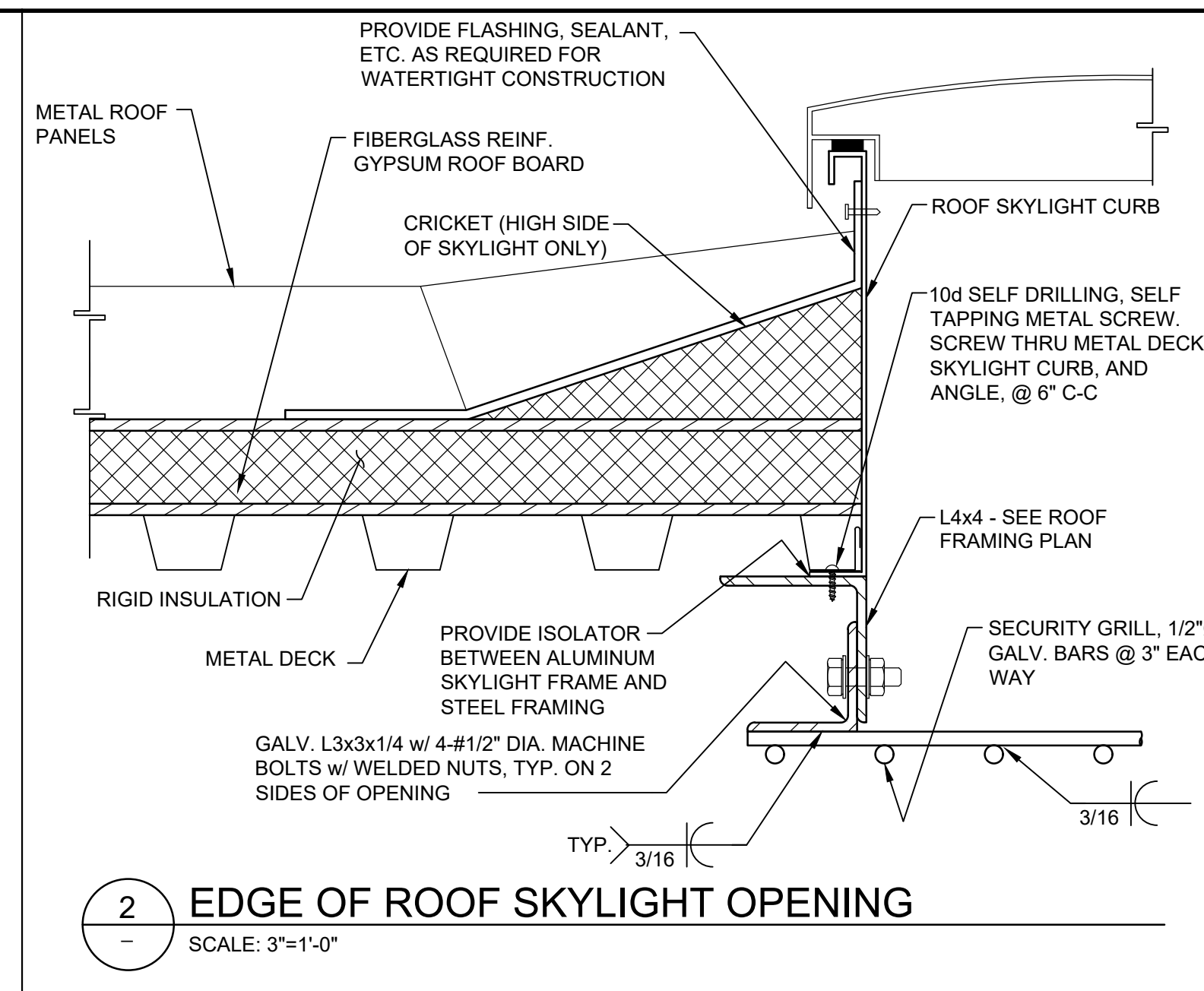
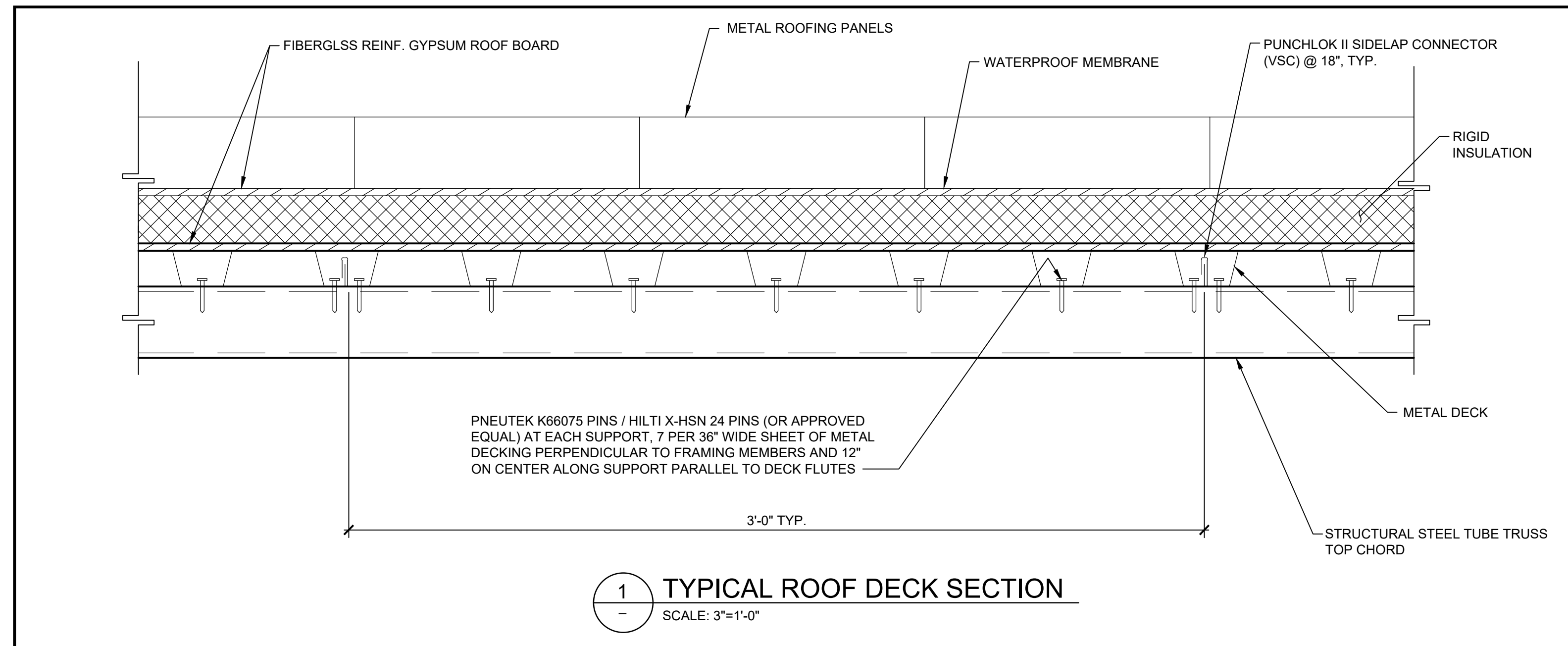
APPROVED BY CITY : _____ DATE _____

ENGINEERING DIVISION

**NEW ROOF DESIGN FOR APPIAN WAY
 PUMP STATION**

BUILDING SECTION

DRAWING NO.	S-301
DESIGNED BY :	JQ
DRAWN BY :	EJH
CHECKED BY :	EY
PROJECT NO.	200-09353-23001
SHT	8 OF 14 SHTS



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FOUNDED 1907
INCORPORATED JUNE 30, 1964

City of Lomita
PUBLIC WORKS DEPARTMENT
24300 NARBONNE AVENUE, LOMITA, CA 90717
TEL. (310) 325-7110 FAX. (310) 325-4024

NO.	DATE	BY	DESCRIPTION	APPROVED

REGISTERED PROFESSIONAL ENGINEER
No. 6177
STATE OF CALIFORNIA

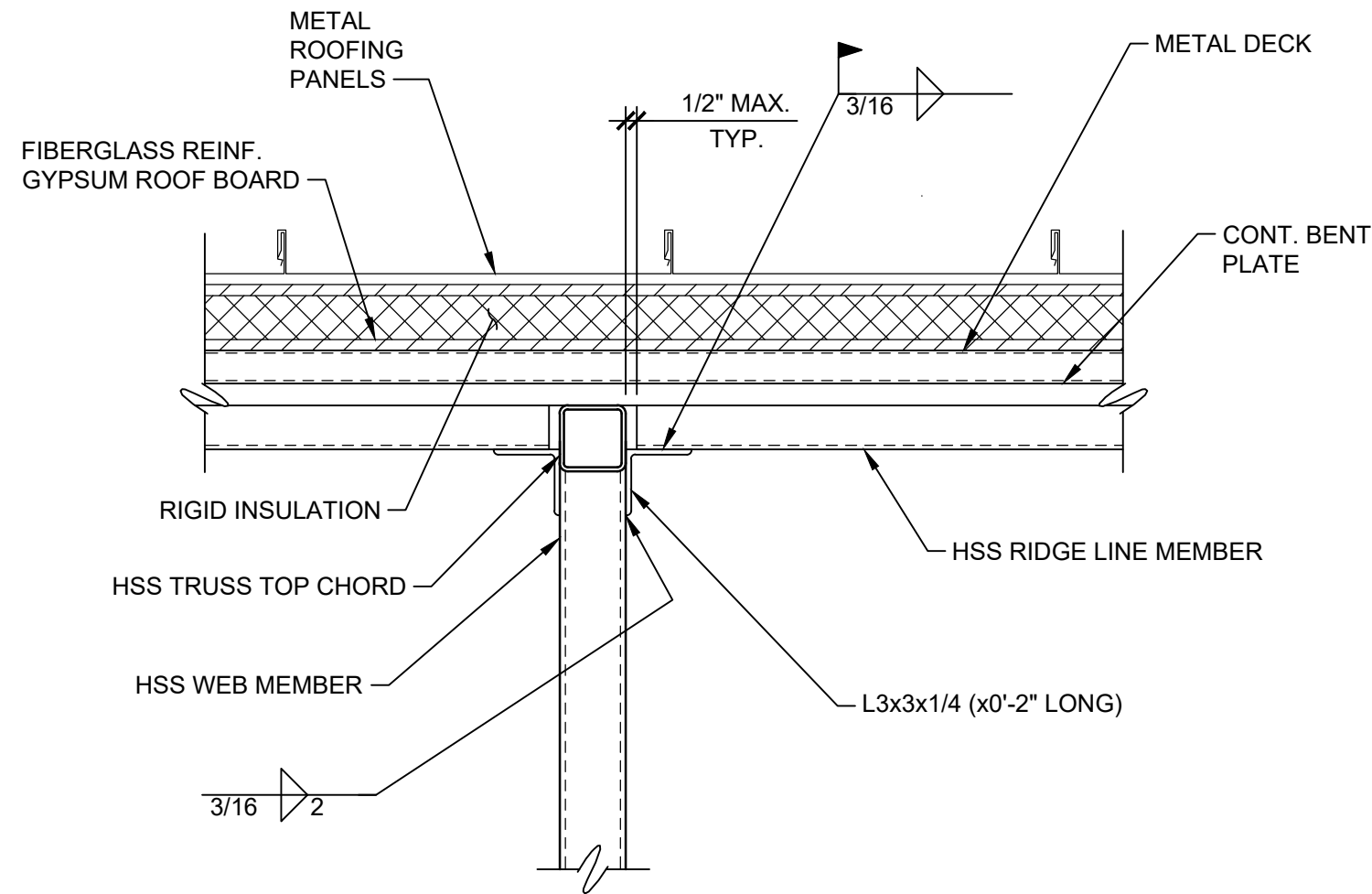
APPROVED BY: _____ DATE: _____
APPROVED BY: _____ DATE: _____

