

**BID NUMBER ITB PW 17-096**

**TO: CITY OF LONG BEACH  
CITY CLERK  
ATTN: Karla Lopez  
333 West Ocean Boulevard, Plaza Level  
Long Beach, California 90802**



**INVITATION TO BID**

**Prefabricated Lifeguard Station**

**CONTRACT NO. 34782**

- 1. COMPLETE CONTRACT:**  
This Invitation to Bid, together with THE NOTICE INVITING BIDS, the entire Bid (including Specifications), or any items(s) thereof, the signature page, Instructions to Bidders, General Conditions, Special Conditions, Bid Section, Addendums, and when required, CONTRACTOR'S BOND shall become the Contract upon its acceptance by the City Manager or designee on behalf of the City of Long Beach, Contractor will be provided with a copy of the executed Contract. All materials or services provided by the Contractor shall comply with the City Charter, and all applicable Federal, State and City Laws.
- 2. SERVICES TO BE PROVIDED BY THE CONTRACTOR:**  
Contractor shall upon acceptance of this Bid by the City, furnish the goods and services herein specified according to the terms and conditions set forth herein.
- 3. AMOUNT TO BE PAID:**  
The City shall pay Contractor for the goods or services as described in the section entitled "PAYMENT" in the Instructions to Bidders.
- 4. CHOICE OF ALTERNATE PROVISIONS; OPTIONS; NOTIFICATION:**  
When alternative provisions are requested, or options are offered, Contractor will be notified as to which provision, or option, is being accepted at the same time that he is notified that he is the successful Bidder.
- 5. DECLARATION OF NON-COLLUSION:**  
The undersigned certifies or declares under penalty of perjury that this Bid is genuine and not sham or collusive, or made in the interest or on behalf of any person or entity not herein named; that the Bidder has not directly or indirectly induced or solicited any other Bidder to submit a sham bid, or any other person or entity to refrain from bidding, and that the Bidder has not in any manner sought by collusion to secure to himself any advantage over other Bidders.

**BIDDER MUST COMPLETE AND SIGN BELOW:**

(Signature of Corporate Officers or persons authorized to sign bids and contracts on behalf of the Contractor – refer to page 2 Instructions Concerning Signatures.)

**EXECUTED AT:** Minden, NV CITY STATE **ON THE** 6 **DAY OF** July MONTH, 20 17 .

**COMPANY NAME:** The Public Restroom Company **TIN:** XXXXXXXXXX (FEDERAL TAX IDENTIFICATION NUMBER)

**STREET ADDRESS:** 2587 Business Parkway **CITY:** Minden **STATE:** NV **ZIP:** 89423

**PHONE:** 888-888-2060 **FAX:** 888-888-1448

**SI** Charles E. Kaufman (SIGNATURE) **President** President (TITLE)

Charles E. Kaufman (PRINT NAME) chuck@publicrestroomcompany.com (EMAIL ADDRESS)

**SI** Charles E. Kaufman (SIGNATURE) **Secretary** Secretary (TITLE)

Charles E. Kaufman (PRINT NAME) chuck@publicrestroomcompany.com (EMAIL ADDRESS)

**ALL SIGNATURES MUST BE NOTARIZED FOR ALL COMPANIES LOCATED OUTSIDE THE STATE OF CALIFORNIA.  
NO OUT-OF-STATE BID WILL BE CONSIDERED UNLESS A NOTARIAL ACKNOWLEDGMENT IS ATTACHED.  
NOTARIES ARE NOT REQUIRED FOR CALIFORNIA BIDDERS.**

**IN WITNESS WHEREOF** the City of Long Beach has caused this contract to be executed as required by law as of the date stated below.

**THE CITY OF LONG BEACH**  
**BY** [Signature]  
Director of Financial Management

10/31/17  
Date

**APPROVED AS TO FORM** 10/20, 2017.  
**CHARLES PARKIN**  
**CITY ATTORNEY**  
[Signature]  
Deputy

**(PROFIT) INITIAL/ANNUAL LIST OF OFFICERS, DIRECTORS AND STATE BUSINESS LICENSE APPLICATION OF:**

ENTITY NUMBER

THE PUBLIC RESTROOM COMPANY  
NAME OF CORPORATION

C29790-2002

FOR THE FILING PERIOD OF DEC, 2016 TO DEC, 2017



\*100103\*

USE BLACK INK ONLY - DO NOT HIGHLIGHT

**\*\*YOU MAY FILE THIS FORM ONLINE AT [www.nvsliverflume.gov](http://www.nvsliverflume.gov)\*\***

Return one file stamped copy. (If filing not accompanied by order instructions, file stamped copy will be sent to registered agent.)

**IMPORTANT:** Read instructions before completing and returning this form.

- Print or type names and addresses, either residence or business, for all officers and directors. A President, Secretary, Treasurer, or equivalent of and all Directors must be named. There must be at least one director. An **Officer** must sign the form. **FORM WILL BE RETURNED IF UNSIGNED.**
- If there are additional officers, attach a list of them to this form.
- Return the completed form with the filing fee. Annual list fee is based upon the current total authorized stock as explained in the Annual List Fee Schedule For Profit Corporations. A \$75.00 penalty must be added for failure to file this form by the deadline. An annual list received more than 90 days before its due date shall be deemed an amended list for the previous year.
- State business license fee is \$500.00/\$200.00 for Professional Corporations filed pursuant to NRS Chapter 89. Effective 2/1/2010, \$100.00 must be added for failure to file form by deadline.
- Make your check payable to the Secretary of State.
- Ordering Copies:** If requested above, one file stamped copy will be returned at no additional charge. To receive a certified copy, enclose an additional \$30.00 per certification. A **copy fee of \$2.00 per page** is required for **each additional copy** generated when ordering 2 or more file stamped or certified copies. Appropriate instructions must accompany your order.
- Return the completed form to: Secretary of State, 202 North Carson Street, Carson City, Nevada 89701-4201, (775) 684-5708.
- Form must be in the possession of the Secretary of State on or before the last day of the month in which it is due. (Postmark date is not accepted as receipt date.) Forms received after due date will be returned for additional fees and penalties. Failure to include annual list and business license fees will result in rejection of filing.

Filed in the office of <i>Barbara K. Cegavske</i> Barbara K. Cegavske Secretary of State State of Nevada	Document Number <b>20160528177-59</b>
	Filing Date and Time <b>12/05/2016 1:16 PM</b>
	Entity Number <b>C29790-2002</b>

(This document was filed electronically.)  
**ABOVE SPACE IS FOR OFFICE USE ONLY**

**CHECK ONLY IF APPLICABLE AND ENTER EXEMPTION CODE IN BOX BELOW**

Pursuant to NRS Chapter 76, this entity is exempt from the business license fee. Exemption code:

**NRS 76.020 Exemption Codes**

- 001 - Governmental Entity
- 005 - Motion Picture Company
- 006 - NRS 680B.020 Insurance Co.

**NOTE: If claiming an exemption, a notarized Declaration of Eligibility form must be attached. Failure to attach the Declaration of Eligibility form will result in rejection, which could result in late fees.**

This corporation is a publicly traded corporation. The Central Index Key number is:

This publicly traded corporation is not required to have a Central Index Key number.

NAME CHARLES E KAUFMAN, III	TITLE(S) PRESIDENT (OR EQUIVALENT OF)
ADDRESS 2587 BUSINESS PARKWAY , USA	CITY STATE ZIP CODE MINDEN NV 89423

NAME CHARLES E KAUFMAN, III	TITLE(S) SECRETARY (OR EQUIVALENT OF)
ADDRESS 2587 BUSINESS PARKWAY , USA	CITY STATE ZIP CODE MINDEN NV 89423

NAME CHARLES E KAUFMAN, III	TITLE(S) TREASURER (OR EQUIVALENT OF)
ADDRESS 2587 BUSINESS PARKWAY , USA	CITY STATE ZIP CODE MINDEN NV 89423

NAME CHARLES E KAUFMAN, III	TITLE(S) DIRECTOR
ADDRESS 2587 BUSINESS PARKWAY , USA	CITY STATE ZIP CODE MINDEN NV 89423

None of the officers or directors identified in the list of officers has been identified with the fraudulent intent of concealing the identity of any person or persons exercising the power or authority of an officer or director in furtherance of any unlawful conduct.

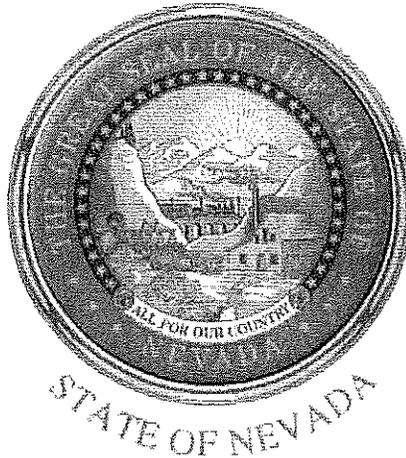
I declare, to the best of my knowledge under penalty of perjury, that the information contained herein is correct and acknowledge that pursuant to NRS 239.330, it is a category C felony to knowingly offer any false or forged instrument for filing in the Office of the Secretary of State.

**X** CHARLES E KAUFMAN

Title: PRESIDENT Date: 12/5/2016 1:16:55 PM

**Signature of Officer or Other Authorized Signature**

SECRETARY OF STATE



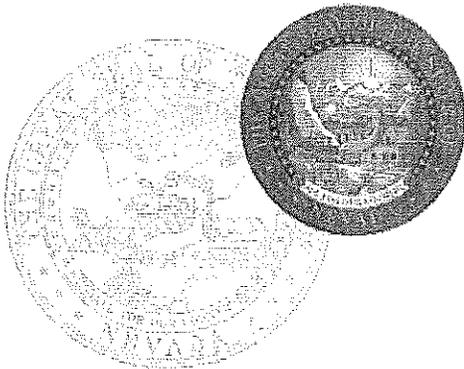
## NEVADA STATE BUSINESS LICENSE

**THE PUBLIC RESTROOM COMPANY**  
Nevada Business Identification # NV20021490814

**Expiration Date: December 31, 2017**

In accordance with Title 7 of Nevada Revised Statutes, pursuant to proper application duly filed and payment of appropriate prescribed fees, the above named is hereby granted a Nevada State Business License for business activities conducted within the State of Nevada.

Valid until the expiration date listed unless suspended, revoked or cancelled in accordance with the provisions in Nevada Revised Statutes. License is not transferable and is not in lieu of any local business license, permit or registration.



IN WITNESS WHEREOF, I have hereunto set my hand and affixed the Great Seal of State, at my office on December 5, 2016

*Barbara K. Cegavske*

BARBARA K. CEGAVSKE  
Secretary of State

***You may verify this license at [www.nvsos.gov](http://www.nvsos.gov) under the Nevada Business Search.***

**License must be cancelled on or before its expiration date if business activity ceases. Failure to do so will result in late fees or penalties which by law cannot be waived.**

**BID NUMBER ITB PW 17-096**

The City of Long Beach is committed to provide maximum opportunities for Disadvantaged, Minority, Women and Long Beach Business Enterprises (DBEs, MBEs, WBEs and Local) to compete successfully in supplying our needs for products and services.

**The following information is submitted regarding the Bidder:**

Legal Form of Bidder:  
Corporation  State of \_\_\_\_\_  
Partnership  State of \_\_\_\_\_  
                    General  Limited   
Joint Venture   
Individual  DBA \_\_\_\_\_  
Limited Liability Company  State of \_\_\_\_\_

Composition of Ownership (more than 51% of ownership of the organization): **OPTIONAL**  
Ethnic (Check one):  
 Black  Asian  Other Non-white  
 Hispanic  American Indian  Caucasian  
Non-ethnic Factors of Ownership (check all that apply):  
 Male  Yes - Physically Challenged  Under 65  
 Female  No - Physically Challenged  Over 65  
Is the firm certified as a Disadvantaged Business:  Yes  No  
Has firm previously been certified as a minority-owned and/or woman-owned business enterprise by any other agency?  
 Yes  No  
Name of certifying agency: \_\_\_\_\_

**INSTRUCTIONS CONCERNING SIGNATURES**

Please use the proper notary form, which applies to your type of organization on all Bid documents, attachments and bonds requiring a signature by officers of your company.

**NOTE: FAILURE TO COMPLY MAY RESULT IN DISQUALIFICATION OF YOUR BID.**

**INDIVIDUAL (Doing Business As)**

- a. The only acceptable signature is the owner of the company. (Only one signature is required.)
- b. The owner's signature must be notarized if the company is located outside of the state of California.

**PARTNERSHIP**

- a. The only acceptable signature(s) is/are that of the general partner or partners.
- b. Signature(s) must be notarized if the partnership is located outside of the state of California.

**CORPORATION**

- a. Two (2) officers of the corporation must sign.
- b. Each signature must be notarized if the corporation is located outside of the state of California.

**OR**

- a. The signature of one officer or the signature of person other than an officer is acceptable if the Bid is accompanied by a certified corporate resolution granting authority to said person to execute contracts on behalf of the corporation.
- b. Signature(s) must be notarized if the corporation is located outside of the state of California.

**LIMITED LIABILITY COMPANY**

- a. The signature on the Bid must be a member or, if the Articles provide for a manager, must be the manager. (Only one signature is required.)
- b. Signature must be notarized if the company is located outside of the state of California.

**THIS INFORMATION IS AVAILABLE IN AN ALTERNATIVE FORMAT BY CONTACTING 562-570-6200.**

### ACKNOWLEDGMENT

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

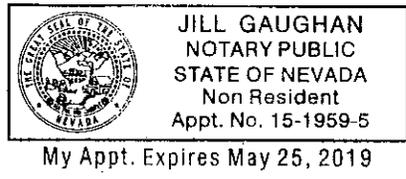
~~State of California~~ State of Nevada  
County of Douglas )

On July 6<sup>th</sup>, 2017 before me, Jill Gaughan, Notary Public  
(insert name and title of the officer)

personally appeared Charles E. Kaufman, President,  
who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are  
subscribed to the within instrument and acknowledged to me that he/she/they executed the same  
in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the  
person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of ~~California~~ Nevada that the foregoing paragraph is true and correct. CU

WITNESS my hand and official seal.  
Signature JM Gaughan (Seal)



#### OPTIONAL

Though the data below is not required by law, it may prove valuable to persons relying on the document and could prevent fraudulent reattachment of this form.

#### CAPACITY CLAIMED BY SIGNER

- INDIVIDUAL
- CORPORATE OFFICER CU  
President Secretary  
TITLE(S)
- PARTNER(S)       LIMITED  
                                   GENERAL
- ATTORNEY-IN-FACT
- TRUSTEE(S)
- GUARDIAN/CONSERVATOR
- OTHER:

#### DESCRIPTION OF ATTACHED DOCUMENT

Bid Number ITB PW 17-096  
TITLE OR TYPE OF DOCUMENT

NUMBER OF PAGES

07 / 06 / 2017  
DATE OF DOCUMENT

**SIGNER IS REPRESENTING:**  
NAME OF PERSON(S) OR ENTITY(IES):  
The Public Restroom Company

SIGNER(S) OTHER THAN NAMED ABOVE

**INSTRUCTIONS TO BIDDERS**

**1. PREPARATION OF BID:**

The preparation of the Bid, including visits to the Site prior to submittal of the Bid, shall be at the expense of Bidder. All prices and notations must be typewritten or written in ink. Any markings in pencil shall not form part of the Bid and shall be disregarded by the City. Any changes or corrections in the Bid must be initialed in ink by the person signing the Bid. Bidder shall state brand name or make of each item bid. If not bidding on item as described, the manufacturer's name and catalog number of the substitute must be given. Bidder shall also attach specifications and furnish other data to establish the suitability of the substitute. Bidder shall quote separately on each item. Bidder shall quote his lowest price and best delivery date as no changes are permitted after the bid opening. Cash discounts offered for payment within fourteen (14) days or less will not be considered when evaluating bids. No telephonic, telegraphic or fax Bids are acceptable.

**NOTE: ALL PAGES OF THE INVITATION TO BID MUST BE RETURNED.**

**2. EXAMINATION OF BID:**

Bidder is responsible for examining the Invitation to Bid and submitting its Bid complete and in conformance with these instructions.

**3. CONDITIONS OF WORK:**

Bidder shall carefully examine the Site to become fully informed regarding all existing and expected conditions and matters, which could affect performance, cost or time of the Work.

**4. DISCREPANCIES IN BID DOCUMENTS:**

If Bidder finds discrepancies in or omissions from the Invitation to Bid, if the intent of the Invitation is not clear, or if provisions of the Specifications restrict Bidder from bidding, he may request in writing that the deficiency(s) be modified. Such request must be received by the City Purchasing Agent at least five (5) working days before bid opening date. Bidders will be notified by Addendum of any approved changes in the Invitation to Bid.

**5. ORAL STATEMENTS:**

The City of Long Beach shall not be bound by oral statements made by any employee or agent concerning this Invitation to Bid. If Bidder requires specific information, Bidder must request it in writing and obtain a reply in writing from the City.

**6. BRAND NAMES AND SPECIFICATIONS:**

The detailed specifications and/or brand names stated are descriptive only and indicate quality, design and construction of items required. **Offers will be considered to supply articles substantially the same as those described herein but with minor variations. Bidders must describe variations in the Bid.** Substitute items must be equal in quality, utility and performance. **The phrase "or approved equal" throughout the specifications means that the City in its sole and absolute discretion shall make the final determination whether or not the substitute items are equal.**

**7. AWARD:**

Bid shall be subject to acceptance by the City for a period of three (3) months unless a lesser period is prescribed in the quotation by Bidder. The City reserves the right to award all items to one Bidder, or to award separate items or groups of items to various Bidders, or to increase or decrease the quantities of any item. Bidder may submit alternate prices or name a lump sum or discount conditional on two or more items being awarded to him.

The City's purchases of goods and services are based on the City's actual needs and requirements. The City is obligated under this contract/purchase order to purchase and pay for only those goods and services that the City needs and requires, and that the City actually orders and receives. Any dollar amount identified as a "not to exceed" amount in any City document is not a guaranteed payment amount to any contractor or service provider. Furthermore, the City may determine that its needs and requirements may be met by City labor or by a second contractor or service provider, even after an award is made to one contractor or service provider. An award is not a promise or guarantee of exclusivity.

Bidders are cautioned that comments and statements, whether oral or written, made by City employees regarding the validity of Bids, the waiver of deviations from Specifications, the possibility or probability of an award being made to a particular Bidder, and other similar matters are NOT binding on the City. Bidders should not order materials, obtain financing or take other actions based on such comments and statements. Only authorization of a Contract by the City Council or issuance of a Purchase Order is conclusive and binding on the City with respect to this Bid and its resulting Contract or Purchase Order. However, prior to authorization by the City Council or issuance of the Purchase Order, Bidders may rely on: (1) approval of an "equal" or "substitute" item which will be issued in writing, and (2) written notice of intent to award by the City Council, which is often issued prior to the authorization by the City Council so that a Bidder can order materials that have a long lead time.

**8. PAYMENT:**

Payment terms are NET/30 unless Bidder otherwise quotes. All Cash Discounts shall be taken and computed from the date of delivery or completion and acceptance of the material, or from date of receipt of invoice, whichever occurs last. Invoices must be submitted as specified at the time of shipping authorization. Partial payments may be made by the City on delivery & acceptance of goods and on receipt of goods and on receipt of Contractor's invoice.

In the event the Contract to be awarded hereunder, including specifications and other documents incorporated therein by reference, provides for the withholding of moneys by the City to ensure performance of such Contract, Contractor may deposit with the City, as a substitute for said withheld moneys, securities listed in Section 16430 of the California Government Code or bank or savings and loan certificates of deposit, or both, equivalent to the amount withheld, provided Contractor requests permission to make such substitution and bears all expenses in connection therewith.

**9. SAFETY APPROVAL:**

Where required by City Regulations, any items delivered must carry Underwriters Laboratories Approval or City of Long Beach City Safety Officer approval. Failure to so comply will be cause to reject Bid. Also, any equipment must conform with the Safety Orders of the California Division of Industrial Safety and OSHA regulations.

**10. BUSINESS LICENSE:**

The Long Beach Municipal Code (LBMC) requires all businesses operating in the City of Long Beach to pay a business license tax. In some cases the City may require a regulatory permit and/or evidence of a State or Federal license. Prior to issuing a business license, certain business types will require the business license application and/or business location to be reviewed by the Development Services, Fire, Health, and/or Police Departments. For more information, go to [www.longbeach.gov/finance/business\\_license](http://www.longbeach.gov/finance/business_license).

**INSTRUCTIONS TO BIDDERS**

**11. PUBLIC WORK AND PREVAILING WAGES:**

The Contractor to whom the contract is awarded, along with its subcontractors, shall pay not less than the general prevailing rate of per diem, holiday and overtime wages established by the Department of Industrial Relations (DIR) of the State of California for the locality in which the public work is to be performed for each craft, classification or type of worker needed to execute the contract. Refer to the California DIR's website, <http://www.dir.ca.gov/dlsr> for such prevailing wages and additional information.

Ethnic Factors of Ownership: (more than 51%)  
Black ( ) American Indian ( )  
Hispanic ( ) Other Non-white ( )  
Asian ( ) Caucasian ( )

Certified by: \_\_\_\_\_  
Valid thru: \_\_\_\_\_  
Dollar value of participation: \$ \_\_\_\_\_

The Director of Public Works of the City by and on behalf of the City Council has obtained from the Director of the Department of Industrial Relations of the State of California the general prevailing rate of per diem wages and the general prevailing rate of holiday and overtime work in the locality in which the public work is to be performed for each craft, classifications or type of workers needed to execute the Contract, and the same is on file with the City Engineer, 9<sup>th</sup> floor, City Hall, 333 W. Ocean Boulevard, Long Beach, California 90802. It shall be mandatory upon the Contractor to whom the Contract is awarded, and his Subcontractors to pay not less than the said prevailing rate of wages to all workers employed by Contractor or said Subcontractors in the execution of the Contract.

**16. BID SUBMITTAL AND WITHDRAWAL OF BIDS:**

Each Bid must be delivered to the location and received on or before the due date and time stated herein. Bids will not be accepted after the date and time stated herein. Bids may be withdrawn without prejudice providing the written request is received by the City Clerk no later than the time set for opening Bids. Withdrawals will be returned to Bidder unopened.

SUBMIT TO:  
CITY OF LONG BEACH  
CITY CLERK – ATTN: KARLA LOPEZ  
333 W OCEAN BLVD/PLAZA LEVEL  
LONG BEACH CA 90802

**12. RIGHT TO REJECT:**

The City reserves the right to reject at any time any or all Bids, or parts thereof, and to waive any variances, technicalities and informalities which do not impair the quality, utility, durability or performance of the items.

**BID DUE DATE: JULY 6, 2017**  
**TIME: 11:00 am**

IF BIDDER HAS ANY QUESTIONS REGARDING THIS INVITATION TO BID PLEASE CONTACT THE FOLLOWING CITY PERSONNEL.

**13. SAMPLES:**

Samples of items when requested or required must be furnished to the City free of expense to the City and, if not destroyed by tests, will upon request be returned at Bidder's expense.

Karla Lopez (562) 570-7082  
BUYER I TELEPHONE NUMBER

**14. PRICES:**

Prices shall be in accordance with those extended to other governmental agencies. In case of error in extension of prices, unit price will govern. All prices must be firm for the Contract term unless the City specifically provides for adjustment.

**17. BID OPENING PROCEDURES:**

All bids are publicly opened and will be posted on the City's online system at the date and time noted on the Invitation to Bid.

Bid results are posted on the City's online system as soon as they have been reviewed for responsiveness. Bids are awarded to the lowest responsible and responsive bidder meeting the City's specifications. Bid results will not be given out via telephone, City email, or facsimile.

**15. CITY'S POLICY FOR MINORITY AND WOMEN-OWNED BUSINESSES:**

The City of Long Beach is committed to providing maximum opportunities for Disadvantaged, Minority, Women and Long Beach Business Enterprises (DBEs, MBEs, WBEs and Local) to compete successfully in supplying our needs for products and services.

CAUTION: Only the City Council has authority to make an award, and a contract is not in effect until the City Council makes an award and contract documents (including insurance and bonds) are signed, submitted and approved.

Bid protest procedures may be obtained from the Buyer. Protests must be submitted within five (5) business days following the electronic notification of intent to award.

**SUBCONTRACTORS**

To assist the City in maintaining records of its Minority and Women Outreach Program, Bidder is requested to provide the following information. Answers are optional, and failure to answer will not disqualify Bid. If additional space is required, Bidder shall attach a separate sheet.

**18. INTER-AGENCY PARTICIPATION:**

IF OTHER AGENCIES EXPRESS AN INTEREST IN PARTICIPATING IN THIS BID, WOULD YOU SUPPLY THE SAME ITEMS.

YES \_\_\_\_\_ NO \_\_\_\_\_

(If yes, any agency electing to participate in this Bid will order its own requirements without regard to the City of Long Beach. The City of Long Beach assumes no liability or payment guarantee on any units sold to participating agencies.)

Company Name: \_\_\_\_\_

Address: \_\_\_\_\_

Commodity/Service Provided: \_\_\_\_\_

Circle appropriate designation: MBE WBE

**INSTRUCTIONS TO BIDDERS**

**19. AMERICANS WITH DISABILITIES ACT:**

Contractor shall have and be allocated the sole responsibility to comply with the Americans with Disabilities Act of 1990 ("ADA") with respect to performance hereunder and contractor shall defend, indemnify and hold the City, its officials and employees harmless from and against any and all claims of failure to comply with or violation of the ADA as said claim relates to this Contract.

**20. EQUAL BENEFITS ORDINANCE:**

Bidders/Proposers are advised that any contract awarded pursuant to this procurement process shall be subject to the applicable provisions of Long Beach Municipal Code section 2.73 et seq., the Equal Benefits Ordinance. Bidders shall refer to Attachment/Appendix for further information regarding the requirements of the Ordinance.

All Bidders/Proposers shall complete and return, with their bid/proposal, the Equal Benefits Ordinance Compliance form contained in the Attachment/Appendix. Unless otherwise specified in this procurement package, Bidders/Proposers do not need to submit supporting documentation verifying with their bids/proposals. However, supporting documentation verifying that the benefits are provided equally shall be required if the Bidder/Proposer that is selected for award of a contract.

**CONTRACT – GENERAL CONDITIONS**

1. Acceptance of the offer contained in this Contract is expressly limited to the terms and conditions of such offer as herein stated.
2. No charges for taxes, transportation, boxing, packaging, crating or returnable containers will be allowed and paid by the City unless separately stated hereon. All sales, use, excise or similar taxes to be paid by the City must be itemized separately hereon and on invoices. The City is exempt from payment of Federal Excise Tax under Certificate No. 95-73 0502K and none shall be charged to the City.
3. The City's obligation to pay the sum herein stated for any one fiscal year shall be contingent upon the City Council of the City appropriating the necessary funds for such payment by the City in each fiscal year during the term of this Contract. For the purposes of this section a fiscal year commences on October 1 of the year and continues through September 30 of the following year. In the event that the City Council of the City fails to appropriate the necessary funds for any fiscal year, then, and in that event, the Contract will terminate at no additional cost or obligation to the City.
4. Contractor shall deliver the materials, equipment, supplies or services, or cause the work to be performed, within the time and in the manner specified in the Contract. Times and dates stated herein are of the essence. If at any time Contractor has reason to believe that deliveries will not be made as scheduled, written notice setting forth the cause of the anticipated delay shall be given immediately to the City. Deliveries must be prepaid. C.O.D. shipments will not be accepted.
5. The City reserves the right at any time to make changes in drawings and specifications, in methods of shipment and packaging and in place of delivery as to any articles covered by this Contract. In such event there will be made an equitable adjustment in price and time of performance mutually satisfactory to Contractor and the City; but any claim by Contractor for such an adjustment must be made within thirty (30) days of such change.
6. Contractor warrants that the goods, machinery or equipment delivered or the work performed hereunder shall conform to the specifications, drawings, samples or other description specified by the City and shall be fit and sufficient for the purpose intended, merchantable, of good material and workmanship, in good working order and free from defect or faulty workmanship for a period of ninety (90) days. When defective goods, machinery, or equipment or faulty workmanship is discovered which requires repair or replacement pursuant to this warranty, Contractor shall provide all labor, materials, parts and equipment to correct such defect at no expense to the City.
7. Contractor shall indemnify, protect and hold harmless City, its Boards, Commissions, and their officials, employees and agents ("Indemnified Parties"), from and against any and all liability, claims, demands, damage, loss, obligations, causes of action, proceedings, awards, fines, judgments, penalties, costs and expenses, including attorneys' fees, court costs, expert and witness fees, and other costs and fees of litigation, arising or alleged to have arisen, in whole or in part, out of or in connection with (1) Contractor's breach or failure to comply with any of its obligations contained in this Contract, including any obligations arising from the Contractor's compliance with or failure to comply with applicable laws, including all applicable federal and state labor requirements including, without limitation, the requirements of California Labor Code section 1770 et seq. or (2) negligent or willful acts, errors, omissions or misrepresentations committed by Contractor, its officers, employees, agents, subcontractors, or anyone under Contractor's control, in the performance of work or services under this Contract (collectively "Claims" or individually "Claim").  
  
In addition to Contractor's duty to indemnify, Contractor shall have a separate and wholly independent duty to defend Indemnified Parties at Contractor's expense by legal counsel approved by City, from and against all Claims, and shall continue this defense until the Claims are resolved, whether by settlement, judgment or otherwise. No finding or judgment of negligence, fault, breach, or the like on the part of Contractor shall be required for the duty to defend to arise. City shall notify Contractor of any Claim, shall tender the defense of the Claim to Contractor, and shall assist Contractor, as may be reasonably requested, in the defense.  
  
If a court of competent jurisdiction determines that a Claim was caused by the sole negligence or willful misconduct of Indemnified Parties, Contractor's costs of defense and indemnity shall be (1) reimbursed in full if the court determines sole negligence by the Indemnified Parties, or (2) reduced by the percentage of willful misconduct attributed by the court to the Indemnified Parties.  
  
If the Contractor elects to use subcontractors, Contractor agrees to require its subcontractors to indemnify Indemnified Parties and to provide insurance coverage to the same extent as Contractor. The provisions of this Section shall survive the expiration or termination of this Contract.
8. The City reserves the right to terminate this Contract at any time in whole or in part even though Contractor is not in default hereunder. In such event there will be made an equitable adjustment of the terms that is mutually satisfactory to the City and Contractor. Upon receipt of any notice of such termination, Contractor shall, unless such notice otherwise directs, immediately discontinue all work on the Contract and deliver, if and as directed, to the City all completed and partially completed articles, work in process and materials purchased or acquired for performance of the Contract. The provisions of this section shall not limit or affect the right of the City to terminate this Contract immediately upon written notice of breach.

**CONTRACT – GENERAL CONDITIONS**

9. The City reserves the right to cancel this Contract or any part thereof and reject delivery of goods if delivery is not undertaken and completed when specified and in accordance with specifications. Contractor shall be charged for any direct losses, but not any consequential damages, sustained by the City by reason of such delay or failure, excepting losses caused by a delay for reasons beyond Contractor's reasonable control. Direct losses shall include any costs to the city in excess of the Contract price of obtaining goods from other sources similar to those cancelled or rejected hereunder.
10. The City shall pay to Contractor the price(s) specified in the Contract on delivery of the materials, equipment, supplies or services and acceptance thereof by the City Manager or his designee, or upon completion of the work to be performed and accepted thereof, as specified in the Contract. Defective articles or articles not in accordance with the City's specifications shall be held for Contractor's instructions at Contractor's risk, and if Contractor so directs will be returned at Contractor's expense.
11. No return or exchange of material, equipment or supplies shall be permitted without written approval of the City Purchasing Agent.
12. All royalties for patents, or changes for the use of patents, which may be involved in any article to be furnished under this Contract shall be included in the Contract price.
13. In cases where a price subject to escalation has been agreed upon, the price escalation shall be shown as a separate item on the invoice. Unless an escalator clause has been shown as a specific part of this Contract Contractor shall not be entitled to reimbursement for costs incurred due to escalation.
14. All materials, supplies and equipment provided under this Contract shall be in full compliance with the Safety Orders and Regulations of the Division of Industrial Safety of the State of California, Title 8, California Code of Regulations (CAL/OSHA) and all applicable OSHA regulations as well as all other applicable California Code of Regulations. Contractor shall indemnify and hold the City, its officials, and employees harmless for, of and from any and all loss, including but not limited to fines, penalties and corrective measures, the City may sustain by reason of Contractor's failure to comply with said laws, rules and regulations in connection with the performance of this Contract.
15. Contractor shall keep confidential and not disclose to others or use in any way to the detriment of the City confidential business or technical information that the City may disclose in conjunction with this Contract or Contractor may learn as a result of performing this Contract.
16. This Contract shall not be assigned in whole or in part, nor any duties delegated without the City's prior written approval.
17. The remedies herein reserved shall be cumulative and additional to any other remedies at law or in equity. The waiver of any breach of this Contract shall not be held to be a waiver of any other or subsequent breach. The City's failure to object to provisions contained in any communication from Contractor shall not be deemed an acceptance of such provisions or a waiver of the provisions of this Contract.
18. This Contract shall not be amended or modified, except by written agreement signed by the parties and expressly referring to this Contract.
19. Contractor shall indemnify, hold harmless and defend the City, its officials and employees from any damage, claim, loss, cost, liability, cause of action or expense, including reasonable attorney's fees, whether or not reduced to judgment, arising from any infringement or claimed infringement of any patent, trademark or copyright, or misappropriation of confidential information or trade secrets of any third party and based on the manufacture, sale or use of goods, machinery or equipment supplied hereunder.
20. Contractor shall furnish further itemization and breakdown of the Contract price when requested by the City.
21. Contractor, in the performance of any work or the furnishing of any labor under this Contract, shall be considered as an independent contractor. Contractor, his agents and employees shall not be considered as employees of the City.
22. Contractor and subcontractor(s) shall not discriminate against any person in the performance of this Contract and shall comply with applicable federal, state and city equal employment opportunity laws, ordinances, rules and regulations. Contractor and subcontractor(s) shall not discriminate against any employee or applicant for employment or against any subcontractor on the basis of race, color, religion, national origin, sex, sexual orientation, AIDS, HIV status, age, disability, or handicap, subject to federal and state laws, rules and regulations.
23. Contractor shall comply with all applicable federal, state and local laws pertaining to the subject matter hereof.
24. Contractor shall submit samples of all documents that Contractor may require the City to execute to complete this transaction. By accepting these samples as part of the bid or by awarding the Contract to a Contractor who has submitted said samples, the City

**CONTRACT – GENERAL CONDITIONS**

does not agree to the terms stated in said samples. This Invitation to Bid and Contractor's bid shall take priority over said samples and this Invitation and Contractor's bid shall become the Contract between the City and the Contractor.

25. All quantities stated herein are only ESTIMATES. The City reserves the right to increase or decrease these estimated quantities based on its actual needs and funds available.
26. The City reserves the right to exercise, at its option, an increase in expenditures by ten (10) percent annually, but the City does not guarantee such an increase.
27. Contractor shall cooperate with the City in all matters relating to taxation and the collection of taxes, particularly with respect to the self-accrual of use tax. Contractor shall cooperate as follows: (i) for all leases and purchases of materials, equipment, supplies or other tangible personal property totaling over \$100,000 shipped from outside California, a qualified Contractor shall complete and submit to the appropriate governmental entity the form in Appendix "A" attached hereto; and (ii) for construction contracts and subcontracts totaling \$5,000,000 or more, Contractor shall obtain a sub-permit from the California Board of Equalization for the Work site. "Qualified" means that the Contractor purchased at least \$500,000 in tangible personal property that was subject to sales or use tax in the previous calendar year.

In completing the form and obtaining the permit(s), Contractor shall use the address of the Work site as its business address and may use any address for its mailing address. Copies of the form and permit(s) shall also be delivered to the Purchasing Agent. The form must be submitted and the permit(s) obtained as soon as Contractor receives a notice of award. Contractor shall not order any materials or equipment over \$100,000 from vendors outside California until the form is submitted and the permit(s) obtained and, if Contractor does so, it shall be a material breach of the Agreement. In addition, Contractor shall make all purchases from its Long Beach sales office and the Long Beach sales office of its vendors if those vendors have a Long Beach office and all purchases made by Contractor under this Agreement which are subject to use tax of \$500,000 or more shall be allocated to the City of Long Beach. Contractor shall require the same form and permit(s) from its subcontractors.

Contractor shall not be entitled to and by signing this Contract waives any claim or damages for delay against City if Contractor does not timely submit these forms to the appropriate governmental entity. Contractor may contact Julissa Jose-Murray at 562-570-6869 for assistance with the form.

28. The California Integrated Waste Management Act (Public Resources Code, Sec. 40000 et seq.) requires governmental entities to achieve fifty (50) percent diversion of waste. In conjunction with the City's Integrated Resources Bureau, the City is currently developing an Environmentally Preferable Product (EPP) procurement plan. These guidelines enable the City Purchasing Agent to greatly expand procurement programs by moving beyond a singular consideration of "recycled-content". EPP procurement facilitates the purchase of products that qualify within a broad range of "environmentally preferable" criteria, such as: minimal packaging; energy savings; non-toxic; manufactured from sustainably-harvested materials. Contractor shall monitor products that fall within the EPP guidelines and document all criteria that qualifies the product as an EPP. Documentation from the manufacturer will be acceptable and may be required during the term of the Contract.
29. **NOTICE TO BIDDERS REGARDING THE PUBLIC RECORDS ACT:**  
Responses to this Invitation to Bid become the exclusive property of the City of Long Beach. All Bids submitted in response to this Invitation to Bid are a matter of public record and shall be regarded as public records. Exceptions will be only those elements in each Bid that are defined by the Bidder as business or trade secrets and are marked as "Trade Secrets", "Confidential" or "Proprietary".

The City shall not be liable or responsible in any way for disclosure of any records not marked as "Trade Secrets", "Confidential" or "Proprietary". The City shall not be liable or responsible in any way for disclosure of any records so marked if disclosure is deemed to be required by law or by a court order.

30. **NOTE: FAILURE TO COMPLY WITH THESE ADDITIONAL CONDITIONS WILL DISQUALIFY A BIDDER. NOTICE OF INTENTION TO APPLY FOR WAIVER OF ALL OR A PORTION OF THESE INSURANCE REQUIREMENTS MUST BE IN COMPLIANCE WITH CITY OF LONG BEACH ADMINISTRATIVE REGULATION 8-27 (AR 8-27). NOTE THAT COMPLIANCE WITH THE CITY'S INDEMNIFICATION IS MANDATORY FOR A RESPONSIVE BIDDER.**

THE FOLLOWING ADDITIONAL CONDITIONS APPLY TO ALL BIDS:

**INSURANCE:** As a condition precedent to the effectiveness of this Contract, Contractor shall procure and maintain at its expense, until completion of performance and acceptance by City, from an insurer admitted (licensed) in the State of California with a current financial responsibility rating of A (Excellent) or better and a current financial size category (FSC) of V (capital surplus and conditional surplus funds of greater than \$10 million) or greater rating as reported by A.M. Best Company or equivalent, unless waived in writing by City's Risk Manager, or non-admitted in the State of California with a current financial responsibility rating of A (Excellent) or better

**CONTRACT – GENERAL CONDITIONS**

and a current financial size category (FSC) of VIII (capital surplus and conditional surplus funds of greater than \$100 million) or greater rating as reported by A.M. Best Company or equivalent, unless waived in writing by City's Risk Manager.

- (a) Commercial general liability insurance or self-insurance equivalent in coverage scope to ISO CG 00 01 10 93 naming **the City of Long Beach, and its boards, officials, employees, and agents** as additional insureds on a form equivalent in coverage scope to ISO CG 20 10 11 85 from and against claims, demands, causes of action, expenses, costs, or liability for injury to or death of persons, or damage to or loss of property arising out activities performed by or on behalf of the Contractor in an amount not less than Two Million Dollars (US \$2,000,000) per occurrence and Two Million Dollars (US \$2,000,000) in general aggregate.
- (b) Workers' compensation coverage as required by the Labor Code of the State of California and Employer's liability insurance with minimum limits of One Million Dollars (US \$1,000,000) per accident or occupational illness. The policy shall be endorsed with a waiver of the insurer's right of subrogation against **the City of Long Beach, and its boards, officials, employees, and agents**.
- (c) Automobile liability insurance equivalent in coverage scope to ISO CA 00 01 06 92 in an amount not less than Five Hundred Thousand Dollars (US \$500,000) combined single limit (CSL) per accident for bodily injury and property damage covering Symbol 1 ("all autos").

Any self-insurance program or self-insurance retention must be approved separately in writing by the City's Risk Manager or designate and shall protect the **City of Long Beach, and its boards, officials, employees, and agents** in the same manner and to the same extent as they would have been protected had the policy or policies not contained retention provisions. Each insurance policy shall be endorsed to state that coverage shall not be suspended, voided, or canceled by either party except after thirty (30) days prior written notice to the City of Long Beach, and shall be primary and not contributing to any other insurance or self-insurance maintained by the City of Long Beach.

**Any subcontractors of all tiers which Contractor may use in the performance of this Contract shall be required to maintain insurance in compliance with the provisions of this section. The additional insured endorsement form number applicable to subcontractors with respect to the general liability insurance shall be the ISO CG 20 26 11 85 form or its equivalent.**

Contractor shall deliver to the City of Long Beach certificates of insurance and original endorsements for approval as to sufficiency and form prior to the start of performance hereunder. The certificates and endorsements for each insurance policy shall contain the original signature of a person authorized by that insurer to bind coverage on its behalf. "Claims-made" policies are not acceptable unless the City's Risk Manager determines that "Occurrence" policies are not available in the market for the risk being insured. In a "Claims-made" policy is accepted, it must provide for an extended reporting period of not less than one hundred eighty (180) days. Such insurance as required herein shall not be deemed to limit Contractor's liability relating to performance under this Contract. The City of Long Beach reserves the right to require complete certified copies of all said policies at any time. Any modification or waiver of the insurance requirements herein shall be made only with the approval of the City's Risk Manager. The procuring of insurance shall not be construed as a limitation on liability or as full performance of the indemnification provisions of this Contract.

To the extent more stringent insurance requirements apply in accordance with the City of Long Beach's Administrative Regulation 8-27 (AR 8-27) and its amendments, the currently in-force AR 8-27 regulations and requirements supersede and replace any insurance requirements stated herein.

**INDEMNITY: To the extent allowed by law**, Contractor shall defend, indemnify, and hold harmless the City, its Commissions and Boards, and their officials, employees, and agents from and against any and all demands, claims, causes of action, liability, loss, liens, damage, costs, and expenses (including attorney's fees) arising from or in any way connected or alleged to be connected with Contractor's performance of the performance under the Contract or the work under or related to the Contract and from any act or omission, willful misconduct, or negligence (active or passive) by or alleged to be by Contractor, its employees, agents, or subcontractors either as a sole or contributory cause, sustained by any person or entity (including employees or representatives of City or Contractor). The foregoing shall not apply to claims or causes of action caused by the sole negligence or willful misconduct of the City, its Commissions and Boards, or their officials, employees, or agents.

In addition to Contractor's duty to indemnify, Contractor shall have a separate and wholly independent duty to defend Indemnified Parties at Contractor's expense by legal counsel approved by City, from and against all Claims, and shall continue this defense until the Claims are resolved, whether by settlement, judgment or otherwise. No finding or judgment of negligence, fault, breach, or the like on the part of Contractor shall be required for the duty to defend to arise. City shall notify Contractor of any Claim, shall tender the defense of the Claim to Contractor, and shall assist Contractor, as may be reasonably requested, in the defense.

If a court of competent jurisdiction determines that a Claim was caused by the sole negligence or willful misconduct of Indemnified Parties, Contractor's costs of defense and indemnity shall be (1) reimbursed in full if the court determines sole negligence by the Indemnified Parties, or (2) reduced by the percentage of willful misconduct attributed by the court to the Indemnified Parties. The provisions of this Section shall survive the expiration or termination of this contract.

**CONTRACT – GENERAL CONDITIONS**

THE FOLLOWING ADDITIONAL CONDITIONS APPLY ONLY IN CASES WHERE CONTRACTOR IS TO PERFORM WORK FOR THE CITY OR ON CITY PROPERTY:

Before execution of a Contract, the bidder shall file two surety bonds with the City of Long Beach subject to the approval of the City Engineer and City Attorney. The bonds shall be on forms provided by the City or acceptable to the City Attorney. The Payment Bond (Material and Labor Bond) shall satisfy claims of material suppliers and mechanics and laborers employed by the contractor on the Work. This bond shall be maintained by the contractor in full force and effect until the work is accepted by the City of Long Beach and until all claims for materials and labor are paid, and shall otherwise comply with the Civil Code. The Performance Bond shall guarantee faithful performance of all work within the time and manner prescribed, free from original or developed defects. This bond shall remain in effect as prescribed within the Contract, until the end of all warranty periods.

If at any time during the progress of the Work, Contractor shall allow any indebtedness to accrue for labor, equipment or materials, or which may become a claim against the City, Contractor shall immediately upon request from the City pay such claim or indebtedness or cause such lien to be dissolved and discharged by giving a bond or otherwise and, in case of his failure so to do, the City may withhold any money due Contractor until such claim or indebtedness is paid or may apply such money toward the discharge thereof; or in such event the City may, at its option, declare this Contract to be terminated, take possession and control of the Work, and complete the same or cause the same to be completed according to the specifications. Contractor shall pay to the City the difference between the Contract price and the actual cost to the City in completing or causing the Work to be completed.

Contractor shall carry on the Work at its own risk until the same is fully completed and accepted and shall, in case of any accident, destruction or injury to the Work or materials before its final completion and acceptance, repair or replace the Work or materials so injured, damaged and destroyed, at his own expense and to the satisfaction of the City. When materials and equipment are furnished by others for installation or erection by Contractor, Contractor shall receive, unload, store and handle same at the Site and become responsible therefore as though such materials and equipment were being furnished by Contractor under the Contract.

Contractor shall list the name and location of the place of business of each Subcontractor who will perform work, labor or services for Contractor, or who specially fabricates and installs a portion of the Work or improvement in an amount in excess of one-half of one percent of Contractor's total contract cost. The Subcontractor list shall be submitted with Contractor's Bid.

**SPECIFICATIONS**

**PROJECT OVERVIEW**

Furnish, Deliver, and Install a total of one (1), with the option of one additional for a total of two (2) Prefabricated Lifeguard Station Buildings to the City of Long Beach and cooperatively work with site general contractor at the following locations:

- Building 1:  
One (1) at Bayshore Lifeguard Station, 5415 E. Ocean Blvd., Long Beach, CA 90803.
- Building 2 (Optional):  
One (1) at 5374 E. Ocean Blvd., Long Beach, CA 90803.

**BID TIMELINE** – All times are Pacific Time

Bid release date:	June 8, 2017
Questions due:	June 14, 2017 by 11:00 am
Response from City to bidder:	June 21, 2017 by 4:00 pm
Bid due date:	July 6, 2017 by 11:00 am

**BID SUBMISSION INSTRUCTIONS:**

It is recommended that bidders visit the City's website [www.longbeach.gov/purchasing](http://www.longbeach.gov/purchasing) on a regular basis for any addenda to the bid.

The following documents shall be submitted as general attachments. Bidders that do not include these items will be deemed non-responsive and their bids will be rejected.

- \_\_\_\_\_ Signed Bid Cover Page
- \_\_\_\_\_ California All Purpose Acknowledgment, Notarized (if applicable)
- \_\_\_\_\_ Debarment Certification Form (Attachment A)
- \_\_\_\_\_ Reference List (Attachment B)
- \_\_\_\_\_ W-9 Form (Attachment C)
- \_\_\_\_\_ Equal Benefits Ordinance (EBO) (Attachment D)
- \_\_\_\_\_ Insurance Requirement (Attachment E)
- \_\_\_\_\_ Secretary of State Certification Print-Out (Attachment F)

**METHOD OF SUBMISSION:**

Electronic Bids shall be submitted via the City's secure online bidding system. All required sections of the Bid must be submitted via the website. Bidder is solely responsible for "on time" submission of their electronic bid. The Bid Management System will not accept late bids and no exceptions shall be made. Bidders will receive an e-bid confirmation number with a time stamp from the Bid Management System indicating that their bid was submitted successfully. The City will only receive those bids that were transmitted successfully.

When bids on certain items are labeled "optional", bidders shall indicate "no bid" or "N/A" in the space provided for an item for which no bid is being offered.

**SPECIFICATIONS**

Bid cover page shall be signed in ink and included with the electronic bid submission as a general attachment. Digital and stamped signatures shall not be accepted.

Pricing shall be submitted electronically on the Line Items tab and all pages of the bid document shall be uploaded as a general attachment.

Submit bid online at: <http://www.planetbids.com/portal/portal.cfm?CompanyID=15810>

**In addition to the electronic submission, bidders shall submit the following original document(s) with wet signature(s) in a sealed envelope to the address shown below:**

1. Original bid cover page
2. A notarized California All-Purpose Acknowledgement Form (for all companies located outside the State of California)

City of Long Beach  
C/O City Clerk  
Attn: Karla Lopez  
333 West Ocean Boulevard, Plaza Level  
Long Beach, CA 90802

Documents shall be clearly labeled in a sealed envelope or box as follows:

**ITB PW 17-096 BID PREFABRICATED LIFEGUARD STATION**

**Electronic Bids and required hard copy forms must be received by 11:00 AM Pacific Time, July 6, 2017. Bids and required hard copy forms that do not arrive by the specified date and time WILL NOT BE ACCEPTED. Bidders may submit their bid any time prior to the above stated deadline.**

Note: E-Bids are sealed and cannot be viewed by the City until the closing date and time. If you need to withdraw your bid, you may do so any time before the bid deadline, by going back into the system and selecting "withdraw".

All questions must be submitted in writing and emailed to [purchasingbids@longbeach.gov](mailto:purchasingbids@longbeach.gov) ATTN: Karla Lopez with the bid number in the subject line of the email message.

**REFERENCES**

Bidder shall furnish a list of five (5) current customers, including company name, street address, telephone number and contact person, for whom Bidder has provided similar items and quantities. The City intends to contact these customers to determine product reliability, performance and other information. Failure to include customer's references will result in rejection of bids. See Reference Information form attachment.

**SPECIFICATIONS**

**AWARD**

The City prefers to award to a single contractor but reserves the right to award contracts to multiple vendors. The City reserves the right in its sole discretion to award all items to one bidder, or to award separate items or groups of items to various bidders, or to increase or decrease the quantities of any item. The City reserves the right to reject at any time any or all bids.

**RIGHT TO REJECT BID**

The City reserves the right, in its discretion, to reject any and all Bids and, to the extent not prohibited by law, to waive any minor irregularity or informality in any Bid that does not affect the validity of the Bid or does not give the bidder a competitive advantage over other bidders.

**BID PROTEST PROCEDURES**

**Who May Protest**

Only a bidder who has actually submitted a bid proposal is eligible to protest a bid. The City will not accept or entertain bid protests from manufacturers, vendors, suppliers, subcontractors or the like. A bidder may not rely on the bid protest submitted by another bidder, but must timely pursue its own protest.

**Time for Protest**

A bidder desiring to protest a bid shall file the protest within five (5) business days of the electronic notification of intent to award. The City Purchasing Agent must receive the protest by the close of the business on the fifth (5<sup>th</sup>) business day following posting of notification of intent to award the contract.

**Form of Protest**

The protest must be in writing and signed by the individual who signed the bid or, if the bidder is a corporation, by an officer of the corporation, and addressed to the City Purchasing Agent. A protest shall not be made by e-mail or fax and the City will not accept such. A protest must set forth a complete and detailed statement of the grounds for the protest and include all relevant information to support the grounds stated, must refer to the specific portion(s) of the contract documents upon which the protest is based, and shall include a valid e-mail address, street address, and phone number sufficient to ensure the City's response will be received.

Once the protest is received by the City Purchasing Agent, the City will not accept additional information on the protest unless the City itself requests it. In that case, the additional information must be submitted within three (3) business days after the request is made and must be received by the City Purchasing Agent by the close of the business on the third (3<sup>rd</sup>) business day.

The City Purchasing Agent or designee will respond, by e-mail or regular mail to the addresses provided in the protest, with a decision regarding the protest within five (5) business days following receipt of the protest or, if applicable, the receipt of requested additional information.

The decision of the City Purchasing Agent shall be final and conclusive.

The procedure and time limits set forth herein are mandatory and are the bidder's sole and exclusive remedy in the event of bid protest. The bidder's failure to comply with these procedures shall constitute

**SPECIFICATIONS**

a waiver of any right to further pursue a bid protest, including filing a Government Code Claim or initiation of legal proceedings.

**ADDITIONAL REQUIREMENTS FROM FUNDING SOURCE**

Any Contract arising from this procurement process may be funded in whole or in part by various granting agencies. Pursuant to said grants, the Awarded Vendor is required to comply with (and to incorporate into its agreements with any sub-vendors) the following provisions in the performance of the Contract, as applicable.

**ORDER OF PRECEDENCE**

In the event of conflicts or discrepancies between these grant funding provisions and any other Contract document, the Federal grant provisions shall take precedence.

**ACCESS TO CONTRACTOR'S RECORDS**

The Awarded Vendor shall provide the City, the Office of State and Local Government Coordination and Preparedness, the Comptroller General of the United States, or any of their authorized representatives, access to any books, documents, papers, and records of the Awarded vendor which are directly pertinent to the work performed under the Contract for the purposes of making audit, examination, excerpts or transcriptions.

**AMERICANS WITH DISABILITIES ACT**

The Awarded Vendor hereby certifies that it will comply, as applicable, with the Americans with Disabilities Act of 1990 ("ADA"), 42 USC §§ 12101 et seq., and its implementing regulations, including Subtitle A, Title II of the ADA. The Awarded Vendor will provide, as applicable, reasonable accommodations to allow qualified individuals with disabilities to have access to and to participate in its programs, services and activities in accordance with the provisions of the ADA. The Awarded Vendor will not discriminate against persons with disabilities or against persons due to their relationship to or association with a person with a disability. Any contract entered into by the Awarded Vendor (or any subcontract thereof), relating to this Agreement, shall be subject to the provisions of this paragraph.

**COMPLIANCE WITH CONTRACT WORK HOURS AND SAFETY STANDARDS ACT**

The Awarded Vendor shall comply with the requirements of §§ 103 and 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C §§ 327-330) as supplemented by Department of Labor regulations (29 CFR Part 5).

**COMPLIANCE WITH COPELAND "ANTI-KICKBACK" ACT**

The Awarded Vendor shall comply with the requirements of the Copeland "Anti-Kickback" Act (18 U.S.C. § 874) as supplemented in the Department of Labor regulations (29 CFR Part 3).

**COMPLIANCE WITH DAVIS-BACON ACT**

The Awarded Vendor shall comply with the requirements of the Davis-Bacon ACT (40 U.S.C. §§ 276 to 276-a7) as supplemented by Department of Labor regulations (29 CFR Part 5) where applicable and shall provide the City with all applicable payroll records on a weekly basis.

**COPYRIGHT**

The Awarded Vendor acknowledges the existence of requirements and regulations of the awarding Federal agency relating to copyrights and right in data, including, but not limited to those set forth in 44

**SPECIFICATIONS**

CFR Part 13.34 which states: "The Federal awarding agency reserves royalty-free, nonexclusive, and irrevocable license to reproduce, publish or otherwise use, and to authorize others to use, for Federal Government purposes: (a) The copyright in any work developed under a grant, subgrant, or contract under a grant or subgrant; and (b) Any rights of copyright to which a grantee, subgrantee or a contractor purchases ownership with grant support." The Awarded Vendor shall comply with 25 CFR 85.34

**DRUG-FREE WORKPLACE**

The Awarded Vendor hereby certifies that it shall provide or shall continue to provide a drug-free workplace as required by the Drug-Free Workplace Act of 1988 (41 U.S.C. § 701), and implemented at 44 CFR Part 17.

**ENERGY EFFICIENCY**

The Awarded Vendor shall comply with all mandatory standards and policies relating to energy efficiency that are contained in the State of California's energy conservation plan issued in compliance with the Energy Policy and Conservation Act (Pub. L.94-163, 89 Stat. 871).

**ENVIRONMENTAL LEGISLATION**

The Awarded Vendor shall comply with all applicable standards, orders or requirements issued under § 306 of the Clean Air Act (42 U.S.C. 1857 (h)), § 508 of the Clean Water Act (33 U.S.C. 1368), Executive Order 11738, and Environmental Protection Agency regulations (40 CFR Part 15).

**MINORITY, WOMEN, AND OTHER BUSINESS ENTERPRISE OUTREACH**

In accordance with CalOES/Grantor directives, as applicable, firms who represent small business enterprises (SBEs), minority business enterprises (MBEs) and women business enterprises (WBEs) are encouraged to participate in competition for this opportunity. Any such enterprise shall include the appropriate SBE/MBE/WBE certification along with its proposal. The Awarded Vendor agrees that, to the extent contractors or subcontractors are utilized, the Awarded Vendors shall use small, minority, women-owned, or disadvantaged business concerns and contractors or subcontractors to the extent practicable and shall take the affirmative steps as set forth in 44 CFR §13.36(e).

**NATIONAL PRESERVATION ACTS**

The Awarded Vendor shall assist City (if necessary) in assuring compliance with § 106 of the National Historic Preservation Act of 1966 (16 U.S.C. § 470), Executive Order 11593 (identification and protection of historic properties), the Archeological and Historical Preservation Act of 1974 (16 U.S.C. § 469 a-1 et seq.), and the National Environmental Policy Act of 1969 (42 U.S.C. § 4321)

**NONDISCRIMINATION; EQUAL EMPLOYMENT OPPORTUNITY**

The Awarded Vendor hereby assures the City that in performing its obligations pursuant to the Contract, it will comply with all applicable nondiscrimination requirements as set forth in 44 CFR Part 13.36. In addition, the Awarded Vendor shall comply with Executive Order 11246 of September 24, 1965, entitled "Equal Opportunity Employment," as amended by Executive Order 11375 of October 13, 1967, and as supplemented in Department of Labor regulations (41 CFR chapter 60), and where applicable to the nondiscrimination provisions of the Omnibus Crime Control and Safe Street Acts of 1968 (42 U.S.C. § 3789d), the Victims of Crimes Act (42 U.S.C. § 10604(e)), the Juvenile Justice and Delinquency Prevention Act (42 U.S.C. § 5672(b)), the Civil Rights Act of 1964 (42 U.S.C. § 2000d), the Rehabilitation Act of 1973 (29 U.S.C. § 794), the Americans with Disabilities Act of 1990 (42 U.S.C. §§ 12131-34), the Education Amendments of 1972 (20 U.S.C. §§ 1681, 1683, 1685-86), and the Age Discrimination Act of 1975 (42 U.S.C. §§ 6101-07), see Executive Order 13279 (equal protection of the

**SPECIFICATIONS**

laws for faith-based and community organizations). This provision must be incorporated by Awarded Vendor into any subcontract exceeding \$10,000.

**PATENT RIGHTS**

The Awarded Vendor acknowledges the existence of requirements and regulations of the awarding Federal agency relating to patent rights with respect to any discovery or invention which arises or is developed in the course or under this Contract, including, but not limited to those regulations and requirements set forth in 44 CFR Part 13.36. Any discovery or invention that arises during the course of this Contract shall be immediately reported to the Department's project management team. The awarding Federal agency shall determine how rights in the invention/discovery shall be allocated consistent with "Government Patent Policy" and 37 CFR Part 401.

**PAYMENTS, REPORTS, RECORDS, RETENTION AND ENFORCEMENT**

The Awarded Vendor acknowledges the requirements and regulations set forth in 44 CFR Parts 13.36 through 13.42 and 49 CFR Part 18 and agrees to cooperate with the City in order to allow the City to comply with said requirements. The Awarded Vendor shall retain all of its records relating to the project for a period of five (5) years after City makes final payment to the Awarded Vendor and all other pending matters are closed.

**PUBLICATIONS**

All publications created and/or published with funding under any contract arising from this RFP shall prominently contain the following statement: "This document was prepared under a grant from FEMA's Grant Programs Directorate, U.S. Department of Homeland Security. Points of view or opinions in this document are those of the author(s) and do not necessarily represent the official position or policies of FEMA's Grant Programs Directorate or the U.S. Department of Homeland Security."

**RIGHTS TO DATA**

The Grantor and the City shall have unlimited rights or copyright license to any data first produced or delivered under this Agreement. "Unlimited rights" means the right to use, disclose, reproduce, prepare derivative works, distribute copies to the public and perform and display publicly, or permit others to do so; as required by 48 CFR 27.401. Where the data are not first produced under this Contract or are published copyrighted data with the notice of 17 U.S.C § 401 or 402, the Grantor acquires the data under copyright license as set forth in 48 CFR 27.404(f) (2) instead of unlimited rights (4 CFR 27.404(a)).

**RIGHTS TO USE INVENTIONS**

City and all grantors and/or awarding Federal Agency shall have an unencumbered right, and a non-exclusive, irrevocable, royalty-free license, to use, manufacture, improve upon and all others to do so for all governmental purposes, any Invention developed under the Contract.

**SYSTEM FOR AWARD MANAGEMENT (SAM)**

In accordance with Executive Orders 12549 and 12689 concerning suspension and debarment, contracts must prohibit contractors from awarding any subcontract to persons (individuals or organizations) listed as having an active exclusion of the Federal system for Awards Management Database ([www.sam.gov](http://www.sam.gov)).

**REGISTRATION WITH CALIFORNIA SECRETARY OF STATE WEBSITE**

SPECIFICATIONS

Awarded vendors/contractors must be registered with the California Secretary of State prior to contract execution. For more information, please consult: <http://www.sos.ca.gov>

See Attachment F. Please include a printout of your business entity from the website.

INSURANCE

See Requirements on page 9, Section 30 and Attachment E.

FUTURE AMENDMENTS

The City reserves the right to change any portion of the work required, to add and/or delete items, or amend such other terms and conditions that may become necessary. Any such revisions shall be accomplished by written amendment to the contract and executed by the Contractor and the City.

DELIVERY REQUIREMENT

1. Building 1 Location: Bayshore Lifeguard Station, 5415 E. Ocean Blvd., Long Beach, CA 90803

(a) City of Long Beach requires delivery of engineered ~~and foundation plans~~ <sup>OK</sup> within 20 business days of receipt of purchase order (ARO) or Notice to Proceed (NTP). Please state the number of delivery days.

30 Business days

(b) City of Long Beach requires delivery of the completed prefabricated building within 90 business days after receipt of purchase order (ARO) or Notice to Proceed (NTP). Please state number of delivery days.

\* From State of California Housing and Community Development approved plans and calculations

90 Business days

2. Building 2 (Optional) Location: 5437 E. Ocean Blvd., Long Beach, CA 90803

(a) City of Long Beach requires delivery of engineered ~~and foundation plans~~ <sup>OK</sup> within 20 business days of receipt of purchase order (ARO) or Notice to Proceed (NTP). Please state the number of delivery days.

30 Business days

(b) City of Long Beach requires delivery of the completed prefabricated building within 90 business days after receipt of purchase order (ARO) or Notice to Proceed (NTP). Please state number of delivery days.

\* From State of California Housing and Community Development approved plans and calculations.

90 Business days

PAYMENT TERMS

Net Invoice ; 1/2 % discount in 10 days.

**BID SECTION**

The City of Long Beach will be purchasing One (1) Prefabricated Lifeguard Station Building and may add One (1) additional building.

**BUILDING 1:**

LOCATION: Bayshore Lifeguard Station, 5415 E. Ocean Blvd., Long Beach, CA 90803

Description	Unit	Quantity
Prefabricated Lifeguard Station	EA	1
Provide five (5) sets of full and complete plans for the building and the foundation for the City permit approval	EA	5
Delivery (no tax on delivery)	EA	1
Tax (9.75% LBC)	EA	1

**BUILDING 2 (Optional):**

LOCATION: 5374 E. Ocean Blvd., Long Beach, CA 90803

Description	Unit	Quantity
Prefabricated Lifeguard Station	EA	1
Provide five (5) sets of full and complete plans for the building and the foundation for the City permit approval	EA	5
Delivery (no tax on delivery)	EA	1
Tax (9.75% LBC)	EA	1

**COST TO BE INPUT ELECTRONICALLY**

**BAYSHORE LIFEGUARD STATION  
TABLE OF CONTENTS – CSI SPECIFICATIONS**

**\* INDICATES FOR REFERENCE ONLY**

**DIVISION 02 – EXISTING CONDITIONS**

02 4100     \*DEMOLITION

**DIVISION 03 – CONCRETE**

03 3000     CAST-IN-PLACE CONCRETE  
03 3523     EXPOSED AGGREGATE CONCRETE FINISHING

**DIVISION 04 – MASONRY**

04 2000     UNIT MASONRY

**DIVISION 05 – METALS**

05 5113     METAL PAN STAIRS  
05 5213     PIPE AND TUBE RAILINGS

**DIVISION 06 – WOOD, PLASTICS, AND COMPOSITES**

06 1000     ROUGH CARPENTRY  
06 2000     FINISH CARPENTRY  
06 4100     ARCHITECTURAL WOOD CASEWORK

**DIVISION 07 – THERMAL AND MOISTURE PROTECTION**

07 1400     FLUID-APPLIED WATERPROOFING  
07 2100     THERMAL INSULATION  
07 4646     FIBER CEMENT SIDING  
07 5400     THERMOPLASTIC MEMBRANE ROOFING  
07 6200     SHEET METAL FLASHING AND TRIM  
07 7123     MANUFACTURED SCUPPERS AND DOWNSPOUTS  
07 9005     JOINT SEALERS

**DIVISION 08 – OPENINGS**

08 1113     HOLLOW METAL DOORS AND FRAMES  
08 3301     SECURITY SHUTTERS  
08 3323     OVERHEAD COILING DOORS  
08 5413     FIBERGLASS WINDOWS  
08 7100     DOOR HARDWARE  
08 7129     SLIDING AND FOLDING DOOR HARDWARE  
08 9100     LOUVERS

**BAYSHORE LIFEGUARD STATION  
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**DIVISION 09 – FINISHES**

09 2116	GYPSUM BOARD ASSEMBLIES
09 3000	TILING
09 5100	SUSPENDED GYPSUM BOARD CEILING
09 9000	PAINTING AND COATING

**DIVISION 10 – SPECIALTIES**

10 1400	SIGNAGE
10 2800	TOILET, SHOWER AND ACCESSORIES
10 5100	LOCKERS
10 7500	FLAGPOLES

**DIVISION 13 – SPECIAL CONSTRUCTION**

13 1200	PREFABRICATED BUILDING
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**DIVISION 22 – PLUMBING**

22 0000	PLUMBING
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**DIVISION 26 – ELECTRICAL**

26 0500	COMMON WORK RESULTS FOR ELECTRICAL
26 0519	LOW VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES
26 0526	GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS
26 0533	RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS
26 0548	VIBRATION AND SEISMIC CONTROLS FOR ELECTRICAL SYSTEMS
26 0553	IDENTIFICATION FOR ELECTRICAL SYSTEMS
26 2416	PANELBOARDS
26 2726	WIRING DEVICES
26 2816	ENCLOSED SWITCHES AND CIRCUIT BREAKERS

**DIVISION 31 – EARTHWORK**

31 1215	*PAVEMENT REPAIR
31 2000	*EXCAVATING BACKFILLING AND COMPACTING FOR PAVEMENT
31 2333	*EXCAVATING BACKFILLING AND COMPACTING FOR UTILITIES
31 6213	*CONCRETE PILES

**BAYSHORE LIFEGUARD STATION  
TABLE OF CONTENTS – CSI SPECIFICATIONS**

**DIVISION 32 – EXTERIOR IMPROVEMENTS**

- 32 1122     \*BASE COURSE
- 32 1313     \*SITE CONCRETE WORK

**DIVISION 33 – UTILITIES**

- 33 1100     \*SITE WATER DISTRIBUTION SYSTEMS
- 33 3100     \*SITE SANITARY SEWER SYSTEMS
- 33 4100     \*STORM DRAINAGE SYSTEMS

## **SECTION 02 4100 - DEMOLITION**

### **PART 1 GENERAL**

#### **1.01 SUMMARY**

- A. Building demolition excluding removal of hazardous materials and toxic substances.
- B. Abandonment, removal and disposal of existing utilities and utility structures.

#### **1.02 RELATED REQUIREMENTS – N/A**

#### **1.03 REFERENCE STANDARDS**

- A. 29 CFR 1926 - U.S. Occupational Safety and Health Standards; current edition.
- B. NFPA 241 - Standard for Safeguarding Construction, Alteration, and Demolition Operations; 2013.

#### **1.04 SUBMITTALS**

- A. Site Plan: Showing:
  - Areas for temporary construction and field offices.
- B. Project Record Documents: Accurately record actual locations of capped and active utilities and subsurface construction.

#### **1.05 QUALITY ASSURANCE**

Demolition Firm Qualifications: Company specializing in the type of work required.

### **PART 2 PRODUCTS – N/A**

### **PART 3 EXECUTION**

#### **3.01 SCOPE**

- A. Remove the entire building designated Life Guard Station.
- B. Remove other items indicated, for salvage, relocation, and recycling.
- C. Fill excavations, open pits, and holes in ground areas generated as result of removals, using specified fill; compact fill as required so that required rough grade elevations do not subside within one year after completion.

## SECTION 02 4100 - DEMOLITION

### 3.02 GENERAL PROCEDURES AND PROJECT CONDITIONS

- A. Comply with applicable codes and regulations for demolition operations and safety of adjacent structures and the public.
1. Obtain and pay for city-required permits.
  2. Use of explosives is not permitted.
  3. Take precautions to prevent catastrophic or uncontrolled collapse of structures to be removed; do not allow worker or public access within range of potential collapse of unstable structures.
  4. Provide, erect, and maintain temporary barriers and security devices.
  5. Conduct operations to minimize effects on and interference with adjacent structures and occupants.
  6. Do not close or obstruct roadways or sidewalks without permit.
  7. Conduct operations to minimize obstruction of public and private entrances and exits; do not obstruct required exits at any time; protect persons using entrances and exits from removal operations.
  8. Obtain written permission from owners of adjacent properties when demolition equipment will traverse, infringe upon or limit access to their property.
- B. Do not begin removal until receipt of notification to proceed from City of Long Beach.
- C. Protect existing structures and other elements that are not to be removed.
1. Prevent movement or settlement of adjacent structures.
  2. Stop work immediately if adjacent structures appear to be in danger.
- D. Minimize production of dust due to demolition operations; do not use water if that will result in ice, flooding, sedimentation of public waterways or storm sewers, or other pollution.
- E. If hazardous materials are discovered during removal operations, stop work and notify Architect and City of Long Beach; hazardous materials include regulated asbestos containing materials, lead, PCB's, and mercury.
- F. Perform demolition in a manner that maximizes salvage and recycling of materials.
1. Dismantle existing construction and separate materials.

## **SECTION 02 4100 - DEMOLITION**

2. Set aside reusable, recyclable, and salvageable materials; store and deliver to collection point or point of reuse.
- G. Provide adequate protection to avoid falling of debris in to the bay.
- H. Refer to Lead and Asbestos Survey Report dated June 17, 2016 in Division F of the Project Manual.

### **3.03 EXISTING UTILITIES**

- A. Coordinate work with utility companies; notify before starting work and comply with their requirements; obtain required permits.
- B. Protect existing utilities to remain from damage.
- C. Do not disrupt public utilities without permit from authority having jurisdiction.
- D. Do not close, shut off, or disrupt existing life safety systems that are in use without at least 7 days prior written notification to City of Long Beach.
- E. Do not close, shut off, or disrupt existing utility branches or take-offs that are in use without at least 3 days prior written notification to City of Long Beach.
- F. Locate and mark utilities to remain; mark using highly visible tags or flags, with identification of utility type; protect from damage due to subsequent construction, using substantial barricades if necessary.
- G. Remove exposed piping, valves, meters, equipment, supports, and foundations of disconnected and abandoned utilities.
- H. Prepare building demolition areas by disconnecting and capping utilities outside the demolition zone; identify and mark utilities to be subsequently reconnected, in same manner as other utilities to remain.

### **3.04 DEBRIS AND WASTE REMOVAL**

- A. Remove debris, junk, and trash from site.
- B. Leave site in clean condition, ready for subsequent work.
- C. Clean up spillage and wind-blown debris from public and private lands.
- D. All items to be removed shall be disposed of at licensed facilities per the applicable laws, rules and regulations, at the contractor's expense.
- E. Dispose of debris in accordance with the City of Long Beach recycling policy.

END OF SECTION

## SECTION 03 3000 - CAST-IN-PLACE CONCRETE

### PART 1 - GENERAL

**1.01** The work of this section includes foundations, piles, floor slab, ramps, walkways and flatwork and slab waterproofing.

### **1.02 RELATED DOCUMENTS**

Drawings and general provisions of the Contract, including General and Supplementary Conditions apply to this Section.

### **1.03 SUMMARY**

A. Section includes cast-in-place concrete, including formwork, reinforcement, concrete materials, mixture design, placement procedures, and finishes.

B. Related Requirements:

1. Section 312000 Excavating Backfilling and Compacting for Pavement for drainage fill under slabs-on-grade.
2. Section 321313 Site Concrete Work for concrete pavement and walks.

### **1.04 DEFINITIONS**

A. Cementitious Materials: Portland cement alone.

B. W/C Ratio: The ratio by weight of water to cementitious materials.

### **1.05 PREINSTALLATION MEETINGS**

A. Preinstallation Conference: Conduct conference at Project site.

1. Before submitting design mixtures, review concrete design mixture and examine procedures for ensuring quality of concrete materials. Require representatives of each entity directly concerned with cast-in-place concrete to attend, including the following:
  - a. Contractor's superintendent.
  - b. Independent testing agency responsible for concrete design mixtures.
  - c. Ready-mix concrete manufacturer.
  - d. Concrete Subcontractor.

## SECTION 03 3000 - CAST-IN-PLACE CONCRETE

- e. Special concrete finish Subcontractor.

### 1.06 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Sustainable Design Submittals:

1. Product Data: For recycled content, indicating postconsumer and preconsumer recycled content and cost.
2. Product Certificates: For regional materials, indicating location of material manufacturer and point of extraction, harvest, or recovery for each raw material. Include distance to Project and cost for each regional material.
3. Laboratory Test Reports: For liquid floor treatments and curing and sealing compounds, indicating compliance with requirements for low-emitting materials.

C. Design Mixtures: For each concrete mixture. Submit alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.

No water may be added at the site.

D. Steel Reinforcement Shop Drawings: Placing Drawings that detail fabrication, bending, and placement. Include bar sizes, lengths, material, grade, bar schedules, stirrup spacing, bent bar diagrams, bar arrangement, splices and laps, mechanical connections, tie spacing, hoop spacing, and supports for concrete reinforcement.

E. Construction Joint Layout: Indicate proposed construction joints required to construct the structure.

Location of construction joints is subject to approval of the Architect.

### 1.07 INFORMATIONAL SUBMITTALS

A. Welding certificates.

B. Material Certificates: For each of the following, signed by manufacturers:

1. Cementitious materials.
2. Admixtures.
3. Form materials and form-release agents.

## **SECTION 03 3000 - CAST-IN-PLACE CONCRETE**

4. Steel reinforcement and accessories.
5. Fiber reinforcement.
6. Waterstops.
7. Curing compounds.
8. Floor and slab treatments.
9. Bonding agents.
10. Adhesives.
11. Vapor retarders.
12. Semirigid joint filler.
13. Joint-filler strips.
14. Repair materials.
15. Slab Waterproofing

C. Material Test Reports: For the following, from a qualified testing agency:

Aggregates: Include service record data indicating absence of deleterious expansion of concrete due to alkali aggregate reactivity.

D. Floor surface flatness and levelness measurements indicating compliance with specified tolerances.

E. Field quality-control reports.

F. Minutes of preinstallation conference.

### **1.08 QUALITY ASSURANCE**

A. Installer Qualifications: A qualified installer who employs on Project personnel qualified as ACI-certified Flatwork Technician and Finisher and a supervisor who is an ACI-certified Concrete Flatwork Technician.

B. Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C 94/C 94M requirements for production facilities and equipment.

Manufacturer certified according to NRMCA's "Certification of Ready Mixed Concrete Production Facilities."

## SECTION 03 3000 - CAST-IN-PLACE CONCRETE

C. Testing Agency Qualifications: An independent agency, acceptable to authorities having jurisdiction, qualified according to ASTM C 1077 and ASTM E 329 for testing indicated.

1. Personnel conducting field tests shall be qualified as ACI Concrete Field Testing Technician, Grade 1, according to ACI CP-1 or an equivalent certification program.
2. Personnel performing laboratory tests shall be ACI-certified Concrete Strength Testing Technician and Concrete Laboratory Testing Technician, Grade I. Testing agency laboratory supervisor shall be an ACI-certified Concrete Laboratory Testing Technician, Grade II.

D. Welding Qualifications: Qualify procedures and personnel according to AWS D1.4/D 1.4M.

### 1.09 PRECONSTRUCTION TESTING

Preconstruction Testing Service: Engage a qualified testing agency to perform preconstruction testing on concrete mixtures.

### 1.010 DELIVERY, STORAGE, AND HANDLING

- A. Steel Reinforcement: Deliver, store, and handle steel reinforcement to prevent bending and damage. Avoid damaging coatings on steel reinforcement.
- B. Waterstops: Store waterstops under cover to protect from moisture, sunlight, dirt, oil, and other contaminants.

### 1.011 FIELD CONDITIONS

- A. Cold-Weather Placement: Comply with ACI 306.1 and as follows. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.
  1. When average high and low temperature is expected to fall below 40 deg F (4.4 deg C) for three successive days, maintain delivered concrete mixture temperature within the temperature range required by ACI 301 (ACI 301M).
  2. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.
  3. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in mixture designs.

## SECTION 03 3000 - CAST-IN-PLACE CONCRETE

B. Hot-Weather Placement: Comply with ACI 301 (ACI 301M) and as follows:

1. Maintain concrete temperature below 90 deg F (32 deg C) at time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated to total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.
2. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade uniformly moist without standing water, soft spots, or dry areas.

### PART 2 - PRODUCTS

#### 2.01 CONCRETE, GENERAL

A. ACI Publications: Comply with the following unless modified by requirements in the Contract Documents:

1. ACI 301 (ACI 301M).
2. ACI 117 (ACI 117M).
3. ACI 318

#### 2.02 FORM-FACING MATERIALS

A. Smooth-Formed Finished Concrete: Form-facing panels that provide continuous, true, and smooth concrete surfaces. Furnish in largest practicable sizes to minimize number of joints.

1. Plywood, metal, or other approved panel materials.
2. Exterior-grade plywood panels, suitable for concrete forms, complying with DOC PS 1, and as follows:
  - a. High-density overlay, Class 1 or better.
  - b. Medium-density overlay, Class 1 or better; mill-release agent treated and edge sealed.
  - c. Structural 1, B-B or better; mill oiled and edge sealed.
  - d. B-B (Concrete Form), Class 1 or better; mill oiled and edge sealed.
3. Overlaid Finish birch plywood.

B. Rough-Formed Finished Concrete: Plywood, lumber, metal, or another

## SECTION 03 3000 - CAST-IN-PLACE CONCRETE

approved material. Provide lumber dressed on at least two edges and one side for tight fit.

- C. Forms for Cylindrical Columns, Pedestals, and Supports: Metal, glass-fiber-reinforced plastic, paper, or fiber tubes that produce surfaces with gradual or abrupt irregularities not exceeding specified formwork surface class. Provide units with sufficient wall thickness to resist plastic concrete loads without detrimental deformation.
- D. Pan-Type Forms: Glass-fiber-reinforced plastic or formed steel, stiffened to resist plastic concrete loads without detrimental deformation.
- E. Void Forms: Biodegradable paper surface, treated for moisture resistance, structurally sufficient to support weight of plastic concrete and other superimposed loads.
- F. Chamfer Strips: Wood, metal, PVC, or rubber strips, 3/4 by 3/4 inch (19 by 19 mm), minimum.
- G. Rustication Strips: Wood, metal, PVC, or rubber strips, kerfed for ease of form removal.
- H. Form-Release Agent: Commercially formulated form-release agent that does not bond with, stain, or adversely affect concrete surfaces and does not impair subsequent treatments of concrete surfaces.

Formulate form-release agent with rust inhibitor for steel form-facing materials.

- I. Form Ties: Factory-fabricated, removable or snap-off glass-fiber-reinforced plastic or metal form ties designed to resist lateral pressure of fresh concrete on forms and to prevent spalling of concrete on removal.
  - 1. Furnish units that leave no corrodible metal closer than 1 inch (25 mm) to the plane of exposed concrete surface.
  - 2. Furnish ties that, when removed, leave holes no larger than 1 inch (25 mm) in diameter in concrete surface.
  - 3. Furnish ties with integral water-barrier plates to walls indicated to receive dampproofing or waterproofing.

### 2.03 STEEL REINFORCEMENT

- A. Recycled Content of Steel Products: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 25 percent.
- B. Reinforcing Bars: ASTM A 615/A 615M, Grade 60 (Grade 420), deformed.

## SECTION 03 3000 - CAST-IN-PLACE CONCRETE

C. Low-Alloy-Steel Reinforcing Bars: ASTM A 706/A 706M, deformed.

### 2.04 REINFORCEMENT ACCESSORIES

A. Joint Dowel Bars: ASTM A 615/A 615M, Grade 60 (Grade 420), plain-steel bars, cut true to length with ends square and free of burrs.

B. Zinc Repair Material: ASTM A 780/A 780M.

C. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded-wire reinforcement in place. Manufacture bar supports from steel wire, plastic, or precast concrete according to CRSI's "Manual of Standard Practice," of greater compressive strength than concrete and as follows:

For concrete surfaces exposed to view, where legs of wire bar supports contact forms, use CRSI Class 1 plastic-protected steel wire or CRSI Class 2 stainless-steel bar supports.

### 2.05 CONCRETE MATERIALS

A. Regional Materials: Concrete shall be manufactured within 500 miles (800 km) of Project site from aggregates and cementitious materials that have been extracted, harvested, or recovered, as well as manufactured, within 500 miles (800 km) of Project site.

B. Regional Materials: Concrete shall be manufactured within 500 miles (800 km) of Project site.

C. Source Limitations: Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant, obtain aggregate from single source, and obtain admixtures from single source from single manufacturer.

D. Cementitious Materials:

1. Portland Cement: ASTM C 150/C 150M, Type II, gray white.
2. Fly Ash: Not Permitted.

E. Normal-Weight Aggregates: ASTM C 33/C 33M, Class 5S coarse aggregate or better, graded. Provide aggregates from a single source with documented service record data of at least 10 years' satisfactory service in similar applications and service conditions using similar aggregates and cementitious materials.

1. Maximum Coarse-Aggregate Size: 1 inch (25 mm) nominal.

## SECTION 03 3000 - CAST-IN-PLACE CONCRETE

2. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.

F. Air-Entraining Admixture: ASTM C 260/C 260M.

G. Chemical Admixtures: Certified by manufacturer to be compatible with other admixtures and that do not contribute water-soluble chloride ions exceeding those permitted in hardened concrete. Do not use calcium chloride or admixtures containing calcium chloride.

1. Water-Reducing Admixture: ASTM C 494/C 494M, Type A.
2. Retarding Admixture: ASTM C 494/C 494M, Type B.
3. Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type D.
4. High-Range, Water-Reducing Admixture: ASTM C 494/C 494M, Type F.
5. High-Range, Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type G.
6. Plasticizing and Retarding Admixture: ASTM C 1017/C 1017M, Type II.

H. Set-Accelerating Corrosion-Inhibiting Admixture: Commercially formulated, anodic inhibitor or mixed cathodic and anodic inhibitor; capable of forming a protective barrier and minimizing chloride reactions with steel reinforcement in concrete and complying with ASTM C 494/C 494M, Type C.

I. Non-Set-Accelerating Corrosion-Inhibiting Admixture: Commercially formulated, non-set-accelerating, anodic inhibitor or mixed cathodic and anodic inhibitor; capable of forming a protective barrier and minimizing chloride reactions with steel reinforcement in concrete.

J. Water: ASTM C 94/C 94M and potable.

### 2.06 WATERSTOPS

A. Flexible Rubber Waterstops: CE CRD-C 513, with factory-installed metal eyelets, for embedding in concrete to prevent passage of fluids through joints. Factory fabricate corners, intersections, and directional changes.

Profile: As indicated.

## SECTION 03 3000 - CAST-IN-PLACE CONCRETE

### 2.07 FLOOR AND SLAB TREATMENTS

- A. Concrete Slab Finish: Top cast acid etch 03 Light Violet with penetrating sealer. See Drawings.
- B. Slab Waterproofing at main building slab only: Hycrete W500 installed in accordance with manufacturer's recommendations.

### 2.08 RELATED MATERIALS

- A. Reglets: Fabricate reglets of not less than 0.022-inch- (0.55-mm-) thick, galvanized-steel sheet. Temporarily fill or cover face opening of reglet to prevent intrusion of concrete or debris.
- B. Dovetail Anchor Slots: Hot-dip galvanized-steel sheet, not less than 0.034 inch (0.85 mm) thick, with bent tab anchors. Temporarily fill or cover face opening of slots to prevent intrusion of concrete or debris.

### 2.09 REPAIR MATERIALS

- A. Repair Underlayment: Cement-based, polymer-modified, self-leveling product that can be applied in thicknesses from 1/8 inch (3.2 mm) and that can be feathered at edges to match adjacent floor elevations.
  - 1. Cement Binder: ASTM C 150/C 150M, portland cement or hydraulic or blended hydraulic cement as defined in ASTM C 219.
  - 2. Primer: Product of underlayment manufacturer recommended for substrate, conditions, and application.
  - 3. Aggregate: Well-graded, washed gravel, 1/8 to 1/4 inch (3.2 to 6 mm) or coarse sand as recommended by underlayment manufacturer.
  - 4. Compressive Strength: Not less than 4000 psi (29 MPa)] <Insert strength> at 28 days when tested according to ASTM C 109/C 109M.
- B. Repair Overlayment: Cement-based, polymer-modified, self-leveling product that can be applied in thicknesses from 1/4 inch (6.4 mm) and that can be filled in over a scarified surface to match adjacent floor elevations.
  - 1. Cement Binder: ASTM C 150/C 150M, portland cement or hydraulic or blended hydraulic cement as defined in ASTM C 219.

## **SECTION 03 3000 - CAST-IN-PLACE CONCRETE**

2. Primer: Product of topping manufacturer recommended for substrate, conditions, and application.
3. Aggregate: Well-graded, washed gravel, 1/8 to 1/4 inch (3.2 to 6 mm) or coarse sand as recommended by topping manufacturer.
4. Compressive Strength: Not less than 5000 psi (34.5 MPa) at 28 days when tested according to ASTM C 109/C 109M.

### **2.010 CONCRETE MIXTURES, GENERAL**

A. Prepare design mixtures for each type and strength of concrete, proportioned on the basis of laboratory trial mixture or field test data, or both, according to ACI 301 (ACI 301M).

Use a qualified independent testing agency for preparing and reporting proposed mixture designs based on laboratory trial mixtures.

B. Limit water-soluble, chloride-ion content in hardened concrete to 0.15 percent by weight of cement.

C. Admixtures: Use admixtures according to manufacturer's written instructions.

D. Color Pigment: Add color pigment to concrete mixture according to manufacturer's written instructions and to result in hardened concrete color consistent with approved mockup.

### **2.011 CONCRETE MIXTURES FOR BUILDING ELEMENTS**

As required by construction documents.

### **2.012 FABRICATING REINFORCEMENT**

Fabricate steel reinforcement according to CRSI's "Manual of Standard Practice."

### **2.013 CONCRETE MIXING**

A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C 94/C 94M and ASTM C 1116/C 1116M, and furnish batch ticket information.

When air temperature is between 85 and 90 deg F (30 and 32 deg C), reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F (32 deg C), reduce mixing and delivery time to 60 minutes.

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### PART 3 - EXECUTION

#### 3.01 FORMWORK INSTALLATION

- A. Design, erect, shore, brace, and maintain formwork, according to ACI 301 (ACI 301M), to support vertical, lateral, static, and dynamic loads, and construction loads that might be applied, until structure can support such loads.
- B. Construct formwork so concrete members and structures are of size, shape, alignment, elevation, and position indicated, within tolerance limits of ACI 117 (ACI 117M).
- C. Limit concrete surface irregularities, designated by ACI 347 as abrupt or gradual, as follows:
1. Class A, 1/8 inch (3.2 mm) for smooth-formed finished surfaces.
  2. Class B, 1/4 inch (6 mm) Class C, 1/2 inch (13 mm) Class D, 1 inch (25 mm) for rough-formed finished surfaces.
- D. Construct forms tight enough to prevent loss of concrete mortar.
- E. Construct forms for easy removal without hammering or prying against concrete surfaces. Provide crush or wrecking plates where stripping may damage cast- concrete surfaces. Provide top forms for inclined surfaces steeper than 1.5 horizontal to 1 vertical.
1. Install keyways, reglets, recesses, and the like, for easy removal.
  2. Do not use rust-stained steel form-facing material.
- F. Set edge forms, bulkheads, and intermediate screed strips for slabs to achieve required elevations and slopes in finished concrete surfaces. Provide and secure units to support screed strips; use strike-off templates or compacting- type screeds.
- G. Provide temporary openings for cleanouts and inspection ports where interior area of formwork is inaccessible. Close openings with panels tightly fitted to forms and securely braced to prevent loss of concrete mortar. Locate temporary openings in forms at inconspicuous locations.
- H. Chamfer exterior corners and edges of permanently exposed concrete.
- I. Form openings, chases, offsets, sinkages, keyways, reglets, blocking, screeds, and bulkheads required in the Work. Determine sizes and locations from trades providing such items.

## SECTION 03 3000 - CAST-IN-PLACE CONCRETE

- J. Clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, and other debris just before placing concrete.
- K. Retighten forms and bracing before placing concrete, as required, to prevent mortar leaks and maintain proper alignment.
- L. Coat contact surfaces of forms with form-release agent, according to manufacturer's written instructions, before placing reinforcement.

### 3.02 EMBEDDED ITEM INSTALLATION

- A. Place and secure anchorage devices and other embedded items required for adjoining work that is attached to or supported by cast-in-place concrete. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
  - 1. Install anchor rods, accurately located, to elevations required and complying with tolerances in Section 7.5 of AISC 303.
  - 2. Install reglets to receive waterproofing and to receive through-wall flashings in outer face of concrete frame at exterior walls, where flashing is shown at lintels, shelf angles, and other conditions.
  - 3. Install dovetail anchor slots in concrete structures as indicated.

### 3.03 REMOVING AND REUSING FORMS

- A. General: Formwork for sides of beams, walls, columns, and similar parts of the Work that does not support weight of concrete may be removed after cumulatively curing at not less than 50 deg F (10 deg C) for 24 hours after placing concrete. Concrete has to be hard enough to not be damaged by form-removal operations, and curing and protection operations need to be maintained.
  - 1. Leave formwork for beam soffits, joists, slabs, and other structural elements that support weight of concrete in place until concrete has achieved at least 75 percent of its 28-day design compressive strength.
  - 2. Remove forms only if shores have been arranged to permit removal of forms without loosening or disturbing shores.
- B. Clean and repair surfaces of forms to be reused in the Work. Split, frayed, delaminated, or otherwise damaged form-facing material are not acceptable for exposed surfaces. Apply new form-release agent.

## SECTION 03 3000 - CAST-IN-PLACE CONCRETE

- C. When forms are reused, clean surfaces, remove fins and laitance, and tighten to close joints. Align and secure joints to avoid offsets. Do not use patched forms for exposed concrete surfaces unless approved by Architect.

### 3.04 SHORING AND RESHORING INSTALLATION

- A. Comply with ACI 318 (ACI 318M) and ACI 301 (ACI 301M) for design, installation, and removal of shoring and reshoring.

Do not remove shoring or reshoring until measurement of slab tolerances is complete.

- B. In multistory construction, extend shoring or reshoring over a sufficient number of stories to distribute loads in such a manner that no floor or member will be excessively loaded or will induce tensile stress in concrete members without sufficient steel reinforcement.
- C. Plan sequence of removal of shores and reshore to avoid damage to concrete. Locate and provide adequate reshoring to support construction without excessive stress or deflection.

### 3.05 STEEL REINFORCEMENT INSTALLATION

- A. General: Comply with CRSI's "Manual of Standard Practice" for fabricating, placing, and supporting reinforcement.

Do not cut or puncture vapor retarder. Repair damage and reseal vapor retarder before placing concrete.

- B. Clean reinforcement of loose rust and mill scale, earth, ice, and other foreign materials that reduce bond to concrete.
- C. Accurately position, support, and secure reinforcement against displacement. Locate and support reinforcement with bar supports to maintain minimum concrete cover. Do not tack weld crossing reinforcing bars.

Weld reinforcing bars according to AWS D1.4/D 1.4M, where indicated.

- D. Set wire ties with ends directed into concrete, not toward exposed concrete surfaces.
- E. Install welded-wire reinforcement in longest practicable lengths on bar supports spaced to minimize sagging. Lap edges and ends of adjoining sheets at least one mesh spacing. Offset laps of adjoining sheet widths to prevent continuous laps in either direction. Lace overlaps with wire.

## SECTION 03 3000 - CAST-IN-PLACE CONCRETE

### 3.06 JOINTS

A. General: Construct joints true to line with faces perpendicular to surface plane of concrete.

B. Construction Joints: Install so strength and appearance of concrete are not impaired, at locations indicated or as approved by Architect.

1. Place joints perpendicular to main reinforcement. Continue reinforcement across construction joints unless otherwise indicated. Do not continue reinforcement through sides of strip placements of floors and slabs.
2. Form keyed joints as indicated. Embed keys at least 1-1/2 inches (38 mm) into concrete.
3. Locate joints for beams, slabs, joists, and girders in the middle third of spans. Offset joints in girders a minimum distance of twice the beam width from a beam-girder intersection.
4. Locate horizontal joints in walls and columns at underside of floors, slabs, beams, and girders and at the top of footings or floor slabs.
5. Space vertical joints in walls as indicated. Locate joints beside piers integral with walls, near corners, and in concealed locations where possible.
6. Use a bonding agent at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.
7. Use epoxy-bonding adhesive at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.

C. Doweled Joints: Install dowel bars and support assemblies at joints where indicated. Lubricate or asphalt coat one-half of dowel length to prevent concrete bonding to one side of joint.

### 3.07 WATERSTOP INSTALLATION

A. Flexible Waterstops: Install in construction joints and at other joints indicated to form a continuous diaphragm. Install in longest lengths practicable. Support and protect exposed waterstops during progress of the Work. Field fabricate joints in waterstops according to manufacturer's written instructions.

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- B. Self-Expanding Strip Waterstops: Install in construction joints and at other locations indicated, according to manufacturer's written instructions, adhesive bonding, mechanically fastening, and firmly pressing into place. Install in longest lengths practicable.

### 3.08 CONCRETE PLACEMENT

- A. Before placing concrete, verify that installation of formwork, reinforcement, and embedded items is complete and that required inspections are completed.
- B. Do not add water to concrete during delivery, at Project site, or during placement unless approved by Architect.
- C. Deposit concrete continuously in one layer or in horizontal layers of such thickness that no new concrete is placed on concrete that has hardened enough to cause seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as indicated. Deposit concrete to avoid segregation.
  1. Deposit concrete in horizontal layers of depth not to exceed formwork design pressures and in a manner to avoid inclined construction joints.
  2. Consolidate placed concrete with mechanical vibrating equipment according to ACI 301 (ACI 301M).
  3. Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations to rapidly penetrate placed layer and at least 6 inches (150 mm) into preceding layer. Do not insert vibrators into lower layers of concrete that have begun to lose plasticity. At each insertion, limit duration of vibration to time necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing mixture constituents to segregate.
- D. Deposit and consolidate concrete for floors and slabs in a continuous operation, within limits of construction joints, until placement of a panel or section is complete.
  1. Consolidate concrete during placement operations, so concrete is thoroughly worked around reinforcement and other embedded items and into corners.
  2. Maintain reinforcement in position on chairs during concrete placement.

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3. Screed slab surfaces with a straightedge and strike off to correct elevations.
4. Slope surfaces uniformly to drains where required.
5. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane, before excess bleedwater appears on the surface. Do not further disturb slab surfaces before starting finishing operations.

### **3.09 FINISHING FORMED SURFACES**

A. Rough-Formed Finish: As-cast concrete texture imparted by form-facing material with tie holes and defects repaired and patched. Remove fins and other projections that exceed specified limits on formed-surface irregularities.

Apply to concrete surfaces not exposed to public view.

B. Smooth-Formed Finish: As-cast concrete texture imparted by form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams. Repair and patch tie holes and defects. Remove fins and other projections that exceed specified limits on formed-surface irregularities.

1. Apply to concrete surfaces exposed to public view.
2. See Section 3.010 below for Floor Finishes.

C. Related Unformed Surfaces: At tops of walls, horizontal offsets, and similar unformed surfaces adjacent to formed surfaces, strike off smooth and finish with a texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces unless otherwise indicated.

### **3.010 FINISHING FLOORS AND SLABS**

A. General: Comply with ACI 302.1R recommendations for screeding, restraightening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.

B. Floors: While still plastic, texture concrete surface that has been screeded and bull-floated or darbied. Use stiff brushes, brooms, or rakes to produce a profile amplitude of 1/4 inch (6 mm) in one direction.

Apply concrete retarder and sealer. Grace Top-Cast acid etch, 03 light violet with glaze and seal penetrating sealer.

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### 3.011 MISCELLANEOUS CONCRETE ITEM INSTALLATION

- A. Steel Pan Stairs: Provide concrete fill for steel pan stair treads, landings, and associated items. Cast-in inserts and accessories as shown on Drawings. Screed, tamp, and trowel finish concrete surfaces.

### 3.012 CONCRETE PROTECTING AND CURING

- A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection and ACI 301 (ACI 301M) for hot-weather protection during curing.
- B. Evaporation Retarder: Apply evaporation retarder to unformed concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h (1 kg/sq. m x h) before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.
- C. Formed Surfaces: Cure formed concrete surfaces, including underside of beams, supported slabs, and other similar surfaces. If forms remain during curing period, moist cure after loosening forms. If removing forms before end of curing period, continue curing for remainder of curing period.
- D. Unformed Surfaces: Begin curing immediately after finishing concrete. Cure unformed surfaces, including floors and slabs, concrete floor toppings, and other surfaces.
- E. Cure concrete according to ACI 308.1, by one or a combination of the following methods:
1. Moisture Curing: Keep surfaces continuously moist for not less than seven days with the following materials:
    - a. Water.
    - b. Continuous water-fog spray.
    - c. Absorptive cover, water saturated, and kept continuously wet. Cover concrete surfaces and edges with 12-inch (300-mm) lap over adjacent absorptive covers.
  2. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches (300 mm), and sealed by waterproof tape or adhesive. Cure for not less than seven days. Immediately repair any holes or tears

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during curing period, using cover material and waterproof tape.

- a. Moisture cure or use moisture-retaining covers to cure concrete surfaces to receive floor coverings.
  - b. Moisture cure or use moisture-retaining covers to cure concrete surfaces to receive penetrating liquid floor treatments.
  - c. Cure concrete surfaces to receive floor coverings with either a moisture-retaining cover or a curing compound that the manufacturer certifies does not interfere with bonding of floor covering used on Project.
3. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Maintain continuity of coating and repair damage during curing period.

Removal: After curing period has elapsed, remove curing compound without damaging concrete surfaces by method recommended by curing compound manufacturer unless manufacturer certifies curing compound does not interfere with bonding of floor covering used on Project.

4. Curing and Sealing Compound: Apply uniformly to floors and slabs indicated in a continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Repeat process 24 hours later and apply a second coat. Maintain continuity of coating and repair damage during curing period.

### 3.013 ACID ETCH TREATMENT AND SEALER

A. Penetrating Liquid Floor Treatment: Prepare, apply, and finish penetrating liquid floor treatment according to manufacturer's written instructions.

1. Remove curing compounds, sealers, oil, dirt, laitance, and other contaminants and complete surface repairs.
2. Do not apply to concrete that is less than 14 days' old.
3. Apply liquid until surface is saturated, scrubbing into surface until a gel forms; rewet; and repeat brooming or scrubbing. Rinse with water; remove excess material until surface is dry. Apply a

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second coat in a similar manner if surface is rough or porous.

B. Sealing Coat: Uniformly apply a continuous sealing coat of curing and sealing compound to hardened concrete by power spray or roller according to manufacturer's written instructions.

C. Product: Grace top-cast acid etch with "glaze n seal" penetrating sealer.

### 3.014 JOINT FILLING

A. Prepare, clean, and install joint filler according to manufacturer's written instructions.

Defer joint filling until concrete has aged at least one month(s). Do not fill joints until construction traffic has permanently ceased.

B. Remove dirt, debris, saw cuttings, curing compounds, and sealers from joints; leave contact faces of joints clean and dry.

C. Install semirigid joint filler full depth in saw-cut joints and at least 2 inches (50 mm) deep in formed joints. Overfill joint and trim joint filler flush with top of joint after hardening.

### 3.015 CONCRETE SURFACE REPAIRS

A. Defective Concrete: Repair and patch defective areas when approved by Architect. Remove and replace concrete that cannot be repaired and patched to Architect's approval.

B. Patching Mortar: Mix dry-pack patching mortar, consisting of 1 part portland cement to 2-1/2 parts fine aggregate passing a No. 16 (1.18-mm) sieve, using only enough water for handling and placing.

C. Repairing Formed Surfaces: Surface defects include color and texture irregularities, cracks, spalls, air bubbles, honeycombs, rock pockets, fins and other projections on the surface, and stains and other discolorations that cannot be removed by cleaning.

1. Immediately after form removal, cut out honeycombs, rock pockets, and voids more than 1/2 inch (13 mm) in any dimension to solid concrete. Limit cut depth to 3/4 inch (19 mm). Make edges of cuts perpendicular to concrete surface. Clean, dampen with water, and brush-coat holes and voids with bonding agent. Fill and compact with patching mortar before bonding agent has dried. Fill form-tie voids with patching mortar or cone plugs secured in place with bonding agent.

2. Repair defects on surfaces exposed to view by blending white

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portland cement and standard portland cement so that, when dry, patching mortar matches surrounding color. Patch a test area at inconspicuous locations to verify mixture and color match before proceeding with patching. Compact mortar in place and strike off slightly higher than surrounding surface.

3. Repair defects on concealed formed surfaces that affect concrete's durability and structural performance as determined by Architect.

D.Repairing Unformed Surfaces: Test unformed surfaces, such as floors and slabs, for finish and verify surface tolerances specified for each surface. Correct low and high areas. Test surfaces sloped to drain for trueness of slope and smoothness; use a sloped template.

1. Repair finished surfaces containing defects. Surface defects include spalls, popouts, honeycombs, rock pockets, crazing and cracks in excess of 0.01 inch (0.25 mm) wide or that penetrate to reinforcement or completely through unreinforced sections regardless of width, and other objectionable conditions.
2. After concrete has cured at least 14 days, correct high areas by grinding.
3. Correct localized low areas during or immediately after completing surface finishing operations by cutting out low areas and replacing with patching mortar. Finish repaired areas to blend into adjacent concrete.
4. Correct other low areas scheduled to receive floor coverings with a repair underlayment. Prepare, mix, and apply repair underlayment and primer according to manufacturer's written instructions to produce a smooth, uniform, plane, and level surface. Feather edges to match adjacent floor elevations.
5. Correct other low areas scheduled to remain exposed with a repair topping. Cut out low areas to ensure a minimum repair topping depth of 1/4 inch (6 mm) to match adjacent floor elevations. Prepare, mix, and apply repair topping and primer according to manufacturer's written instructions to produce a smooth, uniform, plane, and level surface.
6. Repair defective areas, except random cracks and single holes 1 inch (25 mm) or less in diameter, by cutting out and replacing with fresh concrete. Remove defective areas with clean, square cuts and expose steel reinforcement with at least a 3/4-inch (19-mm) clearance all around. Dampen concrete surfaces in contact with patching concrete and apply bonding agent. Mix patching

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concrete of same materials and mixture as original concrete, except without coarse aggregate. Place, compact, and finish to blend with adjacent finished concrete. Cure in same manner as adjacent concrete.

7. Repair random cracks and single holes 1 inch (25 mm) or less in diameter with patching mortar. Groove top of cracks and cut out holes to sound concrete and clean off dust, dirt, and loose particles. Dampen cleaned concrete surfaces and apply bonding agent. Place patching mortar before bonding agent has dried. Compact patching mortar and finish to match adjacent concrete. Keep patched area continuously moist for at least 72 hours.
- E. Perform structural repairs of concrete, subject to Architect's approval, using epoxy adhesive and patching mortar.
- F. Repair materials and installation not specified above may be used, subject to Architect's approval.

### **3.016 FIELD QUALITY CONTROL**

- A. Special Inspections: Owner will engage a special inspector and qualified testing and inspecting agency to perform field tests and inspections and prepare test reports.
- B. Testing Agency: Engage a qualified testing and inspecting agency to perform tests and inspections and to submit reports.
- C. Inspections:
1. Steel reinforcement placement.
  2. Steel reinforcement welding.
  3. Headed bolts and studs.
  4. Verification of use of required design mixture.
  5. Concrete placement, including conveying and depositing.
  6. Curing procedures and maintenance of curing temperature.
  7. Verification of concrete strength before removal of shores and forms from beams and slabs.
- D. Concrete Tests: Testing of composite samples of fresh concrete obtained according to ASTM C 172/C 172M shall be performed according to the following requirements:

## SECTION 03 3000 - CAST-IN-PLACE CONCRETE

1. Testing Frequency: Obtain one composite sample for each day's pour of each concrete mixture exceeding 5 cu. yd. (4 cu. m), but less than 25 cu. yd. (19 cu. m), plus one set for each additional 50 cu. yd. (38 cu. m) or fraction thereof.
2. Testing Frequency: Obtain at least one composite sample for each 100 cu. yd. (76 cu. m) or fraction thereof of each concrete mixture placed each day.

When frequency of testing provides fewer than five compressive-strength tests for each concrete mixture, testing shall be conducted from at least five randomly selected batches or from each batch if fewer than five are used.

3. Slump: ASTM C 143/C 143M; one test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mixture. Perform additional tests when concrete consistency appears to change.
4. Air Content: ASTM C 231/C 231M, pressure method, for normal-weight concrete; ASTM C 173/C 173M, volumetric method, for structural lightweight concrete; one test for each composite sample, but not less than one test for each day's pour of each concrete mixture.
5. Concrete Temperature: ASTM C 1064/C 1064M; one test hourly when air temperature is 40 deg F (4.4 deg C) and below or 80 deg F (27 deg C) and above, and one test for each composite sample.
6. Unit Weight: ASTM C 567/C 567M, fresh unit weight of structural lightweight concrete; one test for each composite sample, but not less than one test for each day's pour of each concrete mixture.
7. Compression Test Specimens: ASTM C 31/C 31M.
  - a. Cast and laboratory cure two sets of two standard cylinder specimens for each composite sample.
  - b. Cast and field cure two sets of two standard cylinder specimens for each composite sample.
8. Compressive-Strength Tests: ASTM C 39/C 39M; test one set of two laboratory-cured specimens at 7 days and one set of two

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specimens at 28 days.

- a. Test one set of two field-cured specimens at 7 days and one set of two specimens at 28 days.
  - b. A compressive-strength test shall be the average compressive strength from a set of two specimens obtained from same composite sample and tested at age indicated.
9. When strength of field-cured cylinders is less than 85 percent of companion laboratory-cured cylinders, Contractor shall evaluate operations and provide corrective procedures for protecting and curing in-place concrete.
  10. Strength of each concrete mixture will be satisfactory if every average of any three consecutive compressive-strength tests equals or exceeds specified compressive strength and no compressive-strength test value falls below specified compressive strength by more than 500 psi (3.4 MPa).
  11. Test results shall be reported in writing to Architect, concrete manufacturer, and Contractor within 48 hours of testing. Reports of compressive-strength tests shall contain Project identification name and number, date of concrete placement, name of concrete testing and inspecting agency, location of concrete batch in Work, design compressive strength at 28 days, concrete mixture proportions and materials, compressive breaking strength, and type of break for both 7- and 28-day tests.
  12. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by Architect but will not be used as sole basis for approval or rejection of concrete.
  13. Additional Tests: Testing and inspecting agency shall make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by Architect. Testing and inspecting agency may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C 42/C 42M or by other methods as directed by Architect.
  14. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

## **SECTION 03 3000 - CAST-IN-PLACE CONCRETE**

15. Correct deficiencies in the Work that test reports and inspections indicate do not comply with the Contract Documents.

E. Measure floor and slab flatness and levelness according to ASTM E 1155 (ASTM E 1155M) within 24 hours of finishing.

### **3.017 PROTECTION OF LIQUID FLOOR TREATMENTS**

Protect liquid floor treatment from damage and wear during the remainder of construction period. Use protective methods and materials, including temporary covering, recommended in writing by liquid floor treatments installer.

**END OF SECTION 033000**

## **SECTION 03 3523 - EXPOSED AGGREGATE CONCRETE FINISHING**

### **PART 1 GENERAL**

#### **1.01 SECTION INCLUDES**

Exposed aggregate concrete finish on cast-in-place concrete work specified in Section 03 3000. All exterior walkways, ramps and flatwork.

#### **1.02 RELATED REQUIREMENTS**

Section 03 3000 - Cast-in-Place Concrete.

#### **1.03 REFERENCE STANDARDS**

- A. ACI 301 - Specifications for Structural Concrete; American Concrete Institute International; 2010 (Errata 2012).
- B. ACI 303R - Guide to Cast-in-Place Architectural Concrete Practice; American Concrete Institute International; 2012.
- C. ACI 308R - Guide to Curing Concrete; American Concrete Institute International; 2001 (Reapproved 2008).
- D. ASTM C150/C150M - Standard Specification for Portland Cement; 2012.

#### **1.04 ADMINISTRATIVE REQUIREMENTS**

Preinstallation Meeting: Convene one week before starting work of this section.

#### **1.05 SUBMITTALS**

Samples: Submit two, 5 lb (2 Kg) plastic bags of each aggregate specified, illustrating size, color and the extremes of color range.

#### **1.06 QUALITY ASSURANCE**

Perform Work in accordance with ACI 301 and ACI 303R.

#### **1.07 DELIVERY, STORAGE, AND HANDLING**

Provide surface retarder in manufacturer's original packaging, including use instructions.

### **PART 2 PRODUCTS**

#### **2.01 APPLICATIONS**

- A. Floor Surfaces

## SECTION 03 3523 - EXPOSED AGGREGATE CONCRETE FINISHING

### 2.02 ACCESSORY MATERIALS

A. Surface Retarder for Horizontal Surfaces: Spray-on liquid that retards surface set.

1. Products:

- a. Grace Top Cast [www.grace.com](http://www.grace.com)
- b. Dayton Superior Corporation; Top Cast: [www.daytonsuperior.com](http://www.daytonsuperior.com).
- c. W.R. Meadows, Inc.; Top-Stop: [www.wrmeadows.com](http://www.wrmeadows.com).

### PART 3 EXECUTION

#### 3.01 EXAMINATION

- A. Verify that items to be cast into concrete are placed securely and will not impede placing concrete.
- B. Notify Architect minimum 24 hours prior to commencement of concreting operations.

#### 3.02 PREPARATION

- A. Clean formwork surfaces.
- B. Clean previously placed concrete with steel brush and apply bonding agent in accordance with manufacturer's instructions.

#### 3.03 AGGREGATE EXPOSURE

- A. Leave formwork in place until concrete has attained 75 percent of design compressive strength.
- B. Immediately after removal of formwork, wash retarded concrete surfaces with water and scrub with stiff bristle brush exposing aggregate to match accepted sample panel.
- C. After removal of formwork, wet concrete surfaces with water and scrub with acid etch solution, exposing aggregate to match accepted sample panel.
- D. After removal of formwork, apply matrix and aggregate to concrete substrate to uniform texture and to match accepted sample panel.

#### 3.04 CURING

Cure concrete floor surfaces as specified in 03 3000.

## **SECTION 03 3523 - EXPOSED AGGREGATE CONCRETE FINISHING**

### **3.05 CLEANING**

When desired finish is achieved, wash and rinse exposed aggregate surfaces.

### **3.06 DEFECTIVE CONCRETE**

- A. Patch, cure, and finish imperfections to match adjacent areas.
- B. Replace concrete not properly placed.

### **3.07 PROTECTION**

Protect concrete from premature drying or staining, excessively hot or cold temperatures, or mechanical injury.

END OF SECTION

## SECTION 04 2000 - UNIT MASONRY

### PART 1 - GENERAL

The work in this section includes the interior and exterior CMU wall construction.

#### 1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General Requirements, apply to this Section.

#### 1.02 SUMMARY

A. Section Includes:

1. Concrete masonry units.
2. Decorative concrete masonry units.
3. Pre-faced concrete masonry units.
4. Structural clay facing tile.
5. Mortar and grout.
6. Steel reinforcing bars.
7. Masonry-joint reinforcement.
8. Ties and anchors.
9. Embedded flashing.
10. Miscellaneous masonry accessories.
11. Masonry-cell fill.

B. Products Installed but not Furnished under This Section:

1. Cast-stone trim in unit masonry.
2. Steel lintels in unit masonry.
3. Steel shelf angles for supporting unit masonry.
4. Cavity wall insulation.

C. Related Requirements:

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1. Section 033000 "Cast-in-Place Concrete" for installing dovetail slots for masonry anchors.
2. Section 072100 "Thermal Insulation" for cavity wall insulation.
3. Section 076200 "Sheet Metal Flashing and Trim" for exposed sheet metal flashing and for furnishing manufactured reglets installed in masonry joints.

### **1.03 DEFINITIONS**

A. CMU(s): Concrete masonry unit(s).

B. Reinforced Masonry: Masonry containing reinforcing steel in grouted cells.

### **1.04 ACTION SUBMITTALS**

A. Product Data: For each type of product.

B. Sustainable Design Submittals:

1. Product Certificates: For regional materials, indicating location of material manufacturer and point of extraction, harvest, or recovery for each raw material. Include distance to Project and cost for each regional material.

C. Shop Drawings: For the following:

1. Masonry Units: Show sizes, profiles, coursing, and locations of special shapes.
2. Stone Trim Units: Show sizes, profiles, and locations of each stone trim unit required.
3. Reinforcing Steel: Detail bending, lap lengths, and placement of unit masonry reinforcing bars. Comply with ACI 315. Show elevations of reinforced walls.
4. Fabricated Flashing: Detail corner units, end-dam units, and other special applications.