02/9/2024

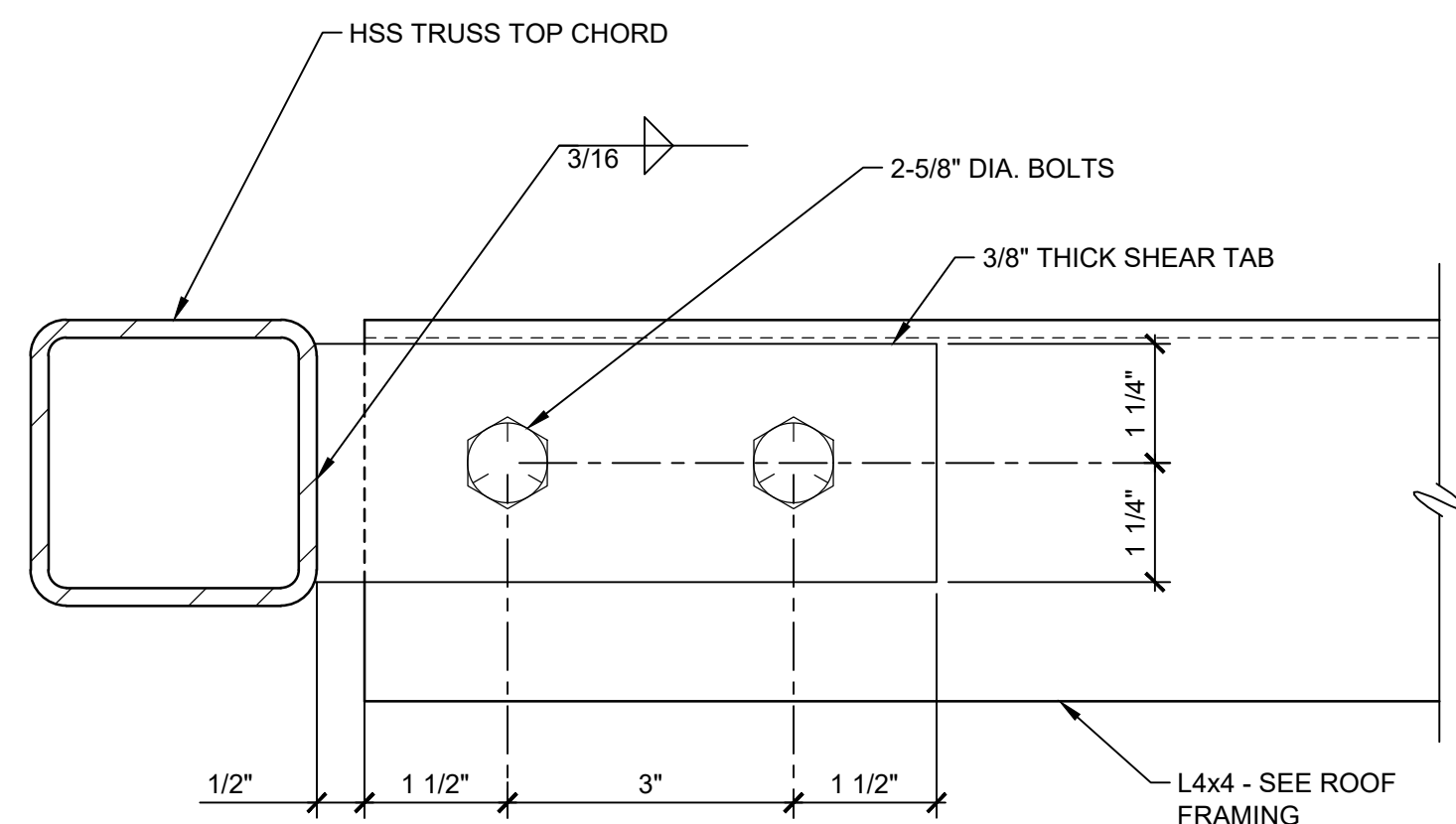
ENGINEERING DIVISION

NEW ROOF DESIGN FOR APPIAN WAY PUMP STATION
STRUCTURAL DETAILS 1

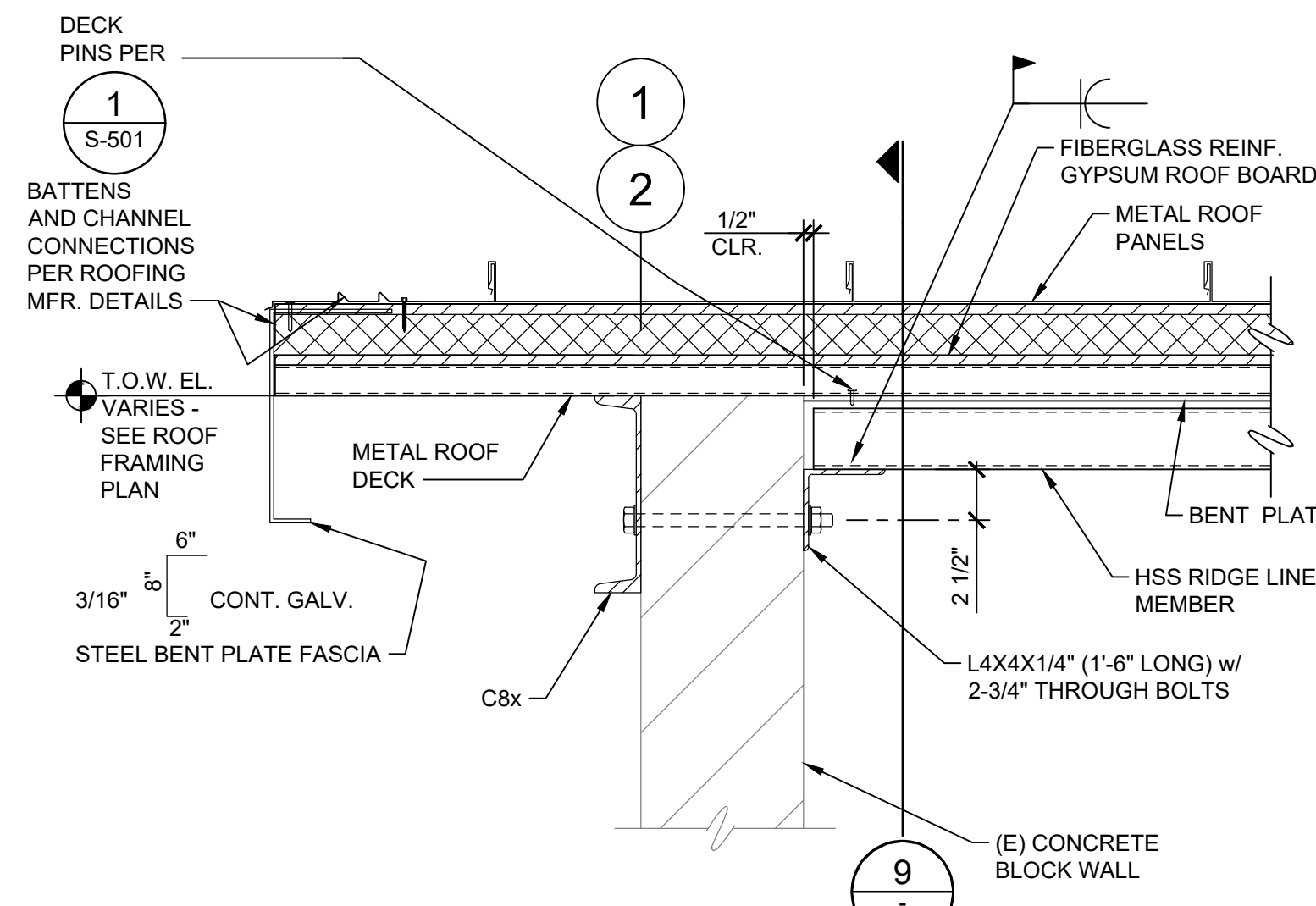
DRAWING NO. S-501
DESIGNED BY: JQ
DRAWN BY: EJM
CHECKED BY: EY
PROJECT NO. 200-09353-23001
SHT 9 OF 14 SHTS



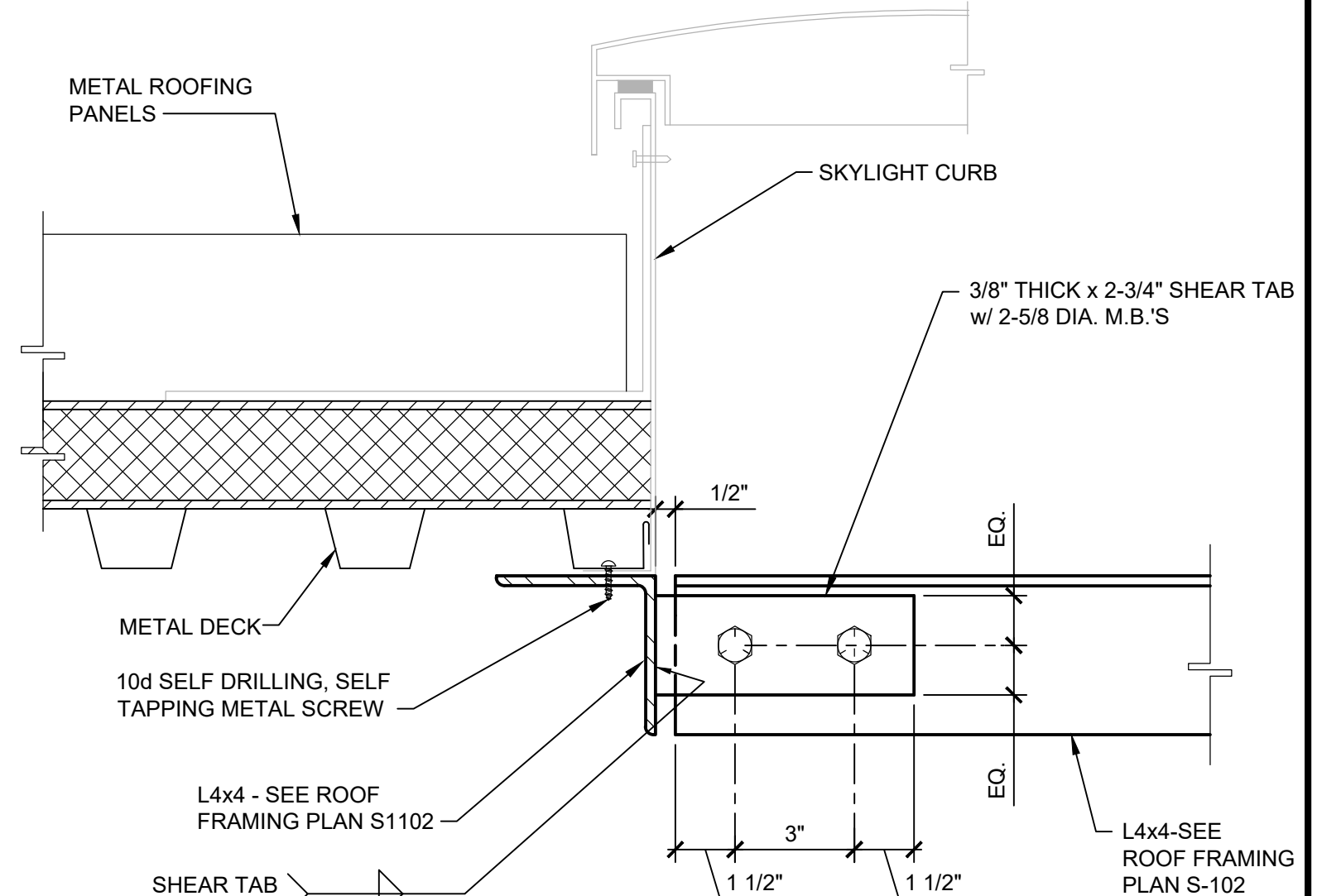
1 RIDGE LINE MEMBER TO TRUSS CONNECTION
SCALE: 1 1/2"=1'-0"