### **1.05 INFORMATIONAL SUBMITTALS**

A. Qualification Data: For testing agency.

B. Material Certificates: For each type and size of the following:

1. Masonry units.

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- a. Include data on material properties material test reports substantiating compliance with requirements.
  - b. For masonry units used in structural masonry include data and calculations establishing average net-area compressive strength of units.
2. Integral water repellent used in CMUs.
  3. Cementitious materials. Include name of manufacturer, brand name, and type.
  4. Mortar admixtures.
  5. Preblended, dry mortar mixes. Include description of type and proportions of ingredients.
  6. Grout mixes. Include description of type and proportions of ingredients.
  7. Reinforcing bars.
  8. Joint reinforcement.
  9. Anchors, ties, and metal accessories.
- C. Mix Designs: For each type of mortar and grout. Include description of type and proportions of ingredients.
1. Include test reports for mortar mixes required to comply with property specification. Test according to ASTM C 109/C 109M for compressive strength, ASTM C 1506 for water retention, and ASTM C 91/C 91M for air content.
  2. Include test reports, according to ASTM C 1019, for grout mixes required to comply with compressive strength requirement.
- D. Statement of Compressive Strength of Masonry: For each combination of masonry unit type and mortar type, provide statement of average net-area compressive strength of masonry units, mortar type, and resulting net-area compressive strength of masonry determined according to TMS 602/ACI 530.1/ASCE 6.
- E. Cold-Weather and Hot-Weather Procedures: Detailed description of methods, materials, and equipment to be used to comply with requirements.

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### 1.06 QUALITY ASSURANCE

Testing Agency Qualifications: Qualified according to ASTM C 1093 for testing indicated.

### 1.07 DELIVERY, STORAGE, AND HANDLING

- A. Store masonry units on elevated platforms in a dry location. If units are not stored in an enclosed location, cover tops and sides of stacks with waterproof sheeting, securely tied. If units become wet, do not install until they are dry.
- B. Store cementitious materials on elevated platforms, under cover, and in a dry location. Do not use cementitious materials that have become damp.
- C. Store aggregates where grading and other required characteristics can be maintained and contamination avoided.
- D. Deliver preblended, dry mortar mix in moisture-resistant containers. Store preblended, dry mortar mix in delivery containers on elevated platforms in a dry location or in covered weatherproof dispensing silos.
- E. Store masonry accessories, including metal items, to prevent corrosion and accumulation of dirt and oil.

### 1.08 FIELD CONDITIONS

- A. Protection of Masonry: During construction, cover tops of walls, projections, and sills with waterproof sheeting at end of each day's work. Cover partially completed masonry when construction is not in progress.
  - 1. Extend cover a minimum of 24 inches (600 mm) down both sides of walls, and hold cover securely in place.
  - 2. Where one wythe of multiwythe masonry walls is completed in advance of other wythes, secure cover a minimum of 24 inches (600 mm) down face next to unconstructed wythe, and hold cover in place.
- B. Do not apply uniform floor or roof loads for at least 12 hours and concentrated loads for at least three days after building masonry walls or columns.
- C. Stain Prevention: Prevent grout, mortar, and soil from staining the face of masonry to be left exposed or painted. Immediately remove grout, mortar, and soil that come in contact with such masonry.
  - 1. Protect base of walls from rain-splashed mud and from mortar splatter by spreading coverings on ground and over wall surface.

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2. Protect sills, ledges, and projections from mortar droppings.
  3. Protect surfaces of window and door frames, as well as similar products with painted and integral finishes, from mortar droppings.
  4. Turn scaffold boards near the wall on edge at the end of each day to prevent rain from splashing mortar and dirt onto completed masonry.
- D. Cold-Weather Requirements: Do not use frozen materials or materials mixed or coated with ice or frost. Do not build on frozen substrates. Remove and replace unit masonry damaged by frost or by freezing conditions. Comply with cold-weather construction requirements contained in TMS 602/ACI 530.1/ASCE 6.

Cold-Weather Cleaning: Use liquid cleaning methods only when air temperature is 40 deg F (4 deg C) and higher and will remain so until masonry has dried, but not less than seven days after completing cleaning.

- E. Hot-Weather Requirements: Comply with hot-weather construction requirements contained in TMS 602/ACI 530.1/ASCE 6.

### PART 2 - PRODUCTS

#### 2.01 MANUFACTURERS

- A. Source Limitations for Masonry Units: Obtain exposed masonry units of a uniform texture and color, or a uniform blend within the ranges accepted for these characteristics, from single source from single manufacturer for each product required.
- B. Source Limitations for Mortar Materials: Obtain mortar ingredients of a uniform quality, including color for exposed masonry, from single manufacturer for each cementitious component and from single source or producer for each aggregate.

#### 2.02 PERFORMANCE REQUIREMENTS

- A. Provide structural unit masonry that develops indicated net-area compressive strengths at 28 days.
1. Determine net-area compressive strength of masonry from average net-area compressive strengths of masonry units and mortar types (unit-strength method) according to TMS 602/ACI 530.1/ASCE 6.
  2. Determine net-area compressive strength of masonry by testing masonry prisms according to ASTM C 1314.

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### 2.03 UNIT MASONRY, GENERAL

- A. Masonry Standard: Comply with TMS 602/ACI 530.1/ASCE 6, except as modified by requirements in the Contract Documents.
- B. Defective Units: Referenced masonry unit standards may allow a certain percentage of units to contain chips, cracks, or other defects exceeding limits stated. Do not use units where such defects are exposed in the completed Work and will be within 20 feet (6 m) vertically and horizontally of a walking surface.
- C. Fire-Resistance Ratings: Comply with requirements for fire-resistance-rated assembly designs indicated.

Where fire-resistance-rated construction is indicated, units shall be listed and labeled by a qualified testing agency acceptable to authorities having jurisdiction.

### 2.04 CONCRETE MASONRY UNITS

- A. Regional Materials: CMUs shall be manufactured within 500 miles (800 km) of Project site from aggregates and cement that have been extracted, harvested, or recovered, as well as manufactured, within 500 miles (800 km) of Project site.
- B. Regional Materials: CMUs shall be manufactured within 500 miles (800 km) of Project site.
- C. Shapes: Provide shapes indicated and as follows, with exposed surfaces matching exposed faces of adjacent units unless otherwise indicated.
  - 1. Provide special shapes for lintels, corners, jambs, sashes, movement joints, headers, bonding, and other special conditions.
  - 2. Provide bullnose units for outside corners unless otherwise indicated.
- D. Integral Water Repellent: Provide units made with integral water repellent for exposed units.

Integral Water Repellent: Liquid polymeric, integral water-repellent admixture that does not reduce flexural bond strength. Units made with integral water repellent, when tested according to ASTM E 514/E 514M as a wall assembly made with mortar containing integral water-repellent manufacturer's mortar additive, with test period extended to 24 hours, shall show no visible water or leaks on the back of test specimen.

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### E. CMUs: ASTM C 90.

1. Unit Compressive Strength: Provide units with minimum average net-area compressive strength of 1,900 psi.
2. Density Classification: Medium weight unless otherwise indicated.
3. Size (Width): Manufactured to dimensions 3/8 inch (10 mm) less than nominal dimensions.
4. Exposed Faces: Provide color and texture matching the range represented by Architect's sample.
5. Faces to Receive Plaster: Where units are indicated to receive a direct application of plaster, provide textured-face units made with gap-graded aggregates.

### 2.05 MASONRY LINTELS

- A. Masonry Lintels: Prefabricated or built-in-place masonry lintels made from bond beam or lintel CMUs matching adjacent CMUs in color, texture, and density classification, with reinforcing bars placed as indicated and filled with coarse grout. Cure precast lintels before handling and installing. Temporarily support built-in-place lintels until cured.

### 2.06 MORTAR AND GROUT MATERIALS

- A. Regional Materials: Aggregate for mortar and grout shall be manufactured within 500 miles (800 km) of Project site from materials that have been extracted, harvested, or recovered, as well as manufactured, within 500 miles (800 km) of Project site.
- B. Regional Materials: Aggregate for mortar and grout—shall be manufactured within 500 miles (800 km) of Project site.
- C. Portland Cement: ASTM C 150/C 150M, Type I or II, except Type III may be used for cold-weather construction. Provide natural color or white cement as required to produce mortar color indicated.

Alkali content shall not be more than 0.1 percent when tested according to ASTM C 114.

- D. Hydrated Lime: ASTM C 207, Type S.
- E. Portland Cement-Lime Mix: Packaged blend of portland cement and hydrated lime containing no other ingredients.

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### F. Aggregate for Mortar: ASTM C 144.

1. For mortar that is exposed to view, use washed aggregate consisting of natural sand or crushed stone.
2. For joints less than 1/4 inch (6 mm) thick, use aggregate graded with 100 percent passing the No. 16 (1.18-mm) sieve.
3. White-Mortar Aggregates: Natural white sand or crushed white stone.
4. Colored-Mortar Aggregates: Natural sand or crushed stone of color necessary to produce required mortar color.

### G. Aggregate for Grout: ASTM C 404.

H. Cold-Weather Admixture: Nonchloride, noncorrosive, accelerating admixture complying with ASTM C 494/C 494M, Type C, and recommended by manufacturer for use in masonry mortar of composition indicated.

I. Water-Repellent Admixture: Liquid water-repellent mortar admixture intended for use with CMUs containing integral water repellent from same manufacturer.

J. Water: Potable.

## 2.07 REINFORCEMENT

A. Uncoated-Steel Reinforcing Bars: ASTM A 615/A 615M or ASTM A 996/A 996M, Grade 60 (Grade 420).

B. Reinforcing Bar Positioners: Wire units designed to fit into mortar bed joints spanning masonry unit cells and to hold reinforcing bars in center of cells. Units are formed from 0.148-inch (3.77-mm) steel wire, hot-dip galvanized after fabrication. Provide units designed for number of bars indicated.

## 2.08 EMBEDDED FLASHING MATERIALS

A. Metal Flashing: Provide metal flashing complying with SMACNA's "Architectural Sheet Metal Manual" and as follows:

1. Stainless Steel: ASTM A 240/A 240M or ASTM A 666, Type 304, 0.016 inch (0.40 mm) thick.
2. Fabricate continuous flashings in sections 96 inches (2400 mm) long minimum, but not exceeding 12 feet (3.7 m). Provide splice plates at joints of formed, smooth metal flashing.

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3. Fabricate through-wall metal flashing embedded in masonry from stainless steel, with ribs at 3-inch (76-mm) intervals along length of flashing to provide an integral mortar bond.
4. Fabricate through-wall flashing with snaplock receiver on exterior face where indicated to receive counterflashing.
5. Fabricate through-wall flashing with drip edge unless otherwise indicated. Fabricate by extending flashing 1/2 inch (13 mm) out from wall, with outer edge bent down 30 degrees and hemmed.
6. Fabricate through-wall flashing with sealant stop unless otherwise indicated. Fabricate by bending metal back on itself 3/4 inch (19 mm) at exterior face of wall and down into joint 1/4 inch (6 mm) to form a stop for retaining sealant backer rod.
7. Fabricate metal drip edges and sealant stops for ribbed metal flashing from plain metal flashing of same metal as ribbed flashing and extending at least 3 inches (76 mm) into wall with hemmed inner edge to receive ribbed flashing and form a hooked seam. Form hem on upper surface of metal so that completed seam sheds water.
8. Fabricate metal drip edges from stainless steel. Extend at least 3 inches (76 mm) into wall and 1/2 inch (13 mm) out from wall, with outer edge bent down 30 degrees and hemmed.
9. Fabricate metal sealant stops from stainless steel. Extend at least 3 inches (76 mm) into wall and out to exterior face of wall. At exterior face of wall, bend metal back on itself for 3/4 inch (19 mm) and down into joint 1/4 inch (6 mm) to form a stop for retaining sealant backer rod.
10. Fabricate metal expansion-joint strips from stainless steel to shapes indicated.
11. Solder metal items at corners.

B. Flexible Flashing: Use the following unless otherwise indicated:

Copper-Laminated Flashing: 7-oz./sq. ft. (2-kg/sq. m) copper sheet bonded between two layers of glass-fiber cloth. Use only where flashing is fully concealed in masonry.

C. Application: Unless otherwise indicated, use the following:

1. Where flashing is indicated to receive counterflashing, use metal flashing.

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2. Where flashing is indicated to be turned down at or beyond the wall face, use metal flashing.
- D. Single-Wythe CMU Flashing System: System of CMU cell flashing pans and interlocking CMU web covers made from UV-resistant, high-density polyethylene. Cell flashing pans have integral weep spouts designed to be built into mortar bed joints and that extend into the cell to prevent clogging with mortar.

### 2.09 MISCELLANEOUS MASONRY ACCESSORIES

- A. Compressible Filler: Premolded filler strips complying with ASTM D 1056, Grade 2A1; compressible up to 35 percent; of width and thickness indicated; formulated from neoprene urethane or PVC.
- B. Preformed Control-Joint Gaskets: Made from styrene-butadiene-rubber compound, complying with ASTM D 2000, Designation M2AA-805 or PVC, complying with ASTM D 2287, Type PVC-65406 and designed to fit standard sash block and to maintain lateral stability in masonry wall; size and configuration as indicated.
- C. Bond-Breaker Strips: Asphalt-saturated felt complying with ASTM D 226/D 226M, Type I (No. 15 asphalt felt).
- D. Weep/Cavity Vent Products: Use one of the following unless otherwise indicated:
1. Wicking Material: Absorbent rope, made from cotton or UV-resistant synthetic fiber, 1/4 to 3/8 inch (6 to 10 mm) in diameter, in length required to produce 2-inch (50-mm) exposure on exterior and 18 inches (450 mm) in cavity. Use only for weeps.
  2. Round Plastic Weep/Vent Tubing: Medium-density polyethylene, 3/8-inch (9-mm) OD by 4 inches (100 mm) long.
  3. Rectangular Plastic Weep/Vent Tubing: Clear butyrate, 3/8 by 1-1/2 by 3-1/2 inches (9 by 38 by 89 mm) long.
  4. Mesh Weep/Vent: Free-draining mesh; made from polyethylene strands, full height and width of head joint and depth 1/8 inch (3 mm) less than depth of outer wythe; in color selected from manufacturer's standard.
  5. Aluminum Weep Hole/Vent: Units made from sheet aluminum, designed to fit into a head joint and consisting of a vertical channel, with louvers stamped in web and with a top flap to keep mortar out of the head joint; factory primed and painted before installation to

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comply with Section 099000 "Painting and Coating" in color selected by Architect.

6. Vinyl Weep Hole/Vent: Units made from flexible PVC, designed to fit into a head joint and consisting of a louvered vertical leg, flexible wings to seal against ends of masonry units, and a top flap to keep mortar out of the head joint; in color selected by Architect.

E. Cavity Drainage Material: Free-draining mesh, made from polymer strands that will not degrade within the wall cavity.

1. Configuration: Provide one of the following:
  - a. Strips, full depth of cavity and 10 inches (250 mm) high, with dovetail-shaped notches 7 inches (175 mm) deep that prevent clogging with mortar droppings.
  - b. Strips, not less than 3/4 inch (19 mm) thick and 10 inches (250 mm) high, with dimpled surface designed to catch mortar droppings and prevent weep holes from clogging with mortar.
  - c. Sheets or strips, full depth of cavity and installed to full height of cavity.
  - d. Sheets or strips not less than 3/4 inch (19 mm) thick and installed to full height of cavity, with additional strips 4 inches (100 mm) high at weep holes and thick enough to fill entire depth of cavity and prevent weep holes from clogging with mortar.

### 2.010 MASONRY-CELL FILL

A. Loose-Fill Insulation: Perlite complying with ASTM C 549, Type II (surface treated for water repellency and limited moisture absorption) or Type IV (surface treated for water repellency and to limit dust generation).

B. Lightweight-Aggregate Fill: ASTM C 331/C 331M.

### 2.011 MASONRY CLEANERS

Proprietary Acidic Cleaner: Manufacturer's standard-strength cleaner designed for removing mortar/grout stains, efflorescence, and other new construction stains from new masonry without discoloring or damaging masonry surfaces. Use product expressly approved for intended use by cleaner manufacturer and manufacturer of masonry units being cleaned.

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### 2.012 MORTAR AND GROUT MIXES

A. General: Do not use admixtures, including pigments, air-entraining agents, accelerators, retarders, water-repellent agents, antifreeze compounds, or other admixtures unless otherwise indicated.

1. Do not use calcium chloride in mortar or grout.
2. Use portland cement-lime mortar unless otherwise indicated.
3. For exterior masonry, use portland cement-lime mortar.
4. For reinforced masonry, use portland cement-lime mortar.
5. Add cold-weather admixture (if used) at same rate for all mortar that will be exposed to view, regardless of weather conditions, to ensure that mortar color is consistent.

B. Preblended, Dry Mortar Mix: Furnish dry mortar ingredients in form of a preblended mix. Measure quantities by weight to ensure accurate proportions, and thoroughly blend ingredients before delivering to Project site.

C. Mortar for Unit Masonry: Comply with ASTM C 270, Proportion Property Specification. Provide the following types of mortar for applications stated unless another type is indicated or needed to provide required compressive strength of masonry.

1. For masonry below grade or in contact with earth, use Type M.
2. For reinforced masonry, use Type S.
3. For mortar parge coats, use Type S.
4. For exterior, above-grade, load-bearing and nonload-bearing walls and parapet walls; for interior load-bearing walls; for interior nonload-bearing partitions; and for other applications where another type is not indicated, use Type S.
5. For interior nonload-bearing partitions, use Type S.

D. Grout for Unit Masonry: Comply with ASTM C 476.

1. Use grout of type indicated or, if not otherwise indicated, of type (fine or coarse) that will comply with TMS 602/ACI 530.1/ASCE 6 for dimensions of grout spaces and pour height.
2. Proportion grout in accordance with ASTM C 476, paragraph 4.2.2 for specified 28-day compressive strength indicated.

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3. Provide grout with a slump of 10 to 11 inches (250 to 280 mm) as measured according to ASTM C 143/C 143M.

### PART 3 - EXECUTION

#### 3.01 EXAMINATION

- A. Examine conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
  1. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.
  2. Verify that foundations are within tolerances specified.
  3. Verify that reinforcing dowels are properly placed.
  4. Verify that substrates are free of substances that impair mortar bond.
- B. Before installation, examine rough-in and built-in construction for piping systems to verify actual locations of piping connections.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

#### 3.02 INSTALLATION, GENERAL

- A. Thickness: Build cavity and composite walls and other masonry construction to full thickness shown. Build single-wythe walls to actual widths of masonry units, using units of widths indicated.
- B. Build chases and recesses to accommodate items specified in this and other Sections.
- C. Leave openings for equipment to be installed before completing masonry. After installing equipment, complete masonry to match construction immediately adjacent to opening.
- D. Use full-size units without cutting if possible. If cutting is required to provide a continuous pattern or to fit adjoining construction, cut units with motor-driven saws; provide clean, sharp, unchipped edges. Allow units to dry before laying unless wetting of units is specified. Install cut units with cut surfaces and, where possible, cut edges concealed.
- E. Select and arrange units for exposed unit masonry to produce a uniform blend of colors and textures. Mix units from several pallets or cubes as they are placed.

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F. Matching Existing Masonry: Match coursing, bonding, color, and texture of existing masonry.

### 3.03 TOLERANCES

#### A. Dimensions and Locations of Elements:

1. For dimensions in cross section or elevation, do not vary by more than plus 1/2 inch (12 mm) or minus 1/4 inch (6 mm).
2. For location of elements in plan, do not vary from that indicated by more than plus or minus 1/2 inch (12 mm).
3. For location of elements in elevation, do not vary from that indicated by more than plus or minus 1/4 inch (6 mm) in a story height or 1/2 inch (12 mm) total.

#### B. Lines and Levels:

1. For bed joints and top surfaces of bearing walls, do not vary from level by more than 1/4 inch in 10 feet (6 mm in 3 m), or 1/2-inch (12-mm) maximum.
2. For conspicuous horizontal lines, such as lintels, sills, parapets, and reveals, do not vary from level by more than 1/8 inch in 10 feet (3 mm in 3 m), 1/4 inch in 20 feet (6 mm in 6 m), or 1/2-inch (12-mm) maximum.
3. For vertical lines and surfaces, do not vary from plumb by more than 1/4 inch in 10 feet (6 mm in 3 m), 3/8 inch in 20 feet (9 mm in 6 m), or 1/2-inch (12-mm) maximum.
4. For conspicuous vertical lines, such as external corners, door jambs, reveals, and expansion and control joints, do not vary from plumb by more than 1/8 inch in 10 feet (3 mm in 3 m), 1/4 inch in 20 feet (6 mm in 6 m), or 1/2-inch (12-mm) maximum.
5. For lines and surfaces, do not vary from straight by more than 1/4 inch in 10 feet (6 mm in 3 m), 3/8 inch in 20 feet (9 mm in 6 m), or 1/2-inch (12-mm) maximum.
6. For vertical alignment of exposed head joints, do not vary from plumb by more than 1/4 inch in 10 feet (6 mm in 3 m), or 1/2-inch (12-mm) maximum.

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7. For faces of adjacent exposed masonry units, do not vary from flush alignment by more than 1/16 inch (1.5 mm) except due to warpage of masonry units within tolerances specified for warpage of units.

### C. Joints:

1. For bed joints, do not vary from thickness indicated by more than plus or minus 1/8 inch (3 mm), with a maximum thickness limited to 1/2 inch (12 mm).
2. For exposed bed joints, do not vary from bed-joint thickness of adjacent courses by more than 1/8 inch (3 mm).
3. For head and collar joints, do not vary from thickness indicated by more than plus 3/8 inch (9 mm) or minus 1/4 inch (6 mm).
4. For exposed head joints, do not vary from thickness indicated by more than plus or minus 1/8 inch (3 mm). Do not vary from adjacent bed-joint and head-joint thicknesses by more than 1/8 inch (3 mm).
5. For exposed bed joints and head joints of stacked bond, do not vary from a straight line by more than 1/16 inch (1.5 mm) from one masonry unit to the next.

### 3.04 LAYING MASONRY WALLS

- A. Lay out walls in advance for accurate spacing of surface bond patterns with uniform joint thicknesses and for accurate location of openings, movement-type joints, returns, and offsets. Avoid using less-than-half-size units, particularly at corners, jambs, and, where possible, at other locations.
- B. Bond Pattern for Exposed Masonry: Unless otherwise indicated, lay exposed masonry in bond pattern indicated on Drawings; do not use units with less-than-nominal 4-inch (100-mm) horizontal face dimensions at corners or jambs.
- C. Stopping and Resuming Work: Stop work by stepping back units in each course from those in course below; do not tooth. When resuming work, clean masonry surfaces that are to receive mortar, remove loose masonry units and mortar, and wet brick if required before laying fresh masonry.
- D. Built-in Work: As construction progresses, build in items specified in this and other Sections. Fill in solidly with masonry around built-in items.
- E. Fill space between steel frames and masonry solidly with mortar unless otherwise indicated.

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F. Where built-in items are to be embedded in cores of hollow masonry units, place a layer of metal lath, wire mesh, or plastic mesh in the joint below, and rod mortar or grout into core.

G. Fill all cores in hollow CMUs.

### 3.05 MORTAR BEDDING AND JOINTING

A. Lay CMUs as follows:

1. Bed face shells in mortar and make head joints of depth equal to bed joints.
2. Bed webs in mortar in all courses of piers, columns, and pilasters.
3. Bed webs in mortar in grouted masonry, including starting course on footings.
4. Fully bed entire units, including areas under cells, at starting course on footings where cells are not grouted.
5. Fully bed units and fill cells with mortar at anchors and ties as needed to fully embed anchors and ties in mortar.

B. Tool exposed joints slightly concave when thumbprint hard, using a jointer larger than joint thickness unless otherwise indicated.

C. Cut joints flush for masonry walls to receive plaster or other direct-applied finishes (other than paint) unless otherwise indicated.

D. Cut joints flush where indicated to receive items per plan.

### 3.06 CONTROL AND EXPANSION JOINTS

A. General: Install control- and expansion-joint materials in unit masonry as masonry progresses. Do not allow materials to span control and expansion joints without provision to allow for in-plane wall or partition movement.

B. Form control joints in concrete masonry as follows using one of the following methods:

1. Fit bond-breaker strips into hollow contour in ends of CMUs on one side of control joint. Fill resultant core with grout, and rake out joints in exposed faces for application of sealant.
2. Install preformed control-joint gaskets designed to fit standard sash block.

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3. Install interlocking units designed for control joints. Install bond-breaker strips at joint. Keep head joints free and clear of mortar, or rake out joint for application of sealant.
  4. Install temporary foam-plastic filler in head joints, and remove filler when unit masonry is complete for application of sealant.
- C. Provide horizontal, pressure-relieving joints by either leaving an airspace or inserting a compressible filler of width required for installing sealant and backer rod specified in Section 079005 "Joint Sealers," but not less than 3/8 inch (10 mm).
1. Locate horizontal, pressure-relieving joints beneath shelf angles supporting masonry.

### 3.07 LINTELS

- A. Install steel lintels where indicated.
- B. Provide masonry lintels where shown and where openings of more than 24 inches (610 mm) for block-size units are shown without structural steel or other supporting lintels.
- C. Provide minimum bearing of 8 inches (200 mm) at each jamb unless otherwise indicated.

### 3.08 FLASHING, WEEP HOLES, AND CAVITY VENTS

- A. General: Install embedded flashing and weep holes in masonry at shelf angles, lintels, ledges, other obstructions to downward flow of water in wall, and where indicated.
- B. Install flashing as follows unless otherwise indicated:
  1. Prepare masonry surfaces so they are smooth and free from projections that could puncture flashing. Where flashing is within mortar joint, place through-wall flashing on sloping bed of mortar and cover with mortar. Before covering with mortar, seal penetrations in flashing with adhesive, sealant, or tape as recommended by flashing manufacturer.
  2. At lintels and shelf angles, extend flashing a minimum of 6 inches (150 mm) into masonry at each end. At heads and sills, extend flashing 6 inches (150 mm) at ends and turn up not less than 2 inches (50 mm) to form end dams.
  3. Interlock end joints of ribbed sheet metal flashing by overlapping ribs not less than 1-1/2 inches (38 mm) or as recommended by flashing

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manufacturer, and seal lap with elastomeric sealant complying with requirements in Section 079005 "Joint Sealers" for application indicated.

4. Install metal drip edges beneath flexible flashing at exterior face of wall. Stop flexible flashing 1/2 inch (13 mm) back from outside face of wall, and adhere flexible flashing to top of metal drip edge.
  5. Install metal flashing termination beneath flexible flashing at exterior face of wall. Stop flexible flashing 1/2 inch (13 mm) back from outside face of wall, and adhere flexible flashing to top of metal flashing termination.
  6. Cut flexible flashing off flush with face of wall after masonry wall construction is completed.
- C. Install single-wythe CMU flashing system in bed joints of CMU walls where indicated to comply with manufacturer's written instructions. Install CMU cell pans with upturned edges located below face shells and webs of CMUs above and with weep spouts aligned with face of wall. Install CMU web covers so that they cover upturned edges of CMU cell pans at CMU webs and extend from face shell to face shell.
- D. Install reglets and nailers for flashing and other related construction where they are shown to be built into masonry.
- E. Install weep holes in exterior wythes and veneers in head joints of first course of masonry immediately above embedded flashing.
1. Use specified weep/cavity vent products or open-head joints to form weep holes.
  2. Use wicking material to form weep holes above flashing under brick sills. Turn wicking down at lip of sill to be as inconspicuous as possible.
  3. Space weep holes 24 inches (600 mm) o.c. unless otherwise indicated.
  4. Space weep holes formed from plastic tubing or wicking material 16 inches (400 mm) o.c.
  5. Cover cavity side of weep holes with plastic insect screening at cavities insulated with loose-fill insulation.
  6. Trim wicking material flush with outside face of wall after mortar has set.

## SECTION 04 2000 - UNIT MASONRY

F. Place pea gravel in cavities as soon as practical to a height equal to height of first course above top of flashing, but not less than 2 inches (50 mm), to maintain drainage.

1. Fill cavities full height by placing pea gravel in cavities as masonry is laid, so that at any point, masonry does not extend more than 24 inches (600 mm) above top of pea gravel.

G. Place cavity drainage material in cavities to comply with configuration requirements for cavity drainage material in "Miscellaneous Masonry Accessories" Article.

H. Install cavity vents in head joints in exterior wythes at spacing indicated. Use specified weep/cavity vent products or open-head joints to form cavity vents.

1. Close cavities off vertically and horizontally with blocking in manner indicated. Install through-wall flashing and weep holes above horizontal blocking.

### 3.09 REINFORCED UNIT MASONRY INSTALLATION

A. Temporary Formwork and Shores: Construct formwork and shores as needed to support reinforced masonry elements during construction.

1. Construct formwork to provide shape, line, and dimensions of completed masonry as indicated. Make forms sufficiently tight to prevent leakage of mortar and grout. Brace, tie, and support forms to maintain position and shape during construction and curing of reinforced masonry.
2. Do not remove forms and shores until reinforced masonry members have hardened sufficiently to carry their own weight and that of other loads that may be placed on them during construction.

B. Placing Reinforcement: Comply with requirements in TMS 602/ACI 530.1/ASCE 6.

C. Grouting: Do not place grout until entire height of masonry to be grouted has attained enough strength to resist grout pressure.

1. Comply with requirements in TMS 602/ACI 530.1/ASCE 6 for cleanouts and for grout placement, including minimum grout space and maximum pour height.
2. Limit height of vertical grout pours to not more than 48 inches.

## SECTION 04 2000 - UNIT MASONRY

### 3.010 FIELD QUALITY CONTROL

- A. Testing and Inspecting: Owner will engage special inspectors to perform tests and inspections and prepare reports. Allow inspectors access to scaffolding and work areas as needed to perform tests and inspections. Retesting of materials that fail to comply with specified requirements shall be done at Contractor's expense.
- B. Inspections: Special inspections according to Level C in TMS 402/ACI 530/ASCE 5.
1. Begin masonry construction only after inspectors have verified proportions of site-prepared mortar.
  2. Place grout only after inspectors have verified compliance of grout spaces and of grades, sizes, and locations of reinforcement.
  3. Place grout only after inspectors have verified proportions of site-prepared grout.
- C. Testing Prior to Construction: One set of tests.
- D. Testing Frequency: One set of tests for each 5000 sq. ft. (464 sq. m) of wall area or portion thereof.
- E. Concrete Masonry Unit Test: For each type of unit provided, according to ASTM C 140 for compressive strength.
- F. Mortar Aggregate Ratio Test (Proportion Specification): For each mix provided, according to ASTM C 780.
- G. Mortar Test (Property Specification): For each mix provided, according to ASTM C 780. Test mortar for compressive strength.
- H. Grout Test (Compressive Strength): For each mix provided, according to ASTM C 1019.
- I. Prism Test: For each type of construction provided, according to ASTM C 1314 at 28 days.

### 3.011 REPAIRING, POINTING, AND CLEANING

- A. Remove and replace masonry units that are loose, chipped, broken, stained, or otherwise damaged or that do not match adjoining units. Install new units to match adjoining units; install in fresh mortar, pointed to eliminate evidence of replacement.

## SECTION 04 2000 - UNIT MASONRY

- B. Pointing: During the tooling of joints, enlarge voids and holes, except weep holes, and completely fill with mortar. Point up joints, including corners, openings, and adjacent construction, to provide a neat, uniform appearance. Prepare joints for sealant application, where indicated.
- C. In-Progress Cleaning: Clean unit masonry as work progresses by dry brushing to remove mortar fins and smears before tooling joints.
- D. Final Cleaning: After mortar is thoroughly set and cured, clean exposed masonry as follows:
1. Remove large mortar particles by hand with wooden paddles and nonmetallic scrape hoes or chisels.
  2. Test cleaning methods on sample wall panel; leave one-half of panel uncleaned for comparison purposes. Obtain Architect's approval of sample cleaning before proceeding with cleaning of masonry.
  3. Protect adjacent stone and nonmasonry surfaces from contact with cleaner by covering them with liquid strippable masking agent or polyethylene film and waterproof masking tape.
  4. Wet wall surfaces with water before applying cleaners; remove cleaners promptly by rinsing surfaces thoroughly with clear water.
  5. Clean brick by bucket-and-brush hand-cleaning method described in BIA Technical Notes 20.
  6. Clean concrete masonry by applicable cleaning methods indicated in NCMA TEK 8-4A.
  7. Clean masonry with a proprietary acidic cleaner applied according to manufacturer's written instructions.
  8. Clean stone trim to comply with stone supplier's written instructions.
  9. Clean limestone units to comply with recommendations in ILI's "Indiana Limestone Handbook."

### 3.012 MASONRY WASTE DISPOSAL

- A. Salvageable Materials: Unless otherwise indicated, excess masonry materials are Contractor's property. At completion of unit masonry work, remove from Project site.
- B. Waste Disposal as Fill Material: Dispose of clean masonry waste, including excess or soil-contaminated sand, waste mortar, and broken masonry units, by crushing and mixing with fill material as fill is placed.

## **SECTION 04 2000 - UNIT MASONRY**

1. Crush masonry waste to less than 4 inches (100 mm) in each dimension.
2. Mix masonry waste with at least two parts of specified fill material for each part of masonry waste. Fill material is specified in Section 312000.
3. Do not dispose of masonry waste as fill within 18 inches (450 mm) of finished grade.

C. Masonry Waste Recycling: Return broken CMUs not used as fill to manufacturer for recycling.

D. Excess Masonry Waste: Remove excess clean masonry waste that cannot be used as fill, as described above or recycled, and other masonry waste, and legally dispose of off Owner's property.

**END OF SECTION 042000**

## SECTION 05 5113 - METAL PAN STAIRS

### PART 1 - GENERAL

Exterior stairs from first floor to viewing platform.

#### 1.01 SUMMARY

A. Section Includes:

1. Preassembled steel stairs with concrete-filled treads.
2. Steel tube railings attached to metal stairs.
3. Steel tube handrails attached to walls adjacent to metal stairs.
4. Railing gates at the level of exit discharge.

B. Related Requirements:

1. Section 033000 "Cast-in-Place Concrete" for concrete fill for stair treads and platforms.
2. Section 055213 "Pipe and Tube Railings" for pipe and tube railings.

#### 1.02 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions, apply to this Section.

#### 1.03 COORDINATION

- A. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' written recommendations to ensure that shop primers and topcoats are compatible with one another.
- B. Coordinate installation of anchorages for metal stairs. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.
- C. Coordinate locations of hanger rods and struts with other work so that they do not encroach on required stair width and are within the fire-resistance-rated stair enclosure.

#### 1.04 ACTION SUBMITTALS

A. Product Data: For metal pan stairs and the following:

## **SECTION 05 5113 - METAL PAN STAIRS**

1. Prefilled metal-pan-stair treads.
2. Precast concrete treads.
3. Epoxy-resin-filled stair treads.
4. Nonslip aggregates and nonslip-aggregate finishes.
5. Abrasive nosings.
6. Paint products.

### **B. Sustainable Design Submittals:**

1. Product Data: For recycled content, indicating postconsumer and preconsumer recycled content and cost.

### **C. Shop Drawings:** Include plans, elevations, sections, details, and attachments to other work.

### **D. Samples for Verification:** For each type and finish of nosing and tread.

### **E. Delegated-Design Submittal:** For stairs and railings, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

## **1.05 INFORMATIONAL SUBMITTALS**

### **A. Retain "Welding certificates" Paragraph below if retaining "Welding Qualifications" Paragraph in "Quality Assurance" Article.**

### **B. Welding certificates.**

### **C. Paint Compatibility Certificates:** From manufacturers of topcoats applied over shop primers certifying that shop primers are compatible with topcoats.

## **1.06 QUALITY ASSURANCE**

### **A. Installer Qualifications:** Fabricator of products.

### **B. Welding Qualifications:** Qualify procedures and personnel according to the following:

1. AWS D1.1/D1.1M, "Structural Welding Code - Steel."
2. AWS D1.3/D1.3M, "Structural Welding Code - Sheet Steel."

## SECTION 05 5113 - METAL PAN STAIRS

### PART 2 - PRODUCTS – N/A

### PART 3 – EXECUTION

#### 3.01 PERFORMANCE REQUIREMENTS

A. Delegated Design: Engage a qualified professional engineer, to design stairs and railings.

B. Structural Performance of Stairs: Metal stairs shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:

1. Uniform Load: 100 lbf/sq. ft. (4.79 kN/sq. m).
2. Concentrated Load: 300 lbf (1.33 kN) applied on an area of 4 sq. in. (2580 sq. mm).
3. Uniform and concentrated loads need not be assumed to act concurrently.
4. Stair Framing: Capable of withstanding stresses resulting from railing loads in addition to loads specified above.
5. Limit deflection of treads, platforms, and framing members to  $L/360$  or 1/4 inch (6.4 mm), whichever is less.

C. Structural Performance of Railings: Railings shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:

1. Handrails and Top Rails of Guards:
  - a. Uniform load of 50 lbf/ft. (0.73 kN/m) applied in any direction.
  - b. Concentrated load of 200 lbf (0.89 kN) applied in any direction.
  - c. Uniform and concentrated loads need not be assumed to act concurrently.
2. Infill of Guards:
  - a. Concentrated load of 50 lbf (0.22 kN) applied horizontally on an area of 1 sq. ft. (0.093 sq. m).
  - b. Infill load and other loads need not be assumed to act concurrently.

## SECTION 05 5113 - METAL PAN STAIRS

D. Seismic Performance of Stairs: Metal stairs shall withstand the effects of earthquake motions determined according to ASCE/SEI 7

1. Component Importance Factor: 1.5.

### 3.02 METALS

- A. Metal Surfaces, General: Provide materials with smooth, flat surfaces unless otherwise indicated. For components exposed to view in the completed Work, provide materials without seam marks, roller marks, rolled trade names, or blemishes.
- B. Recycled Content of Steel Products: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 25 percent.
- C. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.
- D. Steel Tubing: ASTM A 500 (cold formed)] ASTM A 513.
- E. Cast Iron: Either gray iron, ASTM A 48/A 48M, or malleable iron, ASTM A 47/A 47M, unless otherwise indicated.
- F. Uncoated, Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, either commercial steel, Type B, or structural steel, Grade 25 (Grade 170), unless another grade is required by design loads; exposed.
- G. Uncoated, Hot-Rolled Steel Sheet: ASTM A 1011/A 1011M, either commercial steel, Type B, or structural steel, Grade 30 (Grade 205), unless another grade is required by design loads.
- H. Galvanized-Steel Sheet: ASTM A 653/A 653M, G90 (Z275) coating, either commercial steel, Type B, or structural steel, Grade 33 (Grade 230), unless another grade is required by design loads.
- I. Woven-Wire Mesh: Intermediate-crimp, diamond pattern, 2-inch (50-mm) woven-wire mesh, made from 0.135-inch (3.5-mm) nominal diameter wire complying with ASTM A 510 (ASTM A 510M).
- J. Aluminum Extrusions: ASTM B 221 (ASTM B 221M), Alloy 6063-T6.
- K. Aluminum Castings: ASTM B 26/B 26M, Alloy 443.0-F.
- L. Bronze Extrusions: ASTM B 455, Alloy UNS No. C38500 (extruded architectural bronze).
- M. Bronze Castings: ASTM B 584, Alloy UNS No. C83600 (leaded red brass) or No. C84400 (leaded semired brass).

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N. Nickel Silver Castings: ASTM B 584, Alloy UNS No. C97600 (20 percent leaded nickel bronze).

### 3.03 ABRASIVE NOSINGS

A. "Configuration" Subparagraph below is typical description; delete if configurations are indicated on Drawings.

B. Extruded Units: See Drawings for product specification. Fabricate units in lengths necessary to accurately fit openings or conditions.

1. Provide ribbed units, with abrasive filler strips projecting 1/16 inch (1.5 mm) above aluminum extrusion.
2. Provide solid-abrasive-type units without ribs.
3. Nosings: Square-back units, 3 inches (75 mm) wide, without lip.
4. Nosings: Two-piece units, 3 inches (75 mm) wide, with subchannel for casting into concrete.

C. Provide anchors for embedding units in concrete, either integral or applied to units, as standard with manufacturer.

D. Apply bituminous paint to concealed surfaces of cast-metal units set into concrete.

E. Apply clear lacquer to concealed surfaces of extruded units set into concrete.

### 3.04 FASTENERS

A. General: Provide zinc-plated fasteners with coating complying with ASTM B 633 or ASTM F 1941 (ASTM F 1941M), Class Fe/Zn 12 for exterior use, and Class Fe/Zn 5 where built into exterior walls. Select fasteners for type, grade, and class required.

B. Bolts and Nuts: Regular hexagon-head bolts, ASTM A 307, Grade A (ASTM F 568M, Property Class 4.6); with hex nuts, ASTM A 563 (ASTM A 563M); and, where indicated, flat washers.

C. Anchor Bolts: ASTM F 1554, Grade 36, of dimensions indicated; with nuts, ASTM A 563 (ASTM A 563M); and, where indicated, flat washers.

1. Provide mechanically deposited or hot-dip, zinc-coated anchor bolts for exterior stairs.

D. Post-Installed Anchors: Torque-controlled expansion anchors capable of sustaining, without failure, a load equal to six times the load imposed when

## SECTION 05 5113 - METAL PAN STAIRS

installed in unit masonry and four times the load imposed when installed in concrete, as determined by testing according to ASTM E 488/E 488M, conducted by a qualified independent testing agency.

1. Material for Interior Locations: Carbon-steel components zinc plated to comply with ASTM B 633 or ASTM F 1941 (ASTM F 1941M), Class Fe/Zn 5, unless otherwise indicated.
2. Material for Exterior Locations and Where Stainless Steel Is Indicated: Alloy Group 1 (A1) stainless-steel bolts, ASTM F 593 (ASTM F 738M), and nuts, ASTM F 594 (ASTM F 836M).

### 3.05 MISCELLANEOUS MATERIALS

- A. Shop Primer for Galvanized Steel: Primer formulated for exterior use over zinc-coated metal and compatible with finish paint systems indicated.
- B. Galvanizing Repair Paint: High-zinc-dust-content paint complying with SSPC-Paint 20 and compatible with paints specified to be used over it.
- C. Concrete Materials and Properties: Comply with requirements in Section 033000 "Cast-in-Place Concrete" for normal-weight, air-entrained, ready-mix concrete with a minimum 28-day compressive strength of 3000 psi (20 MPa) unless otherwise indicated.
- D. Nonslip-Aggregate Concrete Finish: Factory-packaged abrasive aggregate made from fused, aluminum-oxide grits or crushed emery; rustproof and nonglazing; unaffected by freezing, moisture, or cleaning materials.
- E. Welded Wire Reinforcement: ASTM A 185/A 185M, 6 by 6 inches (152 by 152 mm), W1.4 by W1.4, unless otherwise indicated.

### 3.06 FABRICATION, GENERAL

- A. Provide complete stair assemblies, including metal framing, hangers, struts, railings, clips, brackets, bearing plates, and other components necessary to support and anchor stairs and platforms on supporting structure.
  1. Join components by welding unless otherwise indicated.
  2. Use connections that maintain structural value of joined pieces.
- B. Preassembled Stairs: Assemble stairs in shop to greatest extent possible. Disassemble units only as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation.

## SECTION 05 5113 - METAL PAN STAIRS

- C. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32 inch (1 mm) unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.
- D. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.
- E. Form exposed work with accurate angles and surfaces and straight edges.
- F. Weld connections to comply with the following:
  - 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
  - 2. Obtain fusion without undercut or overlap.
  - 3. Remove welding flux immediately.
  - 4. Weld exposed corners and seams continuously unless otherwise indicated.
  - 5. At exposed connections, finish exposed welds to comply with NOMMA's "Voluntary Joint Finish Standards" for Type 3 welds: partially dressed weld with spatter removed.
- G. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners where possible. Where exposed fasteners are required, use Phillips countersunk screws or bolts unless otherwise indicated. Locate joints where least conspicuous.

### 3.07 STEEL-FRAMED STAIRS

- A. NAAMM standard in "NAAMM Stair Standard" Paragraph below includes only minimal requirements. First option is typical enclosed stair (welds are required to be smooth); second option is economy enclosed stair.
- B. NAAMM Stair Standard: Comply with "Recommended Voluntary Minimum Standards for Fixed Metal Stairs" in NAAMM AMP 510, "Metal Stairs Manual," unless more stringent requirements are indicated.
- C. Stair Framing:
  - 1. Fabricate stringers of steel plates or channels or tubes.
    - a. Provide closures for exposed ends of channel stringers and tubes.

## SECTION 05 5113 - METAL PAN STAIRS

2. Construct platforms of steel plate or channel headers and miscellaneous framing members as indicated.
3. Weld stringers to headers; weld framing members to stringers and headers.
4. Where stairs are enclosed by gypsum board shaft-wall assemblies, provide hanger rods or struts to support landings from floor construction above or below. Locate hanger rods and struts where they do not encroach on required stair width and are within the fire-resistance-rated stair enclosure.
5. Where masonry walls support metal stairs, provide temporary supporting struts designed for erecting steel stair components before installing masonry.

D. Metal Pan Stairs: Form risers, subtread pans, and subplatforms to configurations shown from steel sheet of thickness indicated.

1. Steel Sheet: Uncoated cold hot-rolled steel sheet unless otherwise indicated.
2. Steel Sheet: Galvanized-steel sheet, where indicated.
3. Directly weld metal pans to stringers; locate welds on top of subtreads where they are concealed by concrete fill. Do not weld risers to stringers.
4. Attach risers and subtreads to stringers with brackets made of steel angles or bars. Weld brackets to stringers and attach metal pans to brackets by welding, riveting, or bolting.
5. Shape metal pans to include nosing integral with riser.
6. Attach abrasive nosings to risers.
7. At Contractor's option, provide stair assemblies with metal pan subtreads filled with reinforced concrete during fabrication.
8. Provide epoxy-resin-filled treads, reinforced with glass fibers, with slip-resistant, abrasive surface.
9. Provide subplatforms of configuration indicated or, if not indicated, the same as subtreads. Weld subplatforms to platform framing.
  - a. Smooth Soffit Construction: Construct subplatforms with flat metal under surfaces to produce smooth soffits.

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### 3.08 FINISHES

Apply shop primer to uncoated surfaces of metal stair components, except those with galvanized finishes and those to be embedded in concrete or masonry unless otherwise indicated. Comply with SSPC-PA 1, "Paint Application Specification No. 1: Shop, Field, and Maintenance Painting of Steel," for shop painting.

### PART 4 - INSTALLATION

#### 4.01 INSTALLING METAL PAN STAIRS

- A. Fastening to In-Place Construction: Provide anchorage devices and fasteners where necessary for securing metal stairs to in-place construction. Include threaded fasteners for concrete and masonry inserts, through-bolts, lag bolts, and other connectors.
- B. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing metal stairs. Set units accurately in location, alignment, and elevation, measured from established lines and levels and free of rack.
- C. Install metal stairs by welding stair framing to steel structure or to weld plates cast into concrete unless otherwise indicated.
- D. Provide temporary bracing or anchors in formwork for items that are to be built into concrete, masonry, or similar construction.
- E. Fit exposed connections accurately together to form hairline joints. Weld connections that are not to be left as exposed joints but cannot be shop welded because of shipping size limitations. Do not weld, cut, or abrade surfaces of exterior units that have been hot-dip galvanized after fabrication and are for bolted or screwed field connections.
- F. Field Welding: Comply with requirements for welding in "Fabrication, General" Article.
- G. Place and finish concrete fill for treads and platforms to comply with Section 033000 "Cast-in-Place Concrete."
  - 1. Install abrasive nosings with anchors fully embedded in concrete. Center nosings on tread width.
- H. Install precast concrete treads with adhesive supplied by manufacturer.

#### 4.02 INSTALLING RAILINGS

- A. Adjust railing systems before anchoring to ensure matching alignment at abutting joints. Space posts at spacing indicated or, if not indicated, as

## SECTION 05 5113 - METAL PAN STAIRS

required by design loads. Plumb posts in each direction. Secure posts and rail ends to building construction as follows:

1. Anchor posts to steel by welding to steel supporting members.
  2. Anchor handrail ends to concrete and masonry with steel round flanges welded to rail ends and anchored with postinstalled anchors and bolts.
- B. Attach handrails to wall with wall brackets. Locate brackets as indicated or, if not indicated, at spacing required to support structural loads. Secure wall brackets to building construction as follows:
1. For concrete and solid masonry anchorage, use drilled-in expansion shields and hanger or lag bolts.
  2. For hollow masonry anchorage, use toggle bolts.
  3. For steel-framed partitions, use hanger or lag bolts set into fire-retardant-treated wood backing between studs. Coordinate with stud installation to locate backing members.

### 4.03 ADJUSTING AND CLEANING

- A. Touchup Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.
1. Apply by brush or spray to provide a minimum 2.0-mil (0.05-mm) dry film thickness.
- B. Retain "Touchup Painting" Paragraph below if touchup painting is specified in Section 099000 "Painting and Coating."
- C. Touchup Painting: Cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint.
- D. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A 780/A 780M.

**END OF SECTION 055113**

## **SECTION 05 5213 - PIPE AND TUBE RAILINGS, AND DECORATIVE METAL**

### **PART 1 GENERAL**

#### **1.01 SECTION INCLUDES**

- A. Wall mounted exterior handrails.
- B. Stair railings and guardrails.
- C. Balcony railings and guardrails.
- D. Perforated metal panels.

#### **1.02 RELATED REQUIREMENTS**

- A. Section 03 3000 - Cast-in-Place Concrete: Placement of anchors in concrete.
- B. Section 04 2000 - Unit Masonry: Placement of anchors in masonry.

#### **1.03 REFERENCE STANDARDS**

- A. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless; 2012.
- B. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes; 2013.
- C. ASTM E935 - Standard Test Methods for Performance of Permanent Metal Railing Systems and Rails for Buildings; 2013.
- D. ASTM E985 - Standard Specification for Permanent Metal Railing Systems and Rails for Buildings; 2000 (Reapproved 2006).

#### **1.04 SUBMITTALS**

Shop Drawings: Indicate profiles, sizes, connection attachments, anchorage, size and type of fasteners, and accessories.

### **PART 2 PRODUCTS**

#### **2.01 RAILINGS - GENERAL REQUIREMENTS**

- A. Design, fabricate, and test railing and metal panel assemblies in accordance with the most stringent requirements of ASTM E985 and applicable local code.
- B. Distributed Loads: Design railing assembly, wall rails, and attachments to resist distributed force of 75 pounds per linear foot (1095 N/m) applied to the top of the assembly and in any direction, without damage or permanent set. Test in accordance with ASTM E935.

## SECTION 05 5213 - PIPE AND TUBE RAILINGS

- C. Concentrated Loads: Design railing assembly, wall rails, and attachments to resist a concentrated force of 200 pounds (890 N) applied at any point on the top of the assembly and in any direction, without damage or permanent set. Test in accordance with ASTM E935.
- D. Allow for expansion and contraction of members and building movement without damage to connections or members.
- E. Dimensions: See drawings for configurations and heights.
- F. Provide anchors and other components as required to attach to structure, made of same materials as railing components unless otherwise indicated; where exposed fasteners are unavoidable provide flush countersunk fasteners.
  - 1. For anchorage to concrete, provide inserts to be cast into concrete, for bolting anchors.
  - 2. For anchorage to masonry, provide brackets to be embedded in masonry, for bolting anchors.
- G. Provide slip-on non-weld mechanical fittings to join lengths, seal open ends, and conceal exposed mounting bolts and nuts, including but not limited to elbows, T-shapes, splice connectors, flanges, escutcheons, and wall brackets.

### 2.02 STEEL RAILING SYSTEM - STAINLESS STEEL

- A. Steel Tube: ASTM A500/A500M, Grade B cold-formed structural tubing.
- B. Steel Pipe: ASTM A53/A53M, Grade B Schedule 80, black finish.
- C. Non-Weld Mechanical Fittings: Slip-on, galvanized malleable iron castings, for Schedule 40 pipe, with flush setscrews for tightening by standard hex wrench, no bolts or screw fasteners.
- D. Welding Fittings: Factory- or shop-welded from matching pipe or tube; seams continuously welded; joints and seams ground smooth.
- E. Exposed Fasteners: No exposed bolts or screws.
- F. Straight Splice Connectors: Steel concealed spigots.
- G. Perforated stainless steel panel McNichols Shell 5/8" SS316 Finish, 11GA.

### 2.03 FABRICATION

- A. Accurately form components to suit specific project conditions and for proper connection to building structure.

## SECTION 05 5213 - PIPE AND TUBE RAILINGS

- B. Fit and shop assemble components in largest practical sizes for delivery to site.
- C. Fabricate components with joints tightly fitted and secured. Provide spigots and sleeves to accommodate site assembly and installation.
- D. Welded Joints:
  - 1. Exterior Components: Continuously seal joined pieces by intermittent welds and plastic filler. Drill condensate drainage holes at bottom of members at locations that will not encourage water intrusion.
  - 2. Interior Components: Continuously seal joined pieces by intermittent welds and plastic filler.
  - 3. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.

### PART 3 EXECUTION

#### 3.01 EXAMINATION

Verify that field conditions are acceptable and are ready to receive work.

#### 3.02 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Install components plumb and level, accurately fitted, free from distortion or defects, with tight joints.
- C. Anchor railings securely to structure.
- D. Conceal anchor bolts and screws whenever possible. Where not concealed, use flush countersunk fastenings.

#### 3.03 TOLERANCES

- A. Maximum Variation From Plumb: 1/4 inch (6 mm) per floor level, non-cumulative.
- B. Maximum Offset From True Alignment: 1/4 inch (6 mm).
- C. Maximum Out-of-Position: 1/4 inch (6 mm).

**END OF SECTION**

## **SECTION 06 1000 - ROUGH CARPENTRY**

### **PART 1 GENERAL**

This section includes blocking, shims and trim for windows, doors and cabinetry.

#### **1.01 SECTION INCLUDES**

Grounds, blocking, nailers and miscellaneous wood. All wood shall be treated to marine grade specifications.

#### **1.02 REFERENCE STANDARDS**

- A. AFPA (WFCM) - Wood Frame Construction Manual for One- and Two-Family Dwellings; American Forest and Paper Association; 2012.
- B. PS 20 - American Softwood Lumber Standard; National Institute of Standards and Technology, Department of Commerce; 2010.

#### **1.03 DELIVERY, STORAGE, AND HANDLING**

General: Cover wood products to protect against moisture. Support stacked products to prevent deformation and to allow air circulation.

### **PART 2 PRODUCTS**

#### **2.01 GENERAL REQUIREMENTS**

- A. Dimension Lumber: Comply with PS 20 and requirements of specified grading agencies.
  - 1. Species: Douglas Fir-Larch, unless otherwise indicated.
  - 2. If no species is specified, provide any species graded by the agency specified; if no grading agency is specified, provide lumber graded by any grading agency meeting the specified requirements.
  - 3. Grading Agency: Any grading agency whose rules are approved by the Board of Review, American Lumber Standard Committee ([www.alsc.org](http://www.alsc.org)) and who provides grading service for the species and grade specified; provide lumber stamped with grade mark unless otherwise indicated.

B. Lumber fabricated from old growth timber is not permitted.

#### **2.02 DIMENSION LUMBER FOR CONCEALED APPLICATIONS**

- A. Sizes: Nominal sizes as indicated on drawings, S4S.
- B. Moisture Content: S-dry or MC19.

## **SECTION 06 1000 - ROUGH CARPENTRY**

### **C. Miscellaneous Framing, Blocking, Nailers, Grounds, and Furring:**

1. Lumber: S4S, No. 2 or Standard Grade.
2. Boards: Standard or No. 3.

### **PART 3 EXECUTION**

#### **3.01 PREPARATION**

Where wood framing bears on cementitious foundations, install full width sill flashing continuous over top of foundation, lap ends of flashing minimum of 4 inches (100 mm) and seal.

#### **3.02 INSTALLATION - GENERAL**

- A. Select material sizes to minimize waste.
- B. Reuse scrap to the greatest extent possible; clearly separate scrap for use on site as accessory components, including: shims, bracing, and blocking.

#### **3.03 FRAMING INSTALLATION**

- A. Set structural members level, plumb, and true to line. Discard pieces with defects that would lower required strength or result in unacceptable appearance of exposed members.
- B. Make provisions for temporary construction loads, and provide temporary bracing sufficient to maintain structure in true alignment and safe condition until completion of erection and installation of permanent bracing.
- C. Install structural members full length without splices unless otherwise specifically detailed.
- D. Comply with member sizes, spacing, and configurations indicated, and fastener size and spacing indicated, but not less than required by applicable codes and AFPA Wood Frame Construction Manual.
- E. Construct double joist headers at floor and ceiling openings and under wall stud partitions that are parallel to floor joists; use metal joist hangers unless otherwise detailed.
- F. Frame wall openings with two or more studs at each jamb; support headers on cripple studs.

#### **3.04 BLOCKING, NAILERS, AND SUPPORTS**

- A. Provide framing and blocking members as indicated or as required to support finishes, fixtures, specialty items, and trim.

## **SECTION 06 1000 - ROUGH CARPENTRY**

B. In walls, provide blocking attached to studs as backing and support for wall-mounted items, unless item can be securely fastened to two or more studs or other method of support is explicitly indicated.

C. Provide the following specific non-structural framing and blocking:

1. Cabinets and shelf supports.
2. Wall brackets.
3. Handrails.
4. Grab bars.
5. Towel and bath accessories.
6. Wall-mounted door stops.
7. Chalkboards and marker boards.
8. Wall paneling and trim.
9. Joints of rigid wall coverings that occur between studs.

**END OF SECTION**

## **SECTION 06 2000 - FINISH CARPENTRY**

### **PART 1 GENERAL**

All materials shall be marine grade.

#### **1.01 SECTION INCLUDES**

- A. Finish carpentry items.
- B. Wood door frames, glazed frames.
- C. Wood casings and moldings.
- D. Hardware and attachment accessories.

#### **1.02 REFERENCE STANDARDS**

- A. ANSI A135.4 - American National Standard for Basic Hardboard; 2012.
- B. ANSI A208.1 - American National Standard for Particleboard; 2009.
- C. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards; 2014.
- D. BHMA A156.9 - American National Standard for Cabinet Hardware; Builders Hardware Manufacturers Association; 2010 (ANSI/BHMA A156.9).
- E. NEMA LD 3 - High-Pressure Decorative Laminates; National Electrical Manufacturers Association; 2005.
- F. PS 1 - Structural Plywood; 2009.

#### **1.03 SUBMITTALS**

- A. See Administrative Requirements for submittal procedures.
- B. Product Data:
  - 1. Provide data on fire retardant treatment materials and application instructions.
  - 2. Provide instructions for attachment hardware and finish hardware.

#### **1.04 QUALITY ASSURANCE**

Fabricator Qualifications: Company specializing in fabricating the products specified in this section with minimum five years of documented experience.

## SECTION 06 2000 - FINISH CARPENTRY

### 1.05 DELIVERY, STORAGE, AND HANDLING

Protect work from moisture damage.

### PART 2 PRODUCTS

#### 2.01 FINISH CARPENTRY ITEMS

Quality Grade: Unless otherwise indicated provide products of quality specified by AWI/AWMAC/WI (AWS) for Premium Grade.

#### 2.02 WOOD-BASED COMPONENTS

Wood fabricated from old growth timber is not permitted.

#### 2.03 SHEET MATERIALS

- A. Softwood Plywood Not Exposed to View: Any face species, veneer core; PS 1 Grade A-B; glue type as recommended for application.
- B. Softwood Plywood Exposed to View: Face species as indicated, plain sawn, medium density fiberboard core; PS 1 Grade A-B; glue type as recommended for application.
- C. Particleboard: ANSI A208.1; composed of wood chips, sawdust, or flakes of medium density, made with waterproof resin binders; of grade to suit application; sanded faces.
- D. Hardboard: ANSI A135.4; Pressed wood fiber with resin binder, Class 1 - Tempered, 1/4 inch (6 mm) thick, smooth one side (S1S).

#### 2.04 PLASTIC LAMINATE MATERIALS

Plastic Laminate: NEMA LD 3, HGS; as indicated on drawings color; textured, low gloss finish; matte manufactured by Formica.

#### 2.05 HARDWARE

Hardware: Comply with BHMA A156.9.

#### 2.06 FABRICATION

- A. Shop assemble work for delivery to site, permitting passage through building openings.
- B. Cap exposed plastic laminate finish edges with material of same finish and pattern.

## **SECTION 06 2000 - FINISH CARPENTRY**

- C. When necessary to cut and fit on site, provide materials with ample allowance for cutting. Provide trim for scribing and site cutting.
- D. Apply plastic laminate finish in full uninterrupted sheets consistent with manufactured sizes. Fit corners and joints hairline; secure with concealed fasteners. Slightly bevel arises. Locate counter butt joints minimum 2 feet (600 mm) from sink cut-outs.

### **PART 3 EXECUTION**

#### **3.01 EXAMINATION**

- A. Verify adequacy of backing and support framing.

#### **3.02 INSTALLATION**

- A. Install work in accordance with AWI/AWMAC/WI (AWS) requirements for grade indicated.
- B. Set and secure materials and components in place, plumb and level.
- C. Carefully scribe work abutting other components, with maximum gaps of 1/32 inch (0.79 mm). Do not use additional overlay trim to conceal larger gaps.

#### **3.03 TOLERANCES**

- A. Maximum Variation from True Position: 1/16 inch (1.6 mm).
- B. Maximum Offset from True Alignment with Abutting Materials: 1/32 inch (0.79 mm).

**END OF SECTION**

## **SECTION 06 4100 - ARCHITECTURAL WOOD CASEWORK**

### **PART 1 GENERAL**

#### **1.01 SECTION INCLUDES**

- A. Specially fabricated cabinet units.
- B. Countertops.
- C. Cabinet hardware.
- D. Factory finishing.

#### **1.02 RELATED REQUIREMENTS**

Section 06 1000 - Rough Carpentry: Support framing, grounds, and concealed blocking.

#### **1.03 REFERENCE STANDARDS**

- A. AWI/AWMAC/MI (AWS) - Architectural Woodwork Standards; 2014.
- B. BHMA A156.9 - American National Standard for Cabinet Hardware; Builders Hardware Manufacturers Association; 2010 (ANSI/BHMA A156.9).
- C. NEMA LD 3 - High-Pressure Decorative Laminates; National Electrical Manufacturers Association; 2005.

#### **1.04 ADMINISTRATIVE REQUIREMENTS**

Preinstallation Meeting: Convene a preinstallation meeting not less than one week before starting work of this section; require attendance by all affected installers.

#### **1.05 SUBMITTALS**

- A. See Administrative Requirements, for submittal procedures.
- B. Shop Drawings: Indicate materials, component profiles, fastening methods, jointing details, and accessories.
  - 1. Minimum Scale of Detail Drawings: 1-1/2 inch to 1 foot (1:8).
  - 2. Provide the information required by AWI/AWMAC/MI (AWS).
- C. Product Data: Provide data for hardware accessories.
- D. Samples: Submit actual sample items of proposed cabinet finishes, demonstrating hardware design, quality, and finish.

## **SECTION 06 4100 - ARCHITECTURAL WOOD CASEWORK**

### **1.06 QUALITY ASSURANCE**

Fabricator Qualifications: Company specializing in fabricating the products specified in this section with minimum five years of documented experience.

### **1.07 DELIVERY, STORAGE, AND HANDLING**

Protect units from moisture damage.

### **1.08 FIELD CONDITIONS**

During and after installation of custom cabinets, maintain temperature and humidity conditions in building spaces at same levels planned for occupancy.

## **PART 2 PRODUCTS**

### **2.01 CABINETS**

- A. Quality Grade: Unless otherwise indicated provide products of quality specified by AWI//AWMAC/WI (AWS) for Premium Grade.
- B. Plastic Laminate Faced Cabinets: Premium grade.
- C. Breakroom Cabinets: Plastic laminate faced, Premium grade.
- D. All cabinet core material shall be marine grade plywood.

### **2.02 WOOD-BASED COMPONENTS**

- A. Wood fabricated from old growth timber is not permitted.
- B. Provide wood harvested within a 500 mile (805 km) radius of the project site.
- C. Hardwood Edgebanding: Use solid hardwood edgebanding matching species, color, grain, and grade for exposed portions of cabinetry.

### **2.03 LAMINATE MATERIALS**

#### **A. Manufacturers:**

1. Formica Corporation; as indicated on drawings: [www.formica.com](http://www.formica.com).
2. Panolam Industries International, Inc\Nevamar ; as indicated on drawings: [www.nevamar.com](http://www.nevamar.com).
3. Approved equal.

## SECTION 06 4100 - ARCHITECTURAL WOOD CASEWORK

- B. High Pressure Decorative Laminate (HPDL): NEMA LD 3, types as recommended for specific applications.
- C. Provide specific types as scheduled.
  - 1. Horizontal Surfaces: HGS, 0.048 inch (1.22 mm) nominal thickness, through color, colors as scheduled, finish as scheduled.
  - 2. Vertical Surfaces: VGS, 0.028 inch (0.71 mm) nominal thickness, through color, colors as scheduled, finish as scheduled.

### 2.04 COUNTERTOPS

Solid Surface quartzite as specified on drawings.

### 2.05 ACCESSORIES

- A. Fasteners: Size and type to suit application.
- B. Bolts, Nuts, Washers, Lags, Pins, and Screws: Of size and type to suit application; galvanized or chrome-plated finish in concealed locations and stainless steel or chrome-plated finish in exposed locations.
- C. Concealed Joint Fasteners: Threaded steel.
- D. Grommets: Standard plastic, painted metal, or rubber grommets for cut-outs, in color to match adjacent surface.

### 2.06 HARDWARE

- A. Hardware: BHMA A156.9, types as recommended by fabricator for quality grade specified.
- B. Adjustable Shelf Supports: Standard side-mounted system using recessed metal shelf standards or multiple holes for pin supports and coordinated self rests, polished chrome finish, for nominal 1 inch (25 mm) spacing adjustments.
- C. Drawer and Door Pulls: "U" shaped wire pull, steel with chrome finish, 4 inch centers ("U" shaped wire pull, steel with chrome finish, 100 mm centers).
- D. Cabinet Locks: Keyed cylinder, two keys per lock, master keyed, steel with chrome finish.
- E. Catches: Magnetic.
- F. Drawer Slides:
  - 1. Type: Full extension.

## SECTION 06 4100 - ARCHITECTURAL WOOD CASEWORK

2. Static Load Capacity: Heavy Duty grade.
3. Mounting: Side mounted.
4. Stops: Integral type.
5. Features: Provide self closing/stay closed type.

G. Hinges: piano - continuous self-closing type, stainless steel with satin finish.

1. Products:

- a. Grass America Inc: [www.grassusa.com](http://www.grassusa.com).
- b. Julius Blum, Inc: [www.blum.com](http://www.blum.com).
- c. Approved equal.

H. Sliding Door Track Assemblies: Upper and lower track of satin anodized aluminum, with matching shoe equipped with nylon rollers.

### 2.07 FABRICATION

- A. Assembly: Shop assemble cabinets for delivery to site in units easily handled and to permit passage through building openings.
- B. Edging: Fit shelves, doors, and exposed edges with specified edging. Do not use more than one piece for any single length.
- C. Fitting: When necessary to cut and fit on site, provide materials with ample allowance for cutting. Provide matching trim for scribing and site cutting.
- D. Plastic Laminate: Apply plastic laminate finish in full uninterrupted sheets consistent with manufactured sizes. Fit corners and joints hairline; secure with concealed fasteners. Slightly bevel arises. Locate counter butt joints minimum 2 feet (600 mm) from sink cut-outs.
  1. Apply laminate backing sheet to reverse side of plastic laminate finished surfaces.
  2. Cap exposed plastic laminate finish edges with material of same finish and pattern.
- E. Mechanically fasten back splash to countertops as recommended by laminate manufacturer at 16 inches (400 mm) on center.
- F. Provide cutouts for plumbing fixtures. Verify locations of cutouts from on-site dimensions. Prime paint cut edges.

## SECTION 06 4100 - ARCHITECTURAL WOOD CASEWORK

### PART 3 EXECUTION

#### 3.01 EXAMINATION

- A. Verify adequacy of backing and support framing.
- B. Verify location and sizes of utility rough-in associated with work of this section.

#### 3.02 INSTALLATION

- A. Set and secure custom cabinets in place, assuring that they are rigid, plumb, and level.
- B. Use fixture attachments in concealed locations for wall mounted components.
- C. Use concealed joint fasteners to align and secure adjoining cabinet units.
- D. Carefully scribe casework abutting other components, with maximum gaps of 1/32 inch (1 mm). Do not use additional overlay trim for this purpose.
- E. Secure cabinets to floor using appropriate angles and anchorages.
- F. Countersink anchorage devices at exposed locations. Conceal with solid wood plugs of species to match surrounding wood; finish flush with surrounding surfaces.

#### 3.03 ADJUSTING

- A. Adjust installed work.
- B. Adjust moving or operating parts to function smoothly and correctly.

#### 3.04 CLEANING

Clean casework, counters, shelves, hardware, fittings, and fixtures.

**END OF SECTION**

## SECTION 07 1400 - FLUID-APPLIED WATERPROOFING

### PART 1 GENERAL

#### 1.01 SECTION INCLUDES

Fluid applied membrane waterproofing for all exterior surfaces.

#### 1.02 RELATED REQUIREMENTS

- A. Section 03 3000 - Cast-in-Place Concrete.
- B. Section 04 2000 - Unit Masonry.
- C. Section 07 6200 - Sheet Metal Flashing and Trim.

#### 1.03 REFERENCE STANDARDS

- A. 40 CFR 59, Subpart D - National Volatile Organic Compound Emission Standards for Architectural Coatings; U.S. Environmental Protection Agency; current edition.
- B. ASTM C661 - Standard Test Method for Indentation Hardness of Elastomeric-Type Sealants by Means of a Durometer; 2006 (Reapproved 2011).
- C. ASTM C836/C836M - Standard Specification for High Solids Content, Cold Liquid-Applied Elastomeric Waterproofing Membrane for Use With Separate Wearing Course; 2012.
- D. ASTM C1306 - Standard Test Method for Hydrostatic Pressure Resistance of a Liquid-Applied Waterproofing Membrane; 2008.
- E. ASTM D412 - Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers- Tension; 2006a (Reapproved 2013).
- F. ASTM E96/E96M - Standard Test Methods For Water Vapor Transmission of Materials; 2014.
- G. ASTM E154/E154M - Standard Test Methods for Water Vapor Retarders Used in Contact with Earth Under Concrete Slabs, on Walls, or as Ground Cover; 2008a (Reapproved 2013).
- H. ICC-ES AC29 - Acceptance Criteria for Cold, Liquid-Applied, Below-Grade, Exterior Dampproofing and Waterproofing Materials; ICC Evaluation Service, Inc.; 2011.

## **SECTION 07 1400 - FLUID-APPLIED WATERPROOFING**

### **1.04 SUBMITTALS**

- A. Product Data: Provide data for membrane, surface conditioner, flexible flashings, joint cover sheet, and joint and crack sealants.
- B. Shop Drawings: Indicate special joint or termination conditions and conditions of interface with other materials.
- C. Certificate: Certify that products meet or exceed specified requirements.
- D. Manufacturer's Installation Instructions: Indicate special procedures, perimeter conditions requiring special attention, and acceptable installation temperatures.
- E. Warranty:
  - 1. Submit manufacturer warranty and ensure that forms have been completed in City of Long Beach's name and registered with manufacturer.
  - 2. Submit installer's certification that installation complies with all warranty conditions for the waterproof membrane.

### **1.05 QUALITY ASSURANCE**

Manufacturer Qualifications: Company specializing in manufacture of fluid-applied waterproofing membranes with three years experience.

### **1.06 FIELD CONDITIONS**

- A. Maintain ambient temperatures above 40 degrees F (5 degrees C) for 24 hours before and during application and until cured.

### **1.07 WARRANTY**

- A. Contractor shall correct defective Work within a five year period after Date of Substantial Completion; remove and replace materials concealing waterproofing at no cost to City of Long Beach.
- B. Provide five year manufacturer warranty for waterproofing failing to resist penetration of water, except where such failures are the result of structural failures of building. Hairline cracking of concrete due to temperature change or shrinkage is not considered a structural failure.

## **PART 2 PRODUCTS**

### **2.01 MANUFACTURERS**

- A. Cold-Applied Rubberized Asphalt Waterproofing Manufacturers:

## **SECTION 07 1400 - FLUID-APPLIED WATERPROOFING**

1. AVM Industries, Inc; AVM System 500 (Aussie Membrane):  
www.avmindustries.com.
2. Epro Waterproofing Systems; ECOLINE-S: www.eproserv.com.
3. Approved Equal.

### **2.02 WATERPROOFING APPLICATIONS**

Cold-Applied Rubberized Asphalt Waterproofing: Use at underside of ground slab.

### **2.03 MEMBRANE AND FLASHING MATERIALS**

- A. Cold-Applied Rubberized Asphalt Waterproofing: Rubberized asphaltic compound, suitable for installation on concrete and concrete masonry.
1. Cured Thickness: 0.06 inch (1.5 mm), minimum.
  2. Complying with ICC-ES AC29; evidence of compliance includes current ICC-ES evaluation report citing AC29.
  3. Hydrostatic Pressure Resistance: When tested in accordance with ASTM C1306, at least 50 pounds per square inch (340 kPa) by the rapid test and at least 35 pounds per square inch (240 kPa) by the long term test.
  4. Low Temperature Resistance: No cracking, loss of adhesion, splitting or pinholes when tested at minus 15 degrees F (minus 25 degrees C) in accordance with ASTM C836/C836M.
  5. Adhesion: No separation when tested in accordance with ASTM C836/C836M.
  6. Decay Resistance: No decay when tested in accordance with ASTM E154/E154M.
  7. Wet Film Sag Resistance: No sag or sag within plus/minus 5 mils (0.1 mm) when tested in accordance with ASTM C836/C836M.
  8. Water Vapor Permeance: Less than one perm (60 ng/(Pa s sq m)), when tested in accordance with ASTM E96/E96M.
  9. Heat Aging Resistance: No cracking, splitting, or pinholes when tested in accordance with ASTM C836/C836M.
  10. Elongation at Break: 1000 percent, minimum, when tested in accordance with ASTM D412.

## SECTION 07 1400 - FLUID-APPLIED WATERPROOFING

### 2.04 ACCESSORIES

Sealant for Joints and Cracks in Substrate: Type compatible with waterproofing material and as recommended by waterproofing manufacturer.

### PART 3 EXECUTION

#### 3.01 EXAMINATION

- A. Verify existing conditions before starting work.
- B. Verify substrate surfaces are free of frozen matter, dampness, loose particles, cracks, pits, projections, penetrations, or foreign matter detrimental to adhesion or application of waterproofing system.
- C. Verify that substrate surfaces are smooth, free of honeycomb or pitting, and not detrimental to full contact bond of waterproofing materials.
- D. Verify that items that penetrate surfaces to receive waterproofing are securely installed.

#### 3.02 PREPARATION

- A. Protect adjacent surfaces not designated to receive waterproofing.
- B. Clean and prepare surfaces to receive waterproofing in accordance with manufacturer's instructions. Vacuum substrate clean.
- C. Do not apply waterproofing to surfaces unacceptable to manufacturer.
- D. Fill non-moving joints and cracks with a filler compatible with waterproofing materials.
- E. Seal moving joints and joints with sealant, not rigid filler, using procedures recommended by sealant and waterproofing manufacturers.

#### 3.03 INSTALLATION

- A. Apply waterproofing in accordance with manufacturer's instructions to specified minimum thickness.
- B. Apply primer or surface conditioner at a rate recommended by manufacturer. Protect conditioner from rain or frost until dry.
- C. At joints and cracks less than 1/2 inch (13 mm) in width including joints between horizontal and vertical surfaces, apply 12 inch (300 mm) wide strip of joint cover sheet.

## **SECTION 07 1400 - FLUID-APPLIED WATERPROOFING**

D. Seal membrane and flashings to adjoining surfaces. Install termination bar at all edges. Install counterflashing over all exposed edges.

### **3.04 PROTECTION**

Do not permit traffic over unprotected or uncovered membrane.

**END OF SECTION**

## SECTION 07 2100 - THERMAL INSULATION

### PART 1 GENERAL

#### 1.01 SECTION INCLUDES

- A. Batt insulation in exterior roof construction.
- B. Batt insulation for filling perimeter window and door shim spaces and crevices in exterior wall and roof.

#### 1.02 RELATED REQUIREMENTS

- A. Section 03 3000 - Cast-in-Place Concrete.

#### 1.03 REFERENCE STANDARDS

- A. ASTM C665 - Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing; 2012.
- B. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2014.
- C. ASTM E136 - Standard Test Method for Behavior of Materials in a Vertical Tube Furnace At 750 Degrees C; 2012.

#### 1.04 SUBMITTALS

- A. Product Data: Provide data on product characteristics, performance criteria, and product limitations.
- B. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- C. Manufacturer's Installation Instructions: Include information on special environmental conditions required for installation and installation techniques.

### PART 2 PRODUCTS

#### 2.01 BATT INSULATION MATERIALS

- A. Where batt insulation is indicated, either glass fiber or mineral fiber batt insulation may be used, at Contractor's option.
- B. Glass Fiber Batt Insulation: Flexible preformed batt or blanket, complying with ASTM C665; friction fit.
  - 1. Combustibility: Non-combustible, when tested in accordance with ASTM E136, except for facing, if any.

## SECTION 07 2100 - THERMAL INSULATION

### 2. Manufacturers:

- a. CertainTeed Corporation: [www.certainteed.com](http://www.certainteed.com).
- b. Johns Manville: [www.jm.com](http://www.jm.com).
- c. Owens Corning Corporation; EcoTouch PINK FIBERGLAS Insulation: [www.ocbuildingspec.com](http://www.ocbuildingspec.com).

C. Mineral Fiber Batt Insulation: Flexible or semi-rigid preformed batt or blanket, complying with ASTM C665; friction fit; unfaced flame spread index of 0 (zero) when tested in accordance with ASTM E84.

1. Smoke Developed Index: 0 (zero), when tested in accordance with ASTM E84.

### 2. Manufacturers:

- a. Thermafiber, Inc.; SAFB: [www.thermafiber.com](http://www.thermafiber.com).
- b. Johns Manville; MinWool Sound Attenuation Fire Batts: [www.jm.com](http://www.jm.com).
- c. ROXUL, Inc; ComfortBatt: [www.roxul.com](http://www.roxul.com).

## PART 3 EXECUTION

### 3.01 EXAMINATION

- A. Verify that substrate, adjacent materials, and insulation materials are dry and that substrates are ready to receive insulation.
- B. Verify substrate surfaces are flat, free of honeycomb, fins, irregularities, or materials or substances that may impede adhesive bond.

### 3.02 BATT INSTALLATION

- A. Install insulation and vapor retarder in accordance with manufacturer's instructions.
- B. Install in exterior wall and roof spaces without gaps or voids. Do not compress insulation.
- C. Trim insulation neatly to fit spaces. Insulate miscellaneous gaps and voids.
- D. Fit insulation tightly in cavities and tightly to exterior side of mechanical and electrical services within the plane of the insulation.

## **SECTION 07 2100 - THERMAL INSULATION**

### **3.03 PROTECTION**

Do not permit installed insulation to be damaged prior to its concealment.

**END OF SECTION**

## SECTION 07 4646 - FIBER CEMENT SIDING

### PART 1 GENERAL

#### 1.01 SECTION INCLUDES

Wood-fiber cement siding for exterior CMU walls where indicated on drawings and canopy soffit.

#### 1.02 REFERENCE STANDARDS

- A. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2014.
- B. ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes [Metric]; 2013.
- C. ASTM C1186 - Standard Specification for Flat Fiber Cement Sheets; 2008 (Reapproved 2012).

#### 1.03 SUBMITTALS

- A. Product Data: Manufacturer's data sheets on each product to be used, including:
  - 1. Manufacturer's requirements for related materials to be installed by others.
  - 2. Preparation instructions and recommendations.
  - 3. Storage and handling requirements and recommendations.
  - 4. Installation methods, including nail patterns.
  - 5. 2'x2' samples of each material.
- B. Maintenance Instructions: Periodic inspection recommendations and maintenance procedures.

### PART 2 PRODUCTS

#### 2.01 SIDING

- A. Lap Siding: Individual horizontal boards made of cement and cellulose fiber formed under high pressure with integral surface texture, complying with ASTM C1186 Type A Grade II; with machined edges, for nail attachment.
  - 1. Style: Standard lap style.
  - 2. Texture: Simulated cedar grain.

## SECTION 07 4646 - FIBER CEMENT SIDING

3. Length: 12 ft (3.7 m), nominal.
4. Width (Height): 7-1/4 inches (184 mm).
5. Thickness: 5/16 inch (8 mm), nominal.
6. Finish: Unfinished.
7. Color: As indicated on drawings.
8. Warranty: 50 year limited; transferable.
9. Lap Siding Manufacturers:
  - a. James Hardie Building Products, Inc: [www.jameshardie.com](http://www.jameshardie.com).
  - b. Nichiha USA, Inc: [www.nichiha.com](http://www.nichiha.com).
  - c. Approved Equal.

B. Canopy Panels: Cedarmill panels of same material and finish.

### 2.02 ACCESSORIES

- A. Furring Strips: Galvanized metal channels.
- B. Trim: Same material and smooth texture.
- C. Fasteners: Galvanized or corrosion resistant; length as required to penetrate minimum 1-1/4 inch (32 mm).
- D. Exterior Soffit Vents: One piece, perforated, ASTM B221 (ASTM B221M), 6063 alloy, T5 temper, aluminum, with edge suitable for direct application to gypsum board and manufactured especially for soffit application. Provide continuous vent.
- E. Sealant: Elastomeric, polyurethane or silyl-terminated polyether/polyurethane, and capable of being painted.

## PART 3 EXECUTION

### 3.01 EXAMINATION

- A. Examine substrate and clean and repair as required to eliminate conditions that would be detrimental to proper installation.
- B. Do not begin until unacceptable conditions have been corrected.

## SECTION 07 4646 - FIBER CEMENT SIDING

- C. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

### 3.02 PREPARATION

- A. Install sheet metal flashing:

1. Above door and window trim and casings.

### 3.03 INSTALLATION

- A. Install in accordance with manufacturer's instructions and recommendations.

1. Read warranty and comply with all terms necessary to maintain warranty coverage.
2. Use trim details indicated on drawings.
3. Touch up all field cut edges before installing.
4. Pre-drill nail holes if necessary to prevent breakage.

- B. Over Masonry Walls: Install furring strips of adequate thickness to accept full length of nails and spaced at 16 inches (406 mm) on center. Leave space at top and bottom open; top may be behind soffit; at bottom install insect screen over opening by wrapping a strip of screen over bottom ends of vertical furring strips.

- C. Joints in Horizontal Siding: Avoid joints in lap siding except at corners; where joints are inevitable stagger joints between successive courses.

- D. Do not install siding less than 6 inches (150 mm) from surface of ground nor closer than 1 inch (25 mm) to roofs, patios, porches, and other surfaces where water may collect.

- E. Exterior Soffit Vents: Install according to manufacturer's written instructions and in locations shown on the drawings. Provide vent area specified.

- F. After installation, seal all joints except lap joints of lap siding. Seal around all penetrations. Paint all exposed cut edges.

### 3.04 PROTECTION

- A. Protect installed products until completion of project.

**SECTION 07 4646 - FIBER CEMENT SIDING**

B. Touch-up, repair or replace damaged products before Substantial Completion.

**END OF SECTION**

## SECTION 07 5400 - THERMOPLASTIC MEMBRANE ROOFING

### PART 1 GENERAL

#### 1.01 SECTION INCLUDES

- A. Adhered system with thermoplastic roofing membrane.
- B. Insulation, flat and tapered.
- C. Vapor retarder.
- D. Flashings.
- E. Roofing cant strips.

#### 1.02 RELATED REQUIREMENTS

Section 07 6200 - Sheet Metal Flashing and Trim.

#### 1.03 REFERENCE STANDARDS

- A. ASTM D4434/D4434M - Standard Specification for Poly(Vinyl Chloride) Sheet Roofing; 2012.
- B. ASTM E1980 - Standard Practice for Calculating Solar Reflectance Index of Horizontal and Low-Sloped Opaque Surfaces; 2011.

#### 1.04 SUBMITTALS

- A. Product Data: Provide data indicating membrane materials, flashing materials, insulation, vapor retarder, surfacing, and fasteners.
- B. Sustainable Design Documentation: Test report showing solar reflectance index of membrane.
- C. Specimen Warranty: For approval.
- D. Warranty:
  - 1. Submit manufacturer warranty and ensure that forms have been completed in City of Long Beach's name and registered with manufacturer.
  - 2. Submit installer's certification that installation complies with all warranty conditions for the waterproof membrane.

## SECTION 07 5400 - THERMOPLASTIC MEMBRANE ROOFING

### 1.05 QUALITY ASSURANCE

- A. Perform work in accordance with NRCA Roofing and Waterproofing Manual.
- B. Installer Qualifications: Company specializing in performing the work of this section:

Approved by membrane manufacturer.

### 1.06 DELIVERY, STORAGE, AND HANDLING

- A. Deliver products in manufacturer's original containers, dry, undamaged, with seals and labels intact.
- B. Store products in weather protected environment, clear of ground and moisture.

### 1.07 FIELD CONDITIONS

- A. Do not apply roofing membrane during unsuitable weather.
- B. Do not apply roofing membrane when ambient temperature is below 40 degrees F (5 degrees C) or above 90 degrees F (32 degrees C).
- C. Do not apply roofing membrane to damp or frozen deck surface or when precipitation is expected or occurring.
- D. Do not expose materials vulnerable to water or sun damage in quantities greater than can be weatherproofed the same day.

### 1.08 WARRANTY

- A. Material Warranty: Provide membrane manufacturer's warranty agreeing to replace material that shows manufacturing defects within 5 years after installation.
- B. System Warranty: Provide manufacturer's system warranty agreeing to repair or replace roofing that leaks or is damaged due to wind or other natural causes.
  - 1. Warranty Term: 20 years.
  - 2. For repair and replacement include costs of both material and labor in warranty.
  - 3. Exceptions NOT Permitted:
    - a. Damage due to roof traffic.

## SECTION 07 5400 - THERMOPLASTIC MEMBRANE ROOFING

- b. Damage due to wind of speed greater than 56 mph (90 km/h) but less than 90 mph (145 km/h).
4. Contractor shall provide warranty for labor.

### PART 2 PRODUCTS

#### 2.01 MANUFACTURERS

##### A. Thermoplastic Polyolefin Membrane Materials:

1. GAF; EverGuard TPO: [www.gaf.com](http://www.gaf.com).
2. Carlisle Roofing System, Inc.; Sure-Weld TPO: [www.carlisle-syntec.com](http://www.carlisle-syntec.com).
3. Flex Membrane International Corporation; Flex TPO Plus: [www.flexroofingsystems.com](http://www.flexroofingsystems.com).
4. Pacific polymers Elasto-Deck 5000 x2 as defined on drawing 9/A-8.0.
5. Approved equal.

#### 2.02 ROOFING - UNBALLASTED APPLICATIONS

A. Thermoplastic Membrane Roofing: One ply membrane, fully adhered, over vapor retarder and insulation.

##### B. Roofing Assembly Requirements:

1. Solar Reflectance Index (SRI): Minimum of 64 based on three-year aged value; if three-year aged data is not available, minimum of 82 initial value.
  - a. Calculate SRI in accordance with ASTM E1980.
  - b. Field applied coating may not be used to achieve specified SRI.

C. Acceptable Insulation Types - Constant Thickness Application: Any of the types specified.

1. Minimum 2 layers of cellulose, perlite, molded polystyrene, polyisocyanurate, glass fiber, extruded polystyrene, or composite board.
2. Bottom layer of cellulose, perlite, molded polystyrene, polyisocyanurate, glass fiber, extruded polystyrene, composite, or cellular glass board covered with single layer of cellulose, perlite,

## SECTION 07 5400 - THERMOPLASTIC MEMBRANE ROOFING

molded polystyrene, polyisocyanurate, glass fiber, extruded polystyrene, or composite board.

D. Acceptable Insulation Types - Tapered Application: Any of the types specified.

1. Tapered polyisocyanurate, perlite, or extruded polystyrene board.
2. Tapered polyisocyanurate, perlite, extruded polystyrene, or cellular glass board covered with uniform thickness cellulose, perlite, molded polystyrene, polyisocyanurate, glass fiber, extruded polystyrene, or composite board.
3. Uniform thickness cellulose, perlite, composite, polyisocyanurate, extruded polystyrene, molded polystyrene, glass fiber, or cellular glass board covered with tapered polyisocyanurate, extruded polystyrene, or perlite board.

### 2.03 ROOFING MEMBRANE AND ASSOCIATED MATERIALS

A. Membrane:

1. Material: Polyvinyl chloride complying with ASTM D4434/D4434M.
2. Pacific Polymers Elasto-Deck 5000 x2 traffic coating.
3. Reinforcing: Internal fabric.
4. Thickness: 0.040 inch (1 mm), minimum.
5. Sheet Width: Factory fabricated into largest sheets possible.
6. Color: As indicated on plan.

B. Seaming Materials: As recommended by membrane manufacturer.

C. Membrane Fasteners: As recommended and approved by membrane manufacturer.

D. Vapor Retarder: Material approved by roof manufacturer complying with requirements of fire rating classification; compatible with roofing and insulation materials.

Fire-retardant adhesive.

E. Flexible Flashing Material: Same material as membrane.

## SECTION 07 5400 - THERMOPLASTIC MEMBRANE ROOFING

### PART 3 EXECUTION

#### 3.01 INSTALLATION - GENERAL

- A. Perform work in accordance with NRCA Roofing and Waterproofing Manual and manufacturer's instructions.
- B. Do not apply roofing membrane during unsuitable weather.
- C. Do not apply roofing membrane when ambient temperature is outside the temperature range recommended by manufacturer.
- D. Do not apply roofing membrane to damp or frozen deck surface or when precipitation is expected or occurring.
- E. Do not expose materials vulnerable to water or sun damage in quantities greater than can be weatherproofed the same day.
- F. Coordinate the work with installation of associated counterflashings installed by other sections as the work of this section proceeds.

#### 3.02 EXAMINATION

- A. Verify that surfaces and site conditions are ready to receive work.
- B. Verify deck is supported and secure.
- C. Verify deck is clean and smooth, flat, free of depressions, waves, or projections, properly sloped and suitable for installation of roof system.
- D. Verify deck surfaces are dry and free of snow or ice.
- E. Verify that roof openings, curbs, and penetrations through roof are solidly set, and cant strips are in place.

#### 3.03 CONCRETE DECK PREPARATION

- A. Fill surface honeycomb and variations with latex filler.
- B. Confirm dry deck by moisture meter with 12 percent moisture maximum.

#### 3.04 VAPOR RETARDER AND INSULATION - UNDER MEMBRANE

- A. Apply vapor retarder to deck surface with adhesive in accordance with manufacturer's instructions.
  - 1. Extend vapor retarder under cant strips and blocking to deck edge.

## **SECTION 07 5400 - THERMOPLASTIC MEMBRANE ROOFING**

2. Install flexible flashing from vapor retarder to air seal material of wall construction, lap and seal to provide continuity of the air barrier plane.
- B. Ensure vapor retarder is clean and dry, continuous, and ready for application of insulation.
  - C. Lay subsequent layers of insulation with joints staggered minimum 6 inch (150 mm) from joints of preceding layer.
  - D. Place tapered insulation to the required slope pattern in accordance with manufacturer's instructions.
  - E. Lay boards with edges in moderate contact without forcing. Cut insulation to fit neatly to perimeter blocking and around penetrations through roof.
  - F. Do not apply more insulation than can be covered with membrane in same day.

### **3.05 MEMBRANE APPLICATION**

- A. Roll out membrane, free from wrinkles or tears. Place sheet into place without stretching.
- B. Shingle joints on sloped substrate in direction of drainage.
- C. Fully Adhered Application: Apply adhesive to substrate per manufacturer's recommendations. Fully embed membrane in adhesive. Fully adhere one roll before proceeding to adjacent rolls.
- D. Overlap edges and ends and seal seams by contact adhesive, minimum 3 inches (75 mm). Seal permanently waterproof. Apply uniform bead of sealant to joint edge.
- E. At intersections with vertical surfaces:
  1. Extend membrane over cant strips and up a minimum of 4 inches (100 mm) onto vertical surfaces.
  2. Fully adhere flexible flashing over membrane and up to nailing strips.
- F. Around roof penetrations, seal flanges and flashings with flexible flashing.
- G. Coordinate installation of roof drains and sumps and related flashings.

### **3.06 CLEANING**

- A. Remove bituminous markings from finished surfaces.

## **SECTION 07 5400 - THERMOPLASTIC MEMBRANE ROOFING**

- B. In areas where finished surfaces are soiled by work of this section, consult manufacturer of surfaces for cleaning advice and conform to their documented instructions.
- C. Repair or replace defaced or damaged finishes caused by work of this section.

### **3.07 PROTECTION**

- A. Protect installed roofing and flashings from construction operations.
- B. Where traffic must continue over finished roof membrane, protect surfaces using durable materials.

**END OF SECTION**

## SECTION 07 6200 - SHEET METAL FLASHING AND TRIM

### PART 1 GENERAL

#### 1.01 SECTION INCLUDES

- A. Fabricated sheet metal items, including flashings, and counterflashings.
- B. Sealants for joints within sheet metal fabrications.
- C. Reglets and accessories.

#### 1.02 RELATED REQUIREMENTS

- A. Section 04 2000 - Unit Masonry.
- B. Section 07 7123 - Manufactured Gutters and Downspouts.

#### 1.03 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; 2013.
- C. ASTM B32 - Standard Specification for Solder Metal; 2008 (Reapproved 2014).
- D. ASTM C920 - Standard Specification for Elastomeric Joint Sealants; 2014.
- E. ASTM D4586/D4586M - Standard Specification for Asphalt Roof Cement, Asbestos-Free; 2007 (Reapproved 2012).

### PART 2 PRODUCTS

#### 2.01 SHEET MATERIALS

- A. 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 shown on drawings.

## SECTION 07 6200 - SHEET METAL FLASHING AND TRIM

### 2.02 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: ASTM C920; 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: ASTM D4586, Type I.
- G. Reglets: Surface mounted type, galvanized steel; face and ends covered with plastic tape.
- H. Solder: ASTM B32; Sn50 (50/50) type.

### 2.03 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 flashings to allow toe to extend 2 inches (50 mm) over roofing gravel. Return and brake edges.

## 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.

## SECTION 07 6200 - SHEET METAL FLASHING AND TRIM

### 3.02 PREPARATION

- A. Install starter and edge strips, and cleats before starting installation.
- B. Install surface mounted reglets true to lines and levels. 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. 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.
- D. Solder metal joints for full metal surface contact. After soldering, wash metal clean with neutralizing solution and rinse with water.

### 3.04 FIELD QUALITY CONTROL

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

END OF SECTION

## **SECTION 07 7123 - MANUFACTURED SCUPPERS AND DOWNSPOUTS**

### **PART 1 GENERAL**

#### **1.01 SECTION INCLUDES**

- A. PVC downspouts.
- B. Scuppers.

#### **1.02 REFERENCE STANDARDS**

ASTM D2665 - Standard Specification for Poly Vinyl Chloride (PVC) Plastic Drain, Waste, and Vent Pipe and Fittings; 2014.

#### **1.03 SUBMITTALS**

- A. Submit manufacturer current technical literature for each type of product.
- B. Samples: Provide nominal 3" x 5" sample of each color indicated for scuppers, downspouts and accessories.

### **PART 2 PRODUCTS**

#### **2.01 MATERIALS**

Polyvinyl Chloride (PVC): ASTM D2665, virgin vinyl, SDR 35 pipe and fittings, high impact type, colorfast: white color.

#### **2.02 COMPONENTS**

- A. Downspouts: Polyvinyl chloride (PVC); round profile:
- B. Connectors: Furnish required connector pieces for PVC (polyvinyl chloride) components.
- C. Anchors and Supports: Profiled to suit gutters and downspouts.
  - 1. Anchoring Devices: In accordance with CDA requirements.
  - 2. Downspout Supports: Brackets.
- D. Fasteners: Galvanized steel, with soft neoprene washers.

#### **2.03 ACCESSORIES**

Downspout Boots: Plastic.

## **SECTION 07 7123 – MANUFACTURED SCUPPERS AND DOWNSPOUTS**

### **PART 3 EXECUTION**

#### **3.01 EXAMINATION**

- A. Verify existing conditions before starting work.
- B. Verify that surfaces are ready to receive work.

#### **3.02 PREPARATION**

- A. Verify that substrates are in place and ready for installation of scuppers and downspouts.

#### **3.03 INSTALLATION**

Install gutters, downspouts, and accessories in accordance with manufacturer's instructions.

**END OF SECTION**

## SECTION 07 9005 JOINT SEALERS

### PART 1 GENERAL

#### 1.01 RELATED DOCUMENTS:

Drawings, Division H – General Requirements, Division I – Technical Requirements and Division J – Technical Specifications.

#### 1.01 SECTION INCLUDES

- A. Sealants and joint backing.
- B. Precompressed foam sealers.

#### 1.02 REFERENCE STANDARDS

- A. ASTM C834 - Standard Specification for Latex Sealants; 2010.
- B. ASTM C920 - Standard Specification for Elastomeric Joint Sealants; 2011.
- C. ASTM C1193 - Standard Guide for Use of Joint Sealants; 2013.
- D. ASTM D2240 - Standard Test Method for Rubber Property--Durometer Hardness; 2005 (Reapproved 2010).

#### 1.03 FIELD CONDITIONS

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

### PART 2 PRODUCTS

#### 2.01 MANUFACTURERS

##### A. Gunnable and Pourable Sealants:

1. Adhesives Technology Corporation: [www.atcepoxy.com](http://www.atcepoxy.com).
2. BASF Construction Chemicals-Building Systems: [www.buildingsystems.basf.com](http://www.buildingsystems.basf.com).
3. Bostik Inc: [www.bostik-us.com](http://www.bostik-us.com).
4. Approved Equal

##### B. Preformed Compressible Foam Sealers:

1. EMSEAL Joint Systems, Ltd: [www.emseal.com](http://www.emseal.com).

## SECTION 07 9005 JOINT SEALERS

2. Sandell Manufacturing Company, Inc: [www.sandellmfg.com](http://www.sandellmfg.com).
3. Dayton Superior Corporation: [www.daytonsuperior.com](http://www.daytonsuperior.com).
4. Tremco Global Sealants: [www.tremcosealants.com](http://www.tremcosealants.com).
5. Approved equal.

### 2.02 SEALANTS

A. General Purpose Exterior Sealant: Polyurethane; ASTM C920, Grade NS, Class 25, Uses M, G, and A; single component.

1. Color: Match adjacent finished surfaces.
2. Polyurethane Products:
  - a. Pecora Corporation; DynaTrol I-XL General Purpose One Part Polyurethane Sealant: [www.pecora.com](http://www.pecora.com).
  - b. Pecora Corporation; DynaTrol II General Purpose One Part Polyurethane Sealant: [www.pecora.com](http://www.pecora.com).
  - c. Pecora Corporation; DynaTrol II General Purpose Two Part Polyurethane Sealant: [www.pecora.com](http://www.pecora.com).
  - d. The QUIKRETE Companies; QUIKRETE® Polyurethane Non-Sag Sealant: [www.quikrete.com](http://www.quikrete.com).
  - e. Approved equal.

B. General Purpose Interior Sealant: Acrylic emulsion latex; ASTM C834, Type OP, Grade NF single component, paintable.

1. Color: Match adjacent finished surfaces.
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. Pecora Corporation; AC-20 + Silicone Acrylic Latex Caulking Compound: [www.pecora.com](http://www.pecora.com).

## SECTION 07 9005 JOINT SEALERS

- b. Sherwin-Williams Company; Powerhouse Siliconized Acrylic Latex Sealant: [www.sherwin-williams.com](http://www.sherwin-williams.com).
  - c. Tremco Global Sealants; [www.tremcosealants.com](http://www.tremcosealants.com).
  - d. Approved equal.
- C. Bathtub/Tile Sealant: White silicone; ASTM C920, Uses I, M and A; single component, mildew resistant.
- 1. Applications: Use for:
    - a. Joints between plumbing fixtures and floor and wall surfaces.
  - 2. Products:
    - a. Bostik Inc; [www.bostik-us.com](http://www.bostik-us.com).
    - b. BASF Construction Chemicals-Building Systems; [www.buildingsystems.basf.com](http://www.buildingsystems.basf.com).
    - c. Tremco Global Sealants; [www.tremcosealants.com](http://www.tremcosealants.com).
    - d. Approved equal.
- D. Epoxy Concrete Floor Joint Filler: Self-leveling, pourable, semi-rigid sealant intended for filling cracks and control joints not subject to significant movement; rigid enough to support concrete edges under traffic.
- 1. Composition: Single or multi-part, 100 percent solids by weight.
  - 2. Hardness: 85, minimum, after 7 days, when tested in accordance with ASTM D2240, Shore A.
  - 3. Color: Concrete gray.
  - 4. Joint Width, Minimum: 1/8 inch.
  - 5. Joint Width, Maximum: 1/4 inch.
  - 6. Joint Depth: Provide product suitable for joints from 1/8 inch to 2 inches in depth including space for backer rod.
  - 7. Applications: Use for:
    - a. Control joints in concrete slabs and floors not filled with filler placed in form.
    - b. Construction joints in concrete slabs and floors.

## SECTION 07 9005 JOINT SEALERS

### 8. Products:

- a. Nox-Crete; DynaFlex 502: [www.nox-crete.com](http://www.nox-crete.com)
- b. W.R. Meadows, Inc; Rezi-Weld Flex: [www.wrmeadows.com](http://www.wrmeadows.com).
- c. 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 D 1667, 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 Floor Joints: Test joint filler in inconspicuous area of floor slab. Verify specified product does not stain or discolor slab.

## SECTION 07 9005 JOINT SEALERS

### 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. Install bond breaker where joint backing is not used.
- D. Install sealant free of air pockets, foreign embedded matter, ridges, and sags.
- E. Apply sealant within recommended application temperature ranges. Consult manufacturer when sealant cannot be applied within these temperature ranges.
- F. Tool joints concave.
- G. Concrete Floor Joint Filler: Install concrete floor joint filler per manufacturer's written instructions. After floor joint filler is fully cured, shave joint filler flush with top of concrete slab.

### 3.04 CLEANING

Clean adjacent soiled surfaces.

### 3.05 PROTECTION

Protect sealants until cured.

END OF SECTION

## **SECTION 08 1113 - HOLLOW METAL DOORS AND FRAMES**

### **PART 1 GENERAL**

#### **1.01 SECTION INCLUDES**

- A. Non-fire-rated steel doors and frames.
- B. Thermally insulated steel doors.

#### **1.02 RELATED REQUIREMENTS**

Section 08 7100 - DOOR HARDWARE.

#### **1.03 REFERENCE STANDARDS**

- A. ADA Standards - Americans with Disabilities Act (ADA) Standards for Accessible Design; 2010.
- B. ANSI/SDI A250.8 - Specifications for Standard Steel Doors and Frames (SDI-100); 2014.
- C. ANSI/SDI A250.10 - Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames; 2011.
- D. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2013.
- E. BHMA A156.115 - American National Standard for Hardware Preparation in Steel Doors and Steel Frames; 2014. (ANSI/BHMA A156.115)
- F. ICC A117.1 - Accessible and Usable Buildings and Facilities; International Code Council; 2009 (ANSI).
- G. NAAMM HMMA 840 - Guide Specifications for Installation and Storage of Hollow Metal Doors and Frames; The National Association of Architectural Metal Manufacturers; 2007.

#### **1.04 SUBMITTALS**

- A. Product Data: Materials and details of design and construction, hardware locations, reinforcement type and locations, anchorage and fastening methods, and finishes; and one copy of referenced grade standard.
- B. Shop Drawings: Details of each opening, showing elevations, glazing, frame profiles, and identifying location of different finishes, if any.

## SECTION 08 1113 - HOLLOW METAL DOORS AND FRAMES

### 1.05 QUALITY ASSURANCE

Maintain at the project site a copy of all reference standards dealing with installation.

### PART 2 PRODUCTS

#### 2.01 MANUFACTURERS

##### A. Steel Doors and Frames:

1. Assa Abloy Ceco, Curries, or Fleming: [www.assaabloydss.com](http://www.assaabloydss.com).
2. De La Fontaine Inc: [www.delafontaine.com](http://www.delafontaine.com).
3. Republic Doors: [www.republicdoor.com](http://www.republicdoor.com).
4. Approved equal.

#### 2.02 DOORS AND FRAMES

##### A. Requirements for All Doors and Frames:

1. Accessibility: Comply with ICC A117.1 and ADA Standards.
2. Door Top Closures: Flush with top of faces and edges.
3. Door Edge Profile: Beveled on both edges.
4. Door Texture: Smooth faces.
5. Glazed Lights: Non-removable stops on non-secure side; sizes and configurations as indicated on drawings.
6. Hardware Preparation: In accordance with BHMA A156.115, with reinforcement welded in place, in addition to other requirements specified in door grade standard.
7. Galvanizing for Units in Wet Areas: Components hot-dipped zinc-iron alloy-coated (galvannealed) in accordance with ASTM A653/A653M, with manufacturer's standard coating thickness.
8. Finish: Factory primed, for field finishing.

B. Combined Requirements: If a particular door and frame unit is indicated to comply with more than one type of requirement, comply with all the specified requirements for each type; for instance, an exterior door that is also indicated as being sound-rated must comply with the requirements specified for exterior

## SECTION 08 1113 - HOLLOW METAL DOORS AND FRAMES

doors and for sound-rated doors; where two requirements conflict, comply with the most stringent.

### 2.03 STEEL DOORS

#### A. Exterior Doors:

1. Grade: ANSI/SDI A250.8 (SDI-100); Level 1 - Standard-Duty, Physical Performance Level C, Model 1 - Full Flush.
2. Galvanizing: Components hot-dipped zinc-iron alloy-coated (galvannealed) in accordance with ASTM A653/A653M, with manufacturer's standard coating thickness.
3. Paint doors in accordance with Section 09-9000.

#### B. Interior Doors, Non-Fire-Rated:

1. Grade: ANSI/SDI A250.8 (SDI-100); Level 1 - Standard-Duty, Physical Performance Level C, Model 1 - Full Flush.
2. Thickness: 1-3/4 inch (44.5 mm).

### 2.04 STEEL FRAMES

#### A. General:

1. Comply with the requirements of grade specified for corresponding door.
2. Provide mortar guard boxes for hardware cut-outs in frames to be installed in masonry or to be grouted.
3. Frames in Masonry Walls: Size to suit masonry coursing with head member 4 inches (100 mm) high to fill opening without cutting masonry units.

#### B. Exterior Door Frames: Face welded, seamless with joints filled.

1. Galvanizing: Components hot-dipped zinc-iron alloy-coated (galvannealed) in accordance with ASTM A653/A653M, with manufacturer's standard coating thickness.
2. Finish: Factory primed, for field finishing.
3. Weatherstripping: Integral, recessed into door edge or frame.

#### C. Interior Door Frames, Non-Fire-Rated: Fully welded type.

## **SECTION 08 1113 - HOLLOW METAL DOORS AND FRAMES**

1. Terminated Stops: Provide at all interior doors; closed end stop terminated 6 inches (150 mm) above floor at 45 degree angle.
2. Finish: Factory primed, for field finishing.

### **2.05 ACCESSORY MATERIALS**

- A. Grout for Frames: Portland cement grout of maximum 4-inch slump for hand troweling; thinner pumpable grout is prohibited.
- B. Silencers: Resilient rubber, fitted into drilled hole; 3 on strike side of single door, 3 on center mullion of pairs, and 2 on head of pairs without center mullions.
- C. Temporary Frame Spreaders: Provide for all factory- or shop-assembled frames.

### **2.06 FINISH MATERIALS**

Primer: Rust-inhibiting, complying with ANSI/SDI A250.10, door manufacturer's standard.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify existing conditions before starting work.
- B. Verify that opening sizes and tolerances are acceptable.

### **3.02 PREPARATION**

Coat inside of frames to be installed in masonry or to be grouted, with bituminous coating, prior to installation.

### **3.03 INSTALLATION**

- A. Install in accordance with the requirements of the specified door grade standard and NAAMM HMMA 840.
- B. Coordinate frame anchor placement with wall construction.
- C. Grout frames in masonry construction, using hand trowel methods; brace frames so that pressure of grout before setting will not deform frames.
- D. Coordinate installation of hardware.

## **SECTION 08 1113 - HOLLOW METAL DOORS AND FRAMES**

### **3.04 TOLERANCES**

Maximum Diagonal Distortion: 1/16 in (1.5 mm) measured with straight edge, corner to corner.

### **3.05 ADJUSTING**

Adjust for smooth and balanced door movement.

### **3.06 SCHEDULE**

Refer to Door and Frame Schedule on the drawings.

**END OF SECTION**

## 08 3301 SECURITY SHUTTERS

### PART 1 – GENERAL

#### 1.01 SECTION INCLUDES

Exterior overhead Roll-Up security shutters

#### 1.02 SUBMITTALS

- A. Product Data: Submit manufacturer's product data for all specified components, including specifications, finish information and installation instructions.
- B. Shop Drawings: Submit scaled shop drawings showing layout, sizes and types, product materials, components and accessories, fabrication data, wiring diagrams for motor driven operators, finishes, rough-in dimensions, anchorage with installation requirements and location details.
- C. Samples: Manufacturer's standard array of colors for selection by Architect.
- D. Quality Assurance Submittals:
  - 1. Test Reports: Engineer raised seal test reports showing compliance with specified requirements.
  - 2. Certificates: Engineering certification that design criteria meets specified requirements.
  - 3. Operating and Maintenance Instructions: Submit detailed maintenance requirements and operating instructions.
  - 4. Warranty: Submit specified warranty documents.

#### 1.03 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Obtain rolling shutters through one source from a single manufacturer with a minimum of 20 years experience in manufacturing products comparable to those specified in this section.
- B. Installer Qualifications:

Use only manufacturer's factory trained installers or qualified installers approved by shutter manufacturer.
- C. Regulatory Requirements:
  - 1. Comply with all local and governing code requirements.

## 08 3301 SECURITY SHUTTERS

2. Unless required otherwise, fabricate to withstand wind loads that carry same rating as component and cladding.
- D. Pre-Installation Conference: Conduct a pre-installation meeting to verify project installation and coordination requirements, and field conditions. Conference may be held via telephone conference call.
- E. Electrical Certification: ANSI approved and labeled UL325 as a complete shutter system. Individual testing of components will not be acceptable in lieu of system testing.

### 1.04 DELIVERY, STORAGE AND HANDLING

Deliver components in manufacturer's original, unopened, undamaged containers with identification labels intact. Store components protected from harmful weather conditions and damage from other construction activity.

### 1.05 PROJECT CONDITIONS

Field Measurements: Record actual measurements of openings before fabrication. Show recorded measurements on As-Built drawings.

### 1.06 WARRANTY

- A. Manufacturer's Warranty: Submit, for Owner's acceptance, manufacturer's standard warranty document executed by an authorized company official.
  1. Warranty period: one year parts and labor, not including scaffolding, lifts, or other means to reach the inaccessible areas.
  2. Motors and motor control systems: Manufacturer's standard non-depreciating five-year warranty.

## PART 2 - PRODUCTS

### 2.01 MANUFACTURER

Enviroblind mechanically operated shutters 800-635-5775

### 2.02 OTHER ACCEPTABLE MANUFACTURERS

Substitutions: Approved equal.

### 2.03 MATERIALS

- A. Shutter Components:
  1. Slat Type:

## 08 3301 SECURITY SHUTTERS

- a. Aluminum Single Wall Slats: Narrow slat vinyl coated aluminum.
2. Key lock base slat with standard key engaging steel slides. Key lock on outside.
3. Operation: (Manual)
  - a. Manual operator type: (choose one)

Manual push up/pull down operation with internal drive tube torsion spring lift-assist manufactured to have maximum 35 lbs raise or lower effort.

### 2.04 SHOP FINISH

Side Frames and Track: Vinyl coated – color to be selected from standard colors.

### 2.05 APPLICATION & DESIGN

- A. Box Housing
  1. Shape: shall be (square
  2. Size: Minimum size for shutter.
- B. Locking Mechanism: Lock bar operation into mortised side rails at bottom of each side rail.

Key lock shall be on box side. Cylinder shall be centered.

- C. Codes: Installed shutters shall meet the required building compliance and documentation per section 1.02 SUBMITTALS.

IBC/IRC

## PART 3 - EXECUTION

### 3.01 EXAMINATION

Verify conditions of substrates to determine if acceptable for shutter installation in accordance with manufacturer's instructions. Correct all unsatisfactory conditions prior to commencing shutter installations.

### 1.02 INSTALLATION

- A. Install track and all shutter components to comply with project shop drawings and manufacturer's installation product approvals.

## **08 3301 SECURITY SHUTTERS**

- B. After installation, lubricate, test and adjust shutters to operate properly and free from distortion.

### **3.03 CLEANING**

- A. Clean installed components in accordance with manufacturer's instructions prior to Owner's acceptance. Properly remove from the site all debris remaining from this installation.
- B. Inadequate surface cleaning will result in corrosion formation & potential structural damage.

### **3.04 PROTECTION**

Comply with manufacturer recommendations and protect completed shutter installations from damage during remaining construction so as not to void warranty.

**END OF SECTION**

## SECTION 08 3323 - OVERHEAD COILING DOORS

### PART 1 GENERAL

#### 1.01 SECTION INCLUDES

Overhead coiling doors and window shutters, operating hardware, non-fire-rated and exterior, manual and electric operation.

#### 1.02 REFERENCE STANDARDS

- A. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2013.
- B. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum); National Electrical Manufacturers Association; 2014.
- C. NEMA ICS 2 - Industrial Control and Systems Controllers, Contactors and Overload Relays Rated 600 Volts; National Electrical Manufacturers Association; 2000 (R2005), with errata, 2008.

#### 1.03 SUBMITTALS

- A. Product Data: Provide component dimensions, anchors, fasteners, glass, and internal drainage details.
- B. Shop Drawings: Indicate opening dimensions, framed opening tolerances, affected related work, installation requirements.
- C. Manufacturer's Certificate: Certify that products of this section meet or exceed specified requirements.

### PART 2 PRODUCTS

#### 2.01 MANUFACTURERS

- A. Overhead Coiling Doors:
  - 1. Porvene Doors: [www.porvenedoors.com](http://www.porvenedoors.com).
  - 2. The Cookson Company: [www.cooksondoor.com](http://www.cooksondoor.com).
  - 3. Wayne-Dalton, a Division of Overhead Door Corporation: [www.wayne-dalton.com](http://www.wayne-dalton.com).
  - 4. Approved alternate.

## SECTION 08 3323 - OVERHEAD COILING DOORS

### 2.02 COILING DOORS

A. Exterior Coiling Doors: Steel slat curtain.

1. Capable of withstanding positive and negative wind loads of 20 psf (940 Pa), without undue deflection or damage to components.
2. Single thickness slats.
3. Finish: Galvanized.
4. Finish: Factory painted, match wall color.