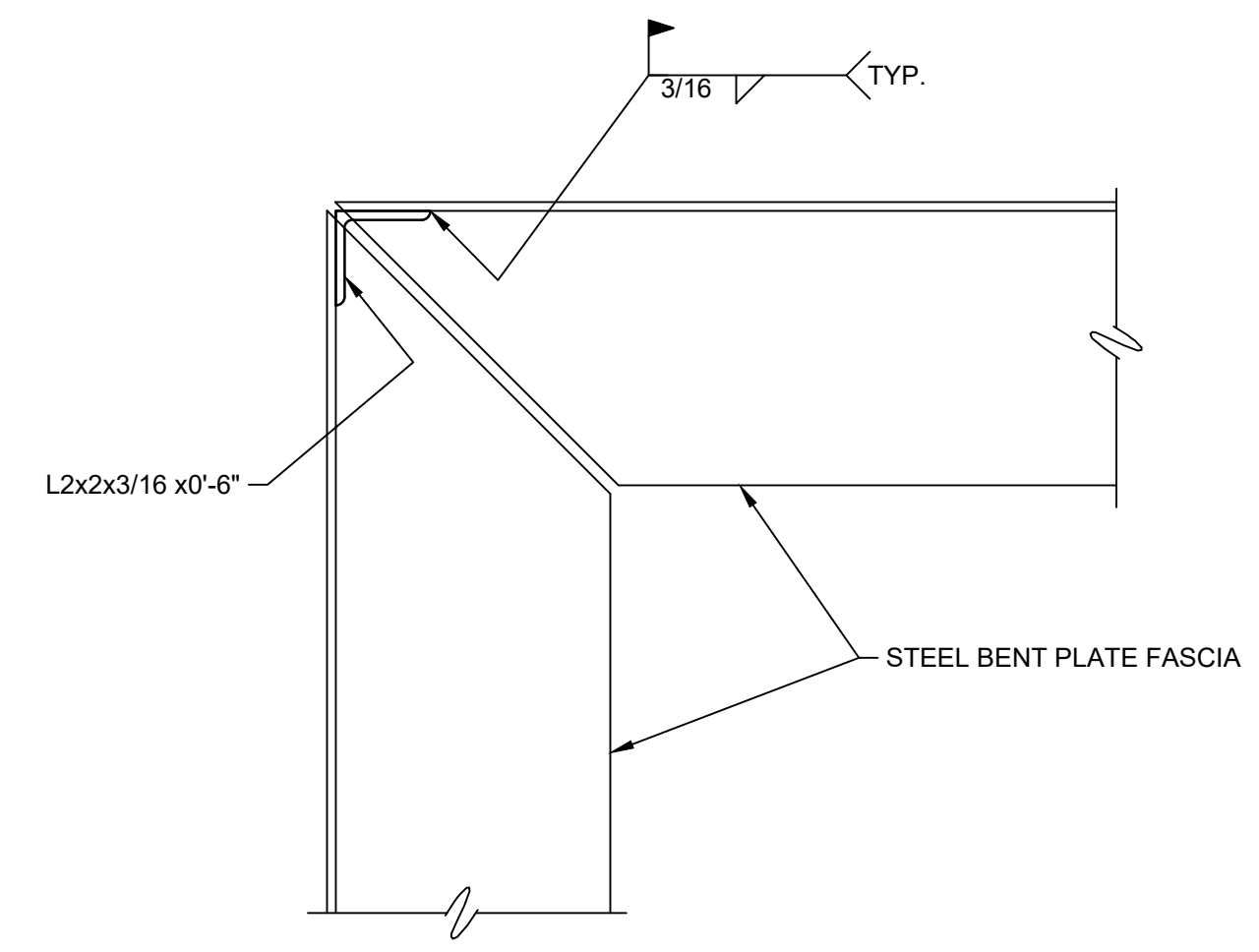
2 ANGLE TO HSS ROOF FRAMING CONNECTION
SCALE: HALFSCALE



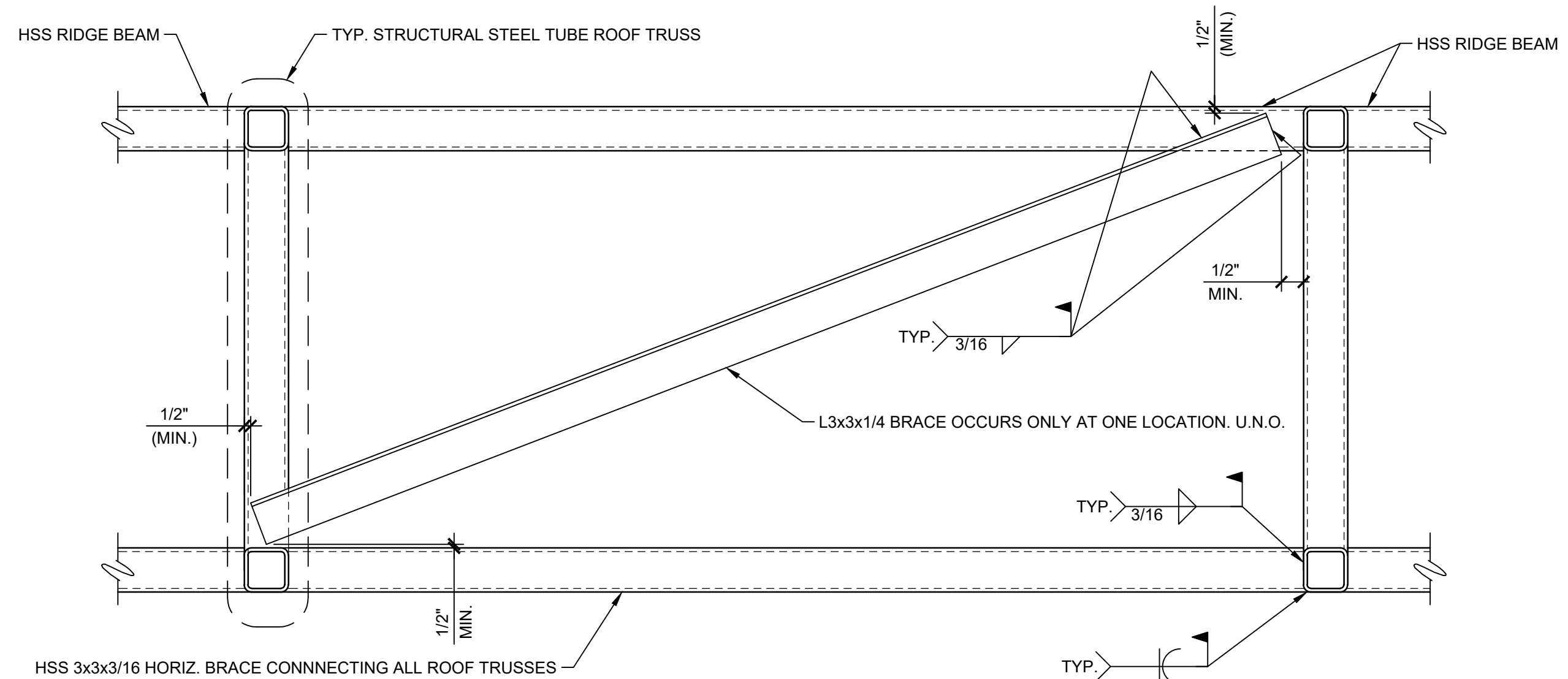
3 RIDGE LINE MEMBER TO END WALL CONNECTION
SCALE: 1 1/2"=1'-0"



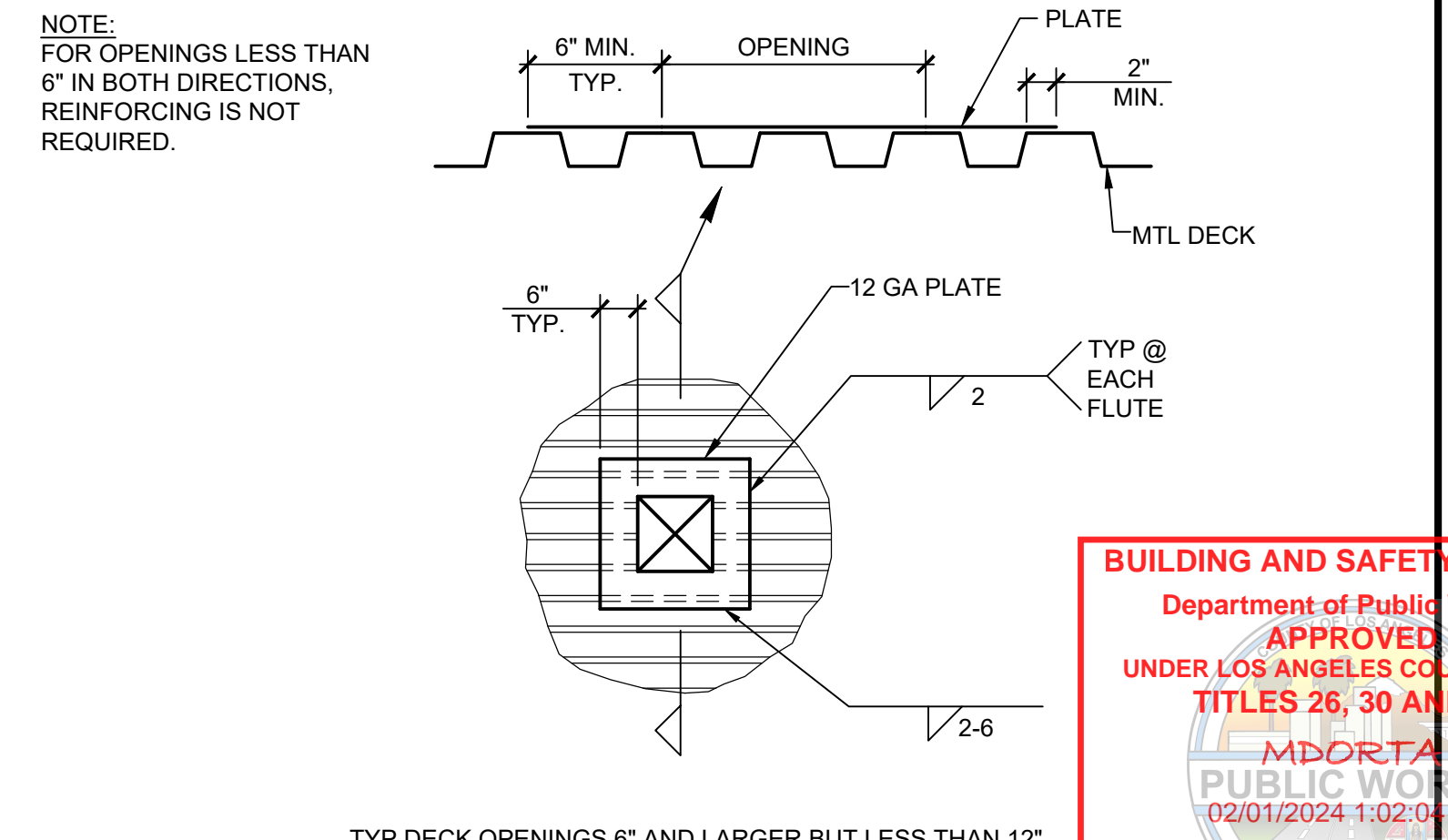
4 ANGLE TO ANGLE CONNECTION
SCALE: 3"=1'-0"



5 FASCIA CORNER CONNECTION
SCALE: 3"=1'-0"



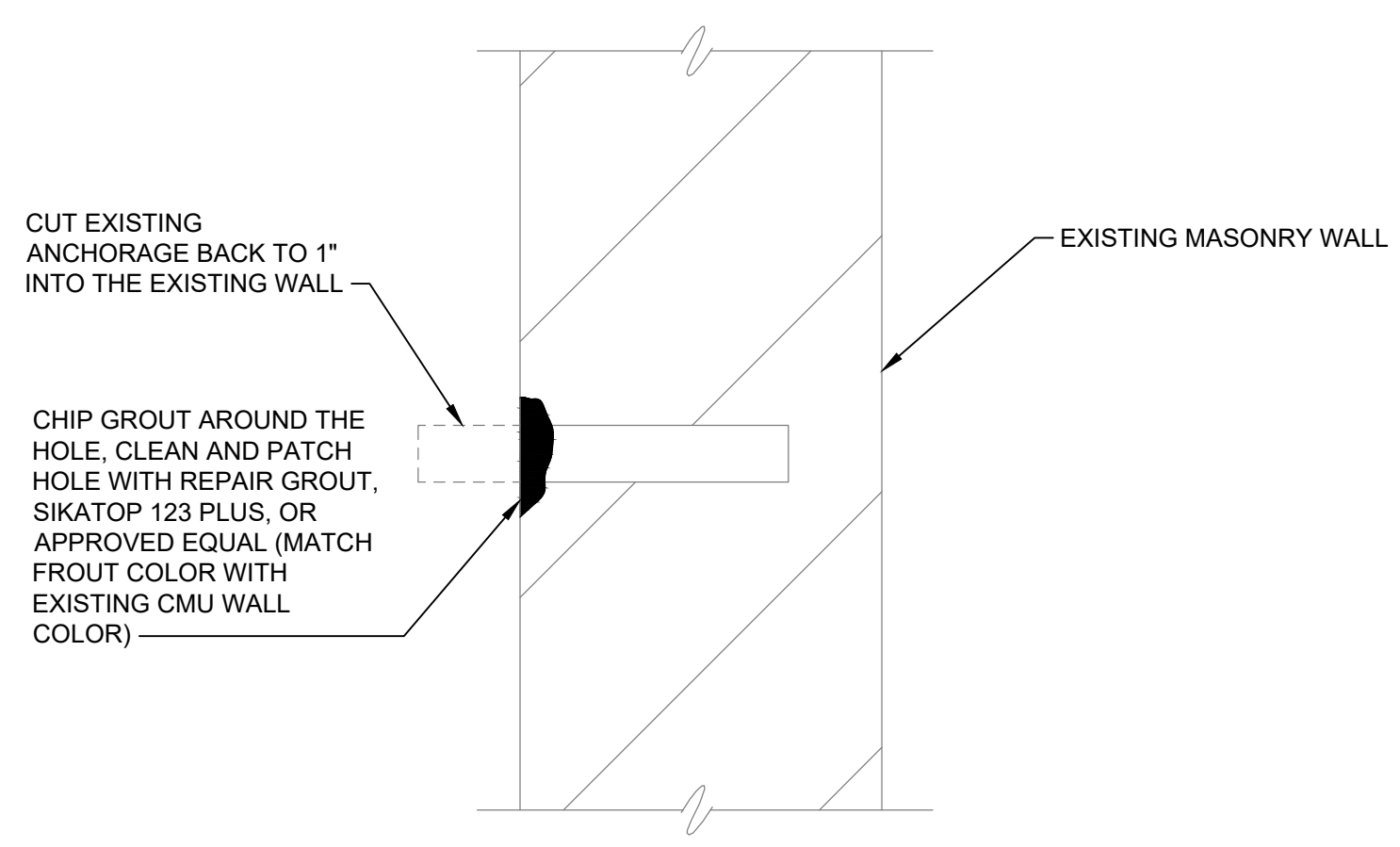
6 ROOF TRUSS BRACING
SCALE: 1 1/2"=1'-0"



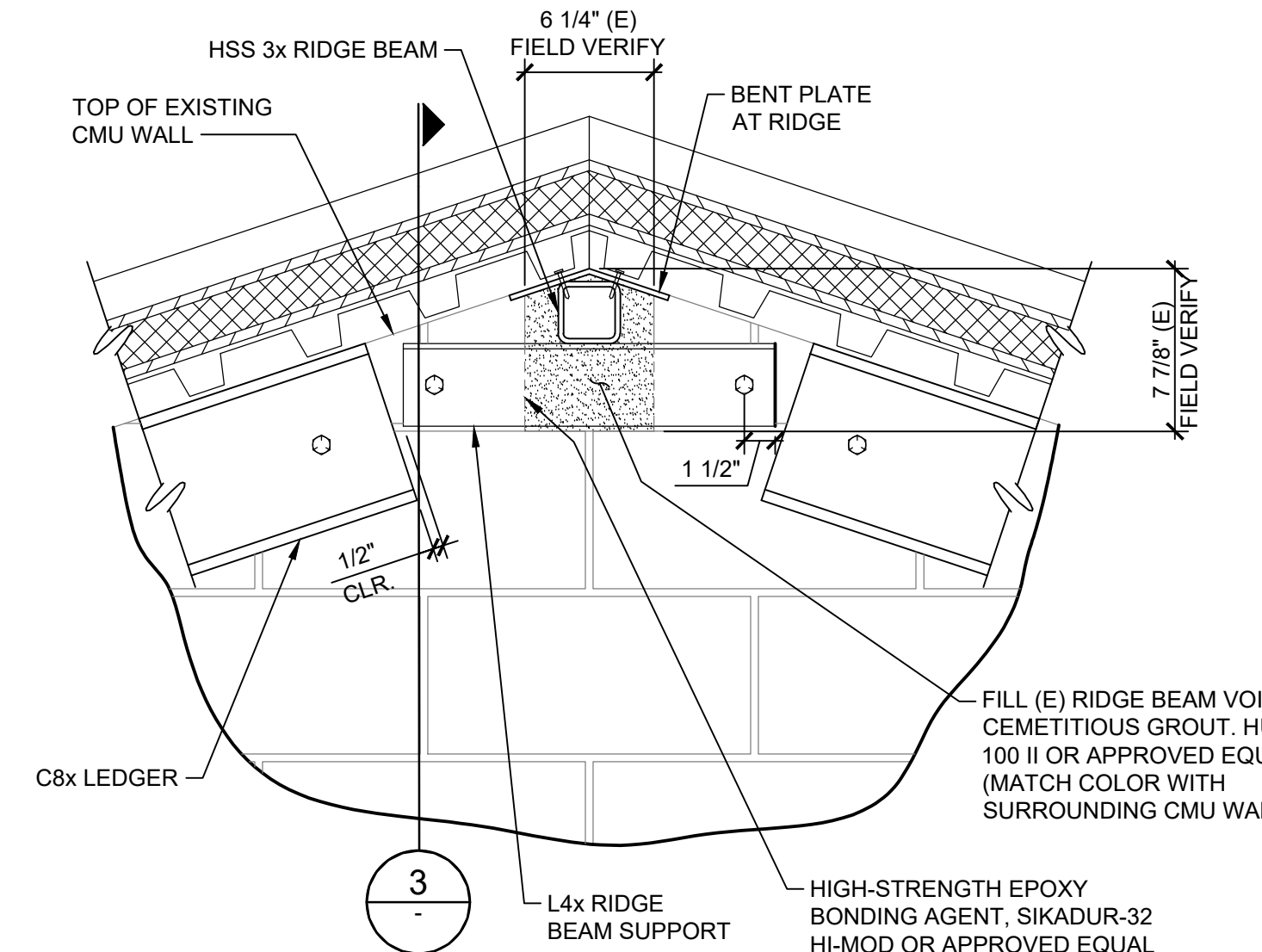
7 SMALL OPENING IN METAL DECK
SCALE: 1 1/2"=1'-0"

BUILDING AND SAFETY DIVISION
Department of Public Works
APPROVED
UNDER LOS ANGELES COUNTY CODE
TITLES 26, 30 AND 31
MDORTA
PUBLIC WORKS
02/01/2024 1:02:04 PM

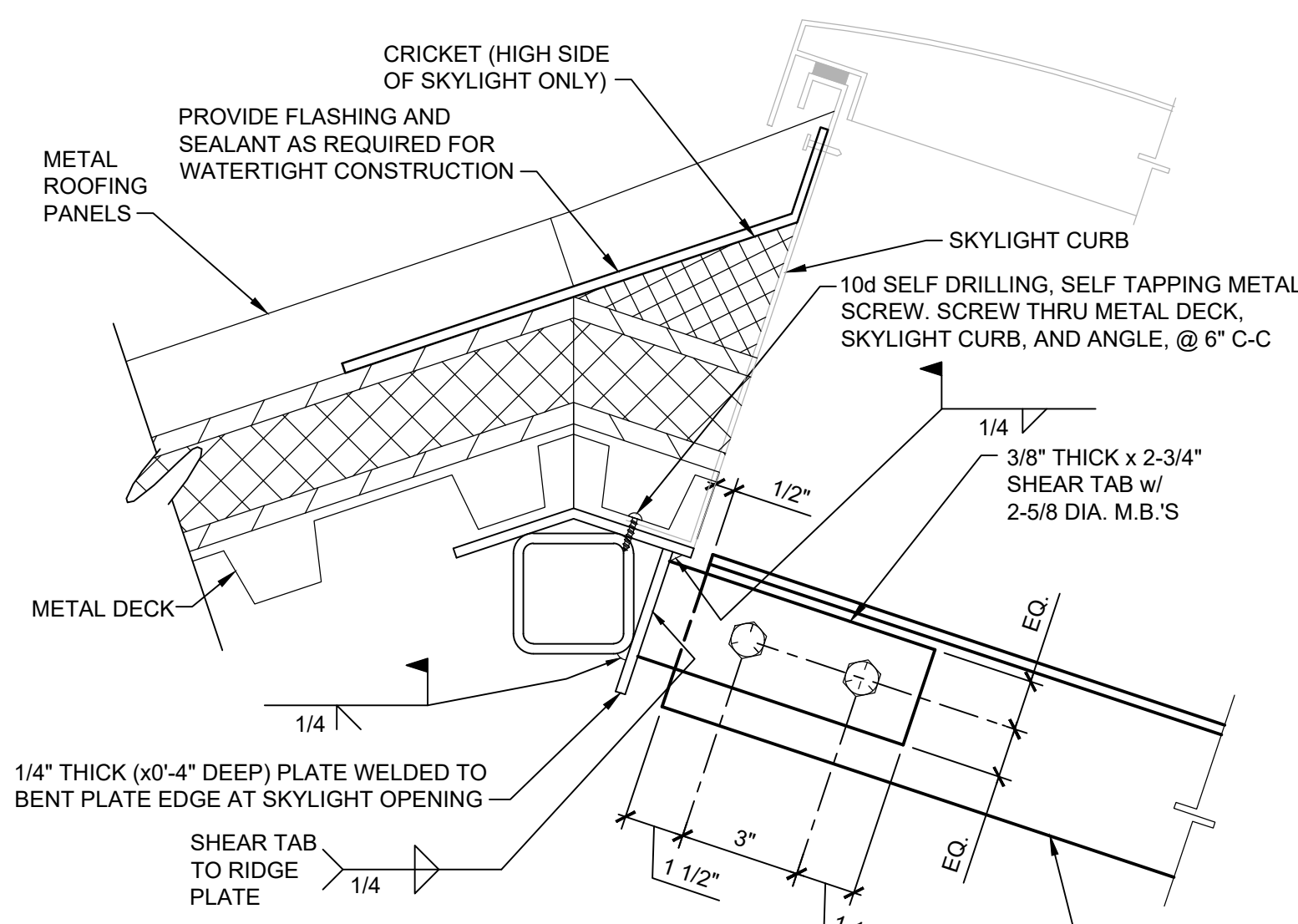
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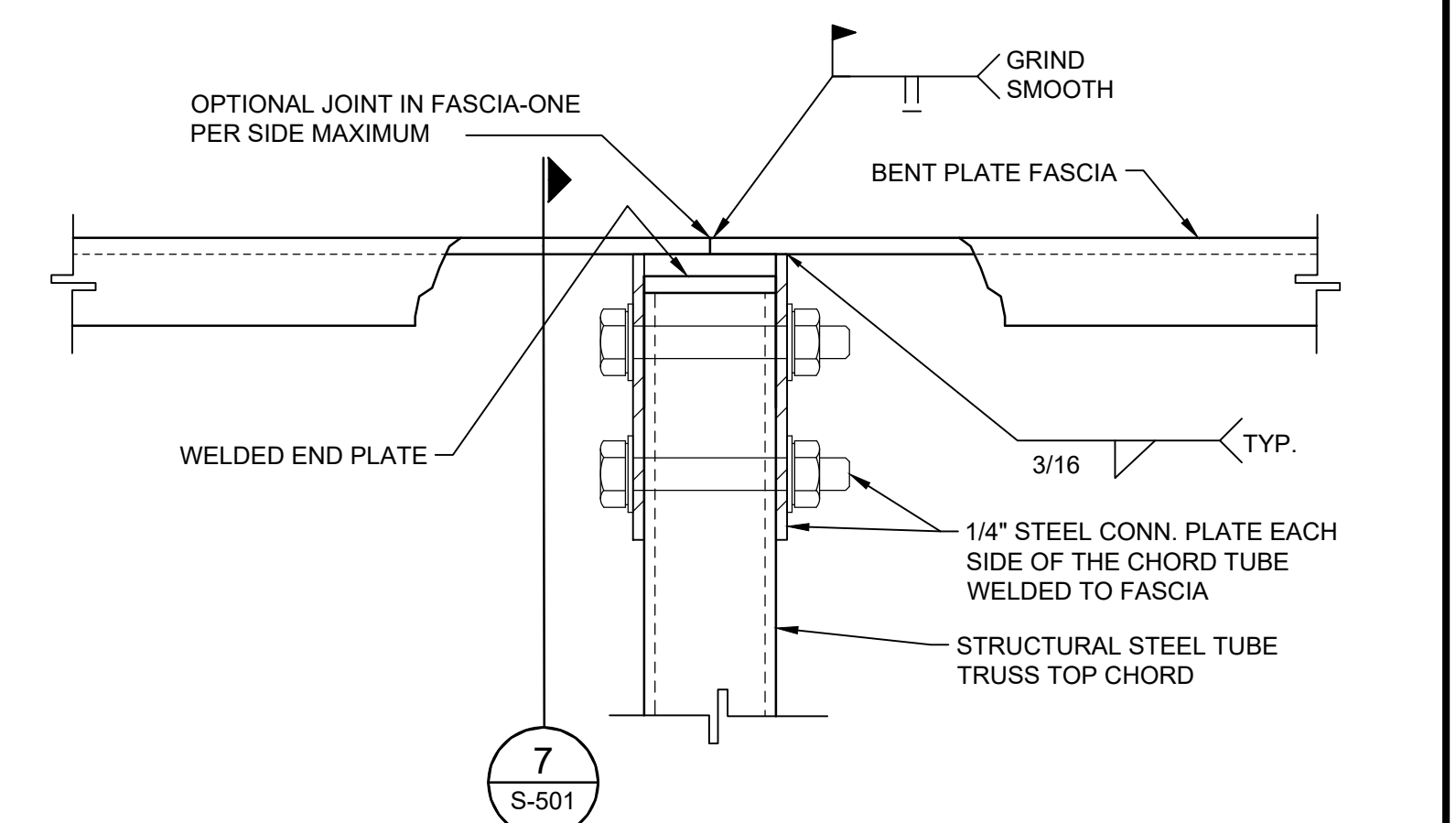
8 REMOVE EXISTING MASONRY ANCHORS
SCALE: 3"=1'-0"