### 2.03 MATERIALS

A. Curtain Construction: Interlocking slats.

1. Slat Ends: Alternate slats fitted with end locks to act as wearing surface in guides and to prevent lateral movement.
2. Curtain Bottom: Fitted with angles to provide reinforcement and positive contact in closed position.
3. Weatherstripping: Moisture and rot proof, resilient type, located at jamb edges, bottom of curtain, and where curtain enters hood enclosure of exterior doors.

B. Basis of design: Enviroblind Series 40R or approved equal.

C. Steel Slats: A653/A653M galvanized steel sheet.

Galvanizing: Minimum G90/Z275 coating.

D. Guide Construction: Continuous, of profile to retain door in place with snap-on trim, mounting brackets of same metal.

E. Roller Shaft Counterbalance: Steel pipe and helical steel spring system, capable of producing torque sufficient to ensure smooth operation of curtain from any position and capable of holding position at mid-travel; with adjustable spring tension; requiring 25 lb (10 kg) nominal force to operate.

### 2.04 ELECTRIC OPERATION

A. Electric Operators:

1. Motor Rating: 1/3 hp (250 W); continuous duty.
2. Motor Controller: NEMA ICS 2, full voltage, reversing magnetic motor starter.

## **SECTION 08 3323 - OVERHEAD COILING DOORS**

3. Controller Enclosure: NEMA 250, Type 1.
  4. Opening Speed: 12 inches per second (300 mm/s).
  5. Brake: Adjustable friction clutch type, activated by motor controller.
  6. Manual override in case of power failure.
- B. Control Station: Standard three button (OPEN-STOP-CLOSE) momentary control for each operator.

24 volt circuit.

- C. Safety Edge: Located at bottom of curtain, full width, electro-mechanical sensitized type, wired to stop operator upon striking object, hollow neoprene covered.

### **PART 3 EXECUTION**

#### **3.01 INSTALLATION**

- A. Install units in accordance with manufacturer's instructions.
- B. Use anchorage devices to securely fasten assembly to wall construction and building framing without distortion or stress.
- C. Securely and rigidly brace components suspended from structure. Secure guides to structural members only.
- D. Fit and align assembly including hardware; level and plumb, to provide smooth operation.
- E. Complete wiring from disconnect to unit components.

#### **3.02 TOLERANCES**

- A. Maintain dimensional tolerances and alignment with adjacent work.
- B. Maximum Variation From Plumb: 1/16 inch (1.5 mm).
- C. Maximum Variation From Level: 1/16 inch (1.5 mm).
- D. Longitudinal or Diagonal Warp: Plus or minus 1/8 inch per 10 ft (3 mm per 3 m) straight edge.

#### **3.03 ADJUSTING**

- A. Adjust operating assemblies for smooth and noiseless operation.

## **SECTION 08 3323 - OVERHEAD COILING DOORS**

### **3.04 CLEANING**

- A. Clean installed components.
- B. Remove labels and visible markings.

**END OF SECTION**

## **SECTION 08 5413 - FIBERGLASS WINDOWS**

### **PART 1 GENERAL**

#### **1.01 SECTION INCLUDES**

- A. Factory fabricated fiberglass windows with fixed and operating sash.
- B. Operating hardware.
- C. Insect screens.

#### **1.02 REFERENCE STANDARDS**

AAMA/WDMA/CSA 101/I.S.2/A440 - North American Fenestration Standard/Specification for windows, doors, and skylights; American Architectural Manufacturers Association/Window and Door Manufacturers Association/Canadian Standards Association; 2011.

#### **1.03 SUBMITTALS**

- A. Product Data: Provide component dimensions, anchors, fasteners, glass, and internal drainage details.
- B. Shop Drawings: Indicate opening dimensions, framed opening tolerances, affected related work, installation requirements.
- C. Submit two samples of operating hardware.
- D. Manufacturer's Certificate: Certify that products of this section meet or exceed specified requirements.
- E. Grade Substantiation: Prior to submitting shop drawings or starting fabrication, submit one of the following showing compliance with specified grade:
  - 1. Evidence of AAMA Certification.
  - 2. Evidence of WDMA Certification.
  - 3. Evidence of CSA Certification.
  - 4. Test report(s) by independent testing agency itemizing compliance and acceptable to authorities having jurisdiction.

#### **1.04 DELIVERY, STORAGE, AND HANDLING**

- A. Protect finished surfaces with wrapping. Do not use adhesive papers or sprayed coatings that bond when exposed to sunlight or weather.

## SECTION 08 5413 - FIBERGLASS WINDOWS

- B. Jig, brace, and box the window frame assemblies for transport to minimize flexing of members or joints.

### 1.05 FIELD CONDITIONS

- A. Do not install sealants when ambient temperature is less than 40 degrees F (5 degrees C).
- B. Maintain this minimum temperature during and after installation of sealants.

### 1.06 WARRANTY

- A. Correct defective Work within a ten year period after Date of Substantial Completion.
- B. Provide ten year manufacturer warranty for insulated glass units from seal failure, interpane dusting or misting, and replacement of same. Include coverage for degradation of color finish.

## PART 2 PRODUCTS

### 2.01 MANUFACTURERS

- A. Fiberglass Windows:
  - 1. Basis of Design: Milgard Corporation; Ultra 3000 series: [www.milgard.com](http://www.milgard.com).
  - 2. Approved equal.

### 2.02 WINDOW UNITS

- A. Fiberglass Windows: Hollow, tubular, multi-layer fiber reinforced material; factory fabricated; with vision glass, related flashings, anchorage and attachment devices. Interior roll down insect screen.
  - 1. Configuration: As indicated on drawings.
  - 2. Movement: Accommodate movement between window and perimeter framing and deflection of lintel, without damage to components or deterioration of seals.
  - 3. System Internal Drainage: Drain to the exterior by means of a weep drainage network any water entering joints, condensation occurring in glazing channel, and migrating moisture occurring within system.
  - 4. Thermal Movement: Design to accommodate thermal movement caused by 100 degrees F (34 degrees C) temperature change without buckling stress on glass, joint seal failure, damaging loads on

## SECTION 08 5413 - FIBERGLASS WINDOWS

structural elements, damaging loads on fasteners, reduction in performance or other detrimental effects.

B. Performance Requirements: Provide products that comply with the following:

1. Grade: AAMA/WDMA/CSA 101/I.S.2/A440 requirements for specific window type:
  - a. Performance Class (PC): R.
  - b. Performance Grade (PG): Equivalent to or greater than design wind load.
2. Design Pressure (DP): In accordance with applicable codes.

### 2.03 GLASS AND GLAZING MATERIALS

As indicated on drawings, insulated glass unit.

### 2.04 HARDWARE

A. Casement and Awning Sash: Zinc die-cast steel worm-gear operator with E-coated finish.

1. Operator Linkage, Hinge Slide.
2. Casement and Awning Sash Lock: Folding arm crank.

B. Horizontal Sliding Sash: Extruded PVC interfacing tracks, limit stops in head and sill track.

Sash Lock: Cam lock and keeper.

C. Double Hung Sash: Metal and nylon spiral friction slide cylinder, each sash, each jamb.

Sash Lock: Self-aligning, cam-action lock.

D. Pivot Window Operator: Lever action handle fitted to projecting sash arms with limit stops.

1. Projecting Sash Arms: Cadmium plated steel, friction pivot joints with nylon bearings, removable pivot clips for cleaning.
2. Sash lock: Lever handle with cam lock.

E. Finish For Exposed Hardware: Match frame finish.

## SECTION 08 5413 - FIBERGLASS WINDOWS

### 2.05 FABRICATION

- A. Fabricate framing, mullions and sash members with fusion welded corners and joints, in a rigid jig. Supplement frame sections with internal reinforcement where required for structural rigidity.
- B. Form sills and stools in one piece. Slope sills for wash.
- C. Form snap-in glass stops, closure molds, weather stops, and flashings for tight fit into window frame section.
- D. Form weather stop flange to perimeter of unit.
- E. Fabricate components with minimum clearances and shim spacing around perimeter of assembly, yet enabling installation and dynamic movement of perimeter seal.
- F. Arrange fasteners to be concealed from view.
- G. Permit internal drainage weep holes and channels to migrate moisture to exterior. Provide internal drainage of glazing spaces to exterior through weep holes.
- H. Assemble insect screen frame, miter and reinforced frame corners. Fit mesh taut into frame and secure. Fit frame with four spring loaded steel pin retainers.
- I. Double weatherstrip operable units.
- J. Factory glaze window units.

### PART 3 EXECUTION

#### 3.01 EXAMINATION

Verify wall openings and adjoining air and vapor seal materials are ready to receive work of this Section.

#### 3.02 INSTALLATION

- A. Install windows in accordance with manufacturer's instructions.
- B. Attach window frame and shims to perimeter opening to accommodate construction tolerances and other irregularities.
- C. Align window plumb and level, free of warp or twist. Maintain dimensional tolerances and alignment with adjacent work.
- D. Set sill members and sill flashing in continuous bead of sealant.

## **SECTION 08 5413 - FIBERGLASS WINDOWS**

- E. Provide thermal isolation where components penetrate or disrupt building insulation. Pack fibrous insulation in shim spaces at perimeter of assembly to maintain continuity of thermal barrier.

### **3.03 ADJUSTING**

Adjust hardware for smooth operation and secure weathertight closure.

### **3.04 CLEANING**

- A. Remove protective material from pre-finished surfaces.
- B. Wash surfaces by method recommended and acceptable to window manufacturer; rinse and wipe surfaces clean.
- C. Remove excess glazing sealant by moderate use of mineral spirits or other solvent acceptable to sealant manufacturer.

**END OF SECTION**

## **SECTION 08 7100 - DOOR HARDWARE**

### **PART 1 GENERAL**

#### **1.01 SECTION INCLUDES**

- A. Hardware for hollow metal doors.
- B. Lock cylinders for doors that hardware is specified in other sections.
- C. Thresholds.
- D. Weatherstripping, seals and door gaskets.
- E. Gate locks.

#### **1.02 RELATED REQUIREMENTS**

- A. Section 08 1113 - Hollow Metal Doors and Frames.

#### **1.03 REFERENCE STANDARDS**

- A. 36 CFR 1191 - Americans with Disabilities Act (ADA) Accessibility Guidelines for Buildings and Facilities; Architectural Barriers Act (ABA) Accessibility Guidelines; current edition.
- B. ADA Standards - Americans with Disabilities Act (ADA) Standards for Accessible Design; 2010.
- C. BHMA A156.2 - American National Standard for Bored and Preassembled Locks & Latches; Builders Hardware Manufacturers Association; 2011 (ANSI/BHMA A156.2).
- D. BHMA A156.3 - American National Standard for Exit Devices; Builders Hardware Manufacturers Association; 2014 (ANSI/BHMA A156.3).
- E. BHMA A156.4 - American National Standard for Door Controls - Closers; Builders Hardware Manufacturers Association, Inc.; 2013 (ANSI/BHMA A156.4).
- F. BHMA A156.5 - American National Standard for Cylinders and Input Devices for Locks; Builders Hardware Manufacturers Association; 2014 (ANSI/BHMA A156.5).
- G. BHMA A156.8 - American National Standard for Door Controls - Overhead Stops and Holders; Builders Hardware Manufacturers Association, Inc.; 2010 (ANSI/BHMA A156.8).

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- H. BHMA A156.13 - American National Standard for Mortise Locks & Latches Series 1000; Builders Hardware Manufacturers Association; 2012 (ANSI/BHMA A156.13).
- I. BHMA A156.14 - American National Standard for Sliding & Folding Door Hardware; Builders Hardware Manufacturers Association; 2013 (ANSI/BHMA A156.14).
- J. BHMA A156.18 - American National Standard for Materials and Finishes; Builders Hardware Manufacturers Association, Inc.; 2012 (ANSI/BHMA A156.18).
- K. BHMA A156.115 - American National Standard for Hardware Preparation in Steel Doors and Steel Frames; 2014 (ANSI/BHMA A156.115).
- L. ICC A117.1 - Accessible and Usable Buildings and Facilities; International Code Council; 2009 (ANSI).
- M. NFPA 80 - Standard for Fire Doors and Other Opening Protectives; 2013.
- N. UL (BMD) - Building Materials Directory; Underwriters Laboratories Inc.; current edition.

### 1.04 ADMINISTRATIVE REQUIREMENTS

- A. Coordinate the manufacture, fabrication, and installation of products that door hardware will be installed upon.
- B. Furnish templates for door and frame preparation to manufacturers and fabricators of products requiring internal reinforcement for door hardware.
- C. Convey City of Long Beach's keying requirements to manufacturers.

### 1.05 SUBMITTALS

- A. Product Data: Manufacturer's catalog literature for each type of hardware, marked to clearly show products to be furnished for this project.
- B. Hardware Schedule: Detailed listing of each item of hardware to be installed on each door. Use door numbering scheme as included in the Contract Documents. Identify electrically operated items and include power requirements.
- C. Keying Schedule: Submit for approval of City of Long Beach.
- D. Manufacturer's Installation Instructions: Indicate special procedures, perimeter conditions requiring special attention.

## **SECTION 08 7100 - DOOR HARDWARE**

- E. Maintenance Data: Include data on operating hardware, lubrication requirements, and inspection procedures related to preventative maintenance.
- F. Project Record Documents: Record actual locations of concealed equipment, services, and conduit.
- G. Maintenance Materials and Tools: Furnish the following for City of Long Beach's use in maintenance of project.

### **1.06 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years of documented experience.
- B. Hardware Supplier Qualifications: Company specializing in supplying commercial door hardware approved by manufacturer.
- C. Hardware Supplier Personnel: Employ an Architectural Hardware Consultant (AHC) to assist in the work of this section.

### **1.07 DELIVERY, STORAGE, AND HANDLING**

Package hardware items individually; label and identify each package with door opening code to match hardware schedule.

### **1.08 WARRANTY**

Provide five year warranty for door closers.

## **PART 2 PRODUCTS**

### **2.01 MANUFACTURERS**

As indicated in the City of Long Beach's hardware specifications.

### **2.02 DOOR HARDWARE - GENERAL**

- A. Provide hardware specified or required to make doors fully functional, compliant with applicable codes, and secure to the extent indicated.
- B. Provide items of a single type of the same model by the same manufacturer.
- C. Provide products that comply with the following:
  - 1. Applicable provisions of federal, state, and local codes.
  - 2. Accessibility: ADA Standards and ICC A117.1.

## SECTION 08 7100 - DOOR HARDWARE

3. Fire-Rated Doors: NFPA 80.
4. Hardware on Fire-Rated Doors, Except Hinges: Listed and classified by UL as suitable for the purpose specified and indicated.
5. Hardware Preparation for Steel Doors and Steel Frames: BHMA A156.115.

D. Finishes: Provide door hardware of the same finish unless otherwise indicated.

1. Primary Finish: Satin chrome plated over nickel on brass or bronze, 626 (approx US26D).
2. Secondary Finish: Satin chrome plated over nickel on brass or bronze, 626 (approx US26D).

Use secondary finish in kitchens, bathrooms, and other spaces containing chrome or stainless steel finished appliances, fittings, and equipment; provide primary finish on one side of door and secondary finish on other side if necessary.

3. Finish Definitions: BHMA A156.18.
4. Exceptions:
  - a. Where base metal is specified to be different, provide finish that is an appearance equivalent according to BHMA A156.18.
  - b. Hinges for Fire-Rated Doors: Steel base metal with painted finish.

### 2.03 LOCKS AND LATCHES

A. Locks: Provide a lock for every door, unless specifically indicated as not requiring locking.

1. Hardware Sets indicate locking functions required for each door.
2. If no hardware set is indicated for a swinging door provide an office lockset.
3. Trim: Provide lever handle or pull trim on outside of all locks unless specifically stated to have no outside trim.
4. Lock Cylinders: Provide key access on outside of all locks unless specifically stated to have no locking or no outside trim.

B. Lock Cylinders: Manufacturer's standard tumbler type, six-pin standard core.

## SECTION 08 7100 - DOOR HARDWARE

1. Provide cams and/or tailpieces as required for locking devices required.

C. Keying: Grand master keyed.

D. Latches: Provide a latch for every door that is not required to lock, unless specifically indicated "push/pull" or "not required to latch".

### 2.04 HINGES

A. Hinges: Provide hinges on every swinging door.

1. Provide five-knuckle full mortise butt hinges unless otherwise indicated.
2. Provide ball-bearing hinges at all doors having closers.
3. Provide hinges in the quantities indicated.
4. Provide non-removable pins on exterior outswinging doors.
5. Where electrified hardware is mounted in door leaf, provide power transfer hinges.

### 2.05 CYLINDRICAL LOCKSETS

A. Locking Functions: As defined in BHMA A156.2, and as follows.

1. Passage: No locking, always free entry and exit.
2. Privacy: F76, emergency tool unlocks.

B. Manufacturers - Cylindrical Locksets:

City of Long Beach Hardware Standards.

### 2.06 MORTISE LOCKSETS

A. Locking Functions: As defined in BHMA A156.13, and as follows:

Entry, Deadbolt: F20, may be locked without key, free egress.

B. Manufacturers - Mortise Locksets:

City of Long Beach Hardware Standards.

## SECTION 08 7100 - DOOR HARDWARE

### 2.07 STOPS AND HOLDERS

A. Stops: Complying with BHMA A156.8; provide a stop for every swinging door, unless otherwise indicated.

1. Provide wall stops, unless otherwise indicated.
2. If wall stops are not practical, due to configuration of room or furnishings, provide overhead stop.
3. Stop is not required if positive stop feature is specified for door closer; positive stop feature of door closer is not an acceptable substitute for a stop unless specifically so stated.

B. Floor Stops: Glynn Johnson.

C. Manufacturers - Overhead Holders/Stops:

1. Assa Abloy Brands; Rixson or Sargent: [www.assaabloydss.com](http://www.assaabloydss.com).
2. Glynn-Johnson, an Allegion brand: [www.allegion.com/us](http://www.allegion.com/us).

### 2.08 SLIDING DOOR HARDWARE

A. Sliding Door Hardware: Complying with BHMA A156.14.

B. Bifolding Door Hardware: Track, hanger fasteners, guides, and pulls; size track and hangers according to manufacturer's recommendations for weight of doors.

C. Bypassing Door Hardware: Track, hanger fasteners, guides, and pulls; size track and hangers according to manufacturer's recommendations for weight of doors.

D. Manufacturers - Sliding and Bifolding Hardware.

### 2.09 FIRE DEPARTMENT LOCK BOX

Fire Department Lock Box: Heavy-duty, surface mounted, solid stainless-steel box with hinged door and interior gasket seal; single drill resistant lock with dust covers and tamper alarm. Locate as directed by Fire Department.

## PART 3 EXECUTION

### 3.01 EXAMINATION

Verify that doors and frames are ready to receive work; labeled, fire-rated doors and frames are present and properly installed, and dimensions are as indicated on shop drawings.

## SECTION 08 7100 - DOOR HARDWARE

### 3.02 INSTALLATION

- A. Install hardware in accordance with manufacturer's instructions and applicable codes.
- B. Use templates provided by hardware item manufacturer.
- C. Install hardware on fire-rated doors and frames in accordance with code and NFPA 80.
- D. Mounting heights for hardware from finished floor to center line of hardware item.

### 3.03 ADJUSTING

Adjust hardware for smooth operation.

### 3.04 CLEANING

Clean adjacent surfaces soiled by hardware installation. Clean finished hardware per manufacturer's instructions after final adjustments has been made. Replace items that cannot be cleaned to manufacturer's level of finish quality at no additional cost.

### 3.05 PROTECTION

Do not permit adjacent work to damage hardware or finish.

END OF SECTION

## **SECTION 08 7129 - SLIDING AND FOLDING DOOR HARDWARE**

### **PART 1 GENERAL**

#### **1.01 SECTION INCLUDES**

Product requirements for hardware for sliding doors supplementing specifications in Section 08 7100.

#### **1.02 RELATED REQUIREMENTS**

Section 08 7100 - DOOR HARDWARE: General administrative and installation requirements applicable to this Section.

#### **1.03 REFERENCED STANDARDS**

BHMA A156.14 - American National Standard for Sliding & Folding Door Hardware; Builders Hardware Manufacturers Association; 2013. (ANSI/BHMA A156.14)

### **PART 2 PRODUCTS**

#### **2.01 MANUFACTURERS**

Basis of Design: Hettich America, LP: [www.hettichamerica.com](http://www.hettichamerica.com), or approved equal.

#### **2.02 SLIDING AND FOLDING DOOR HARDWARE - GENERAL**

- A. Where type or size is not indicated, select from manufacturer's full line based on manufacturer's recommendations, actual door/panel sizes and weights, and configurations indicated on drawings.
- B. Tracks: Provide tracks of appropriate type, size, and length for openings, regardless of manufacturer's standard unit sizes; splice tracks without gaps or offsets.
- C. Accessories: Provide all accessory parts necessary to make door/panel assemblies operate smoothly, close openings completely, and remain in position when closed.

#### **2.03 HARDWARE SETS FOR SLIDING AND FOLDING DOORS**

See Drawings.

#### **2.04 OVERHEAD SUPPORTED SINGLE TRACK SLIDING DOOR HARDWARE, WITH WHEELED CARRIERS**

- A. Track and Carriers: Designed as a set, to suit operational configuration, weight of doors, and manufacturer's limitations, if any, and as follows:

## **SECTION 08 7129 - SLIDING AND FOLDING DOOR HARDWARE**

1. Track: Extruded aluminum track, mounted on under side of opening header, unless otherwise indicated.
  - a. Finish: Mill finish aluminum.
  - b. Length: As indicated on drawings.
2. Number of Carriers: Two per panel.
3. Medium-Duty, Up To 150 pounds (68 kg) Per Panel: I-beam track.
  - a. Comply with ANSI/BHMA A156.14 Grade 1.
  - b. Carriers: Four-wheeled, steel housing with ball and socket suspension system; mounted to top or back of door panels.
  - c. Carrier Wheels: Steel, ball-bearing.
  - d. Vertical Adjustment: 0.25 inches (6.4 mm), nominal.
  - e. Minimum Headroom: 1.875 inches (47.6 mm).
  - f. Maximum Headroom: 2.125 inches (53.9 mm).
  - g. Basis of Design -- Minimum 3/4 Inch Thick Panels: Hettich Grant 71-034 (back mount); 71-111 (top mount).
  - h. Basis of Design -- Minimum 1-3/8 Inch Thick Panels: Hettich Grant 71-138 (back mount); 71-222 (top mount).

### **2.05 OVERHEAD SUPPORTED SINGLE TRACK SLIDING DOOR HARDWARE, BALL-BEARING CARRIERS**

- A. Track and Carriers: Custom-fabricated as a set, to suit operational configuration, weight of panels, and manufacturer's limitations, if any, and as follows:
1. Comply with ANSI/BHMA A156.14 Grade 1.
  2. Track: Extruded aluminum, machined to fit ball-bearing rollers.
  3. Carriers: Continuous ball bearing rollers; no wheeled rollers; mounted to top of panel.
  4. Material for Interior Applications: Aluminum.

Finish: Mill finish.

## **SECTION 08 7129 - SLIDING AND FOLDING DOOR HARDWARE**

5. Material for Exterior Applications: Aluminum with stainless steel components.

Finish: Mill finish.

6. Medium-Duty, Up To 150 pounds (68 kg) Per Panel:
  - a. Door Thickness: 1.0 inch (25.4 mm), minimum.
  - b. Vertical Adjustment: 0.375 inch (9.5 mm), nominal.
  - c. Minimum Headroom: 2.625 inches (66.7 mm).
  - d. Maximum Headroom: 3.0 inches (76.2 mm).
  - e. Basis of Design: Hettich Grant 5150.

### **2.06 DOOR PULLS AND ACCESSORIES**

Full-Size Handle Pulls: TBD.

## **PART 3 EXECUTION**

### **3.01 INSTALLATION**

- A. Install in accordance with Hardware Schedule and manufacturer's instructions.
- B. See Section 08 7100 for additional requirements.

**END OF SECTION**

## SECTION 08 9100 – LOUVERS AND VENTS

### PART 1 GENERAL

#### 1.01 SECTION INCLUDES

Louvers, frames, and accessories.

#### 1.02 REFERENCE STANDARDS

- A. AMCA 511 - Certified Ratings Program Product Rating Manual for Air Control Devices; 2013.
- B. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2015.

#### 1.03 SUBMITTALS

- A. Product Data: Provide data describing design characteristics, maximum recommended air velocity, design free area, materials and finishes.
- B. Shop Drawings: Indicate louver layout plan and elevations, opening and clearance dimensions, tolerances; head, jamb and sill details; blade configuration, screens, blackout areas required, and frames.
- C. Test Reports: Independent agency reports showing compliance with specified performance criteria.

#### 1.04 WARRANTY

- A. Provide twenty year manufacturer warranty against distortion, metal degradation, and failure of connections.

Finish: Include coverage against degradation of exterior finish.

### PART 2 PRODUCTS

#### 2.01 MANUFACTURERS

##### A. Wall Louvers:

1. Airolite Company, LLC: [www.airolite.com](http://www.airolite.com).
2. American Warming and Ventilating: [www.awv.com](http://www.awv.com).
3. Construction Specialties, Inc: [www.c-sgroup.com](http://www.c-sgroup.com).
4. Approved equal.

## SECTION 08 9100 - LOUVERS

### 2.02 LOUVERS

A. Louvers: Factory fabricated and assembled, complete with frame, mullions, and accessories; AMCA Certified in accordance with AMCA 511.

Wind Load Resistance: Design to resist positive and negative wind load of 25 psf (1.2 kPa) without damage or permanent deformation.

B. Stationary Louvers : Horizontal blade, stainless steel construction.

1. Free Area: 50 percent, minimum.
2. Blades: V-shaped, sight-proof.
3. Frame: Depth as indicated on drawings, channel profile; corner joints mitered and, with continuous recessed caulking channel each side.
4. Steel Thickness, Galvanized: Frame 16 gage, 0.0598 inch (1.52 mm) minimum base metal; blades 16 gage, 0.0598 inch (1.52 mm) minimum base metal.

### 2.03 MATERIALS

Stainless Steel: ASTM A666 Type 304, soft temper, smooth surface, No. 4 finish.

## PART 3 EXECUTION

### 3.01 EXAMINATION

Verify that prepared openings and flashings are ready to receive work and opening dimensions are as indicated on shop drawings.

### 3.02 INSTALLATION

- A. Install louver assembly in accordance with manufacturer's instructions.
- B. Install louvers level and plumb.
- C. Set sill members and sill flashing in continuous bead of sealant.
- D. Align louver assembly to ensure moisture shed from flashings and diversion of moisture to exterior.
- E. Secure louver frames in openings with concealed fasteners.

## **SECTION 08 9100 - LOUVERS**

### **3.03 CLEANING**

- A. Strip protective finish coverings.
- B. Clean surfaces and components.

**END OF SECTION**

## **SECTION 09 2116 - GYPSUM BOARD ASSEMBLIES**

### **PART 1 GENERAL**

#### **1.01 SECTION INCLUDES**

- A. Performance criteria for gypsum board assemblies.
- B. Cementitious backing board.
- C. Gypsum wallboard and ceiling.
- D. Joint treatment and accessories.

#### **1.02 REFERENCE STANDARDS**

- A. ANSI A108.11 - American National Standard for Interior Installation of Cementitious Backer Units; 2013.1.
- B. ASTM C475/C475M - Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board; 2012.
- C. ASTM C840 - Standard Specification for Application and Finishing of Gypsum Board; 2013.
- D. ASTM C1047 - Standard Specification for Accessories for Gypsum Wallboard and Gypsum Veneer Base; 2014a.
- E. ASTM C1396/C1396M - Standard Specification for Gypsum Board; 2014.
- F. ASTM D3273 - Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber; 2012.
- G. GA-216 - Application and Finishing of Gypsum Board; Gypsum Association; 2013.

#### **1.03 SUBMITTALS**

Product Data: Provide data on gypsum board, accessories, and joint finishing system.

### **PART 2 PRODUCTS**

#### **2.01 GYPSUM BOARD ASSEMBLIES**

Provide completed assemblies complying with ASTM C840 and GA-216.

## SECTION 09 2116 - GYPSUM BOARD ASSEMBLIES

### 2.02 BOARD MATERIALS

#### A. Manufacturers - Gypsum-Based Board:

1. American Gypsum Company; M-Bloc: [www.americangypsum.com](http://www.americangypsum.com).
2. CertainTeed Corporation; M-2 TECH: [www.certainteed.com](http://www.certainteed.com).
3. USG Corporation; MOLD-TOUGH: [www.usg.com](http://www.usg.com).
4. Approved equal mold resistant gypsum board.

#### B. Gypsum Wallboard: Paper-faced gypsum panels as defined in ASTM C1396/C1396M; sizes to minimize joints in place; ends square cut.

1. Application: Use for vertical surfaces and ceilings, unless otherwise indicated.
2. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.
  - a. Mold-resistant board is required whenever board is being installed before the building is enclosed and conditioned.
  - b. Mold resistant board is required at all locations.
3. Thickness:
  - a. Vertical Surfaces: 5/8 inch (16 mm).
  - b. Ceilings: 5/8 inch (16 mm).

#### C. Backing Board For Wet Areas: One of the following products:

1. Application: Surfaces behind tile in wet areas including tub and shower surrounds and shower ceilings.
2. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.

#### D. Backing Board For Non-Wet Areas: Water-resistant gypsum backing board as defined in ASTM C1396/C1396M; sizes to minimum joints in place; ends square cut.

1. Application: Vertical surfaces behind thinset tile, except in wet areas.
2. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.

## SECTION 09 2116 - GYPSUM BOARD ASSEMBLIES

3. Edges: Tapered.
- E. Ceiling Board: Special sag resistant gypsum ceiling board as defined in ASTM C1396/C1396M; sizes to minimize joints in place; ends square cut.
1. Application: Ceilings, unless otherwise indicated.
  2. Thickness: 5/8 inch.
  3. Edges: Tapered.

### 2.03 ACCESSORIES

- A. Beads, Joint Accessories, and Other Trim: ASTM C1047, rigid plastic, galvanized steel, or rolled zinc, unless noted otherwise.
- B. Joint Materials: ASTM C475 and as recommended by gypsum board manufacturer for project conditions.
1. Tape: 2 inch (50 mm) wide, coated glass fiber tape for joints and corners, except as otherwise indicated.
  2. Ready-mixed vinyl-based joint compound.

## PART 3 EXECUTION

### 3.01 EXAMINATION

Verify that project conditions are appropriate for work of this section to commence.

### 3.02 FRAMING INSTALLATION

- A. Suspended Ceilings and Soffits: Space framing and furring members as indicated.
1. Level ceiling system to a tolerance of 1/1200.
  2. Laterally brace entire suspension system.
  3. Install bracing as required at exterior locations to resist wind uplift.
- B. Standard Wall Furring: Install at concrete walls scheduled to receive gypsum board, not more than 4 inches (100 mm) from floor and ceiling lines and abutting walls. Secure in place on alternate channel flanges at maximum 24 inches (600 mm) on center.

## SECTION 09 2116 - GYPSUM BOARD ASSEMBLIES

### 3.03 BOARD INSTALLATION

- A. Comply with ASTM C 840, GA-216, and manufacturer's instructions. Install to minimize butt end joints, especially in highly visible locations.
- B. Single-Layer Non-Rated: Install gypsum board in most economical direction, with ends and edges occurring over firm bearing.

Exception: Tapered edges to receive joint treatment at right angles to framing.

- C. Cementitious Backing Board: Install over steel framing members and plywood substrate where indicated, in accordance with ANSI A108.11 and manufacturer's instructions.

### 3.04 INSTALLATION OF TRIM AND ACCESSORIES

- A. Corner Beads: Install at external corners, using longest practical lengths.
- B. Edge Trim: Install at locations where gypsum board abuts dissimilar materials and as indicated.

### 3.05 JOINT TREATMENT

- A. Finish gypsum board in accordance with levels defined in ASTM C840, as follows:
  - 1. Level 4: Walls and ceilings to receive paint finish or wall coverings, unless otherwise indicated.
  - 2. Level 1: Fire rated wall areas above finished ceilings, whether or not accessible in the completed construction.
- B. Tape, fill, and sand exposed joints, edges, and corners to produce smooth surface ready to receive finishes.

Feather coats of joint compound so that camber is maximum 1/32 inch (0.8 mm).

### 3.06 TOLERANCES

Maximum Variation of Finished Gypsum Board Surface from True Flatness: 1/8 inch in 10 feet (3 mm in 3 m) in any direction.

**END OF SECTION**

## SECTION 09 3000 - TILING

### PART 1 GENERAL

#### 1.01 SECTION INCLUDES

- A. Tile for floor applications.
- B. Tile for exterior wall applications.
- C. Tile for interior plumbing wall and shower.
- D. Cementitious backer board as tile substrate.
- E. Ceramic accessories.
- F. Ceramic trim.
- G. Non-ceramic trim.

#### 1.02 REFERENCE STANDARDS

- A. ANSI A108/A118/A136.1 - American National Standard Specifications for the Installation of Ceramic Tile - Version; 2013.1.
- B. ANSI A108.1A - American National Standard Specifications for Installation of Ceramic Tile in the Wet-Set Method, with Portland Cement Mortar; 2013.1.
- C. ANSI A108.1B - American National Standard Specifications for Installation of Ceramic Tile on a Cured Portland Cement Mortar Setting Bed with Dry-Set or Latex-Portland Cement Mortar; 2013.1.
- D. ANSI A108.1C - Specifications for Contractors Option: Installation of Ceramic Tile in the Wet-Set Method with Portland Cement Mortar or Installation of Ceramic Tile on a Cured Portland Cement Mortar Bed with Dry-Set or Latex-Portland Cement Mortar; 2013.1.
- E. ANSI A108.4 - American National Standard Specifications for Installation of Ceramic Tile with Organic Adhesives or Water Cleanable Tile-Setting Epoxy Adhesive; 2013.1.
- F. ANSI A108.5 - American National Standard Specifications for Installation of Ceramic Tile with Dry-Set Portland Cement Mortar or Latex-Portland Cement Mortar; 2013.1.
- G. ANSI A108.6 - American National Standard Specifications for Installation of Ceramic Tile with Chemical Resistant, Water Cleanable Tile-Setting and - Grouting Epoxy; 2013.1.

## SECTION 09 3000 - TILING

- H. ANSI A108.8 - American National Standard Specifications for Installation of Ceramic Tile with Chemical Resistant Furan Resin Mortar and Grout; 2013.1.
- I. ANSI A108.9 - American National Standard Specifications for Installation of Ceramic Tile with Modified Epoxy Emulsion Mortar/Grout; 2013.1.
- J. ANSI A108.10 - American National Standard Specifications for Installation of Grout in Tilework; 2013.1.
- K. ANSI A108.11 - American National Standard Specifications for Interior Installation of Cementitious Backer Units; 2013.1.
- L. ANSI A108.12 - American National Standard Specifications for Installation of Ceramic Tile with EGP (Exterior Glue Plywood) Latex-Portland Cement Mortar; 2013.1.
- M. ANSI A108.13 - American National Standard Specifications for Installation of Load Bearing, Bonded, Waterproof Membranes for Thin-Set Ceramic Tile and Dimension Stone; 2013.1.
- N. ANSI A118.3 - American National Standard Specifications for Chemical Resistant, Water Cleanable Tile-Setting and -Grouting Epoxy and Water Cleanable Tile-Setting Epoxy Adhesive; 2013.1.
- O. ANSI A118.4 - American National Standard Specifications for Modified Dry-Set Cement Mortar; 2013.1.
- P. ANSI A118.7 - American National Standard Specifications for High Performance Cement Grouts for Tile Installation; 2013.1.
- Q. ANSI A118.10 - American National Standard Specifications for Load Bearing, Bonded, Waterproof Membranes for Thin-Set Ceramic Tile and Dimension Stone Installation; 2013.1.
- R. ANSI A118.15 - American National Standard Specifications for Improved Modified Dry-Set Cement Mortar; 2013.1.
- S. ANSI A136.1 - American National Standard Specifications for Organic Adhesives for Installation of Ceramic Tile; 2013.1.
- T. TCNA (HB) - Handbook for Ceramic, Glass, and Stone Tile Installation - Version; 2013.1.

### 1.03 ADMINISTRATIVE REQUIREMENTS

Preinstallation Meeting: Convene a preinstallation meeting one week before starting work of this section; require attendance by all affected installers.

## SECTION 09 3000 - TILING

### 1.04 SUBMITTALS

- A. Product Data: Provide manufacturers' data sheets on tile, mortar, grout, and accessories. Include instructions for using grouts and adhesives.
- B. Shop Drawings: Indicate tile layout, patterns, color arrangement, perimeter conditions, junctions with dissimilar materials, control and expansion joints, thresholds, ceramic accessories, and setting details.
- C. Samples: Mount tile and apply grout on two plywood panels, minimum 18 x 18 inches (450 x 450 mm) in size illustrating pattern, color variations, and grout joint size variations.

### 1.05 QUALITY ASSURANCE

Maintain one copy of and ANSI A108/A118/A136.1 and TCNA (HB) on site.

### 1.06 DELIVERY, STORAGE, AND HANDLING

Protect adhesives from freezing or overheating in accordance with manufacturer's instructions.

### 1.07 FIELD CONDITIONS

- A. Do not install solvent-based products in an unventilated environment.
- B. Maintain ambient and substrate temperature of 50 degrees F (10 degrees C) during installation of mortar materials.

## PART 2 PRODUCTS

### 2.01 TILE - AS INDICATED ON DRAWINGS

### 2.02 TRIM AND ACCESSORIES

- A. Ceramic Accessories: Glazed finish, same color and finish as adjacent field tile; same manufacturer as tile.
- B. Pre-Formed Accessories To Be Covered with Tile: High density expanded polystyrene with ANSI A118.10 waterproofing finish.
  - 1. Products:
    - a. LATICRETE International, Inc.; Hydroban Ban:  
[www.laticrete.com](http://www.laticrete.com).
- C. Ceramic Trim: Matching bullnose, double bullnose, cove base, and cove ceramic shapes in sizes coordinated with field tile.

## SECTION 09 3000 - TILING

1. Manufacturers: Same as for tile.

D. Non-Ceramic Trim: PVC - Sand Pebble, style and dimensions to suit application, for setting using tile mortar or adhesive.

1. Applications:

- a. Open edges of wall tile.
- b. Open edges of floor tile.
- c. Wall corners, outside and inside.
- d. Transition between floor finishes of different heights.
- e. Borders and other trim as indicated on drawings.

2. Manufacturers:

- a. Schluter-Systems: [www.schluter.com](http://www.schluter.com).
- b. Custom Building Products: [www.custombuildingproducts.com](http://www.custombuildingproducts.com)

### 2.03 SETTING MATERIALS

A. Manufacturers:

1. LATICRETE International, Inc.; [www.laticrete.com](http://www.laticrete.com).
2. Custom Building Products; [www.custombuildingproducts.com](http://www.custombuildingproducts.com).
3. Merkrete, by Parex USA, Inc; [www.merkrete.com](http://www.merkrete.com).

B. Latex-Portland Cement Mortar Bond Coat: ANSI A118.4, ANSI A118.15.

1. Products:

- a. Custom Building Products; Complete Contact-LFT Premium Rapid Setting Large Format Tile Mortar, with Multi-Surface Bonding Primer: [www.custombuildingproducts.com](http://www.custombuildingproducts.com).
- b. LATICRETE International, Inc; LATICRETE 254 Platinum: [www.laticrete.com](http://www.laticrete.com).

C. Epoxy Adhesive and Mortar Bond Coat: ANSI A118.3.

1. Products:

## SECTION 09 3000 - TILING

- a. Custom Building Products; EBM-Lite Epoxy Bonding Mortar:  
[www.custombuildingproducts.com](http://www.custombuildingproducts.com).
- b. LATICRETE International, Inc; LATICRETE LATAPOXY 300  
Adhesive: [www.laticrete.com](http://www.laticrete.com).

D. Organic Adhesive: ANSI A136.1, thinset mastic type.

### 2.04 GROUTS

#### A. Manufacturers:

1. Custom Building Products; Pro Fusion:  
[www.custombuildingproducts.com](http://www.custombuildingproducts.com).
2. LATICRETE International, Inc; LATICRETE PERMACOLOR Grout:  
per drawings; [www.laticrete.com](http://www.laticrete.com).

#### B. Polymer Modified Grout: ANSI A118.7 polymer modified cement grout.

1. Applications: Use this type of grout where indicated and where no other type of grout is indicated.
2. Use sanded grout for joints 1/8 inch wide and larger; use unsanded grout for joints less than 1/8 inch wide.
3. Color(s): As shown on the drawings.

## PART 3 EXECUTION

### 3.01 EXAMINATION

- A. Verify that sub-floor surfaces are smooth and flat within the tolerances specified for that type of work and are ready to receive tile.
- B. Verify that wall surfaces are smooth and flat within the tolerances specified for that type of work, are dust-free, and are ready to receive tile.
- C. Verify that sub-floor surfaces are dust-free and free of substances that could impair bonding of setting materials to sub-floor surfaces.
- D. Verify that concrete sub-floor surfaces are ready for tile installation by testing for moisture emission rate and alkalinity; obtain instructions if test results are not within limits recommended by tile manufacturer and setting materials manufacturer.

### 3.02 PREPARATION

- A. Protect surrounding work from damage.

## SECTION 09 3000 - TILING

- B. Vacuum clean surfaces and damp clean.
- C. Seal substrate surface cracks with filler. Level existing substrate surfaces to acceptable flatness tolerances.
- D. Install backer board in accordance with ANSI A108.11 and board manufacturer's instructions. Tape joints and corners, cover with skim coat of setting material to a feather edge.
- E. Prepare substrate surfaces for adhesive installation in accordance with adhesive manufacturer's instructions.

### 3.03 INSTALLATION - GENERAL

- A. Install tile and grout in accordance with applicable requirements of ANSI A108.1A thru A108.13, manufacturer's instructions, and TCNA (HB) recommendations.
- B. Lay tile to pattern indicated. Do not interrupt tile pattern through openings.
- C. Cut and fit tile to penetrations through tile, leaving sealant joint space. Form corners and bases neatly. Align floor joints.
- D. Place tile joints uniform in width, subject to variance in tolerance allowed in tile size. Make grout joints without voids, cracks, excess mortar or excess grout, or too little grout.
- E. Form internal angles square and external angles bullnosed.
- F. Install ceramic accessories rigidly in prepared openings.
- G. Install non-ceramic trim in accordance with manufacturer's instructions.
- H. Sound tile after setting. Replace hollow sounding units.
- I. Keep control and expansion joints free of mortar, grout, and adhesive.
- J. Prior to grouting, allow installation to completely cure; minimum of 48 hours.
- K. Grout tile joints unless otherwise indicated. Use Polymer Modified Grout unless otherwise indicated..
- L. At changes in plane and tile-to-tile control joints, use tile sealant instead of grout, with either bond breaker tape or backer rod as appropriate to prevent three-sided bonding.

## **SECTION 09 3000 - TILING**

### **3.04 INSTALLATION - SHOWERS WALLS**

- A. At tiled shower receptors install in accordance with TCNA (HB) Method B415, mortar bed floor, and W244, thin-set over cementitious backer unit walls.
- B. Grout with standard grout as specified above.

### **3.05 INSTALLATION - WALL TILE**

- A. On exterior walls install in accordance with TCNA (HB) Method W244, thin-set over cementitious backer units, with waterproofing membrane.
- B. Over cementitious backer units on studs, install in accordance with TCNA (HB) Method W244, using membrane at toilet rooms.

### **3.06 CLEANING**

Clean tile and grout surfaces.

### **3.07 PROTECTION**

Do not permit traffic over finished floor surface for 4 days after installation.

**END OF SECTION**

## **SECTION 09 5100 - SUSPENDED GYP BOARD CEILING**

### **PART 1 GENERAL**

#### **1.01 SECTION INCLUDES**

Suspended metal grid ceiling system, as indicated on drawings.

#### **1.02 REFERENCE STANDARDS**

ASTM C635/C635M - Standard Specification for the Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings; 2013a.

#### **1.03 SUBMITTALS**

Product Data: Provide data on suspension system components.

#### **1.04 FIELD CONDITIONS**

Maintain uniform temperature of minimum 60 degrees F (16 degrees C), and maximum humidity of 40 percent prior to, during, and after acoustical unit installation.

### **PART 2 PRODUCTS**

#### **2.01 MANUFACTURERS**

A. Suspension Systems:

1. Armstrong World Industries, Inc; for drywall ceilings:  
[www.armstrong.com](http://www.armstrong.com).
2. Chicago Metallic Corporation; for drywall ceilings:  
[www.chicagometallic.com](http://www.chicagometallic.com).
3. Approved equal.

#### **2.02 SUSPENSION SYSTEM(S)**

Suspension Systems - General: Complying with ASTM C635/C635M; die cut and interlocking components, with stabilizer bars, clips, splices, perimeter moldings, and hold down clips as required.

### **PART 3 EXECUTION**

#### **3.01 EXAMINATION**

A. Verify existing conditions before starting work.

## **SECTION 09 5100 - SUSPENDED GYP BOARD CEILING**

B. Verify that layout of hangers will not interfere with other work.

### **3.02 INSTALLATION - SUSPENSION SYSTEM**

- A. Rigidly secure system, including integral mechanical and electrical components, for maximum deflection of 1:360.
- B. Install after major above-ceiling work is complete. Coordinate the location of hangers with other work.
- C. Hang suspension system independent of walls, columns, ducts, pipes and conduit. Where carrying members are spliced, avoid visible displacement of face plane of adjacent members.
- D. Where ducts or other equipment prevent the regular spacing of hangers, reinforce the nearest affected hangers and related carrying channels to span the extra distance.
- E. Do not support components on main runners or cross runners if weight causes total dead load to exceed deflection capability.
- F. Support fixture loads using supplementary hangers located within 6 inches (150 mm) of each corner, or support components independently.
- G. Do not eccentrically load system or induce rotation of runners.

### **3.03 TOLERANCES**

- A. Maximum Variation from Flat and Level Surface: 1/8 inch in 10 feet (3 mm in 3 m).
- B. Maximum Variation from Plumb of Grid Members Caused by Eccentric Loads: 2 degrees.

**END OF SECTION**

## SECTION 09 9000 - PAINTING AND COATING

### PART 1 GENERAL

#### 1.01 SECTION INCLUDES

- A. Surface preparation.
- B. Field application of paints and other coatings.
- C. Scope: Finish all interior and exterior surfaces exposed to view, unless fully factory-finished and unless otherwise indicated.
  - 1. Ceiling of Room 105 shall receive painted finish.
  - 2. All suspended gypsum board ceilings shall receive painted finish.
- D. Do Not Paint or Finish the Following Items:
  - 1. Items fully factory-finished unless specifically so indicated; materials and products having factory-applied primers are not considered factory finished.
  - 2. Items indicated to receive other finishes.
  - 3. Items indicated to remain unfinished.
  - 4. Fire rating labels, equipment serial number and capacity labels, and operating parts of equipment.
  - 5. Floors, unless specifically so indicated.
  - 6. Ceramic and other tiles.
  - 7. Glass.
  - 8. Concealed pipes, ducts, and conduits.

#### 1.02 DEFINITIONS

Conform to ASTM D16 for interpretation of terms used in this section.

#### 1.03 REFERENCE STANDARDS

- A. 40 CFR 59, Subpart D - National Volatile Organic Compound Emission Standards for Architectural Coatings; U.S. Environmental Protection Agency; current edition.
- B. ASTM D16 - Standard Terminology for Paint, Related Coatings, Materials, and Applications; 2012.

## SECTION 09 9000 - PAINTING AND COATING

- C. ASTM D4442 - Standard Test Methods for Direct Moisture Content Measurement of Wood and Wood-Base Materials; 2007.
- D. GreenSeal GS-11 - Paints and Coatings; 2013.
- E. SSPC (PM1) - Good Painting Practice: SSPC Painting Manual, Vol. 1; Society for Protective Coatings; Fourth Edition.
- F. USGBC LEED-NC - LEED Green Building Rating System for New Construction and Major Renovations; U.S. Green Building Council; 2009.

### 1.04 SUBMITTALS

- A. Product Data: Provide complete list of all products to be used, with the following information for each:
  - 1. Manufacturer's name, product name and/or catalog number, and general product category (e.g. "alkyd enamel").
  - 2. MPI product number (e.g. MPI #47).
  - 3. Cross-reference to specified paint system(s) product is to be used in; include description of each system.
  - 4. Manufacturer's installation instructions.
  - 5. If proposal of substitutions is allowed under submittal procedures, explanation of all substitutions proposed.
- B. Samples: Submit three paper "draw down" samples, 8-1/2 by 11 inches (216 by 279 mm) in size, illustrating range of colors available for each finishing product specified.
  - 1. Where sheen is specified, submit samples in only that sheen.
  - 2. Where sheen is not specified, discuss sheen options with Architect before preparing samples, to eliminate sheens definitely not required.
  - 3. Allow 30 days for approval process, after receipt of complete samples by Architect.
  - 4. Paint color submittals will not be considered until color submittals for major materials not to be painted, such as masonry, have been approved.

## SECTION 09 9000 - PAINTING AND COATING

### PART 2 PRODUCTS

#### 2.01 MANUFACTURERS

- A. Provide all paint and coating products used in any individual system from the same manufacturer; no exceptions.
- B. Provide all paint and coating products from the same manufacturer to the greatest extent possible.
  - 1. In the event that a single manufacturer cannot provide all specified products, minor exceptions will be permitted provided approval by Architect is obtained using the specified procedures for substitutions.
  - 2. Substitution of MPI-approved products by a different manufacturer is preferred over substitution of unapproved products by the same manufacturer.
- C. Paints:
  - 1. Base Manufacturer: Dunn Edwards.
  - 2. Behr Process Corporation: [www.behr.com](http://www.behr.com).
  - 3. Glidden Professional, a product of PPG Architectural Coatings: [www.gliddenprofessional.com](http://www.gliddenprofessional.com).
  - 4. Benjamin Moore & Co: [www.benjaminmoore.com](http://www.benjaminmoore.com).

#### 2.02 PAINTS AND COATINGS - GENERAL

- A. Paints and Coatings: Ready mixed, unless intended to be a field-catalyzed coating.
  - 1. Provide paints and coatings of a soft paste consistency, capable of being readily and uniformly dispersed to a homogeneous coating, with good flow and brushing properties, and capable of drying or curing free of streaks or sags.
  - 2. Provide materials that are compatible with one another and the substrates indicated under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.
  - 3. For opaque finishes, tint each coat including primer coat and intermediate coats, one-half shade lighter than succeeding coat, with final finish coat as base color.
  - 4. Supply each coating material in quantity required to complete entire project's work from a single production run.

## SECTION 09 9000 - PAINTING AND COATING

5. Do not reduce, thin, or dilute coatings or add materials to coatings unless such procedure is specifically described in manufacturer's product instructions.
- B. Primers: As follows unless other primer is required or recommended by manufacturer of top coats; where the manufacturer offers options on primers for a particular substrate, use primer categorized as "best" by the manufacturer.
1. Gypsum Board: Interior Institutional Low Odor/VOC Primer Sealer.
  2. Concrete: Interior Institutional Low Odor/VOC Primer Sealer.
- C. Volatile Organic Compound (VOC) Content:
1. Provide coatings that comply with the most stringent requirements specified in the following:
    - a. 40 CFR 59, Subpart D--National Volatile Organic Compound Emission Standards for Architectural Coatings.
  2. Determination of VOC Content: Testing and calculation in accordance with 40 CFR 59, Subpart D (EPA Method 24), exclusive of colorants added to a tint base and water added at project site; or other method acceptable to authorities having jurisdiction.
- D. Colors: As indicated on drawings.

### 2.03 PAINT SYSTEMS - EXTERIOR

- A. All exterior surfaces exposed to view unless fully factory finished or otherwise indicated: including concrete, concrete masonry, wood, fiber cement board. All paint to be marine grade.
1. Preparation as specified by manufacturer.
  2. Two top coats and one coat primer recommended by manufacturer.
  3. Top Coat(s): Exterior Pigmented Elastomeric, Water Based; MPI #113.
- B. Paint E-TR-C - Transparent Finish on exterior Concrete Floors, Unless Otherwise Indicated:
- 2 coats sealer.
- C. Paint CE-OP-3L - Masonry/Concrete, Opaque, Latex, 3 Coat:
1. One coat of block filler.

## **SECTION 09 9000 - PAINTING AND COATING**

2. Semi-gloss: Two coats of latex enamel; TBD.

D. Paint GE-OP-3L - Gypsum Board and Plaster, Opaque, Latex, 3 Coat:

1. One coat of latex primer sealer.

2. Semi Glosst: Two coats of latex; TBD.

### **2.04 PAINT SYSTEMS - INTERIOR**

A. Paint I-OP - All Interior Surfaces including ceilings and soffits shall be Painted, Unless Otherwise Indicated: Including gypsum board, concrete, concrete masonry, brick, wood, plaster, uncoated steel, shop primed steel, galvanized steel, and aluminum. All paint shall be marine grade.

1. Two top coats and one coat primer.

2. Top Coat(s): High Performance Architectural Interior Latex; MPI #138-141.

3. Primer(s): As recommended by manufacturer of top coats.

### **2.05 ACCESSORY MATERIALS**

A. Accessory Materials: Provide all primers, sealers, cleaning agents, cleaning cloths, sanding materials, and clean-up materials required to achieve the finishes specified whether specifically indicated or not; commercial quality.

B. Patching Material: Latex filler.

C. Fastener Head Cover Material: Latex filler.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

A. Verify that surfaces are ready to receive work as instructed by the product manufacturer.

B. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially affect proper application.

C. Test shop-applied primer for compatibility with subsequent cover materials.

D. Measure moisture content of surfaces using an electronic moisture meter. Do not apply finishes unless moisture content of surfaces are below the following maximums:

1. Gypsum Wallboard: 12 percent.

## SECTION 09 9000 - PAINTING AND COATING

2. Plaster and Stucco: 12 percent.
3. Masonry, Concrete, and Concrete Unit Masonry: 12 percent.
4. Interior Wood: 15 percent, measured in accordance with ASTM D4442.
5. Exterior Wood: 15 percent, measured in accordance with ASTM D4442.
6. Concrete Floors and Traffic Surfaces: 8 percent.

### 3.02 PREPARATION

- A. Clean surfaces thoroughly and correct defects prior to coating application.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
- C. Remove or mask surface appurtenances, including electrical plates, hardware, light fixture trim, escutcheons, and fittings, prior to preparing surfaces or finishing.
- D. Seal surfaces that might cause bleed through or staining of topcoat.
- E. Remove mildew from impervious surfaces by scrubbing with solution of tetra-sodium phosphate and bleach. Rinse with clean water and allow surface to dry.
- F. Concrete and Unit Masonry Surfaces to be Painted: Remove dirt, loose mortar, scale, salt or alkali powder, and other foreign matter. Remove oil and grease with a solution of tri-sodium phosphate; rinse well and allow to dry. Remove stains caused by weathering of corroding metals with a solution of sodium metasilicate after thoroughly wetting with water. Allow to dry.
- G. Gypsum Board Surfaces to be Painted: Fill minor defects with filler compound. Spot prime defects after repair.
- H. Plaster Surfaces to be Painted: Fill hairline cracks, small holes, and imperfections with latex patching plaster. Make smooth and flush with adjacent surfaces. Wash and neutralize high alkali surfaces.
- I. Concrete Floors and Traffic Surfaces to be Painted: Remove contamination, acid etch, and rinse floors with clear water. Verify required acid-alkali balance is achieved. Allow to dry.

## SECTION 09 9000 - PAINTING AND COATING

- J. Aluminum Surfaces to be Painted: Remove surface contamination by steam or high pressure water. Remove oxidation with acid etch and solvent washing. Apply etching primer immediately following cleaning.
- K. Galvanized Surfaces to be Painted: Remove surface contamination and oils and wash with solvent. Apply coat of etching primer.
- L. Corroded Steel and Iron Surfaces to be Painted: Prepare using at least SSPC-SP 2 (hand tool cleaning) or SSPC-SP 3 (power tool cleaning) followed by SSPC-SP 1 (solvent cleaning).
- M. Uncorroded Uncoated Steel and Iron Surfaces to be Painted: Remove grease, mill scale, weld splatter, dirt, and rust. Where heavy coatings of scale are evident, remove by hand or power tool wire brushing or sandblasting; clean by washing with solvent. Apply a treatment of phosphoric acid solution, ensuring weld joints, bolts, and nuts are similarly cleaned. Prime paint entire surface; spot prime after repairs.
- N. Shop-Primed Steel Surfaces to be Finish Painted: Sand and scrape to remove loose primer and rust. Feather edges to make touch-up patches inconspicuous. Clean surfaces with solvent. Prime bare steel surfaces. Re-prime entire shop-primed item.
- O. Interior Wood Surfaces to Receive Opaque Finish: Wipe off dust and grit prior to priming. Seal knots, pitch streaks, and sappy sections with sealer. Fill nail holes and cracks after primer has dried; sand between coats. Back prime concealed surfaces before installation.
- P. Exterior Wood Surfaces to Receive Opaque Finish: Remove dust, grit, and foreign matter. Seal knots, pitch streaks, and sappy sections. Fill nail holes with tinted exterior calking compound after prime coat has been applied. Back prime concealed surfaces before installation.

### 3.03 APPLICATION

- A. Exterior Wood to Receive Opaque Finish: If final painting must be delayed more than 2 weeks after installation of woodwork, apply primer within 2 weeks and final coating within 4 weeks.
- B. Apply products in accordance with manufacturer's instructions.
- C. Do not apply finishes to surfaces that are not dry. Allow applied coats to dry before next coat is applied.
- D. Apply each coat to uniform appearance.
- E. Sand wood and metal surfaces lightly between coats to achieve required finish.