9 RIDGE LINE TO END WALL CONNECTION
SCALE: 1 1/2"=1'-0"



10 SKYLIGHT OPENING AT RIDGE LINE
SCALE: 3"=1'-0"



11 TRUSS CHORD TO FASCIA - SPLICE CONNECTION
SCALE: 3"=1'-0"

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City of Lomita
PUBLIC WORKS DEPARTMENT
24300 NARBONNE AVENUE, LOMITA, CA 90717
TEL. (310) 325-7110 FAX. (310) 325-4024

NO.	DATE	BY	DESCRIPTION	APPROVED

REGISTERED PROFESSIONAL ENGINEER
No. 6177
DATE: 02/9/2024

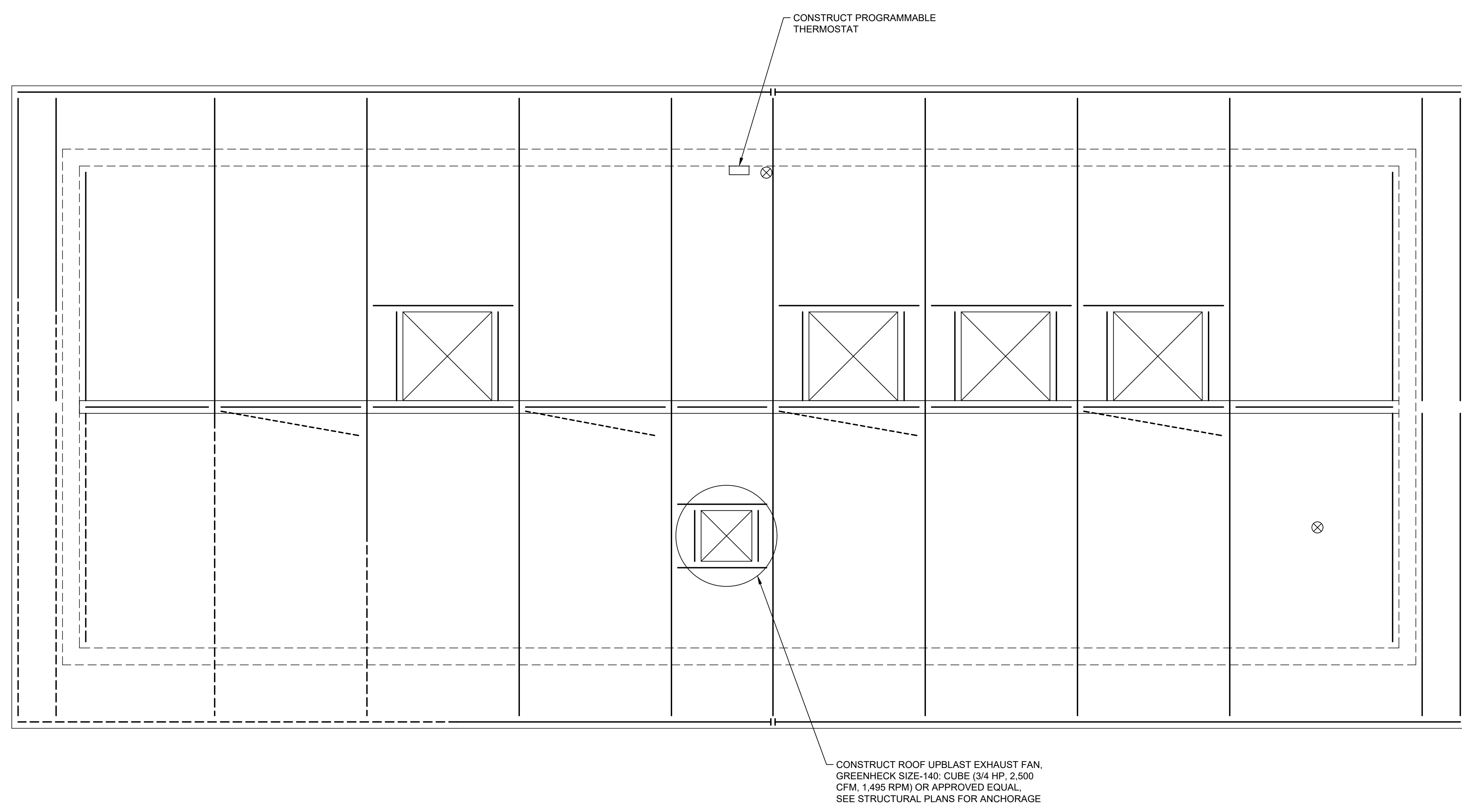
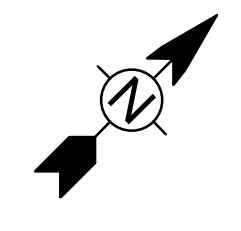
APPROVED BY CITY: _____ DATE: _____

NEW ROOF DESIGN FOR APPIAN WAY PUMP STATION
STRUCTURAL DETAILS 2

DRAWING NO. S-502
DESIGNED BY: JQ
DRAWN BY: EJH
CHECKED BY: EY
PROJECT NO. 200-09353-23001
SHT 10 OF 14 SHITS

BUILDING AND SAFETY DIVISION
 Department of Public Works
APPROVED
 UNDER LOS ANGELES COUNTY CODE
TITLES 26, 30 AND 31
 M.D.R.T.A.
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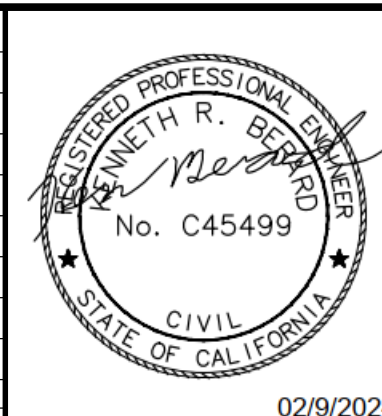
MECHANICAL PLAN
 SCALE: 3/8"=1'-0"

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CITY OF LOMITA CALIFORNIA
 City of Lomita
PUBLIC WORKS DEPARTMENT
 24300 NARBONNE AVENUE, LOMITA, CA 90717
 TEL. (310) 325-7110 FAX. (310) 325-4024

NO.	DATE	BY	DESCRIPTION	APPROVED



SUBMITTED BY : _____ DATE _____

APPROVED BY CITY : _____ DATE _____

ENGINEERING DIVISION

NEW ROOF DESIGN FOR APPIAN WAY PUMP STATION

MECHANICAL PLAN

DRAWING NO.	M-101
DESIGNED BY :	AML
DRAWN BY :	AML
CHECKED BY :	KRB
PROJECT NO.	200-09353-23001
SHT	11 OF 14 SHTS

ELECTRICAL SYMBOLS - PLANS	
SYMBOL	SYMBOL DESCRIPTION
	DUPLEX RECEPTACLE (WP, GFCI AS INDICATED)
	JUNCTION BOX
	SWITCH (3 = 3-WAY SWITCH, 4 = 4-WAY SWITCH, ETC.)
	FLUORESCENT LUMINAIRE CONTROLLED BY SWITCH a
	FLUORESCENT LUMINAIRE CONTROLLED BY SWITCH a W/ EMERGENCY BATTERY PACK
	EMERGENCY LIGHT
	WALL MOUNTED LUMINAIRE
	EXIT LIGHT
	DOWN LIGHT
	POLE MOUNTED LUMINAIRE
	LUMINAIRE TYPE LAMP WATTAGE
	CONDUIT REFERENCE SEE LUMINAIRE SCHEDULE FOR DETAILS
	CONDUIT REFERENCE A = ANALOG SIGNAL C = CONTROL D = DATA LINK F = FIBER OPTIC P = POWER T = TELEPHONE
	UNDERGROUND CONDUIT
	EXPOSED CONDUIT
	GROUNDING CONDUCTOR 30" BELOW GRADE
	HOMERUN TO PANEL "A", CIRCUIT 3
	CONDUIT STUBBED AND CAPPED
	CONDUIT BENDS TOWARD OBSERVER
	CONDUIT BENDS AWAY FROM OBSERVER
	FLEXIBLE CONDUIT CONNECTION (FROM COUPLING/STUB-UP OR JBOX)
	PANELBOARD
	DISCONNECT SWITCH
	COMBINATION STARTER & DISCONNECT SWITCH
	HANDHOLE OR PULL BOX
	DUCT SMOKE DETECTOR
	SMOKE DETECTOR
	FIRE ALARM MANUAL PULL STATION
	FIRE ALARM STROBE
	TELEPHONE OUTLET
	DATA OUTLET
	CONDUIT SEAL
	CONDUIT & WIRE FOR FIRE ALARM SYSTEM
	CONDUIT & WIRE FOR ELECTRONIC KEY PAD TO PLC
	ELECTRONIC KEYPAD
	FIRE ALARM CONTROL PANEL
	LOCAL CONTROL SWITCH
	THERMOSTAT
	INTRUSION SWITCH
	MOTOR (NUMBER INDICATES HORSEPOWER)
	GROUND ROD

ELECTRICAL SYMBOLS - SCHEMATIC DIAGRAMS		
NORMALLY OPEN	NORMALLY CLOSED	SYMBOL DESCRIPTION
		CONTACT
		TIMED CONTACT, CONTACT ACTION REVERSES ON ENERGIZATION (ON DELAY)
		TIMED CONTACT, CONTACT ACTION REVERSES ON DE-ENERGIZATION (OFF DELAY)
		LEVEL SWITCH
		PRESSURE SWITCH
		TEMPERATURE SWITCH
		LIMIT SWITCH
		FLOW SWITCH
		PUSH BUTTON SINGLE CIRCUIT MOMENTARY CONTACT
		SELECTOR SWITCH HOA: HAND-OFF-AUTO (HOA SHOWN IN HAND MODE) HO: HAND-OFF HOR: HAND-OFF-REMOTE R-O: REMOTE-OFF SEE SYMBOLE NOTE 2.
		MOTOR OVERLOAD DEVICE CONTACTS
		PILOT LIGHT A= AMBER, G= GREEN, R= RED, W= WHITE
		CONTROL RELAY
		TIME DELAY RELAY
		MOTOR OR STARTER COIL
		SOLENOID OPERATED VALVE
		ELAPSED TIME METER
		FUSE
		CONTROL POWER TRANSFORMER
		GROUND
		MOTOR SPACE HEATER

SYMBOL NOTES

- THIS DRAWING CONTAINS INDUSTRY STANDARD SYMBOLS. NOT ALL SYMBOLS SHOWN ARE USED ON THIS PROJECT.
- FOR HOA SWITCHES, "XOO" INDICATES THAT THE TOP CONTACT IS CLOSED WHEN THE SWITCH IS SET TO HAND MODE, AND ALL OTHER SWITCH CONTACTS ARE OPEN; "OXO" INDICATES THAT THE MIDDLE CONTACT IS CLOSED WHEN THE SWITCH IS SET TO OFF MODE, AND ALL OTHER SWITCH CONTACTS ARE OPEN; "OOX" INDICATES THAT THE BOTTOM CONTACT IS CLOSED WHEN SWITCH IS IN AUTO MODE, ALL OTHER SWITCH CONTACTS ARE OPEN.

ELECTRICAL SYMBOLS - SINGLE LINE DIAGRAM	
DEVICE	SYMBOL DESCRIPTION
	DRY TYPE TRANSFORMER
	POTENTIAL TRANSFORMER
	CURRENT TRANSFORMER
	FUSE
	MOTOR, 40 HORSEPOWER
	GROUNDING ELECTRODE
	LOW VOLTAGE CIRCUIT BREAKER MCCB UON
	VARIABLE FREQUENCY DRIVE
	SOLID STATE STARTER (SOFT STARTER)
	SURGE PROTECTION DEVICE
	POWER QUALITY MONITOR
	SOLID STATE TRIP
	MOTOR PROTECTION RELAY
	NON-FUSED DISCONNECT SWITCH
	FUSED DISCONNECT SWITCH
	VALVE MOTOR AND ACTUATOR
	MOTOR OVERLOAD HEATER
	MAGNETIC MOTOR STARTER FVNR1 = FULL VOLTAGE NON-REVERSING, NEMA SIZE 1 RV2S2W = REDUCED VOLTAGE 2-SPEED, 2-WINDING
	METER, ELECTRIC UTILITY GRADE UON

ELECTRICAL ABBREVIATIONS

(D)	DEMOLISH
(E)	EXISTING
(F)	FUTURE
(N)	NEW
(R)	RELOCATE
A	AMPERES, ANALOG SIGNAL
AC	ALTERNATING CURRENT
AF	AMPERES FRAME
AFG	ABOVE FINISHED FLOOR
AIC	AMPERES INTERRUPTING CAPACITY
AT	AMPERES TRIP
AWG	AMERICAN WIRE GAUGE
BC	BARE COPPER
BFG	BELOW FINISHED GRADE
C	CONDUIT
CB	CIRCUIT BREAKER
CCT	CORRELATED COLOR TEMPERATURE
CO	CONDUIT ONLY
CP	CONTROL PANEL
CPT	CONTROL POWER TRANSFORMER
CR1	COLOR RENDERING INDEX
CT	CURRENT TRANSFORMER
CU	COPPER
DC	DIRECT CURRENT
DSB	DISTRIBUTION SWITCHBOARD
EF	EXHAUST FAN
ELEV	ELEVATION
ETM	ELAPSED TIME METER
EWI	ELECTRIC WATER HEATER
FCB	FEEDER CIRCUIT BREAKER
FIT	FLOW INDICATING TRANSMITTER
FLEX	FLEXIBLE
FLUOR	FLUORESCENT
FPP	FIBER OPTIC PATCH PANEL
FPR	FEEDER PROTECTION RELAY
FVNR	FULL VOLTAGE NON-REVERSING STARTER
G, GND	GROUND
GFCI	GROUND FAULT CIRCUIT INTERRUPTER
HH	HANDHOLE
HID	HIGH INTENSITY DISCHARGE
HMI	HUMAN MACHINE INTERFACE
HOA	HAND / OFF / AUTOMATIC
HP	HORSEPOWER
HPS	HIGH PRESSURE SODIUM
HS	HAND SWITCH
JB, JBOX	JUNCTION BOX
KAIC	KILOAMPERES INTERRUPTING CAPACITY
KVA	KILOVOLT-AMPERE
KW	KILOWATT
KWH	KILOWATT-HOUR
LED	LIGHT EMITTING DIODE
LCP	LOCAL CONTROL PANEL
LIT	LEVEL INDICATING TRANSMITTER
LOS	LOCKOUT STOP SWITCH
LSLL	LEVEL SWITCH LOW-LOW
LV	LOW VOLTAGE
MCB	MAIN CIRCUIT BREAKER
MCC	MOTOR CONTROL CENTER
MCCB	MOLDED CASE CIRCUIT BREAKER
MCP	MOTOR CIRCUIT PROTECTOR
MH	MANHOLE
MIN	MINIMUM
MLO	MAIN LUGS ONLY
MPR	MOTOR PROTECTION RELAY
MXR	MIXER
NC	NORMALLY CLOSED
NIC	NOT IN CONTRACT
NO	NORMALLY OPEN
NO	NUMBER
NTS	NOT TO SCALE
P	POLE
PB	PUSHBUTTON, PULLBOX
PCS	PVC COATED STEEL
PE	PHOTOELECTRIC
PFR	PHASE FAILURE RELAY
PH	PHASE
PIT	PRESSURE INDICATING TRANSMITTER
PLC	PROGRAMMABLE LOGIC CONTROLLER
PQM	POWER QUALITY MONITOR
PSH	PRESSURE SWITCH HIGH
PT	POTENTIAL TRANSFORMER
REC, RECEPT	RECEPTACLE
RGS	RIGID GALVANIZED STEEL
SCCR	SHORT CIRCUIT CURRENT RATING
SCE	SOUTHERN CALIFORNIA EDISON
SPD	SURGE PROTECTION DEVICE
SSS	SOLID STATE STARTER (SOFT STARTER)
SWBD	SWITCHBOARD
TEMP	TEMPERATURE
TYP	TYPICAL
UON	UNLESS OTHERWISE NOTED
V	VOLT(S)
VA	VOLT-AMPERE
VFD	VARIABLE FREQUENCY DRIVE
W	WATT, WIRE
WP	WEATHERPROOF
XFMR	TRANSFORMER

GENERAL ELECTRICAL NOTES

- REFER TO ELECTRICAL SPECIFICATIONS FOR FURTHER DETAIL AS TO SCOPE, MATERIALS, AND EXECUTION OF ELECTRICAL WORK.
- ELECTRICAL CONTRACTOR TO SIZE ALL WIRING NOT EXPLICITLY SHOWN ON DRAWINGS ACCORDING TO THE REQUIREMENTS OF NATIONAL ELECTRICAL CODE (NEC) FOR THE SPECIFIC APPLICATION AND CONDITIONS.
- ALL CONDUCTORS SHALL BE COPPER (MINIMUM SIZE #10 AWG UNLESS SPECIFICALLY NOTED OTHERWISE).
- CONTRACTOR SHALL SUBMIT SEISMIC ANCHORAGE CALCULATIONS IN CONFORMANCE WITH CODE REQUIREMENTS AND PROVIDE SEISMIC ANCHORAGE MEANS FOR EQUIPMENT IN ACCORDANCE WITH THE CALIFORNIA BUILDING CODE.
- THE ELECTRICAL CONTRACTOR SHALL CONFORM WITH ALL LOCAL CODES AND ORDINANCES, THE STATE OF CALIFORNIA ELECTRICAL SAFETY ORDERS, THE NATIONAL ELECTRICAL CODE AND ANY ADDITIONAL JURISDICTIONS RELATING TO THE WORK.
- THE ELECTRICAL CONTRACTOR SHALL FURNISH AND INSTALL ALL CONDUIT, WIRE, SERVICES, SWITCHBOARDS, AND VFD'S REQUIRED FOR A COMPLETE AND OPERATIONAL ELECTRICAL SYSTEM.
- IN THE EVENT OF A CONFLICT OR INCONSISTENCY BETWEEN ITEMS INDICATED ON THE PLANS AND/OR SPECIFICATIONS, OR WITH CODE REQUIREMENTS, THE NOTE, SPECIFICATION OR CODE WHICH PRESCRIBES AND ESTABLISHES THE MORE COMPLETE JOB OR HIGHER STANDARD SHALL PREVAIL.
- ALL ELECTRICAL EQUIPMENT EXPOSED TO THE CLIMATE SHALL BE WEATHERPROOF.
- ALL ELECTRICAL EQUIPMENT IN THIS PROJECT SHALL BE U.L. LISTED.
- ALL UNDERGROUND CONDUIT SHALL BE INSTALLED AT 30" BELOW FINISHED GRADE MINIMUM.
- THE ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING EXISTING UNDERGROUND FACILITIES AND PROTECTING THESE FACILITIES FROM DAMAGE.
- THE ELECTRICAL CONTRACTOR SHALL ROUTE CONDUITS AS REQUIRED BY FIELD CONDITIONS.
- THE ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR REPAIRING ANY DAMAGE TO EXISTING UNDERGROUND FACILITIES.
- CONTRACTOR SHALL PROVIDE ALL NEEDED CHANNELS, ANGLES, AND ANY OTHER MATERIALS REQUIRED TO SUPPORT LUMINAIRES, CONDUIT, AND ELECTRICAL EQUIPMENT IN THE LOCATIONS SHOWN ON THE DRAWINGS.
- CONTRACTOR SHALL NOT CUT ANY STRUCTURAL MEMBERS OR USE ANY ATTACHMENTS THAT WOULD IMPAIR THEIR STRENGTH.
- CONTRACTOR SHALL DESIGN SUPPORTS IN BETWEEN THE STRUCTURAL SUPPORT MEMBERS AND SUBMIT THE DESIGN AS A SHOP DRAWING SUBMITTAL.
- INSTRUMENTATION IS SHOWN IN THE GENERAL VICINITY OF THE INTENDED LOCATION AND MAY NOT NECESSARILY MATCH LOCATIONS ON THE PLANS. VERIFY ACTUAL LOCATIONS OF INSTRUMENTS AND RUN ASSOCIATED CONDUITS AS REQUIRED.
- ELECTRICAL EQUIPMENT AND MATERIAL TO BE LISTED, LABELED AND INSTALLED PER THE CALIFORNIA ELECTRICAL CODE, THE INSTALLATION STANDARDS/MANUFACTURER'S RECOMMENDATIONS AND, IF REQUIRED, A RECOGNIZED ELECTRICAL TESTING LABORATORY.
- ALL EXPOSED CONDUITS TO BE GALVANIZED RIGID STEEL FOR DRY LOCATIONS AND PVC COATED GALVANIZED RIGID STEEL IN WET LOCATIONS UNLESS OTHERWISE STATED ON THE PLANS.



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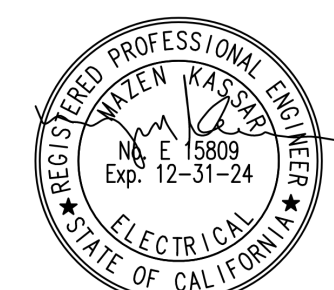
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City of Lomita
PUBLIC WORKS DEPARTMENT