## **SECTION 09 9000 - PAINTING AND COATING**

- F. Vacuum clean surfaces of loose particles. Use tack cloth to remove dust and particles just prior to applying next coat.
- G. Reinstall electrical cover plates, hardware, light fixture trim, escutcheons, and fittings removed prior to finishing.

### **3.04 CLEANING**

Collect waste material that could constitute a fire hazard, place in closed metal containers, and remove daily from site.

**END OF SECTION**

## **SECTION 10 1400 - SIGNAGE**

### **PART 1 GENERAL**

#### **1.01 SECTION INCLUDES**

- A. Room and door signs.
- B. Building identification halo-illuminated signs.

#### **1.02 REFERENCE STANDARDS**

- A. 36 CFR 1191 - Americans with Disabilities Act (ADA) Accessibility Guidelines for Buildings and Facilities; Architectural Barriers Act (ABA) Accessibility Guidelines; current edition.
- B. ADA Standards - Americans with Disabilities Act (ADA) Standards for Accessible Design; 2010.
- C. ICC A117.1 - Accessible and Usable Buildings and Facilities; International Code Council; 2009 (ANSI).

#### **1.03 QUALITY ASSURANCE**

Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years of documented experience.

#### **1.04 SUBMITTALS**

- A. Product Data: Manufacturer's printed product literature for each type of sign, indicating sign styles, font, foreground and background colors, locations, overall dimensions of each sign.
- B. Signage Schedule: Provide information sufficient to completely define each sign for fabrication, including room number, room name, other text to be applied, sign and letter sizes, fonts, and colors.
  - 1. When room numbers to appear on signs differ from those on the drawings, include the drawing room number on schedule.
  - 2. When content of signs is indicated to be determined later, request such information from City Engineer through City Engineer at least 2 months prior to start of fabrication; upon request, submit preliminary schedule.
  - 3. Submit for approval by City Engineer through City Engineer prior to fabrication.

## **SECTION 10 1400 - SIGNAGE**

- C. Samples: Submit two samples of each type of sign, of size similar to that required for project, illustrating sign style, font, and method of attachment.

### **1.05 DELIVERY, STORAGE, AND HANDLING**

- A. Package signs as required to prevent damage before installation.
- B. Package room and door signs in sequential order of installation, labeled by floor or building.
- C. Store tape adhesive at normal room temperature.

### **1.06 FIELD CONDITIONS**

- A. Do not install tape adhesive when ambient temperature is lower than recommended by manufacturer.
- B. Maintain this minimum temperature during and after installation of signs.

## **PART 2 PRODUCTS**

### **2.01 MANUFACTURERS**

#### **A. Flat Signs:**

1. Cosco Industries (ADA signs); ADA Series 1:  
[www.coscoarchitecturalsigns.com](http://www.coscoarchitecturalsigns.com).
2. Mohawk Sign Systems, Inc: [www.mohawksign.com](http://www.mohawksign.com).
3. Approved equal

#### **B. Other Signs:**

Life guard logo painted stainless steel. Artowrk will be provided.

### **2.02 SIGNAGE APPLICATIONS**

- A. Accessibility Compliance: Signs are required to comply with ADA Standards and ICC A117.1 and applicable building codes, unless otherwise indicated; in the event of conflicting requirements, comply with the most comprehensive and specific requirements.
- B. Room and Door Signs: Provide a sign for every doorway, whether it has a door or not, not including corridors, lobbies, and similar open areas.
  1. Sign Type: Flat signs with engraved panel media as specified.

## SECTION 10 1400 - SIGNAGE

2. Provide "tactile" signage, with letters raised minimum 1/32 inch (0.8 mm) and Grade II braille.
3. Character Height: 1 inch (25 mm).
4. Sign Height: 2 inches (50 mm), unless otherwise indicated.
5. Office Doors: Identify with room numbers to be determined later, not the numbers shown on the drawings; in addition, provide "window" section for replaceable occupant name.
6. Conference and Meeting Rooms: Identify with room numbers to be determined later, not the numbers shown on the drawings; in addition, provide "window" section with sliding "In Use/Vacant" indicator.
7. Service Rooms: Identify with room names and numbers to be determined later, not those shown on the drawings.
8. Rest Rooms: Identify with pictograms, the names "MEN" and "WOMEN", room numbers to be determined later, and braille.

### C. Building Identification Signs:

1. Use individual metal letters.
2. Mount on outside wall in location shown on drawings.

## 2.03 SIGN TYPES

### A. Flat Signs: Signage media without frame.

1. Edges: Square.
2. Corners: Square.
3. Wall Mounting of One-Sided Signs: Tape adhesive.

### B. Color and Font: Unless otherwise indicated:

1. Character Font: Helvetica, Arial, or other sans serif font.
2. Character Case: Upper case only.
3. Background Color: Clear.
4. Character Color: Contrasting color.

## **SECTION 10 1400 - SIGNAGE**

### **2.04 TACTILE SIGNAGE MEDIA**

Engraved Panels: Laminated colored plastic; engraved through face to expose core as background color:

Total Thickness: 1/16 inch (1.6 mm).

### **2.05 NON-TACTILE SIGNAGE MEDIA**

Silk Screened Plastic Panels: Letters and graphics silk screened onto reverse side of plastic surface:

1. Sign Color: Clear.
2. Total Thickness: 1/8 inch (3 mm).

### **2.06 ACCESSORIES**

- A. Concealed Screws: Stainless steel, galvanized steel, chrome plated, or other non-corroding metal.
- B. Tape Adhesive: Double sided tape, permanent adhesive.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

Verify that substrate surfaces are ready to receive work.

### **3.02 INSTALLATION**

- A. Install in accordance with manufacturer's instructions.
- B. Install neatly, with horizontal edges level.
- C. Locate signs where indicated:
  1. Room and Door Signs: Locate on wall at latch side of door with centerline of sign at 60 inches (1525 mm) above finished floor.
  2. If no location is indicated obtain City of Long Beach's instructions.
- D. Protect from damage until Substantial Completion; repair or replace damage items.

**END OF SECTION**

## **SECTION 10 2800 - TOILET, SHOWER AND ACCESSORIES**

### **PART 1 GENERAL**

#### **1.01 SECTION INCLUDES**

- A. Toilet paper dispensers.
- B. Electric hand dryers.
- C. Mirrors.
- D. Grab bar.
- E. Shower seat.
- F. Hook.

#### **1.02 REFERENCE STANDARDS**

- A. ADA Standards - Americans with Disabilities Act (ADA) Standards for Accessible Design; 2010.
- B. ASTM A269/A269M - Standard Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service; 2014e1.
- C. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2015.
- D. ASTM C1036 - Standard Specification for Flat Glass; 2011e1.
- E. ASTM C1048 - Standard Specification for Heat-Strengthened and Fully Tempered Flat Glass; 2012.
- F. ASTM C1503 - Standard Specification for Silvered Flat Glass Mirror; 2008 (Reapproved 2013).

### **PART 2 PRODUCTS**

#### **2.01 MANUFACTURERS**

- A. Basis of Design: American Specialties, Inc. (ASI).
- B. Other Acceptable Manufacturers:

Bradley Corporation [www.bradleycorp.com](http://www.bradleycorp.com).

## SECTION 10 2800 - TOILET, SHOWER AND ACCESSORIES

### 2.02 MATERIALS

- A. Accessories - General: Shop assembled, free of dents and scratches and packaged complete with anchors and fittings, steel anchor plates, adapters, and anchor components for installation.
  - 1. Grind welded joints smooth.
  - 2. Fabricate units made of metal sheet of seamless sheets, with flat surfaces.
- B. Keys: Provide 3 keys for each accessory to City of Long Beach; master key lockable accessories.
- C. Stainless Steel Sheet: ASTM A666, Type 304.
- D. Stainless Steel Tubing: ASTM A269/A269M, Type 304 or 316.
- E. Mirror Glass: Annealed float glass, ASTM C1036 Type I, Class 1, Quality Q2, with silvering, protective and physical characteristics complying with ASTM C1503.
- F. Mirror Glass: Tempered safety glass, ASTM C1048; and ASTM C1036 Type I, Class 1, Quality Q2, with silvering as required.
- G. Fasteners, Screws, and Bolts: Hot dip galvanized; tamper-proof; security type.

### 2.03 FINISHES

Stainless Steel: No. 4 Brushed finish, unless otherwise noted.

### 2.04 TOILET ROOM ACCESSORIES

- A. Toilet Paper Dispenser: ASI Model No. 9030.
- B. Electric Dryers: ASI Model No. 0199
- C. Mirrors: ASI Model No. 0600
- D. Grab Bars: ASI Model 3800.

### 2.05 SHOWER AND TUB ACCESSORIES

- A. Folding Shower Seat: ASI Model 8203-28.
  - Size: ADA Standards compliant.
- B. Hook: ASI Model 8425.

## SECTION 10 2800 - TOILET, SHOWER AND ACCESSORIES

### PART 3 EXECUTION

#### 3.01 EXAMINATION

- A. Verify existing conditions before starting work.
- B. Verify exact location of accessories for installation.
- C. For electrically-operated accessories, verify that electrical power connections are ready and in the correct locations.
- D. Verify that field measurements are as indicated on drawings.

#### 3.02 PREPARATION

- A. Deliver inserts and rough-in frames to site at appropriate time for installation.
- B. Provide templates and rough-in measurements as required..
- C. Verify exact location of accessories for installation.
- D. Protect adjacent or adjoining finished surfaces and work from damage during installation.
- E. Coordinate work with placement of wall reinforcement and reinforcement of toilet partitions to receive anchor attachments.
- F. Supply rough-in data in sufficient time to be built into other work.
- G. Do not install accessories until room finishes are completed.

#### 3.03 INSTALLATION

- A. Install accessories in accordance with manufacturers' instructions in locations indicated on the drawings.
- B. Install plumb and level, securely and rigidly anchored to substrate.
- C. Mounting Heights: As required by accessibility regulations, unless otherwise indicated.
  - 1. Grab Bars: As indicated on the drawings.
  - 2. Mirrors: As indicated on drawings.
  - 3. Electric Hand Dryers: Measured to bottom of nozzle:
    - a. 44 inches (1110 mm).

## **SECTION 10 2800 - TOILET, SHOWER AND ACCESSORIES**

### **3.04 PROTECTION**

Protect installed accessories from damage due to subsequent construction operations.

**END OF SECTION**

## SECTION 10 5100 - LOCKERS

### PART 1 GENERAL

#### 1.01 SECTION INCLUDES

Solid plastic lockers.

#### 1.02 RELATED REQUIREMENTS

Section 03 3000 - Cast-in-Place Concrete: Concrete base construction.

#### 1.03 SUBMITTALS

A. Product Data: Manufacturer's data sheets for each type of product indicated include fabrication details, description of materials and finishes.

Product Test Reports: When requested by Architect, provide documentation indicating compliance of products with requirements, from a qualified independent testing agency.

B. Shop drawings: Include overall locker dimensions, floor plan, elevations, sections, details, and attachments to other work. Include choice of options with details.

C. Samples for Selection: furnish samples of manufacturer's full range of colors for initial selection.

D. Samples for Approval: furnish a physical sample of the material in the selected color.

### PART 2 PRODUCTS

#### 2.01 MANUFACTURERS

A. Solid Plastic Lockers:

B. Bradley Lenox series.

#### 2.02 LOCKER APPLICATIONS

A. Wardrobe Lockers: Two tier solid plastic (HDPE) lockers, wall mounted with matching closed base.

1. Width: 12 inches (300 mm).
2. Depth: 15 inches (375 mm).
3. Height: 72 inches (1,830 mm).

## SECTION 10 5100 - LOCKERS

4. Fittings: Hat shelf, 2 coat hooks.
5. Locking: Padlock hasps, for padlocks provided by Owner.

### 2.03 SOLID PLASTIC LOCKERS

- A. Lockers: Factory assembled, made of high density polyethylene (HDPE) panels, homogenous color throughout, with mortise and tenon joints with stainless steel fasteners or heat fused joints.
  1. Doors: Full overlay without frame with vents.
  2. Ventilation: By open space between the back of the door and locker body.
  3. Door Color: To be selected by Architect.
  4. Body Color: Manufacturer's standard white or light color.
- B. Component Thicknesses:

Doors: 1/2 inch (13 mm) minimum thickness.
- C. Solid Plastic Panels: High Density polyethylene (HDPE) formed under high pressure into solid plastic components.
- D. Hinges: Full height of locker, manufacturer's standard heavy duty type.
- E. Locks: Locker manufacturer's standard type of style indicated above.

## PART 3 EXECUTION

### 3.01 EXAMINATION

- A. Verify that prepared bases are in correct position and configuration.
- B. Verify bases and embedded anchors are properly sized.

### 3.02 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Install lockers plumb and square.
- C. Place and secure on prepared base.
- D. Secure lockers with anchor devices to suit substrate materials. Minimum Pullout Force: 100 lb (445 N).

## **SECTION 10 5100 - LOCKERS**

- E. Bolt adjoining locker units together to provide rigid installation.
- F. Install end panels, filler panels, and sloped tops.
- G. Replace components that do not operate smoothly.

### **3.03 CLEANING**

Clean locker interiors and exterior surfaces.

**END OF SECTION**

## SECTION 10 7500 - FLAGPOLES

### PART 1 GENERAL

#### 1.01 SECTION INCLUDES

Aluminum Flagpoles.

#### 1.02 REFERENCE STANDARDS

ASTM A312/A312M - Standard Specification for Seamless, Welded, and Heavily Cold Worked Austenitic Stainless Steel Pipes; 2015.

### PART 2 PRODUCTS

#### 2.01 MANUFACTURERS

A. Flagpoles:

1. American Flagpole: [www.americanflagpole.com](http://www.americanflagpole.com).
2. Concord Industries, Inc: [www.concordindustries.com](http://www.concordindustries.com).
3. Approved equal.

#### 2.02 FLAGPOLES

A. Flagpoles: Stainless steel. 8'-6" high.

1. Design: Straight shaft.
2. Mounting: Vertical wall mounted type.

B. Performance Requirements:

Flagpole With Flag Flying: Resistant without permanent deformation to 120 miles/hr (193 km/hr) wind velocity; non-resonant, safety design factor of 2.5.

#### 2.03 POLE MATERIALS

Stainless Steel: ASTM A312/A312M TP304 grade.

#### 2.04 ACCESSORIES

A. Finial Ball: Stainless steel, 6 inch (150 mm) diameter.

B. Halyard: 5/16 inch (8 mm) diameter polypropylene, braided, white.

## **SECTION 10 7500 - FLAGPOLES**

### **2.05 OPERATORS**

Hand Crank: Removable

### **2.06 MOUNTING COMPONENTS**

Wall Support Assembly: stainless steel; round; one piece assembly, back-plate for through bolting, with stainless steel anchor bolts and cover.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

Verify that wall supports are ready to receive work and dimensions are as indicated on shop drawings.

### **3.02 INSTALLATION**

- A. Install flagpole, base assembly, and fittings in accordance with manufacturer's instructions.
- B. Set brackets for wall set flagpoles anchored securely into wall construction. Seal watertight.

### **3.03 TOLERANCES**

Maximum Variation From Plumb: 1 inch (25 mm).

### **3.04 ADJUSTING**

Adjust operating devices so that halyard and flag function smoothly.

**END OF SECTION**

**SECTION 13 1200  
PREFABRICATED LIFEGUARD STATION**

**PART 1 – GENERAL**

**1.01 DESCRIPTION OF WORK**

- A. This section describes typical basis of design, construction, and installation of a pre-fabricated modular building, with integral concrete mat foundation and does not follow standard outline format of The Construction Specifications Institute (CSI).
- B. This outline Specification shall be used along with the complete relating specification sections. The related sections establish standards, relative codes and basic requirements for the products outlines in Section 131200

**1.02 BUILDING CODES AND DESIGN**

- A. The building shall be designed and installed in compliance with the codes designated by the State of California Department of Housing and Community Development or later as follows:
  - 1. 2008 NEC
  - 2. 2009 UPC, UMC
  - 3. 2010 CBC, California Title 24, California Energy Code, CalGreen
- B. The Prefabricated Building Manufacturer shall provide full and complete engineered plans for the building and the foundation design. A Structural Engineer licensed in the State of California shall stamp the plans.
- C. Plans shall bear the stamp of the State of California Department of Housing and Community Development. The building, prior to shipment from manufacturing facility, shall have a State of California Department of Housing and Community Development insignia affixed to the building per Department regulations.

**1.03 QUALITY ASSURANCE**

- A. The Prefabricated Building shall be sold, designed, manufactured, and shipped from a single source location (Prefabricated Building Manufacturer) to the City. This is to facilitate the ability for City Officials and/or General Contractor to travel to one location to examine the sales office and manufacturing facility, if deemed necessary. For this reason, assignment of subcontract, subcontractor's substitution, or outsourcing is not allowed.
- B. The Prefabricated Building Manufacturer supplier shall be experienced in performing Work of this Section.
- C. The Prefabricated Building Manufacturer shall be licensed with the California Department of Housing Division, prior to bid, as a dealer and manufacturer to

**SECTION 13 1200  
PREFABRICATED LIFEGUARD STATION**

construct and install closed wall modular buildings.

D. The Prefabricated Building Manufacturer shall possess a Class B General Contractor's license in the State of California.

**1.04 INSURANCE REQUIREMENTS**

A. Product Liability

The Prefabricated Building Manufacturer is responsible for incorporating all applicable codes and compliances as set forth by the State and any special local requirements. As such, the Prefabricated Building Manufacturer shall provide a certificate of product liability insurance covering personal injury and property damage.

**1.05 BIDDER QUALIFICATIONS/REQUIREMENTS**

A. Requests for "or equal" must be submitted to City in accordance with the Item Equivalency provisions. Requests shall be submitted with the following:

1. Copy of submitting company's California HCD manufacturer's license.
2. Copy of submitting company's California Class B contractor's license.
3. Copy of submitting company's California HCD dealer's license.
4. Copy of salesperson's California HCD sales license.
5. Floor plan with complete dimensions.
6. Elevations of all four sides.
7. Details.
8. Specifications.
9. A list of each and every deviation from the bid specifications.
10. A list of the last five completed projects of similar design complete with names and phone numbers of general contractors, governing agencies along with their respective contacts, start and completion dates and project costs.

**1.06 SUBMITTALS**

Submit five (5) sets of shop drawings including floor plans, elevations, design criteria, construction details/sections, schedules and schematics, and two (2) sets of structural calculations signed and sealed by a Structural Engineer licensed to practice in the State of California, responsible for their preparation, along with a State of California Department of Housing and Community Development approval stamp.

**SECTION 13 1200  
PREFABRICATED LIFEGUARD STATION**

**PART 2 – BUILDING SPECIFICATIONS**

**2.01 MANUFACTURER**

- A. There are several manufacturers that can design and construct similar prefabricated buildings shown in the drawings and specifications. Other manufacturers may be submitted in accordance with the Item Equivalency provisions. The Owner has incorporated the standards of the following manufacturer as the basis of design for this project:

Public Restroom  
Company  
2587 Business Parkway  
Minden, NV 89423  
(888) 888-2060

Other acceptable Prefabricated Building Manufacturers are:

1. Super Secur Manufacturing.
2. Romtec, Inc.
3. Or approved equal.

- B. It is the General Contractor's responsibility to provide a completed project and agree to the following scope of work with its selected Prefabricated Building Manufacturer.

1. Section 033000 Cast – In – Place Concrete

- A. Door hardware: Section 087100: Door Hardware – Continuous Hinges

**2.02 SEE DRAWINGS AND SPECIFICATIONS FOR BUILDING MATERIALS.**

**PART 3 – EXECUTION**

**3.1 INSTALLATION / SCOPE OF WORK**

- A. General Contractor must prepare the site in accordance with the following scope of work herein outlined and coordinate any required on site inspections. After the site prep has been completed, the building supplier's site installation crew will arrive to perform the installation. They will then verify, with the General Contractor's site supervisor, elevation, offsets, location and access.

**SECTION 13 1200**  
**PREFABRICATED LIFEGUARD STATION**

- B. See Structural Drawings for spacing, blocking and dowel requirements. Building supplier shall verify that all structural elements are in place.
- C. Site Access and Storage: Provide suitable safe clear access to allow a crane (up to 110 tons), and the building on a semi-trailer (up to 40 tons) to reach site (14' width, 70' length, and 14' in height). If path to site is over existing utilities, sidewalks, or other damageable areas, proper marking, plating or other appropriate protection must be provided at no additional cost to the City. Remove any overhead obstructions (i.e. power lines, trees). Obtain Engineer's approval for road closures or any special access that may be required but at no additional cost to the City. Due to the site's constraints, building manufacturer will review the site before bid and determine an approximate location of crane staging and access for delivery of the premanufactured building.
- D. Utilities: Bring water, sewer, and power (if applicable) utilities into point of connection Christy boxes (supplied by the Prefabricated Building Manufacturer), within 6' of the building line at the location shown on our plan.
1. Water: Prefabricated Building Manufacturer will furnish and install a water point of connection (isolation valve), from mechanical chase to a Christy box six feet from the building line. General Contractor must connect service to valve.
  2. Sewer: Prefabricated Building Manufacturer will furnish and install a sewer point of connection from mechanical chase to a Christy box six feet from the building line. General Contractor must connect service.
  3. Electrical: Prefabricated Building Manufacturer will furnish and install a PVC conduit and a Christy box to the point of connection six feet from the building line. General Contractor to pull the electrical service line through the conduit and connect to the main panel lugs inside the building. All electrical inside the building will be furnished and installed by the Prefabricated Building Manufacturer, except as noted above in exclusions.
  4. Testing and repair of leaks is the responsibility of the General Contractor.
  5. Note that a minimum 1½" line with 25 gpm at 60 psi pressure minimum is required to ensure that water closets will operate as designed.
- E. Building supplier will assist the General Contractor to inject the structural grout between the foundation structure and the pre-fab building.
- F. Permits: All building permits shall be borne by General Contractor and/or building manufacturer.
- G. Inspections: Schedule inspections with adequate notice to ensure that the underground plumbing and electrical work is approved prior to placement of building. Schedule final inspection by building officials immediately following

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PREFABRICATED LIFEGUARD STATION**

the Prefabricated Building Manufacturer's completion of installation. Schedule re-inspections immediately following Prefabricated Building Manufacturer's conclusion of any correction items.

- H. Site Clean Up and Debris Removal: Provide an on-site trash bin for disposal of one pick up load of debris. Remove all excess spoils.
- I. All rough and final grading shall be by General Contractor.
- J. Soils Information: See Division F – Permits & Attachments.

**3.2 CLOSE-OUT DOCUMENTS & WARRANTY**

- A. The building supplier shall provide two (2) sets of as-built drawings (one (1) set of bond prints and one (1) set of mylars) for the building and two (2) two copies of maintenance manuals with all associated parts cut sheets, sources for replacement, and maintenance guidelines.
- B. Keys: Section 087100 – Door Hardware: Keying Requirements
- C. Each manual shall include a five (5) year warranty for building construction.

**END OF SECTION**

## SECTION 220000 - PLUMBING

### PART 1 – GENERAL

#### 1.01 CONDITIONS

- A. Definitions, guarantees, submittals, clean-up, as-builts and all other applicable requirements apply to the work under this Section.
- B. Examine all other sections for work related to those sections which are required to be included as work under this Section.
- C. Substitutions: Request for substitutions must be made before bid.
- D. Inspection of conditions: Examine related work and surfaces before starting work of this Section. Report to Architect, in writing, conditions which will prevent proper provision of this work. Beginning work of this Section without reporting unsuitable conditions to Architect constitutes acceptance of conditions by Contractor. Contractor shall perform any required removal, repair, or replacement of this work caused by unsuitable conditions at no additional cost to City.

#### 1.02 SCOPE

- A. Work Included: The work under this Section shall consist of all labor, materials, equipment, facilities, transportation and services necessary for and reasonably incidental to the furnishing, installation, completion and testing of all plumbing work as indicated on the Drawings and as specified herein. The work in general shall include, but not be limited to, the following principal items:
  - 1. Soil, waste and vent system.
  - 2. Acid waste and vent system.
  - 3. Storm drain system.
  - 4. Domestic water system.
  - 5. Fuel gas system.
  - 6. Plumbing fixtures.
  - 7. Condensate and indirect drain.
  - 8. Compressed air.
  - 9. Permits and Fees.
  - 10. Installation of fixtures and equipment specified elsewhere.

#### 1.03 RELATED WORK

- A. Electrical wiring (line and low voltage) and conduit - Division 26.

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- B. Cast-in-place concrete - Section 033000.
- C. Painting, unless specified herein - Section 099000.
- D. Excavating, Backfilling and Compacting - Section 312333.

### 1.04 QUALITY ASSURANCE

- A. Use adequate numbers of skilled workers who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.
- B. Codes and Regulations:
  - 1. In addition to complying with specified requirements, comply with pertinent regulations of governmental agencies having jurisdiction.
  - 2. In the event of conflict between or among specified requirements and pertinent regulations, the more stringent requirement will govern.

### 1.05 PERMITS, CONNECTION CHARGES AND FEES:

Obtain and pay for all permits, sewer connection charge fees and miscellaneous fees, required for execution of this work. Up front sewer, gas and water fee to be paid by City.

### 1.06 CODES AND ORDINANCES:

All work shall be executed and inspected in accordance with all City, County, State, and Federal Codes, Title 24 laws, ordinances, rules and regulations applicable service charges, fees, permits, royalties, taxes, and other similar costs in connection therewith. If to the knowledge of the Contractor, the drawings or Specifications are at variance with the above-mentioned laws, rules, and regulations, he/she shall promptly notify the Architect in writing and any necessary changes can be provided for in his/her contract. If the Contractor performs any work knowing it to be contrary to such laws, rules or regulations, and without notice as required above, he/she shall bear all costs arising therefrom. Permits not required on public work projects.

### 1.07 REFERENCES:

References to standard code Specifications shall mean editions in effect at date of bidding.

### 1.08 WORKMANSHIP, MATERIALS AND EQUIPMENT:

All work shall be performed in a workmanlike manner and shall present a neat and mechanical appearance when completed. All materials shall be of type, quality

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and of minimum rating prescribed herein or indicated by manufacturer's name, type, model or catalog number. All materials furnished and installed under this contract shall be of first quality. All materials shall be a product of domestic manufacturers.

### 1.09 PROTECTION OF WORK:

All work shall be protected at all times from danger by freezing, breakage, dirt, foreign materials, etc., and shall replace all work so damaged. The Contractor shall use every precaution to protect the work of others, and he/she will be held responsible for all damage to other work caused by his/her work or through the neglect of his/her workers.

### 1.10 COORDINATION

- A. All work shall be coordinated with that of other trades to avoid construction delays. If, in the opinion of the Architect, any piping, equipment, etc., has been improperly placed or installed due to lack of coordination, such piping and equipment shall be relocated as directed by the Architect at the Contractor's expense.
- B. As far as possible the work under this Contract shall be indicated on the Design Drawings in such positions as to suit and accommodate the work of the other trades. Therefore, the Contractor is hereby made directly responsible for the correct placing of his/her work and the proper location and connection of his/her work in relation to the work of the various trades.
- C. Equipment Foundations and Bases: Furnish certified details and drawings for approval before fabrication. Furnish parts necessary for each foundation sub-base and support.
- D. Pipe Sleeves and Inserts: Furnish and install all pipe sleeves and pipe support inserts before concrete is poured.

### 1.11 DESIGN CHANGES CAUSED BY PRODUCT SUBSTITUTION

- A. Contractor shall pay costs of design and installation (includes other trades) for changes resulting from substitution of alternate products. Additionally, they shall reimburse the specifying Engineer for their additional time.
- B. Acceptance of alternate products by Architect does not change this requirement.
- C. Contractor shall reimburse Engineer for costs required to review substituted or non-approved alternate products.

### 1.12 EXCAVATING AND BACKFILLING:

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Perform all excavation and backfilling as required. Contractor shall establish all lines and elevations prior to opening trenches and shall be responsible for correctness thereof.

### 1.13 CLEAN-UP:

Contractor shall at all times keep the premises free from accumulation of waste materials or rubbish caused by his/her employees or work. After completion of work and prior to final acceptance, thoroughly clean all parts of the work, remove all debris and surplus equipment and leave installation in perfect condition, ready for use.

### 1.14 SUBMITTALS AND SHOP DRAWINGS

#### A. Submittals:

1. No product will be accepted on job-site without prior approval.
2. Reference catalog cuts and brochures of products to proper paragraph in Specifications. Furnish numerical index by Specification paragraph number listing product name, catalog number and reference to page number of submittal brochure.
3. Cross reference individual catalog numbers of substitute products to numbers of specified materials.
4. Submittals shall be complete and bound in booklet form, otherwise the submittals will be rejected.
5. Submittal shall include, but not be limited to the following:
  - a. Pumps, pump characteristic curves.
  - b. Plumbing fixtures and equipment, cuts, including trim and fittings, and roughing dimensions.
  - c. Water heating equipment and storage tank.
  - d. Drains and waste receptors.
  - e. Schedule of pipe, fittings, valves, with manufacturer and catalog number.
  - f. Specialties, valves, gauges and thermometers of all types.
  - g. Foundations, supports, hangers, inserts.
  - h. Wiring diagrams, control panel boards, motor starters and controls for electrically operated equipment furnished by plumbing trades.
  - i. All special products furnished by plumbing trades.

#### B. Shop Drawings:

1. Prepare shop drawings or transparencies at a scale suitable to

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clearly delineate the subject. Sheet sizes shall be 8-1/2 inches x 11 inches minimum or multiples of 8-1/2 inches x 11 inches.

2. Drawing legend shall contain project title, drawing title, drawing number and number of drawings to set.
3. Scale shop drawings shall be furnished prior to installation of equipment for:
  - a. Areas noted on plan as required shop drawings.
  - b. Approved deviations from Plans.
  - c. Draw equipment rooms layouts to a minimum scale of 1/4 of an inch = 1 foot - 0 inches, including equipment, piping, accessories, showing clearances for operating and servicing.

### C. Conflicts in Shop Drawings or Submittals:

Contractor agrees that shop drawing submittals processed by the Architect do not become contract documents and are not change orders, that the purpose of the shop drawing review is to establish a reporting procedure and is intended for the contractors convenience in organizing his work and to permit the Architect to monitor the contractor's progress and understanding of the design. The process of review of the contractor's submittals is not the purpose of testing the Architect's perception. If deviations, discrepancies or conflicts between shop drawings submittals and contract documents are discovered either prior to or after the shop drawings submittals are processed by the Architect, the contractor agrees that the contract documents shall control and shall be followed.

## 1.15 INTERPRETATION OF THE DRAWINGS AND SPECIFICATIONS

- A. As used in the drawings and Specifications, certain non-technical works shall be understood to have specific meanings as follows:
  1. "Furnish" . . . Purchase and deliver to the project site complete with every necessary appurtenance and support.
  2. "Install" . . . Unload at the delivery point at the site and perform every operation necessary to establish secure mounting and correct operation at the proper location in the project.
  3. "Provide" . . . "Furnish" and "Install".
- B. Except where modified by a specific notation to the contrary it shall be understood that the indication and/or description of any item, in the drawings or Specifications or both, carries with it the instruction to furnish

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and install the item, regardless of whether or not this instruction is explicitly stated as part of the indication or description.

- C. It shall be understood that the Specifications and drawings are complementary and are to be taken together for a complete interpretation of the work. Exceptions are that notes on the drawings which refer to an individual element of work take precedence over the Specifications where they conflict with same.
- D. No exclusions from, or limitation, in the language used in the drawings or Specifications shall be interpreted as meaning that the appurtenances or accessories necessary to complete any required system or item of equipment are to be omitted.
- E. The drawings of necessity utilize symbols and schematic diagrams to indicate various items of work. Neither of these have any dimensional significance, nor do they delineate every item required for the intended installation. The work shall be installed in accordance with the diagrammatic intent expressed on the Plumbing Drawings, and in conformity with the dimensions indicated on Architectural and Structural Working Drawings and on equipment shop drawings.
- F. No interpretation shall be made from the limitations of symbols and diagrams that any elements necessary for complete work are excluded.

### 1.16 OPERATING AND MAINTENANCE DATA

- A. Upon completion of the installation provide two (2) complete sets of operating and maintenance instructions for the systems specified in this section to the Owner's Representative.
- B. The Contractor shall incorporate, among others in the set of operating and maintenance instructions to the Owner's representative, the following directions:
  - 1. Schedule of major components of each system with manufacturer's catalog data, nameplate data, and parts list.
  - 2. Preventive maintenance schedule for each major component of each system.
  - 3. Pressure test reports.
  - 4. Directory: Names, addresses and telephone numbers of General Contractor, its subcontractor's and related equipment suppliers, including name of person to contact in each case.
  - 5. Provide a separate listing of all components from each manufacturer

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and from each supplier.

6. Specific Manufacturer's Warranties. List each piece of equipment covered, with day and date warranty begins, date of expiration and name, address and telephone number of person to contact regarding problems during warranty period.
7. Listing of extra stock parts furnished as part of the Contract.

### 1.17 MANUFACTURER'S WARRANTY:

Standard warranty of manufacturer shall apply for replacement of parts after expiration of other warranty periods stated in Specifications if they are for shorter time than standard manufacturer's warranty. Manufacturer shall furnish and replace parts to City. Furnish Architect printed manufacturer's warranties complete with material included and expiration dates upon project completion.

### 1.18 GUARANTEES

- A. All materials furnished shall be guaranteed, in writing, on a form approved by the City, for a period of one (1) year after date of acceptance of the project by the City. Should any trouble develop during this period due to defective materials or workmanship, the Contractor shall furnish all new materials and labor to correct the trouble without any cost to the City.
- B. Any defective materials or inferior workmanship noticed at time of installation shall be corrected immediately to the entire satisfaction of the City.
- C. The Contractor shall guarantee that his/her installation of all materials and equipment will meet the performance requirements of these Specifications, and that all equipment will deliver the specified or required capacities.
- D. The Contractor shall be responsible for all damage to any part of the premises caused by leaks or breaks in pipe lines, fixtures or equipment provided under this Section of the Specifications, for a period of one (1) year after date of acceptance by the City.

## PART 2 – PRODUCTS

### 2.01 SANITARY SOIL WASTE AND VENT SYSTEM

- A. Soil, waste and vent piping to 5 feet outside the building may be one of the following:
  1. Hubless cast iron soil pipe and fittings, CISPI - 301, ASTM A888, with stainless steel clamp and shield couplings, CISPI - 301

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2. Hubless cast iron soil pipe, CISPI- 301, ASTM A888 with hub and spigot cast iron fittings CISPI - 301, ASTM A74 with the A.B. & I. "Best" cast iron coupling and rubber gaskets, ASTM C564.
  3. Hubless cast iron soil pipe, CISPI-301, ASTM A 888 with M.G. mechanical joint couplings.
  4. Schedule 40 ABS or PVC DWV pipe and drainage pattern fittings. Solvent cement joints.
- B. Soil piping from 5 feet outside the building may be one of the following:
1. Certainteed Corp. "fluid tight" p.v.c. gravity sewer pipe and fittings or approved equivalent.
  2. Extra heavy bell and spigot vitrified clay pipe and fittings with compression joints.
  3. Same as specified to 5 feet outside building.
- C. Cleanouts:
1. Acceptable Manufacturers: J.R. Smith as specified, or equivalent by Josam, Wade or Zurn.
  2. Accessories: Where installed in construction with waterproof membrane, provide cleanouts with flashing clamp device with corrosion-resistant clamping bolts.
  3. Floors:
    - a. Finished (tile or resilient covering): J.R. Smith #4048 with Nikaloy square top and tapered thread bronze plug. Set tops square with floor tile or resilient covering pattern.
    - b. Unfinished: J.R. Smith #4248 with cast iron round tractor type cover and tapered thread bronze plug.
  4. Walls: Tapped tee or C.I. ferrule, with tapered thread bronze plug. J.R. Smith #4472 chrome plated for tiled walls, prime coated for painted walls.
- D. Floor Drains:
1. Acceptable Manufacturers: J.R. Smith as specified, or equivalent by Josam, Wade or Zurn.
  2. Accessories:
    - a. Where installed in conjunction with waterproof membranes, provide with flashing clamp device with corrosion-resistant clamping bolts.
    - b. Provide with trap primer tailpiece where required. J.R. Smith #2695Y-2.

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### 2.02 STORM DRAIN SYSTEM

- A. Pipe and Fittings: Same as specified for soil, waste and vent system.

### 2.03 DOMESTIC HOT AND COLD WATER SYSTEMS

- A. Pipe and Fittings: Type "L" hard-drawn copper tube, ASTM B88, with wrought copper solder joint fittings, ANSI B16.22. Cast bronze solder joint fittings, ANSI B16.18, may be used only for sizes for which wrought copper fittings are not manufactured. Leadless solder joints.

- B. Lead Free Valves:

1. Provide systems with valves where indicated on Drawings and as specified. All valves shall be easily accessible. Valves for similar service shall be of same manufacturer.
2. Provide systems with valves so located and arranged as to give complete regulating control over all systems. Valves shall be installed on both sides of all equipment, on risers and on all branch mains.
3. Acceptable Manufacturers: Hammond, Milwaukee, Stockham, Nibco Manufacturer's name and figure number specified are for type, construction and quality required.
  - a. Ball Valve (2 inches and smaller): Hammond #8501, 150 lb., threaded.
  - b. Ball Valve (2½ inches and larger): Nibco #S-580-66, 150 lb., flanged.
  - c. Check Valve (2 inches and smaller): Hammond #UP904, 125 lb., threaded.

- C. Lead Free Unions and Flanges:

1. Unions (2 inches and smaller): Cast bronze ground joint pattern, brass to iron seat, ASTM B62 and ANSI B16.18.
2. Flanges (2½ inches and larger): 150 lb., cast bronze, solder joint, ASTM B62 and ANSI B16.24.
  - a. Flange gaskets shall be 1/16 of an inch thick and suitable for water. Garlock or approved equivalent.
  - b. Bolting Materials: Carbon steel heavy hex bolts and nuts, ASTM A307 type B.

- D. Specialties:

1. Water Hammer Arrestors:
  - a. Acceptable Manufacturers: Precision Plumbing Products,

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Sioux Chief.

- b. Locate as shown on Drawings and size in accord with Plumbing and Drainage Institute Standard No. WH-201.
2. Hose Bibbs: J.R. Smith, Model 8104 with vacuum breaker and keyed access.
3. Trap Primer Assemblies:
  - a. Trap primers for drains shall be as indicated and specified.

### 2.04 CONDENSATE AND RELIEF DISCHARGES:

Type "L" or "M" hard-drawn copper tube, ASTM B88, with wrought copper solder joint fittings, ANSI B16.22. Solder: Same as specified for water system.

### 2.05 INSTALLATION OF FIXTURES AND EQUIPMENT SPECIFIED ELSEWHERE

A. Work Included:

1. Rough-in and connect plumbing services required for laboratory and/or restrooms equipment as indicated on the drawings.
2. Furnish and install straight or angle stops on all domestic hot and cold water lines at hose bibbs, and elsewhere as indicated or required.
3. Furnish and install gas shut-off cocks and gas manifolds as indicated or required.
4. Furnish and install water hammer arrestors in hot and cold water lines to all equipment or apparatus equipped with quick closing valves.
5. Install gas emergency shut-off valves furnished by others.

B. Products:

1. Materials and Methods:
  - a. Water Supply Stops: Brass-Craft straightway and angle type, as required.
  - b. Fixture Traps: Cast brass, adjustable P-trap, code approved.
  - c. Refer to the various sections included under Division No. 23 for material requirements for each particular system.
  - d. All exposed uninsulated piping, valves, etc., furnished by this Contractor for kitchen equipment shall be chrome plated.

### 2.06 INDIRECT WASTE:

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Type DWV copper drainage tube, ASTM B306 with cast brass or wrought copper drainage fittings, ASTM and ANSI B16.4, leadless solder.

### 2.07 FIXTURES AND TRIM

- A. Basic Requirements:
1. Smoothly grout joints between fixture and floor or wall with silicone grout.
  2. Provide brass plated brass work sleeves over exposed piping used in conjunction with fixtures, unless specified otherwise.
  3. Provide all supplies and wastes with escutcheons.
  4. Fixture P-traps:
    - a. Concealed: Hubless cast iron or non-adjustable cast brass.
    - b. Exposed: Cast brass or copper tubing, adjustable, brass finish where concealed or covered to conform to handicap requirements, chrome plated where exposed.
  5. Angle and Straight Stops and Risers: Brass-Craft or approved equivalent.
  6. Trap Arms:

Schedule 40 galvanized steel pipe.
  7. All water closets shall use a maximum of 1.6 gallons per flush and urinals a maximum of 1 gallon per flush.

### 2.08 PIPE INSULATION

- A. Pipe Insulation: Owens-Corning Fiberglas #25 ASJ/SSL, Halstead closed cell or approved equivalent. See Sheet P-1 for thickness requirement.
- B. Valve and Fitting Covers for Fiberglass Insulation: Manville "Zeston 2000".
- C. Installation shall be per manufacturer's instructions.
- D. Handicap Trap and Hot Water Trap Insulation: Trap Wrap by Brocar-Products Inc. or Handi Lav-Guard Insulation Kits by Truebro, Inc.
- E. Metal Jacketing: Provide metal jacketing for all insulated piping exposed to weather.
1. Piping: Apply aluminum metal jacket 0.016 in. with moisture barrier around pipe and slip edge into preformed Z lock position to shed water. Butt next jacket section leaving approximately 3/8 of an inch gap. Place preformed 2 inches butt strap with sealant over the seam and secure with 1/2 of an inch aluminum band and wing seal.

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2. Fittings: Apply prefabricated metal fittings identical in composition to pipe jacketing.

### 2.09 PIPE HANGERS AND SUPPORTS

#### A. General:

1. A hanger assembly shall consist of an upper attachment secured to structure, a hanger rod and a pipe hanger.
  - a. The upper attachment shall be as follows:
    - 1) Concrete: Concrete insert, or expansion shield.
    - 2) Steel Framing: Beam clamp.
    - 3) Wood Framing: Angle clip with one leg bolted thru wood member with a plate washer on each side. Bolt shall be same size as required rod size. Lag bolts will not be allowed.
2. Pipes at the same elevation may be supported by acceptable trapeze hangers.
3. Explosive type fasteners or studs will not be permitted.
4. Hangers and supports shall fit outside of all pipe insulation and insulation inserts unless specified otherwise.
5. Refer to Drawings for fabrication of special supports.
6. All water piping shall be isolated from structure.

#### B. Hanger spacing for horizontal suspended piping shall be as follows, unless specified or shown on the Drawings otherwise.

1. Cast iron soil pipe shall be supported at not more than 5 feet intervals with support not more than 18 inches from hub.
2. Steel Pipe 1 inch and Smaller: Not to exceed 6 feet - 0 inches.
3. Steel Pipe 1-1/4 inches and Larger: Not to exceed 10 feet - 0 inches.
4. Copper Tubing 1½ inches and Smaller: Not to exceed 6 feet - 0 inches.
5. Copper Tubing 2 inches and Larger: Not to exceed 10 feet - 0 inches
6. In all cases, space pipe supports to provide adequate support for the pipes, the medium in the pipes, insulation, valves and fittings to prevent any sagging or separation of joints.

#### C. Hanger Rods: Solid mild steel, sized as specified below. Maximum length of all thread rod shall not exceed 6 inches.

Pipe Size

Rod Diameter

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1/2 of an inch thru 3 inches	3/8 of an inch
4 inches thru 6 inches	1/2 of an inch

- D. Vertical piping shall be supported, not hung, at each floor with malleable iron or steel bolted pipe clamps. Clamps for water pipes shall rest on neoprene and cork pads.
- E. Hangers shall be clevis, or split ring type. Acceptable manufacturers: B-Line, Tolco, Michigan Hanger, or approved equivalent.
- F. Provide pipe to structure or hanger isolation as follows:
  - 1. Hangers: Water piping shall be isolated from hangers with two (2) layers of 1/4 of an inch felt.
  - 2. Through Structural Members:
    - a. All waste piping shall be isolated from all points of contact with the structure of the building with two (2) thicknesses of 1/4 of an inch heavy plumbers' felt. There shall be no points of contact between any waste line and the structure of the building including studs, gypboard, plates, headers, or any other part of the building.
    - b. All water piping shall be isolated the same as the waste piping except piping 1 inch and smaller. 1 inch and smaller water piping shall be isolated using Acousto-Plumb isolators as manufactured by Speciality Products Co. This includes stub-outs at fixtures.

### 2.10 PIPE FLASHING

- A. Provide a flashing assembly at every pipe passing through a roof.
- B. Lead flashing and counterflashing:
  - 1. For Vent Piping: Stoneman #S-1000-4, 4 lb. lead, 6 inch skirt.
  - 2. For Other Than Vent Piping: Stoneman Versa-Flash, 4 lb. lead, 6 inch skirt.

### 2.11 ACCESS PANELS

- A. Provide metal access panels and frames for all valves, trap primers, or similar items requiring adjustment or servicing located in concealed spaces.
- B. Access Panels: Face-of-wall and ceiling type: Steel with primecoat finish in painted walls and ceilings: polished chrome-plated bronze in tile walls.
- C. Access panel sizes shall be 12 inches x 12 inches for valves 2 inches and

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smaller and individual trap primers, 18 inches x 18 inches for valves 2-1/2 inches and larger and trap primers with distribution boxes.

- D. Provide panels with cylinder locks, keyed alike.
- E. Panels in fire rated walls shall have same rating as walls.
- F. Acceptable Manufacturers: Josam, Milcor, Elmdor, or Zurn.

### 2.12 DIELECTRIC ISOLATORS

- A. Isolate incompatible piping materials.
- B. For piping 2 inches in diameter and smaller, use unions or companion flanges equivalent to EPCO.
- C. For piping 2-1/2 inches in diameter and larger, use flange dielectric isolation sets equivalent to F.H. Mahoney type E, 150 lb. class.

### 2.13 TOOLS

- A. Furnish all special tools necessary for the care and operation of any equipment.
- B. Identify tools for the specific equipment.

### 2.14 PIPE SLEEVES

- A. Provide pipe sleeves for all piping passing through concrete walls and floors.
- B. Sleeves shall be Crete-Sleeves by Sperzel Co. or approved equivalent.

## PART 3 - EXECUTION

### 3.01 EXCAVATION, BACKFILL, AND DEWATERING

- A. General: Perform all excavating, trenching, backfilling, compacting and dewatering required for the installation of the work of this Division 31.
- B. Excavate, backfill, and compact in accordance with Trenching, Backfill and Compacting Section of Specifications.
- C. Dewatering:
  - 1. Lay pipe in dry trenches and keep trenches completely dry until piping system has been tested, cleaned, insulated, inspected and accepted by the City and completely backfilled before dewatering function ceases.

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2. Furnish and operate pumps, well points, siphons or other equipment as may be required to provide complete dewatering of trenches and disposal of excess water.

### 3.02 PIPING INSTALLATION

#### A. Layout of Work:

1. Perform all dimensional layout of the work and establish all lines and grades as set forth on the Drawing.
2. Be responsible for conformity of the finished work with Drawings and Specifications.
3. Layout rough-in for contract equipment as well as City furnished equipment and appliances in accordance with rough-in diagrams provided by the Manufacturer.

#### B. Installation:

1. Inspect all piping prior to installation, pipe found unsatisfactory on inspection or damaged by handling shall be promptly removed from the job site.
2. All piping systems shall be graded and valved to provide complete drainage and control of all systems.
3. Install horizontal sanitary and storm drainage piping to uniform grades conforming to the applicable code for this installation or as indicated on Drawings.
4. All piping shall run parallel to building construction and shall be neat and workmanlike. Do not cut or drill structural members except as approved by the Structural Engineer, or specifically noted on the Drawings.
5. Conceal all piping in finished portions of the building unless noted otherwise on the Drawings.
6. Coupled shot sections of pipe, bushings, close nipples, long screws, and crosses are prohibited.
7. Install all piping in such a manner as to prevent any undue noise from the flow of water under normal conditions.
8. Install piping to permit free expansion and contractions, except where the Drawings specifically indicate an anchor or guide. Do not connect stiffening structural members to bends or elbows. Water piping shall be secured to structure at fixture locations.
9. Use offsets necessary to prevent undue strain on piping. The springing of piping into place is prohibited.
10. Select and install pipe supports and hangers in such a manner as to

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impose only negligible restraint on the free movement of piping and not deform piping. No anchors shall be employed.

11. Locate pipe supports as close as possible to valves or other heavy piping specialties.
12. Carefully locate supports and hangers so that they do not hinder free movement of adjoining piping or occupy open space in a pipe rack.
13. Buried Piping:
  - a. Carefully handle and lower pipe in such a manner as to avoid damage to the pipe.
  - b. Excavate a socket hole under the joint so that pipe will be supported on its body. Provide socket holes large enough (but not excessive) to allow adequate space for workers to "make" the joints.
14. All exposed polished or enamel connection from fixtures shall be put on with special care showing no tool marks or threads at fittings.
15. Sway bracing shall be installed per Governing Jurisdictional.

### 3.03 PIPE JOINTS

- A. Threaded Steel Pipe:
  1. Cut square and remove all burrs. Ream for full flow.
  2. Cut threads with clean dies. Apply thread compound to male threads only.
  3. After jointing, not more than three full threads shall remain exposed.
- B. Copper Tubing:
  1. Cut square and remove all burrs. Ream for full flow.
  2. Clean outside ends of tubing and male fittings and sockets of female fittings to bright finish. Clean with emery cloth.
  3. Properly apply solder flux to surfaces being jointed. Application and type of flux shall be as recommended by the specific solder manufacturer.
  4. Remove internal parts of solder-end valves prior to soldering.
  5. Refer to specific piping system for type of solder.
- C. Cast Iron Soil Pipe and Joints: Install in accord with coupling manufacturer's instructions. Refer to specific piping system for type of coupling.

### 3.04 PROTECTIVE COATING FOR UNDERGROUND PIPING

- A. General: Protect underground pipe as specified. Protect fittings similar to

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pipng.

- B. Cast Iron Pipe: Asphaltum varnish or similar coating standard of pipe manufacturer.
- C. Copper Tubing and Pipe: No coating required.

### 3.05 CLEANING AND DEGREASING OF PIPING

- A. Clean all piping systems to remove all dirt, grease, scale, foreign substances, etc.
- B. Use air and/or inert gas blown through the lines of gas system, to prove the piping clean. All other piping systems shall be thoroughly flushed out with water unless specified otherwise.
- C. Prior to commencing work, submit for approval a complete procedure for flushing of piping systems. Include flushing source, system flushing inlet pressure, and size of inlet and outlet flushing connections with their locations for each system.

### 3.06 PLUMBING AND FIXTURE INSTALLATION

- A. Each fixture shall be installed at the height and location shown on drawings. Fixture supplies, trap and trap arm shall be set square with wall, in line with fixture outlets, and properly aligned to prevent any undue strain on fixtures. Fixtures shall be set level. Joint between fixture and wall or floor shall be grouted smoothly with G.E. silicone grout. All fixtures shall have their water supplies protected against possible back siphonage. The discharge outlets of supply faucets for sinks and lavatories shall clear the top of the overflow rim by at least 1 inch.
- B. Backing and Support: Fixture or supporting arms shall be securely attached to a backing plate in accordance with the manufacturer's instructions. Backing plates shall be 1/4 of an inch thick x 6 inches wide and shall be connected to a minimum of 3 studs. Plates shall be drilled and tapped in each case to receive the fixture mounting bolts. Fixture bolts shall be brass with chrome plated heads when exposed.
  - 1. For Wood Stud Construction: Recess backing plate flush with studs. Attach backing plate to each stud that it crosses with two 3/8 of an inch steel bolts (on 4 inch centers) extended through stud and secured rear side with nuts provided with 1/8 of an inch x 2 inches steel backup washers.
  - 2. For Metal Stud Construction: Attach backing plate to each stud that it crosses by 3/16 of an inch fillet weld on top and bottom edges of the plate and across the full width of stud flange.

### 3.07 EQUIPMENT AND APPLIANCE INSTALLATION

- A. Install equipment and appliances, both City furnished and in contract where

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shown, as indicated, and in accordance with manufacturer's recommendations for the specific service.

- B. Provide anchor bolts, setting Drawings and templates for setting equipment.
- C. Assure correct alignment of equipment or appliance after setting.
- D. Where grouting is necessary, use non-shrink type.

### 3.08 TESTING OF PIPING

- A. Testing and inspection of all piping systems and associated equipment for leaks shall be accomplished after installation and cleaning and prior to placing into service.
- B. A rigid visual inspection of each specific piping system shall be made prior to conducting tightness tests, to ascertain that all appurtenances and equipment are provided, properly connected and supported, and in all respects ready for testing.
- C. Equipment such as hot water, flexible hose, safety valves and similar test pressure. Equipment shall either be disconnected from the piping or be isolated by valves or blanks during testing.
- D. Indicated pressure gauges mounted locally may be tested with the lines, provided the test pressure does not exceed the scale range.
- E. The application of pressure to a system shall be under control at all times, so that in no case shall the test pressure be exceeded by more than 6%.
- F. Gauges used for testing shall be tested for accuracy as directed or approved by the City, and then installed as close as possible to the low point of the piping system.
- G. Do not apply test pressure until the piping system and its contents approach the same temperature.
- H. While piping is under test, exercise care that excessive pressure does not occur due to increase in ambient temperature.
- I. Piping test pressure shall be as specified with the particular system. If test pressures are not specified, they shall be 150% of design pressure for the specific system being tested.
- J. Conduct hydrostatic tests with water at a temperature below 100 degrees F.
  - 1. Fill the system slowly with water and vent at highest points to expel the air before pressurizing.
  - 2. Carefully examine all joints for leaks or defects.
  - 3. Provide connections as required to accomplish the above.
- K. Keep accurate test records of each line or system tested. Each test shall include:
  - 1. Identification of piping system and test number.

## SECTION 220000 - PLUMBING

2. Testing medium.
  3. Test pressure.
  4. Date of test acceptance.
- L. Tests: Allow to stand 4 hours or longer as directed to provide tight without leaks. Perform tests in presence of the City or his/her representative.
1. Soil, waste, and vent system and storm drain system. Test with water to a static head of 10 feet.
  2. Domestic Water System: Test with water at 1-1/2 times system pressure.
  3. Gas System: Test with air at 40 psi.
- M. At the completion of the work, completely adjust all valves and equipment for their proper use and seating.

### 3.09 STERILIZING OF PIPING AND FIXTURES

- A. Water lines and fixtures shall be flushed thoroughly prior to chlorination to remove dirt, etc. Screens on faucets to be removed during injection and replaced after completion of disinfection.
1. Injection shall start only when all fixtures are connected up and ready for operation.
  2. A service cock on riser, either 3/4 of an inch to at least 1-1/4 inches, shall be provided by the Plumbing Contractor and located at the water service entrance. The disinfecting agent shall be injected into and through the system from these cocks or risers only.
  3. Chlorine (either gas or liquid) must be used as disinfecting agent. Calcium or sodium hypochlorite (liquid or powdered), or as approved in Federal and AMWWA procedures, may be used.
  4. The disinfecting agent shall be injected by a proportioning pump or device through the service cock or riser slowly and continuously at an even rate.
  5. All outlets must be fully opened at least twice during injection, and the residual checked with orthotolidine solution.
  6. When the chlorine residual concentration indicated is not less than 50 quarts per million at all outlets, then all fixtures and water supply valves must be closed and secured.
  7. Then the residual shall be retained for a period of not less than 24 hours.
  8. After the retention, the residual upon checking at most outlets shall not be less than 10 parts per million. If less, then the disinfection must be repeated as described above.

## SECTION 220000 - PLUMBING

- B. If satisfactory, all piping and fixtures must be flushed until residual chlorine or orthotolidine tests shall not be greater than the incoming water supply.
- C. All work and Certification of Performance must be done by approved applicators or qualified personnel with chemical and laboratory experience.

### 3.10 DEMOLITION

- A. The Contractor shall visit the site and familiarize him/herself with all existing conditions affecting his/her work. Special attention should be given to possible Asbestos products, removal is by others, and this Contractor shall take all necessary safety precautions.
- B. Protection:
  - 1. Perform demolition in such a manner as to eliminate hazards to persons and property and to minimize interference with use of neighboring utilities and structures or interruption of use of such utilities and free passage to and from the structures.
  - 2. Provide safeguards, including warning signs and the like that are required for the protection of Owner's and Contractor's employees and others, during demolitions and removal operations.
  - 3. Care shall be taken to prevent spread of flying particles and dust.
- C. Contractor shall examine all the items which are designated to be reused, and refurbish them and store them for reuse.
- D. Contractor shall contact Owner to see which items (equipment, fixtures, etc.) Owner wishes to keep. Owner will direct Contractor as to where items shall be stored.
- E. All removed equipment, piping, etc., which are not to be reused or kept by the Owner shall be removed from the site and shall become the property of the Contractor.
- F. On completion of the demolition work and after removal of all debris, the site shall be left in clean condition satisfactory to the Owner. Cleaning shall include offsite disposal of items, materials, debris, and rubbish resulting from demolition operations.

END OF SECTION

## SECTION 26 0500 COMMON WORK RESULTS FOR ELECTRICAL

### PART 1 - GENERAL

#### 1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary
- B. Specifications are part of a larger set of construction documents. The bidder is responsible for information contained in the entire set.

#### 1.02 SUMMARY

- A. Section Includes:
  - 1. Electrical equipment coordination and installation.
  - 2. Sleeves for raceways and cables.
  - 3. Sleeve seals.
  - 4. Grout.
  - 5. Common electrical installation requirements.
  - 6. Touchup painting.

#### 1.03 DEFINITIONS

- A. EPDM: Ethylene-propylene-diene terpolymer rubber.
- B. NBR: Acrylonitrile-butadiene rubber.

#### 1.04 COORDINATION

- A. Coordinate arrangement, mounting, and support of electrical equipment:
  - 1. To allow maximum possible headroom unless specific mounting heights that reduce headroom are indicated.
  - 2. To provide for ease of disconnecting the equipment with minimum interference to other installations.
  - 3. To allow right of way for piping and conduit installed at required slope.
  - 4. So connecting raceways, cables, wireways, cable trays, and busways will be clear of obstructions and of the working and access space of other equipment.

## **SECTION 26 0500 COMMON WORK RESULTS FOR ELECTRICAL**

- B. Sequence, coordinate, and integrate installing electrical materials and equipment for efficient flow of the Work. Coordinate installing large equipment requiring positioning before closing in the building.
- C. Coordinate installation of required supporting devices and set sleeves in cast-in-place concrete, masonry walls, and other structural components as they are constructed.
- D. Coordinate chases, slots, and openings with general construction work and arrange in building structure during progress of construction to facilitate the electrical installations that follow.
- E. Coordinate location of access panels and doors for electrical items that are behind finished surfaces or otherwise concealed. Access doors and panels are specified in Division 08 Section.
- F. Coordinate electrical testing of electrical, mechanical, and architectural items, so equipment and systems that are functionally interdependent are tested to demonstrate successful interoperability.
- G. Coordinate connecting electrical service to components furnished under other sections, include connections for equipment specified in other Sections.

### **PART 2 - PRODUCTS**

#### **2.01 SLEEVES FOR RACEWAYS AND CABLES**

- A. Steel Pipe Sleeves: ASTM A 53/A 53M, Type E, Grade B, Schedule 40, galvanized steel, plain ends.
- B. Sleeves for Rectangular Openings: Galvanized sheet steel.
  - 1. Minimum Metal Thickness:
    - a. For sleeve cross-section rectangle perimeter less than 50 inches (1270 mm) and no side more than 16 inches (400 mm), thickness shall be 0.052 inch (1.3 mm).
    - b. For sleeve cross-section rectangle perimeter equal to, or more than, 50 inches (1270 mm) and 1 or more sides equal to, or more than, 16 inches (400 mm), thickness shall be 0.138 inch (3.5 mm).

#### **2.02 SLEEVE SEALS**

- A. Description: Modular sealing device, designed for field assembly, to fill annular space between sleeve and raceway or cable.
  - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

## **SECTION 26 0500 COMMON WORK RESULTS FOR ELECTRICAL**

- a. Advance Products & Systems, Inc.
  - b. Calpico, Inc.
  - c. Or Approved Equal
2. Sealing Elements: EPDM or NBR interlocking links shaped to fit surface of cable or conduit. Include type and number required for material and size of raceway or cable.
  3. Pressure Plates: Plastic, or Stainless steel. Include two for each sealing element.
  4. Connecting Bolts and Nuts: Stainless steel of length required to secure pressure plates to sealing elements. Include one for each sealing element.

### **2.03 GROUT**

Nonmetallic, Shrinkage-Resistant Grout: ASTM C 1107, factory-packaged, nonmetallic aggregate grout, noncorrosive, nonstaining, mixed with water to consistency suitable for application and a 30-minute working time.

### **2.04 TOUCHUP PAINTING**

- A. For Equipment: Equipment manufacturer's paint selected to match installed equipment finish.
- B. Galvanized Surfaces: Zinc-rich paint recommended by item manufacturer.

## **PART 3 - EXECUTION**

### **3.01 COMMON REQUIREMENTS FOR ELECTRICAL INSTALLATION**

- A. Comply with NECA 1.
- B. Measure indicated mounting heights to bottom of unit for suspended items and to center of unit for wall-mounting items.
- C. Headroom Maintenance: If mounting heights or other location criteria are not indicated, arrange and install components and equipment to provide maximum possible headroom consistent with these requirements.
- D. Equipment: Install to facilitate service, maintenance, and repair or replacement of components of both electrical equipment and other nearby installations. Connect in such a way as to facilitate future disconnecting with minimum interference with other items in the vicinity.
- E. Right of Way: Give to piping systems installed at a required slope.

## **SECTION 26 0500 COMMON WORK RESULTS FOR ELECTRICAL**

- F. Materials and Components: Install level, plumb, and parallel and perpendicular to other building systems and components, unless otherwise indicated.
- G. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, used those specified in UL 486A and UL 486B.

### **3.02 SLEEVE INSTALLATION FOR ELECTRICAL PENETRATIONS**

- A. Electrical penetrations occur when raceways, cables, wireways, cable trays, or busways penetrate concrete slabs, concrete or masonry walls, or fire-rated floor and wall assemblies.
- B. Verify with other trades prior to penetration of assemblies.
- C. Concrete Slabs and Walls: Install sleeves for penetrations unless core-drilled holes or formed openings are used. Install sleeves during erection of slabs and walls.
- D. Use pipe sleeves unless penetration arrangement requires rectangular sleeved opening.
- E. Cut sleeves to length for mounting flush with both surfaces of walls.
- F. Extend sleeves installed in floors 2 inches (50 mm) above finished floor level.
- G. Size pipe sleeves to provide 1/4-inch (6.4-mm) annular clear space between sleeve and raceway or cable, unless indicated otherwise.
- H. Seal space outside of sleeves with grout for penetrations of concrete and masonry

Promptly pack grout solidly between sleeve and wall so no voids remain. Tool exposed surfaces smooth; protect grout while curing.

- I. Interior Penetrations of Non-Fire-Rated Walls and Floors: Seal annular space between sleeve and raceway or cable, using joint sealant appropriate for size, depth, and location of joint. Comply with requirements in Division 07 Section "Joint Sealants."
- J. Roof-Penetration Sleeves: Seal penetration of individual raceways and cables with flexible boot-type flashing units applied in coordination with roofing work.
- K. Aboveground, Exterior-Wall Penetrations: Seal penetrations using steel pipe sleeves and mechanical sleeve seals. Select sleeve size to allow for 1-inch (25-mm) annular clear space between pipe and sleeve for installing mechanical sleeve seals.

### **3.03 SLEEVE-SEAL INSTALLATION**

- A. Install to seal exterior wall penetrations.

## **SECTION 26 0500 COMMON WORK RESULTS FOR ELECTRICAL**

- B. Use type and number of sealing elements recommended by manufacturer for raceway or cable material and size. Position raceway or cable in center of sleeve. Assemble mechanical sleeve seals and install in annular space between raceway or cable and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make watertight seal.

### **3.04 CONNECTIONS TO EQUIPMENT**

- A. For each electrical connection indicated or otherwise required, provide complete assembly of materials, including but not necessarily limited to pressure connectors, terminals (lugs), electrical insulating tape, electrical solder, electrical soldering flux, heat-shrinkable insulating tubing, cable ties, solderless wirenuts, and other items and accessories as needed to complete splices and terminations of types indicated.
- B. Install in accordance with equipment manufacturer's written instructions and with recognized industry practices, and complying with applicable requirements of UL, NEC and NECA's "Standard of Installation" to ensure that products fulfill requirements.

### **3.05 FIELD QUALITY CONTROL**

Inspect installed components for damage and faulty work. Replace damaged or faulty components.

**END OF SECTION 260500**

## **SECTION 26 0519 LOW-VOLTAGE ELEC POWER CONDUCTORS & CABLES**

### **PART 1 - GENERAL**

#### **1.01 RELATED DOCUMENTS**

Drawings and general provisions of the Contract, apply to this Section.

#### **1.02 SUMMARY**

A. Section Includes:

1. Building wires and cables rated 600 V and less.
2. Connectors, splices, and terminations rated 600 V and less.

#### **1.03 SUBMITTALS**

Product Data Sheets, Cut Sheets and Manufacturer's recommendations for installation and operation.

#### **1.04 DEFINITIONS**

A. EPDM: Ethylene-propylene-diene terpolymer rubber.

B. NBR: Acrylonitrile-butadiene rubber.

#### **1.05 QUALITY ASSURANCE**

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

B. Comply with NFPA 70.

#### **1.06 COORDINATION**

Set sleeves in cast-in-place concrete, masonry walls, and other structural components as they are constructed.

### **PART 2 - PRODUCTS**

#### **2.01 CONDUCTORS AND CABLES**

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Alcan Products Corporation; Alcan Cable Division.
2. American Insulated Wire Corp.; a Leviton Company.
3. Or Approved Equal.

## **SECTION 26 0519 LOW-VOLTAGE ELEC POWER CONDUCTORS & CABLES**

- B. Copper Conductors: Comply with NEMA WC 70.
- C. Conductor Insulation: Comply with NEMA WC 70 for Types THW, THHN-THWN, XHHW, UF, USE, and SO.
- D. Multi-conductor Cable: Comply with NEMA WC 70 for armored cable, Type AC; metal-clad cable, Type MC; mineral-insulated, metal-sheathed cable, Type MI; nonmetallic-sheathed cable, Type NM, Type SO, and Type USE with ground wire.

### **2.02 CONNECTORS AND SPLICES**

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. AFC Cable Systems, Inc.
  - 2. Hubbell Power Systems, Inc.
  - 3. Or Approved Equal
- B. Description: Factory-fabricated connectors and splices of size, ampacity rating, material, type, and class for application and service indicated.

## **PART 3 - EXECUTION**

### **3.01 CONDUCTOR MATERIAL APPLICATIONS**

- A. Feeders: Copper for feeders smaller than No. 4 AWG; copper or aluminum for feeders No. 4 AWG and larger. Solid for No. 10 AWG and smaller; stranded for No. 8 AWG and larger.
- B. Branch Circuits: Copper. Solid for No. 10 AWG and smaller; stranded for No. 8 AWG and larger.

### **3.02 CONDUCTOR INSULATION AND MULTICONDUCTOR CABLE APPLICATIONS AND WIRING METHODS**

- A. Service Entrance: Type THHN-THWN, single conductors in raceway; Type XHHW, single conductors in raceway; Type SE or USE multiconductor cable.
- B. Exposed Feeders: Type THHN-THWN, single conductors in raceway; Armored cable, Type AC; Metal-clad cable, Type MC; Nonmetallic-sheathed cable, Type NM.
- C. Feeders Concealed in Ceilings, Walls, Partitions, and Crawlspace: Type THHN-THWN, single conductors in raceway; Armored cable, Type AC; Metal-clad cable, Type MC; Mineral-insulated, metal-sheathed cable, Type MI; Nonmetallic-sheathed cable, Type NM.

## **SECTION 26 0519 LOW-VOLTAGE ELEC POWER CONDUCTORS & CABLES**

- D. Feeders Concealed in Concrete, below Slabs-on-Grade, and Underground: Type THHN-THWN, single conductors in raceway; Underground feeder cable, Type UF.
- E. Exposed Branch Circuits, Including in Crawlspace: Type THHN-THWN, single conductors in raceway; Armored cable, Type AC; Metal-clad cable, Type MC; Nonmetallic-sheathed cable, Type NM.
- F. Branch Circuits Concealed in Ceilings, Walls, and Partitions: Type THHN-THWN, single conductors in raceway; Armored cable, Type AC; Metal-clad cable, Type MC; Nonmetallic-sheathed cable, Type NM.
- G. Cord Drops and Portable Appliance Connections: Type SO, hard service cord with stainless-steel, wire-mesh, strain relief device at terminations to suit application.
- H. Class 1 Control Circuits: Type THHN-THWN, in raceway.
- I. Class 2 Control Circuits: Type THHN-THWN, in raceway; Power-limited cable, concealed in building finishes; Power-limited tray cable, in cable tray.

### **3.03 INSTALLATION OF CONDUCTORS AND CABLES**

- A. Conceal cables in finished walls, ceilings, and floors, unless otherwise indicated.
- 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.
- C. Use pulling means, including fish tape, cable, rope, and basket-weave wire/cable grips that will not damage cables or raceway.
- D. Install exposed cables parallel and perpendicular to surfaces of exposed structural members, and follow surface contours where possible.
- E. Identify and color-code conductors and cables.
- F. Remove existing wire from raceways before pulling in new wire and cable.

### **3.04 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 and UL 486B.
- B. Make splices and taps that are compatible with conductor material and that possess equivalent or better mechanical strength and insulation ratings than unspliced conductors.

## **SECTION 26 0519 LOW-VOLTAGE ELEC POWER CONDUCTORS & CABLES**

1. Use oxide inhibitor in each splice and tap conductor for aluminum conductors.

C. Wiring at Outlets: Install conductor at each outlet, with at least 6 inches (150 mm) of slack.

### **3.05 FIELD QUALITY CONTROL**

A. Perform tests and inspections and prepare test reports.

B. Tests and Inspections:

1. After installing conductors and cables and before electrical circuitry has been energized, test service entrance and feeder conductors for compliance with requirements.
2. Perform each visual and mechanical inspection and electrical test stated in NETA Acceptance Testing Specification. Certify compliance with test parameters.
3. Infrared Scanning: After Substantial Completion, but not more than 60 days after Final Acceptance, perform an infrared scan of each splice in cables and conductors No. 3 AWG and larger. Remove box and equipment covers so splices are accessible to portable scanner.
  - a. Follow-up Infrared Scanning: Perform an additional follow-up infrared scan of each splice 11 months after date of Substantial Completion.
  - b. Instrument: Use an infrared scanning device designed to measure temperature or to detect significant deviations from normal values. Provide calibration record for device.
  - c. Record of Infrared Scanning: Prepare a certified report that identifies splices checked and that describes scanning results. Include notation of deficiencies detected, remedial action taken, and observations after remedial action.

C. Test Reports: Prepare a written report to record the following:

1. Test procedures used.
2. Test results that comply with requirements.
3. Test results that do not comply with requirements and corrective action taken to achieve compliance with requirements.

D. Remove and replace malfunctioning units and retest as specified above.

**END OF SECTION 260519**

## SECTION 26 0526 GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

### PART 1 - GENERAL

#### 1.01 RELATED DOCUMENTS

Drawings and general provisions of the Contract apply to this Section.

#### 1.02 SUMMARY

A. Section Includes:

Methods and materials for grounding systems and equipment.

#### 1.03 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Other Informational Submittals: Plans showing dimensioned as-built locations of grounding features specified in Part 3 "Field Quality Control" Article, including the following:

1. Grounding arrangements and connections for separately derived systems.
2. Grounding for sensitive electronic equipment.

C. Field quality-control test reports.

D. Operation and Maintenance Data: For grounding to include the following in emergency, operation, and maintenance manuals:

1. Instructions for periodic testing and inspection of grounding features at grounding connections for separately derived systems based on NETA MTS and NFPA 70B.
  - a. Tests shall be to determine if ground resistance or impedance values remain within specified maximums, and instructions shall recommend corrective action if they do not.
  - b. Include recommended testing intervals.

#### 1.04 QUALITY ASSURANCE

A. Testing Agency Qualifications: An independent agency, with the experience and capability to conduct the testing indicated, that is a member company of the International Electrical Testing Association or is a nationally recognized testing laboratory (NRTL) as defined by OSHA in 29 CFR 1910.7, and that is acceptable to authorities having jurisdiction.

Testing Agency's Field Supervisor: Person currently certified by the International Electrical Testing Association to supervise on-site testing specified in Part 3.

B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

C. Comply with UL 467 for grounding and bonding materials and equipment.

## **PART 2 - PRODUCTS**

### **2.01 CONDUCTORS**

A. Insulated Conductors: Copper or tinned-copper wire or cable insulated for 600 V unless otherwise required by applicable Code or authorities having jurisdiction.

B. Bare Copper Conductors:

1. Solid Conductors: ASTM B 3.
2. Stranded Conductors: ASTM B 8.
3. Tinned Conductors: ASTM B 33.
4. Bonding Cable: 28 kcmil, 14 strands of No. 17 AWG conductor, 1/4 inch (6 mm) in diameter.
5. Bonding Conductor: No. 4 or No. 6 AWG, stranded conductor.
6. Bonding Jumper: Copper tape, braided conductors, terminated with copper ferrules; 1-5/8 inches (41 mm) wide and 1/16 inch (1.6 mm) thick.
7. Tinned Bonding Jumper: Tinned-copper tape, braided conductors, terminated with copper ferrules; 1-5/8 inches (41 mm) wide and 1/16 inch (1.6 mm) thick.

C. Grounding Bus: Rectangular bars of annealed copper, 1/4 by 2 inches (6 by 50 mm) in cross section, unless otherwise indicated; with insulators.

### **2.02 CONNECTORS**

A. Listed and labeled by a nationally recognized testing laboratory acceptable to authorities having jurisdiction for applications in which used, and for specific types, sizes, and combinations of conductors and other items connected.

B. Bolted Connectors for Conductors and Pipes: Copper or copper alloy, bolted pressure-type, with at least two bolts.

Pipe Connectors: Clamp type, sized for pipe.

C. Welded Connectors: Exothermic-welding kits of types recommended by kit manufacturer for materials being joined and installation conditions.

## **2.03 GROUNDING ELECTRODES**

A. Ground Rods: Copper-clad, Zinc-coated, or Stainless steel, sectional type; 3/4 inch by 10 feet (19 mm by 3 m) or 5/8 by 96 inches (16 by 2400 mm) in diameter.

## **PART 3 - EXECUTION**

### **3.01 APPLICATIONS**

A. Conductors: Install solid conductor for No. 8 AWG and smaller, and stranded conductors for No. 6 AWG and larger, unless otherwise indicated.

B. Underground Grounding Conductors: Install bare tinned-copper conductor, No. 2/0 AWG minimum.

Bury at least 30 inches (750 mm) below grade.

C. Isolated Grounding Conductors: Green-colored insulation with continuous yellow stripe. On feeders with isolated ground, identify grounding conductor where visible to normal inspection, with alternating bands of green and yellow tape, with at least three bands of green and two bands of yellow.

D. Grounding Bus: Install in electrical and telephone equipment rooms, in rooms housing service equipment, and elsewhere as indicated.

1. Install bus on insulated spacers 1 inch (25 mm), minimum, from wall 6 inches (150 mm) above finished floor, unless otherwise indicated.
2. Where indicated on both sides of doorways, route bus up to top of door frame, across top of doorway, down to specified height above floor, and connect to horizontal bus.

E. Conductor Terminations and Connections: Make connections so galvanic action or electrolysis possibility is minimized. Select connectors, connection hardware, conductors, and connection methods so metals in direct contact will be galvanically compatible.

1. Use electroplated or hot-tin-coated materials to ensure high conductivity and to make contact points closer to order of galvanic series.
2. Make connections with clean, bare metal at points of contact.
3. Make aluminum-to-steel connections with stainless-steel separators and mechanical clamps.

4. Make aluminum-to-galvanized steel connections with tin-plated copper jumpers and mechanical clamps.
5. Coat and seal connections having dissimilar metals with inert material to prevent future penetration of moisture to contact surfaces.
6. Exothermic-Welded Connections: Comply with manufacturer's written instructions. Welds that are puffed up or that show convex surfaces indicating improper cleaning are not acceptable.
7. Pipe and Equipment Grounding Conductor Terminations: Bolted connectors.
8. Connections to Structural Steel: Welded connectors.

### **3.02 EQUIPMENT GROUNDING**

- A. Install insulated equipment grounding conductors with all feeders and branch circuits.
- B. Air-Duct Equipment Circuits: Install insulated equipment grounding conductor to duct-mounted electrical devices operating at or above 120 V. Bond conductor to each unit and to air duct and connected metallic piping.
- C. Water Heater, Heat-Tracing, and Antifrost Heating Cables: Install a separate insulated equipment grounding conductor to each electric water heater and heat-tracing cable. Bond conductor to heater units, piping, connected equipment, and components.
- D. Isolated Equipment Enclosure Circuits: For designated equipment supplied by a branch circuit or feeder, isolate equipment enclosure from supply circuit raceway with a nonmetallic raceway fitting listed for the purpose. Install fitting where raceway enters enclosure, and install a separate insulated equipment grounding conductor. Isolate conductor from raceway and from panelboard grounding terminals. Terminate at equipment grounding conductor terminal of the applicable derived system or service, and at an isolated ground terminal on the equipment enclosure.
- E. Signal and Communication Equipment: For telephone, alarm, voice and data, and other communication equipment, provide No. 4 AWG minimum insulated grounding conductor in raceway from grounding electrode system to each service location, terminal cabinet, wiring closet, and central equipment location.
  1. Service and Central Equipment Locations and Wiring Closets: Terminate grounding conductor on a 1/4-by-2-by-12-inch (6-by-50-by-300-mm) grounding bus.
  2. Terminal Cabinets: Terminate grounding conductor on cabinet grounding terminal.

### 3.03 INSTALLATION

- A. Grounding Conductors: Route along shortest and straightest paths possible, unless otherwise indicated or required by Code. Avoid obstructing access or placing conductors where they may be subjected to strain, impact, or damage.
- B. Common Ground Bonding with Lightning Protection System: Comply with NFPA 780 and UL 96 when interconnecting with lightning protection system. Bond electrical power system ground directly to lightning protection system grounding conductor at closest point to electrical service grounding electrode. Use bonding conductor sized same as system grounding electrode conductor, and install in conduit.
- C. Ground Rods: Drive rods until tops are 2 inches (50 mm) below finished floor or final grade.
  - 1. Interconnect ground rods with grounding electrode conductor below grade and as otherwise indicated. Make connections without exposing steel or damaging coating, if any.
  - 2. For grounding electrode system, install at least two rods spaced at least one-rod length from each other and located at least the same distance from other grounding electrodes, and connect to the service grounding electrode conductor.
- D. Bonding Straps and Jumpers: Install in locations accessible for inspection and maintenance, except where routed through short lengths of conduit.
  - 1. Bonding to Structure: Bond straps directly to basic structure, taking care not to penetrate any adjacent parts.
  - 2. Bonding to Equipment Mounted on Vibration Isolation Hangers and Supports: Install so vibration is not transmitted to rigidly mounted equipment.
  - 3. Use exothermic-welded connectors for outdoor locations, but if a disconnect-type connection is required, use a bolted clamp.
- E. Grounding and Bonding for Piping:
  - 1. Metal Water Service Pipe: Install insulated copper grounding conductors, in conduit, from building's main service equipment, or grounding bus, to main metal water service entrances to building. Connect grounding conductors to main metal water service pipes, using a bolted clamp connector or by bolting a lug-type connector to a pipe flange, using one of the lug bolts of the flange. Where a dielectric main water fitting is installed, connect grounding conductor on street side of fitting. Bond metal grounding conductor conduit or sleeve to conductor at each end.

2. Water Meter Piping: Use braided-type bonding jumpers to electrically bypass water meters. Connect to pipe with a bolted connector.
  3. Bond each above ground portion of gas piping system downstream from equipment shutoff valve.
- F. Bonding Interior Metal Ducts: Bond metal air ducts to equipment grounding conductors of associated fans, blowers, electric heaters, and air cleaners. Install tinned bonding jumper to bond across flexible duct connections to achieve continuity.
- G. Grounding for Steel Building Structure: Install a driven ground rod at base of each corner column and at intermediate exterior columns at distances not more than 60 feet (18 m) apart.
- J. Ufer Ground (Concrete-Encased Grounding Electrode): Fabricate according to NFPA 70, using a minimum of 20 feet (6 m) of bare copper conductor not smaller than No. 4 AWG.
1. If concrete foundation is less than 20 feet (6 m) long, coil excess conductor within base of foundation.
  2. Bond grounding conductor to reinforcing steel in at least four locations and to anchor bolts. Extend grounding conductor below grade and connect to building grounding grid or to grounding electrode external to concrete.

### **3.04 FIELD QUALITY CONTROL**

- A. Testing Agency: Engage a qualified testing and inspecting agency to perform the following field tests and inspections and prepare test reports:
1. After installing grounding system but before permanent electrical circuits have been energized, test for compliance with requirements.
  2. Test completed grounding system at each location where a maximum ground-resistance level is specified, at service disconnect enclosure grounding terminal, and at individual ground rods. Make tests at ground rods before any conductors are connected.
    - a. Measure ground resistance not less than two full days after last trace of precipitation and without soil being moistened by any means other than natural drainage or seepage and without chemical treatment or other artificial means of reducing natural ground resistance.
    - b. Perform tests by fall-of-potential method according to IEEE 81.

3. Prepare dimensioned drawings locating each ground rod and ground rod assembly, and other grounding electrodes. Identify each by letter in alphabetical order, and key to the record of tests and observations. Include the number of rods driven and their depth at each location, and include observations of weather and other phenomena that may affect test results. Describe measures taken to improve test results.

B. Report measured ground resistances that exceed the following values:

1. Power and Lighting Equipment or System with Capacity 500 kVA and Less: 10 ohms.
2. Power Distribution Units or Panelboards Serving Electronic Equipment: 3 ohms.
3. Handhole Grounds: 10 ohms.

C. Excessive Ground Resistance: If resistance to ground exceeds specified values, notify Architect or Engineer of Record promptly and include recommendations to reduce the ground resistance.

**END OF SECTION 260526**

## **SECTION 33 4100 - STORM DRAINAGE SYSTEMS**

### **PART 1 - GENERAL**

#### **1.01 SUMMARY**

A. Section Includes:

Catch basins, drainage pipes; sub-surface drains.

B. Related Sections:

1. Section 312333: Excavating, Backfilling and Compacting for Utilities.
2. Section 311215: Pavement Repair.
3. Section 321313: Site Concrete Work.

#### **1.02 SUBMITTALS**

- A. Shop Drawings: Submit site plan denoting locations of lines, valves, and appurtenances.
- B. Product Data: Manufacturer's catalog data for all required materials. Include technical data for accessories, information concerning gaskets, joints and couplings.
- C. Certificates: Certificates attesting that tests set forth in referenced publication have been performed and the results required by design have been met.

#### **1.03 QUALITY ASSURANCE**

Comply with the following as a minimum requirement: Standard Specifications for Public Works Construction, current edition.

### **PART 2 - PRODUCTS**

#### **2.01 MATERIALS**

- A. Storm Drain Pipe: Provide in conformance with Section 207 - Pipes and Section 208 - Pipe Joint Types and Materials of the Standard Specifications for Public Works Construction.
- B. Concrete, Mortar and Related Materials: Conform to Section 321313: Site Concrete Work.
- C. Metal Covers, Grates, Frames and Accessories:

## **SECTION 33 4100 - STORM DRAINAGE SYSTEMS**

1. Conform to Section 206 - Miscellaneous Metal Items of the Standard Specifications for Public Works Construction.
  2. Hot-dip galvanize steel parts after fabrication and before installation, in accordance with Section 210 - Paint and Protective Coating of the Standard Specifications for Public Works Construction.
  3. Grates and Frames: Vandal-proof design and construction.
  4. Precast open bottom catch basin: Jensen 24"x24" drop inlet. See C-2.0.
- D. Bedding Material for Pipe: Conform to the requirements of Section 312333: Excavating, Backfilling and Compacting for Utilities, as required.
- E. Filter Material for Subsurface Drain: Non-woven geotextile filter fabric, Mirafi 14ON, or equal.
- F. Aggregate around Perforated Pipe: 6 inches of gravel containing no particles finer than a 3/8 inch to 1/2 inch sieve opening size.
- G. Manhole Brick Mortar, Grout, and Plaster: Conform to Standard Specifications for Public Works Construction, Section 202 - Masonry Materials.
- H. Precast Storm Water Treatment Unit (SWTU): Conform to Manufacturer's specifications.
- I. FloGard LoPro Trench Drain Filter: Conform to Manufacturer's specifications, or approved equal.

### **PART 3 - EXECUTION**

#### **3.01 EXCAVATION, BACKFILLING AND COMPACTING**

Conform to the requirements of Section 312333: Excavating, Backfilling and Compacting for Utilities, as required.

#### **3.02 INSTALLATION OF PIPE**

- A. Conform to Section 306 - Underground Conduit Construction of the Standard Specifications for Public Works Construction.
- B. Non-ferrous drainpipe installed with less than 12 inches of cover to finish grade shall be provided with a 4 inch thick concrete pipe encasement.

## **SECTION 33 4100 - STORM DRAINAGE SYSTEMS**

### **3.03 DRAINAGE APPURTENANCES**

Catch basins, junction chambers, manholes, box culverts, outlet chambers and other drainage structures: Construct as indicated on Drawings and as specified in Section 321313: Site Concrete Work.

### **3.04 ABANDONED DRAINAGE LINES AND STRUCTURES**

Cap or plug existing drain lines that are cut and abandoned and remove existing drainage structures that are abandoned.

### **3.05 CLEANUP**

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

### **3.06 PROTECTION**

Protect the Work of this section until Substantial Completion.

**END OF SECTION**

## SECTION 33 3100 - SITE SANITARY SEWER SYSTEMS

### PART 1 - GENERAL

#### 1.01 SUMMARY

- A. Provisions of the General and Supplementary Conditions apply to this section.
- B. Section Includes:
  - Site sanitary sewer systems 2 feet away from the building wall, unless noted otherwise, to existing public and/or Project site sanitary sewer.
- C. Related Sections:
  - 1. Section 312333: Excavating, Backfilling and Compacting for Utilities.
  - 2. Section 321313: Site Concrete Work.
  - 3. Section 311215: Pavement Repair.

#### 1.02 SUBMITTALS

- A. Shop Drawings: Submit site plan denoting locations of lines, valves, and appurtenances.
- B. Product Data: Manufacturer's catalog data for materials. Include technical data for accessories, gaskets, joints and couplings.
- C. Certificates: Certificates attesting that tests set forth in referenced publication have been performed and the results required by design have been met.

#### 1.03 QUALITY ASSURANCE

- A. Comply with the following as a minimum requirement:
  - 1. Standard Specifications for Public Works construction, current edition.
  - 2. California Plumbing Code, CPC, current edition.
  - 3. California Administrative Code, Title 22, Section 64630(e)(2).

## SECTION 33 3100 - SITE SANITARY SEWER SYSTEMS

### PART 2 – PRODUCTS

#### 2.01 MATERIALS

##### A. Pipeline:

1. Building or Project site sanitary sewer:
  - a. Cast iron soil, hubless, service weight, with stainless steel-banded hubless coupling. FS WW-P-401, conforms to CISPI 310 and IAPMO IS 6. Manufactured by American Foundry, Tyler, or equal.
  - b. Vitrified clay extra strength with plain end, meeting the requirements of ASTM C 700, installed with mechanical compression couplings. Joints conforming to ASTM C 425. Installation shall be in accordance with ASTM C 12. Manufactured by Mission Clay Products, or equal.
  - c. Acrylonitrile-Butadiene-Styrene Schedule 40 plastic drainpipe and fittings meeting the requirements of ASTM D 2661 and D 3311. Provide ABS solvent cement for piping and joint connections and install in accordance with IAMPO Standards IS 5, 9, and UPC Section 718.

##### B. Cleanout Assemblies: Cleanout plug shall be line size.

1. In covered concrete-paved floors: Iron body with UPC recognized plug, top, and adjustable sleeve, cut-off ferrule, polished brass/nickel/bronze, and secured scoriated cover:

Square:	SMITH	JOSAM	ZURN
	4053	56030-2	Z-1400

Round:	SMITH	JOSAM	WADE	ZURN
	4033	56010-2	W-6000	Z-1400

2. Outside covered concrete-paved floors: Secured cover, extra heavy-duty, adjustable sleeve, cut-off ferrule, UPC recognized brass type plug, scoriated tractor type cover:

SMITH	JOSAM-	ZURN	WADE
4233	56050-2	Z-1402-HD	W-7030-Y

3. In yard boxes: Raised threaded head brass plug. WADE 8590A, or equal.

## **SECTION 33 3100 - SITE SANITARY SEWER SYSTEMS**

- C. Yard Boxes: Brooks No. 3-TL, or equal, with cast-iron locking cover with the word "SEWER," embossed on the cover in one inch high upper case lettering.
- D. Concrete, Mortar and Related Materials: Conform to Section 321313: Site Concrete Work, unless noted otherwise.
- E. Metal Covers, Frames and Accessories:
  - 1. Conform to Section 206 – Miscellaneous Metal Items of the Standard Specifications for Public Works Construction.
  - 2. Metal Covers and Frames: Vandal-resistant design and construction.
  - 3. Hot-dip galvanize steel parts after fabrication and prior to assembly in accordance with Section 210 – Paint and Protective Coating of the Standard Specifications for Public Works Construction.
- F. Bedding Materials: Conform to the requirements of Section 312333: Excavating, Backfilling and Compacting for Utilities, as required.

### **PART 3 – EXECUTION**

#### **3.01 PIPELINE INSTALLATION**

- A. Install pipelines in a uniform alignment and slope to the point of connection as indicated. Before trench excavation, verify size, material, depth, and location of the point of connection.
- B. Unless indicated otherwise, pipe slope shall not be less than 1/4 inch per foot or 2 percent unless pipe inverts are indicated. Where invert elevations are indicated, install pipe at a uniform slope between inverts. Slope may be less upon the review of the Architect.
- C. Join pipes and fittings as recommended by the manufacturer.

#### **3.02 CLEARANCES OF SANITARY PIPELINE**

- A. Buildings or Structures: 2 feet.
- B. Parallel to Water Line:
  - 1. Building sanitary drain, starting 2 feet from the building wall to Project site sanitary sewer or public sewer, is not permitted to be installed in a common trench with the water line unless the bottom of the water line is at least 12 inches above the top of the sewer pipeline.

## **SECTION 33 3100 - SITE SANITARY SEWER SYSTEMS**

2. In addition, the water piping shall be placed on a solid shelf excavated on one side of the common trench with a minimum clear horizontal distance of 12 inches from the sewer or drain line.
3. Project site sanitary sewer, receiving more than one building sanitary drain or acid pipeline, shall be separated from the water line in accordance with the requirements of the State of California, Human and Welfare Agency, Department of Health Services.

### **C. Crossing Water Line:**

1. Building sanitary drain shall be installed a minimum of 12 inches below the water line.
2. Project site sanitary sewer shall be separated from the water main in accordance with the requirements of the State of California Administrative Code, Title 22, Section 64630(e)(2).

### **3.03 MANHOLES**

Provide manholes in accordance with the Standard Plans for Public Works Construction, unless otherwise indicated.

### **3.04 CLEANOUTS**

- A. Provide cleanout at the upper terminal for each sanitary pipeline, at intervals not exceeding 100 feet in straight run and any fraction thereof and for each aggregate horizontal change in direction exceeding 135 degrees.
- B. Install required cleanouts before back filling of horizontal pipelines.
- C. In unpaved and asphalt-paved areas, install cleanouts in yard boxes 2 inches below the yard box cover.
- D. In concrete-paved areas, extend cleanouts flush with finish grade.
- E. In traffic areas, install countersunk cleanout plugs where raised heads protrude.

### **3.05 ABANDONED SEWERS AND STRUCTURES**

Plug or cap every abandoned sanitary pipeline within 5 feet of the property line in a code required manner.

### **3.06 TESTING**

- A. After installation, test each sanitary pipeline and each section of the pipeline between successive manholes for either infiltration or exfiltration.

## **SECTION 33 3100 - SITE SANITARY SEWER SYSTEMS**

Test shall be conducted in accordance with Section 306 - Underground Conduit Construction of the Standard Specifications for Public Works Construction.

- B. Where excessive ground water is encountered test the pipeline for infiltration.
- C. When infiltration or exfiltration exceeds allowable amounts as set forth in the Section 306 formula, perform repairs or replacements as necessary to comply with the required limits.

### **3.07 PROTECTION**

Protect the Work of this section until Substantial Completion.

### **3.08 CLEANUP**

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

**END OF SECTION**

## SECTION 33 1100 - SITE WATER DISTRIBUTION SYSTEMS

### PART 1 - GENERAL

#### 1.01 SUMMARY

- A. Provisions of the General and Supplementary Conditions apply to this section.
- B. Section Includes:
  - 1. Site water distribution systems located at least 5 feet outside the building perimeter, extending to an existing water line or meter.
- C. Related Sections:
  - 1. Section 312333: Excavating, Backfilling and Compacting for Utilities.
  - 2. Section 333100: Site Sanitary Sewer.
  - 3. Section 311215: Pavement Repair.
  - 4. Section 321313: Site Concrete Work

#### 1.02 SUBMITTALS

- A. Shop Drawings: Submit site plan indicating locations of lines, valves, and related appurtenances.
- B. Product Data: Manufacturer's catalog data for materials. Include technical data for accessories, gaskets, joints and couplings.
- C. Certificates: Certificates attesting that tests set forth in referenced publications have been performed, and the performance requirements have been satisfied.

#### 1.03 QUALITY ASSURANCE

- A. Comply with the following as a minimum requirement:
  - 1. ANSI:
    - a. ANSI B16.18 Cast Copper Alloy Solder Joint Pressure Fittings.
    - b. ANSI B18.5.2.1M Metric Round Head Short Square Neck Bolts.

## SECTION 33 1100 - SITE WATER DISTRIBUTION SYSTEMS

2. ASME:
  - a. ASME B16.3 Malleable Iron Threaded Fittings.
  - b. ASME B16.4 Cast Iron Threaded Fittings.
  - c. ASME B16.22 Wrought Copper and Copper Alloy Solder Joint Pressure Fittings.
  - d. ASME B16.26 Cast Copper Alloy Fitting for Flared Copper Tubes.
  - e. ASME B18.2.2 Square and Hex Nuts (Inches Series).
  - f. ASME B18.5.2M Metric Round Head Square Neck Bolts.
3. ASTM:
  - a. ASTM A 47 Ferric Malleable Iron Castings.
  - b. ASTM A 48 Gray Iron Castings.
  - c. ASTM A 53 Pipe, Steel, Black and Hit-Dipped, Zinc-Coated Welded and Seamless.
  - d. ASTM A 307 Carbon Steel bolts and Studs, 60,000 psi Tensile Strength.
  - e. ASTM A 563 Ductile Iron Castings.
  - f. ASTM A 563 Carbon and Alloy Steel Nuts.
  - g. ASTM B 61 Steam or Valve Bronze Castings.
  - h. ASTM B 62 Composition Bronze or Ounce Metal Castings.
  - i. ASTM B 88 Seamless Copper Water Tube.
  - j. ASTM C 94 Ready-Mixed Concrete.
  - k. ASTM D 1527 Acrylonitrile-Butadiene-Styrene (ABS) Plastic Pipe, Schedules 40 and 80.
  - l. ASTM D 1785 Poly Vinyl Chloride (PVC) Plastic Pipe, Schedules 40, 80 and 120.
  - m. ASTM D 2235 Solvent Cement for ABS Plastic Pipe, and Fittings.

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- n. ASTM D 2241 PVC Plastic Pipe Fittings, Schedule 40.
  - o. ASTM D 2282 ABS Plastic Pipe.
  - p. ASTM D 2466 PVC Plastic Pipe Fittings, Schedule 40.
  - q. ASTM D 2468 ABS Plastic Pipe Fittings, Schedule 40.
  - r. ASTM D 2564 PVC Plastic Piping Systems.
  - s. ASTM D 2774 Underground Installation of Thermoplastic Pressure Piping.
  - t. ASTM D 2855 Making Solvent-Cemented Joints with PVC Pipe and Fittings.
  - u. ASTM D 3139 Joints Pressure Pipes Using Flexible Elastomeric Seals.
  - v. ASTM F 402 Safe Handling Of Solvent Cements, Primer and Cleaners Used for Joining Thermoplastic Pipes and Fittings.
  - w. ASTM F 477 Elastomeric Seals for Joining Plastic Pipes.
4. American Water Works Association (AWWA) Standards:
- a. AWWA C104/A21.4 Cement-Mortar Lining For Ductile-Iron Pipe and Fittings For Water
  - b. AWWA C110/A21.10 Ductile-Iron and Gray-Iron Fittings, 3 inches through 48 inches, for Water and Other Liquids.
  - c. AWWA C111/A21.11 Rubber-Gasket Joints for Ductile-Iron pressure Pipe and Fittings.
  - d. AWWA C153/A21.53 Ductile-Iron Compact Fittings, 3 inches through 16 inches, for Water and Other Liquids.
  - e. AWWA C500 Gate Valves for Water and Sewerage Systems.
  - f. AWWA C503 Wet- Barrel Fire Hydrants.
  - g. AWWA C508 Swing-Check Valves for Waterworks Service, 2 inches through 24 inches NPS.
  - h. AWWA C509 Resilient-Seated Gate Valves for Water and Sewerage Systems.

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- i. AWWA C511 Reduced-Pressure Principal Backflow-Prevention Assembly.
  - j. AWWA C600 Installation of Ductile-Iron Water Mains and Their Appurtenances.
  - k. AWWA C651 Disinfecting Water Mains.
  - l. AWWA C 800 Underground Service Line valves and Fittings.
  - m. AWWA C900 PVC Pressure Pipe, 4 inches through 12 inches, for Water Distribution.
  - n. AWWA M23 PVC Pipe - Design and Installation.
5. Manufacturers Standardization Society (MSS) of the Valve and Fittings Industry:
- a. MSS SP-80 Bronze Gate, Globe, Angle and Check Valves.
6. Uni-Bell PVC Pipe Association (UBPPA):
- a. UBPPA UNI-B-3 Installation of PVC Pressure Pipe.
  - b. UBPPA UNI-B-8 Direct Tapping of PVC Pressure Water Pipe.
  - c. UBPPA UNI-B-13 Standard Performance Specification on joined restrained devices for use with Poly Vinyl Chloride (PVC) Pipe.
7. Underwriters Laboratories Inc. (UL):
- a. UL 246 Hydrants for Fire-Protection Service.
  - b. UL 262 Gate Valves for Fire-Protection Service.
  - c. UL 312 Check Valves for Fire-Protection Service.
  - d. UL 789 Indicator Posts for Fire-Protection Service.
- B. Provide all valves from the same manufacturer.

### 1.04 PRODUCT HANDLING

- A. Store items above ground on platforms, skids, or other required supports.
- B. Protect materials from direct sunlight.

## SECTION 33 1100 - SITE WATER DISTRIBUTION SYSTEMS

- C. Protect coating and linings on piping, fittings, and accessories from damage. Repair and/or replace damaged coatings or linings.

### PART 2 - PRODUCTS

#### 2.01 MATERIALS

- A. Pipe:
  - 1. Pipe sizes up to 5 inches shall be copper water tubes, Type L hard, ANSI H23.1, ASTM B 88, IAPMO IS. Muller Brass, Cambridge-Lee Halstead, or equal. If required by soil conditions, provide Type K.
  - 2. Pipe sizes 6 inches and larger shall be PVC water main pipe material complying with ASTM D 1784 Cell Class 12454B and AWWA C900. Piping shall be plain end or gasket bell end, pressure class 200 (DR14) with cast iron pipe equivalent OD.
- B. Poly Vinyl Chloride (PVC) Water Main Fittings shall be gray-iron or ductile iron conforming to AWWA C110/A21.10 or AWWA C153/A21.53 and shall have cement mortar lining conforming to AWWA C104/A21.4, standard thickness unless otherwise indicated on Drawings. Fittings shall be mechanical joints.
- C. PVC Joints and Jointing Materials:
  - 1. Pipe joints shall be push on as specified in ASTM D 3139.
  - 2. Joints between pipe and metal fittings, valves, and other accessories shall be mechanical joints as specified in AWWA C111/A21.11.
  - 3. Provide each joint connection with an elastomeric gasket suitable for the bell or coupling installation.
  - 4. Gaskets for push on joints for pipe shall conform to ASTM F 477.
  - 5. Gaskets for push on joints and compression type joints or mechanical joints for connections between pipes and metal fittings, valves, and other accessories shall be as specified in AWWA C111/A21.11.
  - 6. Sleeve-type mechanically coupled joints may be provided instead of push-on joints on plain-end PVC plastic joints. Comply with requirements of ASTM D 3139.
- D. Gates Valves for PVC:

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1. Non-rising stem type with double disc gates and mechanical joint ends conform to AWWA C500.
2. Non-rising stem type with mechanical joints ends shall conform to AWWA C509.
3. Valves designed for a working pressure of 175 psi shall be inside-screw type with operating nut, double disc or spit wedge type gate. Valve shall be provided with mechanical joints as required for the pipe to which it is intended to connect.
4. Valves with UL listing of 262 shall conform to AWWA C500. Valves shall open by counter-clockwise rotation of valve stem.
5. Stuffing boxes shall be provided with O-ring stem seals and shall be bolted and constructed to permit easy removal of parts for repair.
6. Sleeve type mechanical couplings may be provided instead of mechanical and push on joint ends.
7. Valve ends and gaskets for connection to sleeve type mechanical couplings shall conform to specified requirements for the joint or coupling.

### E. Gate Valves in Valve Pits:

1. Outside screw and yoke rising stem type valves with double disc gates and flanged ends shall conform to AWWA C500.
2. Outside screw and yoke rising stem type valves with flanged ends shall conform to AWWA C509.
3. Outside screw and yoke type Valves with double disc gates or split-wedge type gate and flanged ended ends shall be designed for 175 psi and conform to UL 262.
4. Provide valves with hand wheels that open by counterclockwise rotation of the valve stem.
5. Stuffing boxes shall be provided with O-ring stem seals and shall be bolted and constructed to permit easy removal of parts for repair.

### F. Check Valves for PVC:

1. Valves shall be swing-check type conforming to AWWA C508 or UL 312.

## SECTION 33 1100 - SITE WATER DISTRIBUTION SYSTEMS

2. Valves shall be provided with cast iron or steel body and cover, flanged ends and clear port opening.
  3. Valves shall be designed for a working pressure of 175 psi.
- G. Valve Boxes: Valve boxes shall be cast iron and painted with bituminous paint. Shaft shall be adjustable with the word "WATER" cast on the valve box cap. Box shaft shall be 5-1/4 inches minimum diameter. Provide either pedestrian or vehicular traffic type as required. Valve boxes shall be as manufactured by Alhambra Foundry Company, or equal.
- H. Mechanical Thrust Restraint:
1. Restraint shall be incorporated into the follower gland.
  2. Restraint shall consist of individually actuated wedges that increase resistance to pull out as pressure or external forces increase.
  3. Gland shall be ductile iron conforming to ASTM A 536.
  4. Provide twist off nuts and tee-head bolts of the same size to ensure proper actuating of restraint devices.
  5. Restraining device shall be provided with pressure rating equal to that of the pipe on which it is installed.
  6. Restraining gland shall be UL listed.
  7. Mechanical thrust restraint devices shall be EBAA Iron Megalug, or equal.
- I. Restraint Device Adapters:
1. Restrained flange adapters shall be provided instead of threaded or welded flange spool pieces on plain end of ductile iron or PVC pipe.
  2. Flange adapters shall be manufactured of ductile iron conforming to ASTM A 536 and be provided with flange bolt circles compatible with ANSI/AWWA C115/A21.15.
  3. Restraint of flange adapter shall consist of a multiple number of individually actuated gripping wedges to maximize restraint capability.
  4. Torque limiting actuating screws shall be provided to insure proper initial set of gripping wedges.
  5. Flange adapter shall be capable of deflection during assembly or permit lengths of pipe to be field cut to allow at least 0.6 inch of gap

## SECTION 33 1100 - SITE WATER DISTRIBUTION SYSTEMS

- between end of pipe and mating flange without affecting integrity of seal.
6. Flange adapter shall be provided with a safety factor of at least 2:1 for rated pressure.
  7. Restraint device adapters shall be EBAA Iron Megaflange, or equal.
- J. Tracer Wire for Nonmetallic Pipes: Tracer wires shall be electrically continuous #14 copper or aluminum tracer wire, Type TW, blue plastic covered for domestic water and red for fire sprinkler. Provide in sufficient length to be continuous over each installed section of nonmetallic pipe.
- K. Pipe markers shall be a concrete plaque inscribed with the word "WATER."
- L. Water Service Line Materials:
1. Copper Tubing: Copper tubing shall conform to ASTM B 88, Type L.
  2. Fittings for Copper Tubing: Fittings for solder-type joints shall conform to ANSI B16.18 or ASME/ANSI B16.22. Fittings for compression-type joints shall conform to ASME/ANSI B16.26, flared tube type.
  3. Water Service Line Appurtenances:
    - a. Corporation stops shall be ground key type; manufactured of bronze conforming to ASTM B 61 or ASTM B 62; and suitable for the working pressure of the system. Ends shall be suitable for solder-joint or flared tube compression type joint connection. Threaded ends for inlet and outlet of corporation stops shall conform to AWWA C800; coupling nut for connection to flared copper tubing and shall conform to ASME/ANSI B16.26.
    - b. Goosenecks shall be type K copper tubing. Joint ends for goosenecks shall be as required for connecting to corporation stop and service line. Where multiple gooseneck connections are required for individual service, connect goosenecks to service line through brass or bronze branch connection; the total clear area of branches shall be at least equal to clear area of service line. Length of goosenecks shall be as indicated or required.
    - c. Curb of service stops shall be ground key, round way, inverted key type; bronze, conforming to ASTM B 61 or

## SECTION 33 1100 - SITE WATER DISTRIBUTION SYSTEMS

ASTM B 62; and rated at 150 psi. Ends shall be as required for connection to service piping. Arrow shall be cast into body of curb or service stop indicating direction of flow.

- d. Gate valves 3 inches and smaller shall be MSS SP-80, Class 150, solid wedge, and non-rising stem. Valves shall be provided with flanged end connections, or threaded end connections with union on one side of valve. Provide hand wheel operators.
  - e. Gate valves in valve pits, smaller than 3 inches, shall be MSS SP-80, Class 150, solid wedge, inside screw, rising stem. Valves shall be provided with flanged end connections or threaded end connections with union on one side of valve and hand wheel operator.
  - f. Valve boxes shall be provided at each gate valve. Valve boxes shall be as of size suitable for valve on which it is installed.
- M. Water meter indicated on Drawings will be installed by water purveyor for the area, unless noted otherwise.

N. Strainers:

STR-1 Description: Wye type with monel or stainless steel strainer cylinder (manufacturer's standard mesh), and gasketed machine strainer cap. Where indicated on Drawings, provide with valved (globe valve) blow out piping, same size as blow out plug:

2" and smaller: C.M. Bailey #100-A, 250 lb., cast iron body, threaded, Keckley 'B'.

2 1/2" and larger: C.M. Bailey #100-A, 125 lb., cast iron body, flanged.

C.M.BAILEY ARMSTRONG      MUESSCO      KECKLEY 'A'

STR-2 "Y" pattern, cast iron bodies, 125 psi, monel screen 16sq. mesh. Open area at least twice the cross-sectional area of IPS pipe in which strainer is installed and may be woven wire or perforated type. Screwed ends for sizes up to 2", flanged ends for 2 1/2" and larger perforations, in accordance with the following:

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BAILY #100 ARMSTRONG RP & C KECKLEY

STR-3 Flanged, bucket type, semi-steel body, 125 psi, stainless steel screen with 1/8" diameter perforations (mounted above grade for water service). All sizes:

BAILEY #1 ZURN 150 Series RP 7 C KECKLEY GFV

### O. Backflow Preventer Assemblies:

1. Assembly shall be provided with flanged connections, galvanized cast-iron or epoxy coated construction.
2. Backflow preventer shall be suitable for cold water working pressure of 175 psi.
3. Internal parts shall be designed for replacement without removing valves from line.
4. Reduced pressure backflow preventer assembly shall consist of two check valves located between two shut-off valves with an area of reduced pressure between two check valves and a relief device arranged to discharge to atmosphere.
  - a. Assembly shall be 2" Watts LF009M2PCQT per City of Long Beach Standards.
  - b. Fluctuation in piping pressure shall not cause cycling. Backflow preventer shall automatically maintain low pressure zone to positively prevent backflow of water into system. Assembly shall automatically indicated failure of any part vital to backflow prevention by the continuous discharge relief device.
5. Backflow preventer devices shall be tested and certified by the water agency having jurisdiction. Testing shall be performed in the presence of the IOR.

## PART 3 - EXECUTION

### 3.01 EXCAVATION, BACKFILLING AND COMPACTING

Conform to requirements in Section 312333: Excavation, Backfilling and Compacting for Utilities

## SECTION 33 1100 - SITE WATER DISTRIBUTION SYSTEMS

### 3.02 PIPE INSTALLATION

Project site water lines shall terminate approximately 5 feet from buildings, unless otherwise indicated on Drawings. Temporarily cap or plug terminals for future connection to building.

### 3.03 CLEARANCES OF WATER LINE

- A. Building or Structures: 2 feet.
- B. Parallel to Sewer Line:
  - 1. Water line 5 inches or less in diameter shall not be installed in a common trench with the building sanitary drain unless the bottom of the water line is at least 12 inches above the top of the building sanitary drain or where the water line is installed on a solid shelf excavated on one side of the common trench with a minimum clear horizontal distance of 5 feet from the building sanitary drain.
  - 2. Water mains larger than 5 inches in diameter shall be separated from the Project site sanitary sewer, receiving more than one building sanitary drain or acid pipeline, in accordance with the requirement of the State of California, Human and Welfare Agency, Department of Health Services.
- C. Crossing Sewer Line:
  - 1. A water main shall be separated from sanitary sewer in accordance with the requirements of the State of California Administrative Code, Title 22, Section 64630(e)(2), unless modified herein.
  - 2. Install water main a minimum of 12 inches clear above a sanitary sewer.
  - 3. A water main greater than 5 inches in diameter, crossing under a Project site sanitary sewer line, shall be installed with all their joints located at least 10 feet away from each side of the sanitary sewer line.
  - 4. A water main greater than 5 inches in diameter, crossing over a Project site sanitary sewer line, shall be installed with all their joints located at least 4 feet away from each side of the sanitary sewer line.
- D. Install all water mains no closer than 10 feet horizontally clear from the edge of sewage leach fields, seepage pits and septic tanks.

## SECTION 33 1100 - SITE WATER DISTRIBUTION SYSTEMS

### 3.04 PIPE INSTALLATION AND JOINING

- A. Remove fins and burrs from pipe and fittings.
- B. Clean piping, fitting, valves, and accessories before installing. Maintain items in a clean condition.
- C. Provide proper facilities for lowering sections of pipe into trenches. Do not drop into piping, fittings, or other materials into trenches. Accurately cut pipe and install without springing or forcing. Replace any piping or fitting that does not provide sufficient space for proper installation of joining material.
- D. Blocking or wedging between bells and spigots is not permitted. Install bell and spigot pipe with bell end pointing in the direction of flow.
- E. Install piping to the lines and grades indicated or required. Low points and dips are not permitted. Support piping at proper elevation and grade with secure and uniform supports. Wood support blocking is not permitted. Where sand cement slurry will not be furnished for backfill, install piping so that full length of each section of pipe and each fitting will solidly rest on pipe bedding. Excavate recesses to accommodate bells, joints, and couplings. Provide anchors and supports where indicated or required for installation. Provide proper allowances and devices for expansion and contraction of piping and systems.
- F. Maintain trenches free of standing water until pipe joints have been installed.
- G. At the end of each day close open ends of pipe with temporary wood blocks or bulkheads.
- H. Do not install piping when trench or weather conditions prevent proper installation.

### 3.05 INSTALLATION OF TRACER WIRE AND PIPE MARKERS

- A. Tracer Wire: Install continuous length of tracer wire for full length of each run of nonmetallic pipe. Fasten wire to top of pipe in such a manner that it will not be displaced during construction operations. Wire shall be fastened to pipe at not greater than 20-foot intervals. Wire shall terminate above finished grade with a 12 inch lead taped around each riser. Provide a tracer wire to grade under a permanent marker where straight-line transitions of metallic to non-metallic pipe are installed.
- B. Underground Pipe Markers: Provide markers at grade where non-metallic pipe is installed and for each horizontal change in direction.

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### 3.06 CONNECTIONS TO EXISTING WATER LINES

- A. After IOR has inspected installation, perform connections to servicing water lines. Schedule connection to provide the minimum interruption of existing services.
- B. Provide a tap or drilling machine with valve and mechanical joint type sleeves for connections to waterlines under pressure.
- C. Bolt sleeves around mains; bolt valve conforming to AWWA C500 to branch. Open valve, attach drilling machine, perform tap, close valve, and remove drilling machine, without interruption of service. Notify the IOR in writing at least 5 days prior to the date of scheduled connections.

### 3.07 INSTALLATION OF VALVES

- A. Provide gate valves conforming to AWWA C 500 and UL 262 in accordance with AWWA C600 for valve and fitting installation and with recommendations of AWWA C500 Appendix "Installation, Operation, and Maintenance of Gate Valves".
- B. Provide gate valves conforming to AWWA C 600 in accordance with AWWA C 509 for valve and fitting installation and with recommendations of AWWA C 500 Appendix "Installation, Operation, and Maintenance of Gate Valves".
- C. Provide gate valves on PVC mater mains in accordance with AWWA M23 Chapter 7, "Installation."
- D. Provide check valves and fittings in accordance with applicable requirements of AWWA C600 unless noted otherwise on the Drawings.
- E. Provide gate and check valve joints as specified for the type of joints between pipe and fittings.

### 3.08 INSTALLATION OF HYDRANTS

- A. Install hydrants according to requirements of AWWA C 600 for hydrant installation and as indicated. Provide joints as specified for the type of joints between pipe and fittings.
- B. Install hydrant on a 6-inch key gate valve at least 4 feet, but no more than 10 feet from the hydrant.

### 3.09 INSTALLATION OF BACKFLOW PREVENTERS

Install in accordance with manufacturer's recommendations.