24300 NARBONNE AVENUE, LOMITA, CA 90717
TEL. (310) 325-7110 FAX. (310) 325-4024

NO.	DATE	BY	DESCRIPTION	APPROVED



SUBMITTED BY: _____ DATE: _____

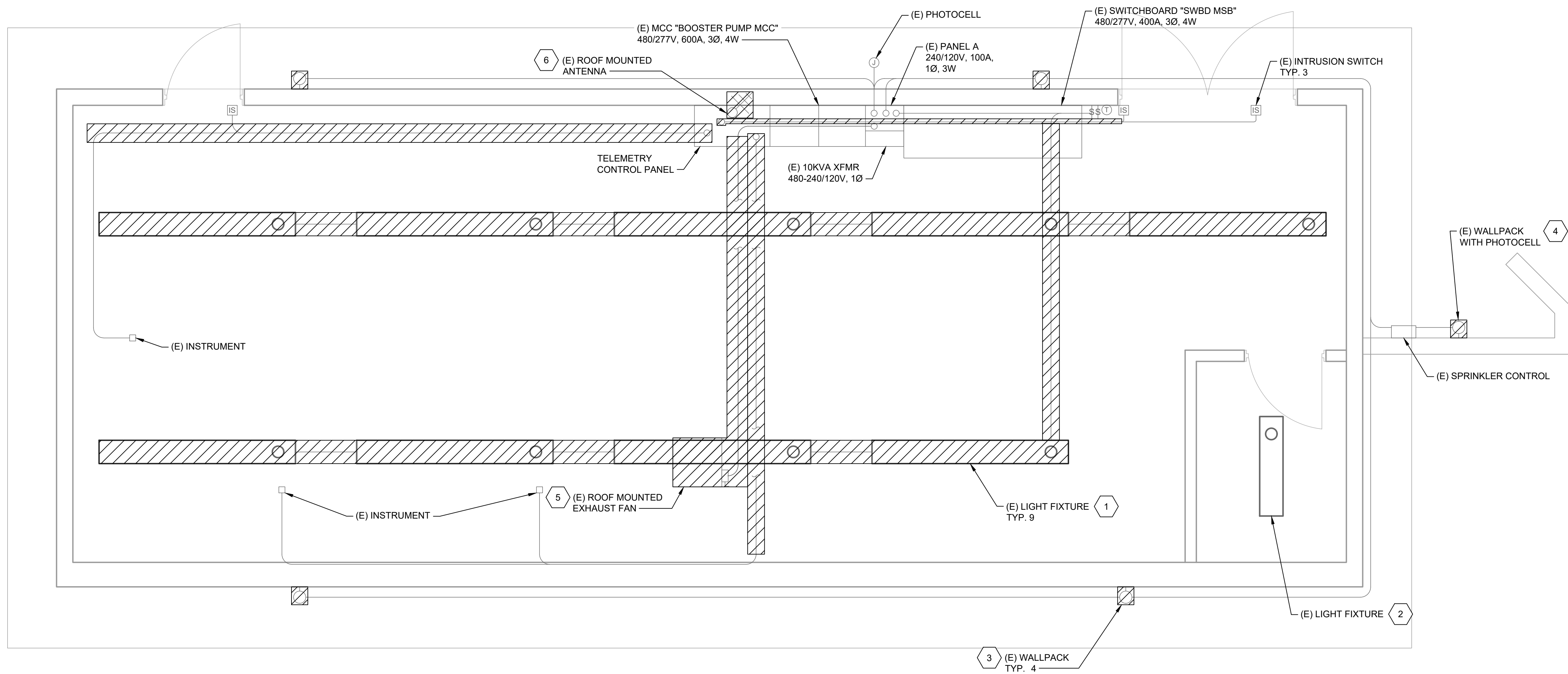
APPROVED BY CITY: _____ DATE: _____

ENGINEERING DIVISION

NEW ROOF DESIGN FOR APPIAN WAY
PUMP STATION

ELECTRICAL SYMBOLS AND ABBREVIATIONS

DRAWING NO.	E-001
DESIGNED BY:	JL
DRAWN BY:	JL
CHECKED BY:	MK
PROJECT NO.	200-09353-23001
SHT	12 OF 14 SHTS



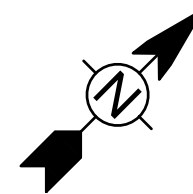
GENERAL NOTES

1. THE SCOPE OF WORK IS TO REPLACE THE WOODEN ROOF WITH A STEEL ROOF. THE EXISTING ROOF MOUNTED EXHAUST FAN WILL BE REPLACED WITH A NEW ONE. THE EXISTING CEILING AND OUTDOOR LIGHTS SHALL BE REPLACED. A NEW WALLPACK SHALL BE INSTALLED ON THE SOUTH-WEST WALL OF THE BUILDING.
2. PRIOR TO BEGINNING ANY WORK DETERMINE THE EXACT LOCATIONS OF THE EXISTING EQUIPMENT, LIGHT FIXTURES, AND CONDUITS/WIRING.
3. THE CONDUITS AND WIRING ATTACHED TO THE WOODEN ROOF SHALL BE DISCONNECTED AND REMOVED. TEMPORARY CONDUITS AND WIRES SHALL BE INSTALLED TO KEEP THE PUMP STATION IN OPERATION DURING THE CONSTRUCTION. NEW CONDUITS AND WIRES SHALL BE INSTALLED AFTER THE NEW ROOF IS INSTALLED.
4. CONTRACTOR NOT TO EXCEED 8 HOURS OF POWER AND ANTENNA OUTAGE FROM OLD ELECTRICAL CONNECTIONS TO NEW CONNECTION TRANSITION.
5. ALL CONDUIT LOCATIONS ARE SCHEMATIC/DIAGRAMMATIC.

CONSTRUCTION NOTES

- 1 EXISTING LIGHT FIXTURES SHALL BE REMOVED AND DISPOSED PRIOR TO ROOF REMOVAL. NEW LIGHTS WILL BE INSTALLED AFTER THE NEW ROOF IS PLACED. REFER TO SHEET E-102 FOR MORE DETAILS.
- 2 EXISTING LIGHT FIXTURE IN THE RESTROOM TO BE KEPT IN PLACE.
- 3 EXISTING WALLPACKS SHALL BE REMOVED AND DISPOSED. CONDUITS/WIRES SHALL BE KEPT IN PLACE. THESE WALLPACKS WILL BE REPLACED NEW ONES. REFER TO SHEET E-102 FOR MORE DETAILS.
- 4 EXISTING WALLPACK WITH PHOTOCELL SHALL BE REMOVED AND DISPOSED. CONDUITS/WIRES SHALL BE KEPT IN PLACE. THIS WALLPACK WILL BE REPLACED A NEW ONE. REFER TO SHEET E-102 FOR MORE DETAILS.
- 5 EXISTING ROOF MOUNTED EXHAUST FAN AND DISCONNECT SWITCH SHALL BE DISCONNECTED AND REMOVED. NEW EXHAUST FAN AND DISCONNECT SWITCH WILL BE INSTALLED AFTER THE NEW ROOF IS PLACED. REFER TO SHEET E-102 FOR MORE DETAILS.
- 6 EXISTING ROOF MOUNTED ANTENNA SHALL BE REMOVED AND TEMPORARILY PLACED ON A MAST OUTSIDE THE BUILDING AT THE SIMILAR HEIGHT AND DIRECTION AND CONNECTED TO THE TELEMETRY CONTROL PANEL PRIOR TO ROOF REMOVAL.

1 ELECTRICAL DEMO PLAN
SCALE: 3/8"=1'-0"



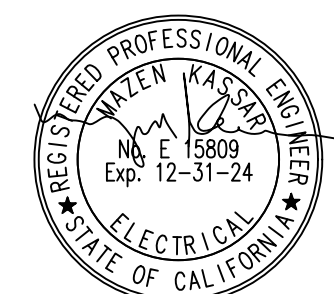
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NO.	DATE	BY	DESCRIPTION	APPROVED



SUBMITTED BY : _____ DATE _____

APPROVED BY City : _____ DATE _____

02/9/2024 ENGINEERING DIVISION

**NEW ROOF DESIGN FOR APPIAN WAY
PUMP STATION**

ELECTRICAL DEMOLITION PLAN

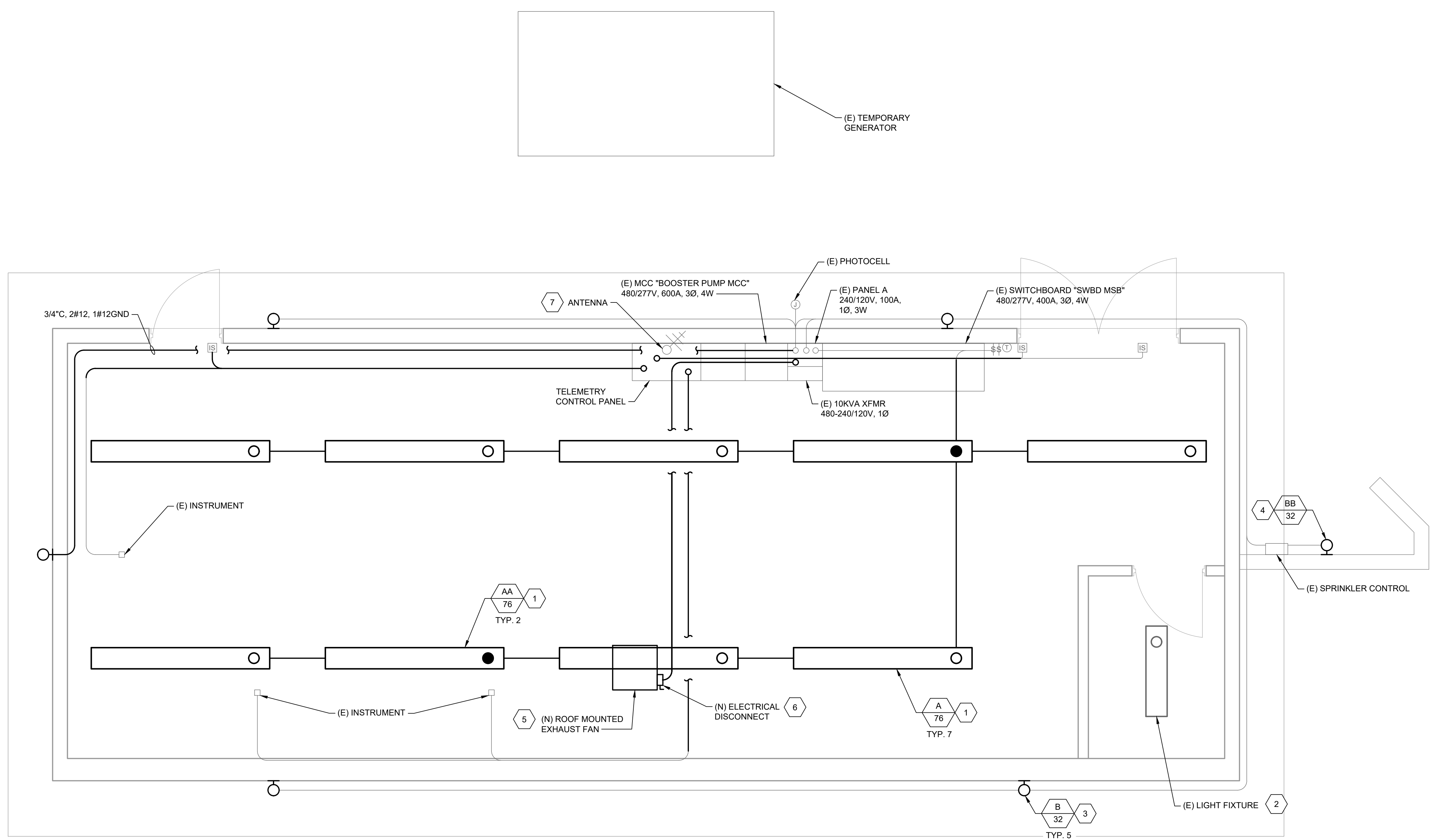
DRAWING NO.	E-101
DESIGNED BY :	JL
DRAWN BY :	JL
CHECKED BY :	MK
PROJECT NO.	200-09353-23001
SHT	13 OF 14 SHTS

GENERAL NOTES

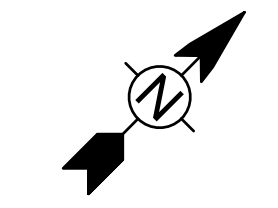
1. THE SCOPE OF WORK IS TO REPLACE THE WOODEN ROOF WITH A STEEL ROOF. THE EXISTING ROOF MOUNTED EXHAUST FAN WILL BE REPLACED WITH A NEW ONE. THE EXISTING CEILING AND OUTDOOR LIGHTS SHALL BE REPLACED. A NEW WALLPACK SHALL BE INSTALLED ON THE SOUTH-WEST WALL OF THE BUILDING.
2. PRIOR TO BEGINNING ANY WORK DETERMINE THE EXACT LOCATIONS OF THE EXISTING EQUIPMENT, LIGHT FIXTURES, AND CONDUITS/WIRING.
3. NEW CONDUITS AND WIRES SHALL BE INSTALLED AFTER THE NEW ROOF IS INSTALLED.
4. ALL CONDUIT LOCATIONS ARE SCHEMATIC/DIAGRAMMATIC.
5. EXPOSED CONDUITS SHALL BE GALVANIZED RIGID STEEL CONDUITS. ELECTRICAL METALLIC TUBING IS ACCEPTABLE FOR INDOOR LIGHTING.

CONSTRUCTION NOTES

- 1 NEW LIGHT FIXTURES WILL BE INSTALLED AT THE SAME LOCATIONS AFTER THE NEW ROOF IS INSTALLED.
- 2 EXISTING LIGHT FIXTURE IN THE RESTROOM TO BE KEPT IN PLACE.
- 3 INSTALL NEW WALLPACK AND CONNECT TO EXISTING CONDUIT/WIRES.
- 4 INSTALL NEW WALLPACK WITH PHOTOCELL AND CONNECT TO EXISTING CONDUIT/WIRES.
- 5 INSTALL NEW ROOF MOUNTED EXHAUST FAN.
- 6 NEW DISCONNECT SHALL BE INSTALLED ON THE ROOF AND NEAR THE NEW ROOF MOUNTED EXHAUST FAN.
- 7 EXISTING ANTENNA SHALL BE REINSTALLED AND PERMANENTLY SUPPORTED/ATTACHED IN THE ORIGINAL LOCATION AT THE SIMILAR HEIGHT AND DIRECTION AFTER THE NEW ROOF HAS BEEN INSTALLED.



1 ELECTRICAL SITE PLAN
SCALE: 3/8"=1'-0"



LIGHTING FIXTURE SCHEDULE														
FIXTURE I.D.	FIXTURE				VOLTS	NO.	WATTS AND TYPE	FIXTURE				DESCRIPTION AND VARIATIONS	MANUFACTURER AND CATALOG NO.	
	INCAND.	FLOOR.	H.P.S.	MET. HAL.				LED	RECESS.	SURFACE	PEND.			WALL
A 76					•	1	76						NEMA 4X FIBERGLASS HOUSING PENDANT MOUNTING, FEM LED LUMINAIRE WITH 5000K COLOR TEMPERATURE, DIMMABLE WITH FITTINGS ON BOTH ENDS AND DUAL PENDANT MOUNTING BRACKETS.	LITHONIA FEM-L96-12000LM-LPACL-MD-GZ10-50K-80CRI-DPMB-WLFEND2 OR APPROVED EQUAL.
AA 76					•	1	76						NEMA 4X FIBERGLASS HOUSING PENDANT MOUNTING, FEM LED LUMINAIRE WITH 5000K COLOR TEMPERATURE, DIMMABLE WITH FITTINGS ON BOTH ENDS AND DUAL PENDANT MOUNTING BRACKETS. EQUIPPED WITH LED BATTERY PACK.	LITHONIA FEM-L96-12000LM-LPACL-MD-GZ10-50K-80CRI-DPMB-WLFEND2-E10WMCP OR APPROVED EQUAL.
B 32					•	1	32						LED WALL PACK, PRISMATIC GLASS LENS. IP65 RATED. 5000K COLOR TEMPERATURE.	LITHONIA TWX2 LED-P2-50K-MVOLT OR EQUAL
BB 32					•	1	32						LED WALL PACK, PRISMATIC GLASS LENS. IP65 RATED. 5000K COLOR TEMPERATURE. EQUIPPED WITH PHOTOCELL.	LITHONIA TWX2 LED-P2-50K-MVOLT-PE OR EQUAL

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TEL. (310) 325-7110 FAX. (310) 325-4024

NO.	DATE	BY	DESCRIPTION	APPROVED

SUBMITTED BY: _____ DATE: _____

APPROVED BY CITY: _____ DATE: _____

NEW ROOF DESIGN FOR APPIAN WAY
PUMP STATION
ELECTRICAL SITE PLAN

DRAWING NO. E-102
DESIGNED BY: JL
DRAWN BY: JL
CHECKED BY: MK
PROJECT NO. 200-09353-23001
SHT 14 OF 14 SHTS

APPENDIX I

CONSTRUCTION AND DEMOLITION DEBRIS RECYCLING SUMMARY

CONSTRUCTION AND DEMOLITION DEBRIS RECYCLING SUMMARY

Project Type: Roadway and/or Bridge/Structure Water/Sewer
 Traffic Signal/Street Lighting Other _____

Project Name: _____ Date: _____

City Contract No. _____

Project Location: _____

Thomas Guide Page/Grid No(s): _____

Contractor Name: _____

Contractor Address: _____

Contractor License #: _____

Project Duration: From: _____ To: _____

Demolition and Recycling Cost: \$ _____

Type(s) of Debris Generated	Total Quantity Generated (tons, c.y. or units)	Reuse / Recycling		Disposal	
		Total Quantity (tons, c.y. or units)	Name of Reuse/Recycling Facility/Site	Total Quantity (tons, c.y. or units)	Name of Disposal Facility
Asphalt					
Brick					
Concrete					
Green Waste					
Metal (ferrous)					
Metal (non-ferrous)					
Mixed Debris					
Rock					
Soil Wood Waste					
Other:					
Total					

Notes:

- Other debris types may include, but are not limited to: Ash, Cardboard, Carpeting, Glass Gravel, Land Clearing Debris, Non-friable Asbestos, Paper, Plastic, Porcelain, Roofing Material, Sand and Tires. Attach additional sheets if necessary.
- If the debris is taken to a transfer station solely for the purpose of reuse/recycling, then list the transfer station as the reuse/recycling facility/site.
- If the debris is taken to a transfer station solely for the purpose of transfer to a disposal facility, then list the transfer station as the disposal facility.

Prepared by _____ Signature _____ Phone #: _____

APPENDIX II

INSPECTION RECORD FOR LOS ANGELES COUNTY DIVISION OF BUILDING AND SAFETY



COUNTY OF LOS ANGELES

Hours: 8:00 AM - 4:30 PM
 Monday - Friday
 LOMITA
 (310) 534-3760
 24320 SOUTH NARBONNE AVENUE
 LOMITA, CA 90717

INSPECTION RECORD

Job Address:

Permit No.

Description: _____

NO.	INSPECTION	DATE	INSPECTOR
-----	------------	------	-----------

Building Inspection and Approvals

B1	Location/Setbacks		
B2	Soils Engineer		
B3	Foundation/Forms		
B4	Retaining Walls		
B5	Masonry Walls		
B6	Bolts/Hld Downs/Strps		
B7	Floor Slab & Steel		
B8	Raised Floor Framing		
B9	Underfloor Insulation		
B10	1st Floor Sheathing		
B11	2nd Flr Frame/Sheath		
B12	Window Replacement		
B13	Roof Sheating		
B14	Masonry/Mfg Fireplace		
B15	Roof Covering		
B16	Frame/Bracing		
B17	Insulat/Weather Strip		

Do Not Cover Walls Until Frame, Insulation, & Rough Electrical, Mechanical, & Plumbing Have Been Signed

B18	Interior Lath/Drywall		
B19	Exterior Lath		
B20	T-Bar Ceiling		
B21	Rated Floor/Ceiling		
B22	Rated Walls		
B23	Rated Shafts		
B24	Disabled Access		
B25	Demolition		
B26	Lot Drainage		
B27			
B28	(Address posted) Enter Building Final Below		

Electrical Inspection and Approvals

E1	Temporary Power		
E2	Service/Ground <input type="checkbox"/> Location <input type="checkbox"/> UFER <input type="checkbox"/> Water Ground <input type="checkbox"/> Driven Rod		
E3	Underground elect		
E4	Outlets		
E5	Rough Conduit		
E6	Rough Wiring		
E7	Dist Panel(s)		
E8	Rough Electrical		
E9	Smoke Detectors		
E10	Svr Ground Fault Test		
E11	Service Panel		
E12			
E13	Electrical Final		

NO.	INSPECTION	DATE	INSPECTOR
-----	------------	------	-----------

Mechanical Inspection and Approvals

M1	FAU/Wall Furnace		
M2	Exhaust Vent		
M3	Combustion Air		
M4	Duct Work		
M5	Rough Mechanical		
M6	AC/Compressor		
M7	Thermostat		
M8	Fire Dampers		
M9	Smoke Detectors		
M10	Commercial Hood		
M11	Boiler		
M12			
M13	Mechanical Final		

Plumbing Inspection and Approvals

P1	Water Service		
P2	Under Floor/Slab		
P3	Shower Pan		
P4	Water Lines		
P5	Rough Gas Piping		
P6	Rough Plumbing		
P7	Sewer (Public/Private)		
P8	Backflow Preventer		
P9	Water Heater		
P10	Lawn Sprinkler		
P11	Roof Drains		
P12	Gas (Test/Final)		
P13			
P14	Plumbing Final		

Verify Other Approvals

O1	Spec. Insp. Reports		
O2	Methane System		
O3	Grading Approval		
O4	Struct. Observation		
O5			

Agency Approvals

A1	Fire Department		
A2	Construction Division		
A3	Environmental Prog.		
A4	Health Department		
A5	AQMD		
A6	Planning Dept.		
A7	Business License		
A8	CalTrans		
A9	Highway Dedicat/Impr		
A10			
B28	BUILDING FINAL Certificate of Occupancy		

POST THIS CARD AND THE APPROVED PLANS IN A CONSPICUOUS PLACE ACCESSIBLE TO THE INSPECTOR. IT SHALL BE THE DUTY OF THE APPLICANT TO CAUSE THE WORK TO REMAIN ACCESSIBLE AND EXPOSED FOR INSPECTION PURPOSES. PERMITS WILL BE VOIDED IF WORK IS NOT STARTED WITHIN 180 DAYS OR IS SUSPENDED FOR A PERIOD EXCEEDING 180 DAYS.

APPENDIX III

ASBESTOS TEST RESULTS



EMSL Analytical, Inc.

200 Route 130 North Cinnaminson, NJ 08077

Tel/Fax: (800) 220-3675 / (856) 786-5974

<http://www.EMSL.com> / cinnasblab@EMSL.com

EMSL Order: 042406352
Customer ID: CLAR53
Customer PO:
Project ID:

Attention: Christian Goerrissen Clark Seif Clark PO Box 4299 Chatsworth, CA 91313	Phone: (818) 402-9844 Fax: (818) 727-2556 Received Date: 03/27/2024 9:40 AM Analysis Date: 04/01/2024 Collected Date:
Project: 10000154 /26255 Appian Way Lomita / City Water System /	

**Test Report: Asbestos Analysis of Bulk Materials via AHERA Method 40CFR 763 Subpart E
Appendix E supplemented with EPA 600/R-93/116 using Polarized Light Microscopy**

Sample	Description	Appearance	Non-Asbestos		Asbestos
			% Fibrous	% Non-Fibrous	% Type
0154B1 <small>042406352-0001</small>	Roof Southwest	Gray	5% Cellulose	90% Non-fibrous (Other)	None Detected
	Corner - Cement	Fibrous	5% Synthetic		
	Shingle	Homogeneous			
0154B2 <small>042406352-0002</small>	Roof Southwest	Black	8% Cellulose	92% Non-fibrous (Other)	None Detected
	Corner - Felt	Fibrous			
		Homogeneous			

Analyst(s)
Andrea Doughty (2)

Samantha Rundstrom
Samantha Rundstrom, Laboratory Manager
or Other Approved Signatory

EMSL maintains liability limited to cost of analysis. Interpretation and use of test results are the responsibility of the client. This report relates only to the samples reported above, and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. The report reflects the samples as received. Results are generated from the field sampling data (sampling volumes and areas, locations, etc.) provided by the client on the Chain of Custody. Samples are within quality control criteria and met method specifications unless otherwise noted. The above analyses were performed in general compliance with Appendix E to Subpart E of 40 CFR (previously EPA 600/M4-82-020 "Interim Method") but augmented with procedures outlined in the 1993 ("final") version of the method. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST or any agency of the federal government. Non-friable organically bound materials present a problem matrix and therefore EMSL recommends gravimetric reduction prior to analysis. Unless requested by the client, building materials manufactured with multiple layers (i.e. linoleum, wallboard, etc.) are reported as a single sample. Estimation of uncertainty is available on request.

Samples analyzed by EMSL Analytical, Inc. Cinnaminson, NJ NVLAP Lab Code 101048-0, AIHA LAP, LLC-IHLAP Lab 100194, PA ID# 68-00367, LA #04127

Initial report from: 04/01/2024 17:03:02



CLARK SEIF CLARK, INC.
HEALTH & SAFETY • ENGINEERING • ENVIRONMENTAL

042406352
Chain of Custody Form- Bulk Sampling

5 DAYS

CSC Job # 10000154		Sampling By Christian Goerrissen		Date Taken March 26, 2024		# Samples 2	Page # 1	Total Pages 1	
Job Name & Location Lomita Railroad Museum CITY OF LOMITA 2437 250 th Street CITY WATER SYSTEM Lomita, CA 90717 DRS 26255 ARRIAN WAY					Customer Id No.: BOA Architecture				
Sample Analysis: PLM - Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy		Lab Submitted to: ETSL							
ID #	Material Description	HM	Location of Sample	Condition	Friable	Quantity			
B1	CEMENT ROOF SHINGLE	1	ROOF SW CORNER	Good	NO	~2000P			
B2	ROOF Felt	2	1	✓	✓	✓			
CONDITION CODE				FRIABLE CODE		HOMOGENEOUS CODE		QUANTITY CODE	
G= GOOD D	F= FAIR	P= POOR	Y= YES	N= NO	HA= HOMOGENEOUS MATERIAL		SF= Square Ft.	LF= LINEAR Ft.	
INSPECTION COMMENTS:									
Relinquished By:					Date & Time				
[Signature]					3-26-24 @ 3:00 PM				
Received By:					Date & Time				
[Signature] Stephan Goerrissen					3/27/24 Ray				

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