## SECTION 33 1100 - SITE WATER DISTRIBUTION SYSTEMS

### 3.10 WATER SERVICE LINE CONNECTION TO WATER MAINS

- A. Connect service line to main by corporation stop and gooseneck. Install service stop as indicated on the Drawings. Connect service lines to PVC plastic water mains in accordance with UBPPA UNI-B8 and AWWA M23, Chapter 9, "Service Connections".
- B. Special Requirements for Plastic Piping: Unless otherwise indicated, install pipe and fittings in accordance with ASTM D 2774 and ASTM D 2855. Handle solvent cements for plastic pipe jointing in accordance with ASTM F 402. Install joints according to ASTM D 2855. Install other joints to materials other than pipe materials in accordance with plastic pipe manufacturer's recommendations.
- C. Connect plastic pipe service lines to corporation stops and gate valves according to plastic pipe manufacturer's recommendations.

### 3.11 INSTALLATION OF STRAINERS:

Strainers shall be installed on each water main downstream of the meter, above grade, when a pressure regulator assembly is not provided. Main strainer shall be "Y" flange type.

### 3.12 DISINFECTION OF DOMESTIC WATER PIPING SYSTEM

- A. When water piping has been installed and tested, sterilize system before use and/or Substantial Completion.
- B. Inject solution of liquid chlorine or sodium hypochlorite and water containing at least 50 PPM of free chlorine into a system in a manner to ensure that entire system is completely filled with solution. During this procedure operate valves and test outlets for residual chlorine. Continue injection until outlets indicate at least 59 PPM of free chlorine.
- C. After injection, isolate system and hold solution in retention for a period of at least 8 hours. Perform tests for residual chlorine after retention. If such tests indicate less than 50 PPM of residual chlorine, repeat entire procedure. After satisfactory sterilization has been verified, flush entire system until all traces of chlorine have been removed or until chlorine content is no greater than in existing water supply.

### 3.13 ELECTROLYSIS PREVENTION

- A. Insulating (dielectric) couplings or 6-inch long brass nipples shall be installed at locations specified or as required. Dielectric insulators shall be provided to insulate dissimilar metal to metal contact. Flanges shall be provided with a complete insulating component consisting of gasket bolt

## **SECTION 33 1100 - SITE WATER DISTRIBUTION SYSTEMS**

sleeves and bolt washers. Dielectric insulators shall be installed at locations indicated or as required.

- B. Where steel or cast iron below grade connects to copper or brass piping above grade, the transition from steel or cast iron pipe to copper or brass pipe shall be installed in an above grade accessible location.
- C. Underground dielectric connections shall be in accessible yard boxes.
- D. Above ground dielectric connections shall be exposed.

### **3.14 ABANDONING WATER LINES AND STRUCTURES**

- A. Water lines and all appurtenances to be abandoned in place shall be cut and removed from all areas where new Work is being installed.
- B. Cap or plug abandoned existing drain lines in a code recognized manner.

### **3.15 TESTS AND INSPECTIONS**

- A. Provide labor, equipment, materials, test equipment and incidentals required for performing required field tests.
- B. Tests shall not be performed for 5 days after concrete thrust blocks have been installed.
- C. Testing Procedure: Water mains and service lines shall be tested in accordance with applicable specified standard.
  - 1. Test water service lines in accordance with applicable requirements of AWWA C 600. No leakage is permitted.
  - 2. Pressure testing: Before pressure test, soak portion of piping being tested with water for a minimum of 24 hours. Provide hydrostatic pressure of 50 psi greater than the maximum working pressure of tested system. Provide 200 psi hydrostatic test pressure for system piping of 2 inches in diameter and larger. Provide and maintain test pressure for at least 2 hours. Leakage test may be performed at same time as the pressure test.

### **3.16 CLEANING**

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

**SECTION 33 1100 - SITE WATER DISTRIBUTION SYSTEMS**

**3.17 PROTECTION**

Protect the Work of this section until Substantial Completion.

**END OF SECTION**

## SECTION 32 1313 - SITE CONCRETE WORK

### PART 1 - GENERAL

#### 1.01 SUMMARY

- A. Section Includes:
  - 1. Portland cement concrete pavement and cement walks.
- B. Related Sections:
  - 1. Section 312000: Excavating, Backfilling and Compacting for Pavement.
  - 2. Section 321122: Base Course.
  - 3. Section 331100: Site Water Distribution Systems.
  - 4. Section 333100: Site Sanitary Sewer Systems.

#### 1.02 SUBMITTALS

- A. Shop Drawings: Submit plans, elevations and details of concrete site Work.
- B. Product Data: Submit mix designs and manufacturer's technical data for materials and products. Submit 3" x 3" concrete Sample of each specified color
- C. Material Sample: Submit one concrete bumper to the IOR for destructive testing.

#### 1.03 QUALITY ASSURANCE

Comply with Standard Specifications For Public Works Construction.

### PART 2 - PRODUCTS

#### 2.01 MATERIALS

- A. Concrete, Mortar and Related Materials: Comply with applicable provisions of Standard Specifications for Public Works Construction, Section 201 - Concrete, Mortar and Related Materials:
  - 1. Concrete: 28-day compressive strength 2,500 psi, unless specified otherwise.
  - 2. Reinforcing Mesh: ASTM A 185, 4x4/W1.4 x W1.4 welded wire mesh.

## **SECTION 32 1313 - SITE CONCRETE WORK**

3. Expansion Joint Filler: Preformed expansion joint filler, bituminous type, complying with ASTM D 994.
- B. Form Materials:
1. Side forms: Douglas fir, Construction Grade or Better or metal forms.
  2. Stakes: Douglas fir, Construction Grade or Better or metal stakes.

### **PART 3 - EXECUTION**

#### **3.01 CONSTRUCTION OF FORMS FOR CAST-IN-PLACE STRUCTURES**

- A. Concrete Pavement: Install Portland cement concrete pavement in compliance with the Standard Specifications for Public Works Construction, Section 302- Roadway Surfacing.
- B. Miscellaneous Exposed Concrete: Install concrete curbs, walks, gutters, cross gutters, access ramps, driveways, catch basins, yard boxes, vaults and similar structures, in compliance with the Standard Specifications for Public Works Construction, Section 303 - Concrete and Masonry Construction.
- C. Exposed Concrete Bases: Install bases, such as for post, flagpole, light standards and similar bases, in compliance with the Standard Specifications for Public Works Construction, Section 303 - Concrete and Masonry Construction.
- D. Post, flagpole, light standard footings below grade, underground conduit bedding, encasements, thrust blocks and similar structures may be placed directly in excavations conforming to the required sizes.
- E. Reinforcement installation and concrete placement, surface finishes, curing and removal of forms shall be performed in compliance with applicable provisions of Standard Specifications for Public Works Construction, Section 303 - Concrete and Masonry Construction. Provide heavy broom finish at slopes exceeding six (6) percent and medium broom finish at slopes up to six (6) percent.

#### **3.02 CLEAN UP**

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

#### **3.03 PROTECTION**

Protect the Work of this section until Substantial Completion.

**SECTION 32 1313 - SITE CONCRETE WORK**

**END OF SECTION**

## SECTION 32 1122 - BASE COURSE

### PART 1 - GENERAL

#### 1.01 SUMMARY

A. Section Includes:

Installation of base material for on-grade walkways.

#### 1.02 SUBMITTALS

- A. Product Data: Submit material source, technical information and test data for base materials. Gradation and quality certifications shall be dated within 30 days of the submittal.
- B. Sample: Submit Sample of proposed base course material.

#### 1.03 QUALITY ASSURANCE

Comply with the following as a minimum requirement: Standard Specifications for Public Works Construction, current edition.

### PART 2 - PRODUCTS

#### 2.01 UNTREATED BASE MATERIALS

- A. The following base materials are classified, in order of preference, in conformance with the requirements of Standard Specifications for Public Works Construction: Section 200 - Rock Materials.
1. Crushed aggregate base or crushed slag base.
  2. Crushed miscellaneous base.
  3. Processed miscellaneous base.
  4. Select sub-base.
  5. Disintegrated Granite Base: Conforming to requirements of the Standard Specifications for Public Works Construction: Section 400 - Alternate Rock Products, Asphalt Concrete, Portland Cement Concrete and Untreated Base Material.

#### 2.02 MATERIAL APPROVAL

Base material shall be reviewed by the IOR before installation., The Owner may choose to have additional tests performed by a geotechnical engineer, retained by the owner before installation

## SECTION 32 1122 - BASE COURSE

### PART 3 - EXECUTION

#### 3.01 INSTALLATION

- A. Install base course material in layers not exceeding 4 inches in thickness, unless required otherwise. Grade and compact to indicated levels or grades, cut and fill, water and roll until the surface is hard and true to line, grade and required section. Provide a relative compaction of at least 95 percent, unless otherwise required.
- B. Grade base course to elevations indicated on Drawings, ready to receive surfacing.

#### 3.02 PROTECTION

Protect the Work of this section until Substantial Completion.

#### 3.03 CLEANUP

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

**END OF SECTION**

## SECTION 31 6213 - CONCRETE PILES

### PART 1 - GENERAL

#### 1.01 RELATED DOCUMENTS

Drawings and general provisions of the Contract apply to this Section.

#### 1.02 SUMMARY

Section includes solid, precast, prestressed concrete piles.

#### 1.03 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: For concrete piles. Prepared by or under the supervision of a qualified professional engineer detailing fabrication and lifting devices necessary for handling and driving piles.

1. Indicate pile dimensions, cross sections, locations, and sizes. Show details of pile splices and shoes.
2. Indicate types of reinforcement, including prestressing strand, and detail fabricating, bending, and placing.
3. Indicate layout and dimensions, and identify each pile. Indicate welded connections by AWS standard symbols. Detail cast-in hardware.
4. Indicate transportation, storage, and lifting points.
5. Include arrangement of static pile reaction frame, test and anchor piles, equipment, and instrumentation. Submit structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

C. Delegated-Design Submittal: For concrete piles.

Indicate compliance with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

#### 1.04 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer manufacturer professional engineer and testing agency.

B. Welding certificates.

C. Design Mixes: For each concrete mix.

## SECTION 31 6213 - CONCRETE PILES

- D. Material Certificates: For steel reinforcements, prestressing strand and concrete admixtures.
- E. Material Test Reports: For concrete materials.
- F. Pile-Driving Records: Submit within three days of driving each pile.
- G. Field quality-control reports.

### 1.05 QUALITY ASSURANCE

#### A. Manufacturer Qualifications:

1. Engineering Responsibility: Assumes engineering responsibility to comply with requirements in "Performance Requirements" Article by engaging a qualified professional engineer to prepare design calculations, Shop Drawings, and other structural data for piles.
2. PCI Plant Certification Program: Participates in PCI's Plant Certification Program and is designated a PCI-Certified Plant for B2 and C2 product group and category, or better.

#### B. Installer Qualifications: An authorized representative who is trained and approved by manufacturer.

Installer's responsibility includes engaging a qualified professional engineer to prepare pile-driving records.

#### C. Testing Agency Qualifications: Qualified according to ASTM C 1077 and ASTM E 329 for testing indicated and accredited by IAS or ILAC Mutual Recognition Arrangement as complying with ISO/IEC 17025.

#### D. Design Practices: Comply with ACI 318 (ACI 318M) and the recommendations in PCI Committee Report: "Recommended Practice for Design, Manufacture and Installation of Prestressed Concrete Piling."

#### E. Quality-Control Standard: For manufacturing procedures and testing requirements, quality-control recommendations, and dimensional tolerances for piles, comply with applicable requirements in PCI MNL-116, "Manual for Quality Control for Plants and Production of Structural Precast Concrete Products."

#### F. Comply with requirements in ACI 301, "Specifications for Structural Concrete."

#### G. Welding Qualifications: Qualify procedures and personnel according to the following:

1. AWS D1.1/D1.1M, "Structural Welding Code - Steel."

## SECTION 31 6213 - CONCRETE PILES

2. AWS D1.4/D1.4M, "Structural Welding Code - Reinforcing Steel."

### 1.06 DELIVERY, STORAGE, AND HANDLING

- A. Deliver piles to Project site in such quantities and at such times to ensure continuity of installation. Handle and store piles at Project site to prevent cracking, distorting, warping, or other physical damage, and so markings are visible.
- B. Lift and support piles only at designated lifting or supporting points as shown on Shop Drawings.

### 1.07 FIELD CONDITIONS

- A. Protect structures, underground utilities, and other construction from damage caused by pile driving.
- B. Site Information: A geotechnical report has been prepared for this Project and is referenced elsewhere in the Project Manual for information only.
- C. Preconstruction Photographs: Inventory and record the condition of adjacent structures, underground utilities, and other construction. Document conditions that might be misconstrued as damage caused by pile driving.

## PART 2 - PRODUCTS

### 2.01 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Engage a qualified professional engineer to design piles, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.
- B. Structural Performance: Piles shall withstand transportation, erection, and driving stresses and design loads within limits indicated and under conditions existing at Project site.

### 2.02 MOLD MATERIALS

Molds: Provide molds of metal, plastic, wood, or another material that is nonreactive with concrete and that produces required finish surfaces.

### 2.03 STEEL REINFORCEMENT

- A. Reinforcing Bars: ASTM A 615/A 615M, Grade 60 (Grade 420); deformed.
- B. Low-Alloy-Steel Reinforcing Bars: ASTM A 706/A 706M.
- C. Deformed-Steel Wire: ASTM A 496/A 496M.

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### 2.04 PRESTRESSING TENDONS

Prestressing Strand: ASTM A 416/A 416M, Grade 250 or 270 (Grade 1725 or 1860); uncoated, seven-wire, low-relaxation strand.

### 2.05 CONCRETE MATERIALS

A. General: Limit water-soluble chloride ions in concrete to the maximum percentage by mass of cementitious material permitted by ACI 318 (ACI 318M), but not more than 0.06 percent.

B. Portland Cement: ASTM C 150/C 150M, Type II, of same type, brand, and source.

1. Fly Ash: ASTM C 618, Class C or F.
2. Silica Fume: ASTM C 1240, amorphous silica.

C. Normal-Weight Aggregates: Except as modified by PCI MNL-116, ASTM C 33/C 33M, with coarse aggregates complying with Class 4S. Provide aggregates from single source.

Nominal Maximum Size of Aggregate: 1 inch (25 mm).

D. Water: Potable, free of deleterious material that may affect color stability, setting, or strength of concrete, and complying with chemical limits of PCI MNL-116.

E. Admixtures: Provide admixtures certified by manufacturer to be compatible with other admixtures.

1. Air-Entraining Admixture: ASTM C 260/C 26M.
2. Water-Reducing Admixture: ASTM C 494/C 494M, Type A.
3. Retarding Admixture: ASTM C 494/C 494M, Type B.
4. Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type D.
5. Water-Reducing and Accelerating Admixture: ASTM C 494/C 494M, Type E.
6. High-Range, Water-Reducing Admixture: ASTM C 494/C 494M, Type F.
7. High-Range, Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type G.

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8. Plasticizing and Retarding Admixture: ASTM C 1017/C 1017M, Type II.

### 2.06 PILE ACCESSORIES

Pile Shoes: 1-inch- (25-mm-) thick minimum, carbon-steel plate fabricated to match shape of pile tip.

### 2.07 CONCRETE MIXES

A. Prepare design mixes for each type of concrete required.

Limit use of fly ash and silica fume to not exceed, in total, 25 percent of portland cement by weight.

B. Design mixes may be prepared by a qualified independent testing agency or by qualified personnel at precast manufacturing plant at precast manufacturer's option.

C. Proportion mixes by either laboratory trial batch or field-test data methods according to ACI 211.1, with materials to be used on Project, to provide normal-weight concrete with the following properties:

1. Compressive Strength (28 Days): 5000 psi (34.5 MPa) minimum or as required to adequately support design loads indicated
2. Maximum Water-Cementitious Material Ratio: 0.40.

### 2.08 FABRICATION

A. Molds: Accurately construct molds, mortar tight, of sufficient strength to withstand pressures due to concrete placement and temperature changes and for prestressing and detensioning operations. Maintain molds to provide completed piles of shapes, lines, and dimensions indicated, within fabrication tolerances specified in PCI MNL-116 and PCI MNL-135.

1. Unless molds are stripped before detensioning, design molds so stresses are not induced in piles due to deformation of concrete under prestress or movement during detensioning.
2. Chamfer edges and corners of square piles.

B. Reinforcement: Comply with recommendations in CRSI's "Manual of Standard Practice" for fabricating, placing, and supporting reinforcement. Clean reinforcement of loose rust and mill scale, earth, and other materials that reduce or destroy bond with concrete.

1. Accurately position, support, and secure reinforcement against displacement by molds, construction, or concrete placement. Locate

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and support reinforcement by metal chairs, runners, bolsters, spacers, and hangers, as required.

2. Place reinforcement to obtain at least the minimum coverages for concrete protection. Arrange, space, and securely tie bars and bar supports to hold reinforcement in position while placing concrete. Set wire ties so ends are directed into concrete, not toward exposed concrete surfaces.
- C. Prestress tendons for piles by either pretensioning or post-tensioning methods. Comply with PCI MNL-116.
- D. Pile Shoes: Accurately position and secure pile shoes at pile tips so as to not affect pile alignment during driving. Weld pile shoes to longitudinal reinforcements.
- E. Pile Splices: Accurately position and secure pile-splice segments requiring embedding in tips of piles.
- F. Mix concrete according to PCI MNL-116 and requirements in this Section. After initial concrete batching, no additional water may be added.
- G. Place concrete in a continuous operation to prevent seams or planes of weakness from forming in piles. Comply with requirements in PCI MNL-116 for measuring, mixing, transporting, and placing concrete.
1. Thoroughly consolidate placed concrete by internal and external vibration without dislocating or damaging reinforcement and built-in items. Use equipment and procedures complying with PCI MNL-116.
  2. Comply with ACI 306.1 procedures for cold-weather concrete placement.
  3. Comply with ACI 305R recommendations for hot-weather concrete placement.
- H. Identify pickup points of piles with permanent markings that correspond with markings indicated on Shop Drawings. Imprint casting date on each pile.
- I. Cure concrete, according to requirements in PCI MNL-116, by moisture retention without heat or by accelerated heat curing using low-pressure live steam or radiant heat and moisture.
- J. Delay detensioning piles until concrete has attained at least 70 percent of its compressive strength as established by test cylinders cured under the same conditions as concrete.

## SECTION 31 6213 - CONCRETE PILES

1. If concrete has been heat cured, detension while concrete is still warm and moist to avoid dimensional changes that may cause cracking or undesirable stresses.
  2. Detension pretensioned tendons either by gradually releasing tensioning jacks or by heat-cutting tendons, using a sequence and pattern to prevent shock or unbalanced loading.
- K. Where ends of strands are not enclosed or covered, cut flush and cover with a high-strength mortar bonded to unit with an epoxy-resin bonding agent.
- L. Fabricate precast, prestressed concrete piles straight and true to size and shape with exposed edges and corners precise and true so each finished unit complies with PCI MNL-116 and PCI MNL-135 product tolerances.
- M. Finish: Fabricate concrete piles with normal plant-run finish produced in forms that impart a smooth finish to concrete. Small surface holes caused by air bubbles, normal color variations, form joint marks, and minor chips and spalls are tolerated. Major or unsightly imperfections, honeycombs, or structural defects are not permitted.
- Finish unformed surfaces by trowel unless otherwise indicated. Consolidate concrete, bring to proper level with straightedge, float, and trowel to a smooth, uniform finish.
- N. Pile-Length Markings: Mark each pile with horizontal lines at 12-inch (305-mm) intervals; label the distance from pile tip at 60-inch (1524-mm) intervals. Maintain markings on piles until driven.

### 2.09 SOURCE QUALITY CONTROL

- A. Testing Agency: Owner will engage a qualified testing agency to evaluate pile manufacturer's quality-control and testing methods.
- Allow Owner's testing agency access to material storage areas, concrete production equipment, concrete placement, and curing facilities. Cooperate with Owner's testing agency, and provide samples of materials and concrete mixes as may be requested for additional testing and evaluation.
- B. Testing: Test and inspect piles according to PCI MNL-116.
- Strength of piles will be considered deficient if units fail to comply with requirements.
- C. If there is evidence that strength of piles may be deficient or may not comply with PCI MNL-116 requirements, Owner will employ an independent testing

## SECTION 31 6213 - CONCRETE PILES

agency to obtain, prepare, and test cores drilled from hardened concrete to determine compressive strength according to ASTM C 42/C 42M.

1. A minimum of three representative cores shall be taken from piles of suspect strength, from locations directed by Architect.
  2. Cores shall be tested, following immersion in water, in a wet condition per ACI 301 if piles are wet under service conditions.
  3. Cores shall be tested in an air-dry condition per ACI 301 if piles are dry under service conditions.
  4. Strength of concrete for each series of three cores shall be considered satisfactory if average compressive strength is at least 85 percent of the 28-day design compressive strength and no core compressive strength is less than 75 percent of the 28-day design compressive strength.
  5. Test results shall be reported in writing on same day that tests are performed, with copies to Architect, Contractor, and pile manufacturer. Test reports shall include the following:
    - a. Project identification name and number.
    - b. Date when tests were performed.
    - c. Name of precast concrete manufacturer.
    - d. Name of concrete testing agency.
    - e. Identification letter, name, and type of pile represented by core tests; design compressive strength; type of break; compressive strength at break, corrected for length-diameter ratio; and direction of applied load to core in relation to horizontal plane of concrete as placed.
- D. Patching: If core test results are satisfactory and piles comply with requirements, solidly fill core holes with patching mortar and finish to match adjacent pile surfaces.
- E. Piles will be considered defective if they do not pass tests and inspections.
- F. Prepare test and inspection reports.

## SECTION 31 6213 - CONCRETE PILES

### PART 3 - EXECUTION

#### 3.01 EXAMINATION

Site Conditions: Do not start pile-driving operations until earthwork fills have been completed or excavations have reached an elevation of 6 to 12 inches (152 to 305 mm) above bottom of footing or pile cap.

#### 3.02 DRIVING EQUIPMENT

A. Pile Hammer: Air-, steam-, hydraulic-, or diesel-powered type capable of consistently delivering adequate peak-force duration and magnitude to develop the ultimate capacity required for type and size of pile driven and character of subsurface material anticipated.

Use pile hammer capable of adjustment to deliver reduced impact to maintain tensile stress within 70 percent of yield strength of pile reinforcement.

B. Hammer Cushions and Driving Caps: Between hammer and top of pile, provide hammer cushion and steel driving cap as recommended by hammer manufacturer and as required to drive pile without damage.

C. Leads: Use fixed, semifixed, or hanging-type pile-driver leads that hold the full length of pile firmly in position and in axial alignment with hammer.

#### 3.03 DRIVING PILES

A. General: Continuously drive piles to elevations or penetration resistance indicated or established by static load testing of piles. Establish and maintain axial alignment of leads and piles before and during driving.

B. Heaved Piles: Redrive heaved piles to tip elevation at least as deep as original tip elevation with a driving resistance at least as great as original driving resistance.

C. Pile Splices: Splice piles during installation, and align pile segments concentrically.

D. Driving Tolerances: Drive piles without exceeding the following tolerances, measured at pile heads:

1. Location: 4 inches (102 mm) from location indicated after initial driving, and 6 inches (152 mm) after pile driving is completed.
2. Plumb: Maintain 1 inch (25 mm) in 48 inches (1219 mm) from vertical, or a maximum of 4 inches (102 mm), measured when pile is aboveground in leads.

## SECTION 31 6213 - CONCRETE PILES

3. Batter Angle: Maximum 1 inch (25 mm) in 48 inches (1219 mm) from required angle, measured when pile is aboveground in leads.

E. Withdraw damaged or defective piles and piles that exceed driving tolerances, and install new piles within driving tolerances.

Fill holes left by withdrawn piles using cohesionless soil material such as gravel, broken stone, and gravel-sand mixtures. Place and compact in lifts not exceeding 72 inches (1830 mm).

F. Abandon and cut off rejected piles as directed by Architect. Leave rejected piles in place, and install new piles in locations as directed by Architect.

G. Cut off tops of driven piles square with pile axis and at elevations indicated.

H. Buildups: Construct buildups to elevations indicated of cast-in-place reinforced concrete with compressive strength not less than 5000 psi (34.5 MPa) at 28 days.

I. Pile-Driving Records: Maintain accurate driving records for each pile, compiled and attested to by a qualified professional engineer. Include the following data:

1. Project name and number.
2. Name of Contractor.
3. Type of pile and date of casting.
4. Pile location in pile group and designation of pile group.
5. Sequence of driving in pile group.
6. Pile dimensions.
7. Ground elevation.
8. Elevation of tips after driving.
9. Final tip and cutoff elevations of piles after driving pile group.
10. Records of re-driving.
11. Elevation of splices.
12. Type, make, model, and rated energy of hammer.
13. Weight and stroke of hammer.
14. Type of pile-driving cap used.

## SECTION 31 6213 - CONCRETE PILES

15. Cushion material and thickness.
  16. Actual stroke and blow rate of hammer.
  17. Pile-driving start and finish times, and total driving time.
  18. Time, pile-tip elevation, and reason for interruptions.
  19. Number of blows for every 12 inches (305 mm) of penetration, and number of blows per 1 inch (25 mm) for the last 6 inches (152 mm) of driving.
  20. Pile deviations from location and plumb.
  21. Preboring, jetting, or special procedures used.
  22. Unusual occurrences during pile driving.
- J. Certified Piles Survey: Engage a land surveyor to prepare a piles survey showing final location of piles in relation to the property survey and existing benchmarks.

Notify Architect when deviations from locations exceed allowable tolerances.

### 3.04 FIELD QUALITY CONTROL

- A. Special Inspections: Owner will engage a qualified special inspector to perform the following special inspections:
- Pile foundations.
- B. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections.
- C. Tests and Inspections:
1. Dynamic Pile Testing: High-strain dynamic monitoring shall be performed and reported according to ASTM D 4945 during initial driving and during restriking on one single piles.
  2. Low-strain integrity measurement shall be performed and reported for each pile.
- D. Piles will be considered defective if they do not pass tests and inspections.
- E. Prepare test and inspection reports.

**SECTION 31 6213 - CONCRETE PILES**

**3.05 DISPOSAL**

Remove withdrawn piles and cutoff sections of piles from site and legally dispose of them off Owner's property.

**END OF SECTION 31 6213**

## **SECTION 31 2333 - EXCAVATING, BACKFILLING AND COMPACTING FOR UTILITIES**

### **PART 1 - GENERAL**

#### **1.01 SUMMARY**

A. Section Includes:

1. Excavating, backfilling and compacting utility trenches such as water, gas, irrigation, storm drain, sewer lines, concrete-encased conduits, and manholes, vaults, valve boxes, catch basins, underground tanks, thrust blocks, yard boxes, pull boxes and other utility appurtenances.

B. Related Sections:

1. Section 312000: Excavating, Backfilling and Compacting for Pavement.
2. Section 331100: Site Water Distribution Systems.
3. Section 333100: Site Sanitary Sewer Systems.
4. Section 334100: Storm Drainage Systems.
5. Section 311215: Pavement Repair.
6. Section 321313: Site Concrete Work.

#### **1.02 SYSTEM DESCRIPTION**

A. Import and Export of Earth Materials:

1. Fees: Pay as required by authorities having jurisdiction over the area.
2. Bonds: Post as required by authorities having jurisdiction over the area.
3. Haul Routes and Restrictions: Comply with requirements of authorities having jurisdiction over the area.

#### **1.03 QUALITY ASSURANCE**

Comply with the following as a minimum requirement: Standard Specifications for Public Works construction, current edition except as modified herein.

#### **1.04 PROJECT CONDITIONS**

- A. Information on Drawings or in soils report does not constitute a guarantee of accuracy or uniformity of soil conditions over the Project site.

## **SECTION 31 2333 - EXCAVATING, BACKFILLING AND COMPACTING FOR UTILITIES**

- B. A copy of the foundation investigation and soils report are in Division F – Permits and Attachments.

### **PART 2 - PRODUCTS**

#### **2.01 MATERIALS**

- A. Bedding material from trench bottom to one foot above the pipe:
  - 1. Sand, gravel, crushed aggregate or native free-draining granular material providing a sand equivalent of at least 30 or a coefficient of permeability greater than 1.4 inches per hour.
  - 2. Sand complying with the Specifications for cement concrete aggregates.
- B. Backfill Materials:

Excavated trench material to be installed for backfilling shall be clean, free of large clods, and stones larger than 2-1/2 inches in any dimension.

### **PART 3 - EXECUTION**

#### **3.01 GENERAL**

- A. Before excavation, contact the "Underground Service Alert of Southern California" (USASC) for information on buried utilities and pipelines.
- B. Barricade trenches, ditches, pits, sumps, and similar Work outside the barricaded working area with chain link fence as specified in Section 01500: Construction Facilities and Temporary Controls, and in accordance with Cal-OSHA standards and requirements.
- C. Saw-cut concrete or bituminous paving for trench installation.
- D. Trenches over 5 feet in depth shall conform to the Construction Safety Orders of the California Division of Industrial Safety.
- E. Where indicated and/or required to excavate in lawn areas, protect adjoining lawn areas outside of the Work area. Replace or install removed sod upon completion of backfill by installing sod level with adjacent lawns. If installation of removed sod fails, furnish sod and install to match existing lawns.
- F. Backfill over excavations to the required elevations with earth, gravel, sand, or concrete and compact as required. Provide excavations free from standing water by pumping, draining, or providing protection against water intrusion. Slope adjacent grades away from excavations to minimize entry of water.

**SECTION 31 2333 - EXCAVATING, BACKFILLING AND COMPACTING FOR UTILITIES**

- G. Do not install piping lengthwise under concrete walks without review by the Architect.
- H. Do not excavate trenches parallel to footings closer than 18 inches from the face of the footing or below a plane having a downward slope of 2 horizontal to one vertical, from a line 9 inches above bottom of footings.
1. Unless otherwise indicated on Drawings, depth of excavations outside the buildings shall allow for a minimum coverage above top of pipe, tank, or conduit measured from the lowest adjoining finished grade, as follows:
- |                           |  |
|---------------------------|--|
| Steel Pipe                | 36 inches below finished grade   |
| Copper Water Tube         | 36 inches below finished grade   |
| Cast-Iron Pressure Pipe   | 36 inches below finished grade   |
| Tanks or other structures | 36 inches below finished grade   |
| Soil, Sewer & Storm Drain | minimum 36 inches below finished grade, and as required for proper pitch and traffic load. (Install polypropylene sewer pipe with at least 24 inches coverage) |
2. Trench width shall provide ample space for fitting and joining. Excavate for piping bells and fittings, bell and spigot pipe and other fittings.
- I. Unless indicated otherwise, excavate trenches to the required depths for utilities, such as pipes, conduit and tanks, with minimum allowances of 6 inches at the bottom and 6 inches at the sides for bedding of unprotected piping or as required for concrete encasement of conduits as indicated on Drawings. Grade bottom of trenches to a uniform smooth surface. Remove loose soil from the excavation before installing sand bedding or concrete encasement.
- J. Provide excavations free from standing water by pumping, draining, or providing protection against water intrusion. If soil becomes soft, soggy, or saturated, excavate to firm undisturbed soil and fill as required. Slope adjacent grades away from excavations to minimize entry of water.
- K. Provide a minimum clear dimension of 2 inches from sides of wall excavation to outer surfaces of buried pipes or conduits installed in the same trench or outside surfaces of containers and/or tanks.
- L. Do not install backfill until required inspections and testing is completed.
- M. Backfill electrical or other excavated utility trenches located outside of barricaded installation areas within 24 hours after inspection by the IOR.

## **SECTION 31 2333 - EXCAVATING, BACKFILLING AND COMPACTING FOR UTILITIES**

- N. Install backfill materials in layers not exceeding 4 inches in thickness and compact to 90 percent of the maximum density.
- O. If materials excavated from the Project site are not permitted for trench backfill in paved areas, backfill trenches with a cement-sand slurry mix. Install backfill to an elevation of the existing undisturbed grade plus one inch.
- P. Install and compact sand bedding to provide a uniform full length bearing under piping and conduits.
- Q. Where portions of existing structures, walks, paving, or other improvements are removed or cut for piping or conduit installation, replace the material with equal quality, finished to match adjoining existing improvements. Repair pavement as specified in Section 311215: Pavement Repair.

### **3.02 INSPECTION AND TESTING**

- A. Owner Consultant will inspect and test excavations, material quality, and installation and compaction of fill materials.
- B. Compaction test shall be performed in accordance with ASTM D 1557, method "C."

### **3.03 PROTECTION**

Protect the Work of this section until Substantial Completion.

### **3.04 CLEANUP**

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

**END OF SECTION**

## **SECTION 31 2000 - EXCAVATING, BACKFILLING AND COMPACTING FOR PAVEMENT**

### **PART 1 - GENERAL**

#### **1.01 SUMMARY**

A. Section Includes:

1. Excavating, backfill, and compacting for paved areas.
2. Installation of fill materials.

B. Related Sections:

1. Section 312333: Excavating, Backfilling and Compacting for Utilities.
2. Section 321122: Base Course.
3. Section 321313: Site Concrete Work.

#### **1.02 SYSTEM DESCRIPTION**

A. Import and Export of Earth Materials:

1. Fees: Pay as required by authorities having jurisdiction over the area.
2. Bonds: Post as required by authorities having jurisdiction over the area.
3. Haul Routes and Restrictions: Comply with requirements of authorities having jurisdiction over the area.

#### **1.03 SUBMITTALS**

Imported Soils: A geotechnical engineer, retained by the Owner as an Owner Consultant, shall obtain initial product Sample for testing in accordance with the terms of sub-section 3.05 of this section.

#### **1.04 QUALITY ASSURANCE**

Comply with Standard Specifications for Public Works Construction, current edition, except as modified herein.

#### **1.05 PROJECT CONDITIONS**

- A. Information on Drawings or in soils report does not constitute a guarantee of accuracy or uniformity of soil conditions over the Project site.
- B. A copy of the foundation investigation and soils report are in Division F – Permits and Attachments.

## SECTION 31 2000 - EXCAVATING, BACKFILLING AND COMPACTING FOR PAVEMENT

### PART 2 - PRODUCTS

#### 2.01 BASE MATERIALS

Concrete Slabs On Grade: Provide "Crushed Aggregate Base" as specified in the Standard Specifications for Public Works Construction, Section 200: "Rock Materials," with  $\frac{3}{4}$  inch maximum size aggregates. Provide 3 inch thick base, unless noted otherwise.

#### 2.02 FILL AND BACKFILL MATERIALS

- A. Sand available from on-site excavations, less debris or organic matter, will be suitable for re-use. Material shall conform to these specified requirements and related sections.
- B. Fill material exhibiting a wide variation in consistency and/or moisture content shall be blended and/or aerated to stabilize and upgrade the material.
- C. Imported Fill Material:
  - 1. Provide suitable materials obtained from Project site excavations for earthwork and fill materials. If excavated materials are not of suitable quality or sufficient quantity, import additional materials as necessary.
- D. Soil beneath building slab is non compacted sand.

### PART 3 - EXECUTION

#### 3.01 SITE PREPARATION

Clear the Project site as required.

#### 3.02 PROTECTION

- A. Protect and guard excavations against danger to life, limb, and property as required by, but not limited to, OSHA regulations.
- B. Protect adjacent existing improvements including landscaping against damage.

#### 3.03 EXISTING UTILITY LINES

- A. Protect existing utility lines from damage or displacement.
- B. Remove conduits or pipes not in service, exposed during Work, unless a minimum cover of 2 feet is provided. Remove concrete, clay or other non-metallic pipe over 8 inches in diameter, unless otherwise indicated.

#### 3.04 EXCAVATION

## SECTION 31 2000 - EXCAVATING, BACKFILLING AND COMPACTING FOR PAVEMENT

Unclassified Excavations: Comply with the Standard Specifications for Public Works Construction, Section 300: "Earthwork," except as modified herein.

### 3.05 FILL

- A. Unclassified Fill and Compaction: Comply with the Standard Specifications for Public Works Construction, Section 300: "Earthwork," except as modified herein.
- B. Provide fill materials as specified in Part 2 – Products. If excavated materials from the Project site are not of required quality or sufficient quantity, import additional materials as necessary.
- C. In addition to the requirements of this section, import and/or exported materials shall comply with the general requirements.
- D. Imported fill materials shall be sampled by a geotechnical engineer, retained by the Owner as an Owner Consultant, for compliance with the requirements of Part 2 of this section.
- E. The geotechnical engineer, retained by the Owner as an Owner Consultant, shall submit all samples to an approved independent approved testing laboratory for testing.
- F. Initial sampling shall be performed by the geotechnical engineer, retained by the Owner as an Owner Consultant, before importing material to the Project site. Identify the location of the source site in addition to the address, name of the person and/or entity responsible for the source site. The geotechnical engineer, retained by the Owner as an Owner Consultant, shall obtain both the initial and additional samples from the identified site and shall submit all samples to the approved independent testing laboratory for testing.
- G. The geotechnical engineer, retained by the Owner as an Owner Consultant, shall perform additional sampling during import operations. If the total quantity of import is determined to be greater than 1000 cubic yards of material, one sample shall be obtained and submitted for testing tested for each 250 cubic yards of imported material. If the total quantity of import is determined to be less than 1000 yards, one sample shall be obtained and submitted for testing for each 100 cubic yards of imported material.
- H. The independent approved testing laboratory shall perform the required tests and report results of all tests noting if the tested material passed or failed such tests and shall furnish copies to the IOR, Architect, OAR, Contractor, and others as required. Report shall state tests were conducted under the responsible charge of a licensed State of California professional engineer and the material was tested in accordance with applicable provisions of the Contract Documents, Title 24, CCR Upon completion of the Work of this section, the independent testing laboratory

## **SECTION 31 2000 - EXCAVATING, BACKFILLING AND COMPACTING FOR PAVEMENT**

and geotechnical engineer shall submit a verified report as required by Title 24, CCR.

- I. Bills of lading or equivalent documentation will be submitted to the IOR on a daily basis.
- J. Upon completion of import operations, provide the OAR a certification statement attesting that all imported material has been obtained from the identified source site.

### **3.06 INSTALLATION OF MATERIALS**

- A. Fill or backfill materials shall be installed in horizontal layers of 6 inches, unless otherwise required. Each layer shall be evenly placed and moistened or aerated as necessary. Unless otherwise reviewed by the geotechnical engineer, retained by the Owner as an Owner Consultant, each layer of fill material shall cover the length and width of the area to be filled before the next layer of material is installed. Top surface of each layer shall be installed to an approximate level with a crown or crossfall of at least 1 in 50, but no more than 1 in 20. Provide adequate drainage at all times during construction of the Work of this section.

### **3.07 COMPACTING**

- A. Each layer of fill material shall be compacted by tamping, sheepfoot rollers, or pneumatic-tired rollers to provide specified relative compaction. At inaccessible locations, provide specified compaction by manually held, operated and directed compaction equipment.
- B. Unless otherwise indicated, compact each layer of earth fill to a relative compaction of at least 90 percent.
- C. When fill materials, or a combination of fill materials, are encountered or provided which develop densely packed surfaces as a result of installation or compacting operations, scarify each compacted layer before installing the next succeeding layer.

### **3.08 INSPECTION AND TESTING**

- A. The geotechnical engineer, retained by the Owner as an Owner Consultant, will inspect and test excavations, sample material quality as required in Part 2, and observe installation and compaction of fill materials.
- B. The geotechnical engineer, retained by the Owner as an Owner Consultant, will sample imported fill materials from their designated source before delivery to the Project site.
- C. Installation of backfill shall be observed by the geotechnical engineer, retained by the Owner as an Owner Consultant.

## **SECTION 31 2000 - EXCAVATING, BACKFILLING AND COMPACTING FOR PAVEMENT**

- D. The geotechnical engineer, retained by the Owner as an Owner Consultant, will inspect and test excavation Work before the installation of fill and/or other materials.
- E. Compaction: Test compaction in accordance with ASTM D 1557, Method C.

### **3.09 PROTECTION**

Protect the Work of this section until Substantial Completion.

### **3.10 CLEANING**

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

**END OF SECTION**

## **SECTION 31 1215 - PAVEMENT REPAIR**

### **PART 1 - GENERAL**

#### **1.01 SUMMARY**

- A. Section Includes:
  - 1. Bituminous Surfacing Repair: Areas removed for utility trenches, heaved by tree roots, cracked areas, protruding areas where pavement meets hard surfaces, depressed areas, holes and areas around new structures, and raveled bituminous pavement.
  - 2. Concrete Pavement Repair: Areas heaved by tree roots, cracked areas, holes and trenches, and areas around new structures.
- B. Related Sections:
  - 1. Section 312000: Excavating, Backfilling and Compacting for Pavement.
  - 2. Section 312333: Excavating, Backfilling and Compacting for Utilities.
  - 4. Section 321122: Base Course.
  - 5. Section 321313: Site Concrete Work.

#### **1.02 SUBMITTALS**

- A. Shop Drawings: Submit Shop Drawings indicating areas to be repaired.
- B. Product Data: Submit manufacturer's technical data for materials and products.

#### **1.03 QUALITY ASSURANCE**

Comply with Standard Specifications for Public Works Construction, current edition.

### **PART 2 - PRODUCTS**

#### **2.01 MATERIALS**

- A. Materials specified in Section 321122: Base Course.
- B. Materials specified in Section 321313: Site Concrete Work.

## SECTION 31 1215 - PAVEMENT REPAIR

### 2.02 BITUMINOUS MATERIALS

Provide materials and products of the class, grade or type indicated, conforming to relevant provisions of Section 203 - Bituminous Materials of the latest Standard Specifications for Public Works Construction.

### 2.03 HEADERS AND STAKES

- A. Headers: Redwood, Construction Heart Grade, size 2 x 6, unless otherwise indicated on Drawings.
- B. Stakes: 2 x 4 redwood or 2 x 3 Douglas fir; Construction Grade.
- C. Nails: Common, galvanized, 12d minimum.

### 2.04 SLURRY

Cement-sand slurry; minimum one sack of cement per cubic yard of mixture.

## PART 3 - EXECUTION

### 3.01 PAVEMENT REMOVAL

- A. Remove bituminous and concrete pavement in accordance with applicable provisions of Section 300 - Earthwork of the Standard Specifications for Public Works Construction.
- B. Pavement Heaved by Roots: Remove pavement to limits of distortion and expose roots. Trim roots to provide at least 12 inches clearance to pavement.
- C. Remove protruding bituminous surfaces flush with the surrounding grade using a suitable tool or equipment so that adjacent finishes are not blackened.
- D. Remove raveled and depressed bituminous pavement to limits indicated or required.
- E. Saw cut existing improvements, trim holes and trenches in bituminous and concrete pavement to permit mechanical hand tampers to compact the fill.
- F. Remove broken concrete by saw cutting. If the required cut line is within 30 inches of a score or joint line or edge, cut and remove to the score, joint line, or edge.

## SECTION 31 1215 - PAVEMENT REPAIR

### 3.02 EXCAVATING, BACKFILLING AND COMPACTING

- A. Conform to requirements in Section 312333: Excavating, Backfilling and Compacting for Utilities, as required.
- B. Where subgrade or base is deemed to be unstable or otherwise unsuitable, excavate such materials to firm earth, and replace with a required material. Install and compact fill materials in accordance with the requirements of related Specification sections.

### 3.03 HEADERS

- A. Install headers along edge of bituminous surfacing abutting turf, earth, or planting area, unless indicated otherwise.
- B. Install headers so the bottom surface has continuous bearing on solid grade. Where excavation for headers is undercut, thoroughly tamp soil under the header. Compact backfill on both sides of header to the density of the adjacent undisturbed grade.
- C. Fasten headers in place with redwood or Douglas fir stakes of length necessary to extend into solid earth a minimum of 12 inches. Stakes shall be of sound material, neatly pointed, driven vertically, and securely nailed to headers. Space stakes, not to exceed 4 feet on centers with top of stakes set one inch below top of header. Provide a minimum of 2-12d galvanized common nails through each stake.
- D. Remove existing headers where new surfacing is installed adjacent to existing surfacing.
- E. Install temporary headers at transverse joints of paving where continuous paving operations are not maintained.
- F. Provide additional stakes and devices as required to fasten headers.

### 3.04 BASE COURSE

- A. Unless otherwise indicated, base course shall be crushed aggregate base, fine grade, 3 inches thick or equal to thickness of the existing base, whichever is greater.
- B. Fill grade and compact as specified in Section 31 2333 Excavating Backfilling for Utilities.

## SECTION 31 1215 - PAVEMENT REPAIR

### 3.05 RESURFACING

- A. Holes and Trenches: Remove loose dirt and backfill with cement-sand slurry allowing for surfacing one inch thicker than existing. Unless otherwise indicated on Drawings, resurface flush with existing adjoining pavement installing the same type of materials and section provided in existing improvements.
- B. Other Areas: Other surface improvements damaged or removed shall be cut to a neat even line and excavated one inch below the bottom of the existing pavement. Resurface by following the original grades and installing the same type of materials provided in existing improvements.
- C. Where bituminous surfacing abuts concrete, masonry, walks or paving, tamp joint smooth, if necessary, as described above to obtain a uniformly even joint, true to line and grade. Tamp and smooth materials before asphalt cools.

### 3.06 REPAIRING AND RESEALING EXISTING SURFACES

- A. Preparation of Surfaces: Prior to filling cracks, clean existing bituminous surfacing of loose and foreign materials and coat with a film of asphalt emulsion.
- B. Repair of Existing Surfacing:
  - 1. Fill cracks 1/2 inch wide and less with RS-1 emulsion and silica sand or other required material. Cracks larger than 1/2 inch wide shall be filled with Type C2 Asphalt Concrete as specified. Cracks shall be filled to the level of adjacent surfacing.
  - 2. Where low areas, holes, or depressions occur in existing surfacing, repair with emulsified asphalt. Install material, strike off the emulsified asphalt with a straightedge flush with adjoining surfacing. Finish with a steel trowel, and after dehydration, compact by rolling or tamping.
- C. Testing: Flood test entire area in presence of the IOR. Entire area tested shall be free of standing water or puddles.

### 3.07 CLEANING

- A. Remove all stains on the Project site and adjacent properties caused by or attributed to the Work of this section.
- B. Remove rubbish, debris, and waste materials and legally dispose of off the Project site.

**SECTION 31 1215 - PAVEMENT REPAIR**

**3.08 PROTECTION**

Protect the Work of this section until Substantial Completion.

**END OF SECTION**

## SECTION 262816 – ENCLOSED SWITCHES AND CIRCUIT BREAKERS

### PART 1 – GENERAL

#### 1.00 RELATED DOCUMENTS:

Drawings, Division H – General Requirements, Division I – Technical Requirements and Division J – Technical Specifications apply to this Section.

#### 1.01 SUMMARY

- A. Section Includes:
  - 1. Fusible switches.
  - 2. Nonfusible switches.
  - 3. Receptacle switches.
  - 4. Shunt trip switches.
  - 5. Molded-case circuit breakers (MCCBs).
  - 6. Molded-case switches.
  - 7. Enclosures.

#### 1.02 DEFINITIONS

- A. NC: Normally closed.
- B. NO: Normally open.
- C. SPDT: Single pole, double throw.

#### 1.03 PERFORMANCE REQUIREMENTS

- A. Seismic Performance: Enclosed switches and circuit breakers shall withstand the effects of earthquake motions determined according to ASCE/SEI 7.
  - 1. The term "withstand" means "the unit will remain in place without separation of any parts from the device when subjected to the seismic forces specified and the unit will be fully operational after the seismic event."

#### 1.04 ACTION SUBMITTALS

- A. Product Data: For each type of enclosed switch, circuit breaker, accessory, and component indicated. Include dimensioned elevations, sections, weights, and manufacturers' technical data on features, performance, electrical characteristics, ratings, accessories, and finishes.
  - 1. Enclosure types and details for types other than NEMA 250, Type 1.

## **SECTION 262816 – ENCLOSED SWITCHES AND CIRCUIT BREAKERS**

2. Current and voltage ratings.
  3. Short-circuit current ratings (interrupting and withstand, as appropriate).
  4. Include evidence of NRTL listing for series rating of installed devices.
  5. Detail features, characteristics, ratings, and factory settings of individual overcurrent protective devices, accessories, and auxiliary components.
- B. Shop Drawings: For enclosed switches and circuit breakers. Include plans, elevations, sections, details, and attachments to other work.  
Wiring Diagrams: For power, signal, and control wiring.

### **1.05 INFORMATIONAL SUBMITTALS**

- A. Qualification Data: For qualified testing agency.
- B. Seismic Qualification Certificates: For enclosed switches and circuit breakers, accessories, and components, from manufacturer.
1. Basis for Certification: Indicate whether withstand certification is based on actual test of assembled components or on calculation.
  2. Dimensioned Outline Drawings of Equipment Unit: Identify center of gravity and locate and describe mounting and anchorage provisions.
  3. Detailed description of equipment anchorage devices on which the certification is based and their installation requirements.
- C. Field quality-control reports.
1. Test procedures used.
  2. Test results that comply with requirements.
  3. Results of failed tests and corrective action taken to achieve test results that comply with requirements.
- D. Manufacturer's field service report.

### **1.06 CLOSEOUT SUBMITTALS**

- A. Operation and Maintenance Data: For enclosed switches and circuit breakers to include in emergency, operation, and maintenance manuals. Include the following:
1. Manufacturer's written instructions for testing and adjusting enclosed switches and circuit breakers.

## **SECTION 262816 – ENCLOSED SWITCHES AND CIRCUIT BREAKERS**

### **1.07 QUALITY ASSURANCE**

- A. Testing Agency Qualifications: Member company of NETA or an NRTL.
  - 1. Testing Agency's Field Supervisor: Currently certified by NETA to supervise on-site testing.
- B. Source Limitations: Obtain enclosed switches and circuit breakers, overcurrent protective devices, components, and accessories, within same product category, from single source from single manufacturer.
- C. Product Selection for Restricted Space: Drawings indicate maximum dimensions for enclosed switches and circuit breakers, including clearances between enclosures, and adjacent surfaces and other items. Comply with indicated maximum dimensions.
- D. 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.
- E. Comply with NFPA 70.

### **1.08 PROJECT CONDITIONS**

- A. Environmental Limitations: Rate equipment for continuous operation under the following conditions unless otherwise indicated:
  - 1. Ambient Temperature: Not less than minus 22 deg F (minus 30 deg C) and not exceeding 104 deg F (40 deg C).
  - 2. Altitude: Not exceeding 6600 feet (2010 m).
- B. Interruption of Existing Electric Service: Do not interrupt electric service to facilities occupied by City or others unless permitted under the following conditions and then only after arranging to provide temporary electric service according to requirements indicated:
  - 1. Notify Construction Manager no fewer than seven days in advance of proposed interruption of electric service.
  - 2. Indicate method of providing temporary electric service.
  - 3. Do not proceed with interruption of electric service without Construction Manager's written permission.
  - 4. Comply with NFPA 70E.

### **1.09 COORDINATION**

Coordinate layout and installation of switches, circuit breakers, and components with equipment served and adjacent surfaces. Maintain required workspace clearances and required clearances for equipment access doors and panels.

## SECTION 262816 – ENCLOSED SWITCHES AND CIRCUIT BREAKERS

### PART 2 – PRODUCTS

#### 2.01 FUSIBLE SWITCHES

- A. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
1. Eaton Electrical Inc.; Cutler-Hammer Business Unit.
  2. General Electric Company; GE Consumer & Industrial - Electrical Distribution.
  3. Siemens Energy & Automation, Inc.
  4. Square D; a brand of Schneider Electric.
- B. Type GD, General Duty, Single Throw, 240-V ac, 800 A and Smaller: UL 98 and NEMA KS 1, horsepower rated, with cartridge fuse interiors to accommodate indicated fuses, lockable handle with capability to accept two padlocks, and interlocked with cover in closed position.
- C. Type HD, Heavy Duty, Single Throw, 240-V ac, 1200 A and Smaller: UL 98 and NEMA KS 1, horsepower rated, with clips or bolt pads to accommodate indicated fuses, lockable handle with capability to accept three padlocks, and interlocked with cover in closed position.
- D. Type HD, Heavy Duty, Six Pole, Single Throw, 240-V ac, 200 A and Smaller: UL 98 and NEMA KS 1, horsepower rated, with clips or bolt pads to accommodate indicated fuses, lockable handle with capability to accept three padlocks, and interlocked with cover in closed position.
- E. Type HD, Heavy Duty, Double Throw, 240-V ac, 1200 A and Smaller: UL 98 and NEMA KS 1, horsepower rated, with clips or bolt pads to accommodate indicated fuses, lockable handle with capability to accept three padlocks, and interlocked with cover in closed position.
- F. Accessories:
1. Equipment Ground Kit: Internally mounted and labeled for copper and aluminum ground conductors.
  2. Lugs: Mechanical type, suitable for number, size, and conductor material.
  3. Service-Rated Switches: Labeled for use as service equipment.

#### 2.02 NONFUSIBLE SWITCHES

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

## SECTION 262816 – ENCLOSED SWITCHES AND CIRCUIT BREAKERS

- B. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
1. Eaton Electrical Inc.; Cutler-Hammer Business Unit.
  2. General Electric Company; GE Consumer & Industrial - Electrical Distribution.
  3. Siemens Energy & Automation, Inc.
  4. Square D; a brand of Schneider Electric.
- C. Type GD, General Duty, Single Throw, 600 A and Smaller: UL 98 and NEMA KS 1, horsepower rated, lockable handle with capability to accept two padlocks, and interlocked with cover in closed position.
- D. Type HD, Heavy Duty, Single Throw, 240-V ac, 1200 A and Smaller: UL 98 and NEMA KS 1, horsepower rated, lockable handle with capability to accept three padlocks, and interlocked with cover in closed position.
- E. Type HD, Heavy Duty, Six Pole, Single Throw, 240-V ac, 200 A and Smaller: UL 98 and NEMA KS 1, horsepower rated, lockable handle with capability to accept three padlocks, and interlocked with cover in closed position.
- F. Type HD, Heavy Duty, Double Throw, 240-V ac, 1200 A and Smaller: UL 98 and NEMA KS 1, horsepower rated, lockable handle with capability to accept three padlocks, and interlocked with cover in closed position.
- G. Accessories:
1. Equipment Ground Kit: Internally mounted and labeled for copper and aluminum ground conductors.
  2. Lugs: Mechanical type, suitable for number, size, and conductor material.
  3. Accessory Control Power Voltage: Remote mounted and powered as indicated on Drawings.

### 2.03 MOLDED-CASE CIRCUIT BREAKERS

- A. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
1. Eaton Electrical Inc.; Cutler-Hammer Business Unit.
  2. General Electric Company; GE Consumer & Industrial - Electrical Distribution.
  3. Siemens Energy & Automation, Inc.

## SECTION 262816 – ENCLOSED SWITCHES AND CIRCUIT BREAKERS

4. Square D; a brand of Schneider Electric.
- B. General Requirements: Comply with UL 489, NEMA AB 1, and NEMA AB 3, with interrupting capacity to comply with available fault currents.
- C. Thermal-Magnetic Circuit Breakers: Inverse time-current element for low-level overloads and instantaneous magnetic trip element for short circuits. Adjustable magnetic trip setting for circuit-breaker frame sizes 250 A and larger.
- D. Adjustable, Instantaneous-Trip Circuit Breakers: Magnetic trip element with front-mounted, field-adjustable trip setting.
- E. Electronic Trip Circuit Breakers: Field-replaceable rating plug, rms sensing, with the following field-adjustable settings:
  1. Instantaneous trip.
  2. Long- and short-time pickup levels.
  3. Long- and short-time time adjustments.
  4. Ground-fault pickup level, time delay, and  $I^2t$  response.
- F. Current-Limiting Circuit Breakers: Frame sizes 400 A and smaller, and let-through ratings less than NEMA FU 1, RK-5.
- G. Integrally Fused Circuit Breakers: Thermal-magnetic trip element with integral limiter-style fuse listed for use with circuit breaker and trip activation on fuse opening or on opening of fuse compartment door.
- H. Ground-Fault, Circuit-Interrupter (GFCI) Circuit Breakers: Single- and two-pole configurations with Class A ground-fault protection (6-mA trip).
- I. Ground-Fault, Equipment-Protection (GFEP) Circuit Breakers: With Class B ground-fault protection (30-mA trip).
- J. Features and Accessories:
  1. Standard frame sizes, trip ratings, and number of poles.
  2. Lugs: Mechanical type, suitable for number, size, trip ratings, and conductor material.
  3. Application Listing: Appropriate for application; Type SWD for switching fluorescent lighting loads; Type HID for feeding fluorescent and high-intensity discharge lighting circuits.
  4. Ground-Fault Protection: Comply with UL 1053; integrally mounted, self-powered type with mechanical ground-fault indicator; relay with adjustable pickup and time-delay settings, push-to-test feature,

## **SECTION 262816 – ENCLOSED SWITCHES AND CIRCUIT BREAKERS**

internal memory, and shunt trip unit; and three-phase, zero-sequence current transformer/sensor.

5. Shunt Trip: Trip coil energized from separate circuit, with coil-clearing contact.

### **2.04 ENCLOSURES**

- A. Enclosed Switches and Circuit Breakers: NEMA AB 1, NEMA KS 1, NEMA 250, and UL 50, to comply with environmental conditions at installed location.
  1. Indoor, Dry and Clean Locations: NEMA 250, Type 1.
  2. Outdoor Locations: NEMA 250, Type 3R.
  3. Kitchen Wash-Down Areas: NEMA 250, Type 4X, stainless steel.
  4. Other Wet or Damp, Indoor Locations: NEMA 250, Type 4.
  5. Indoor Locations Subject to Dust, Falling Dirt, and Dripping Noncorrosive Liquids: NEMA 250, Type 12.

## **PART 3 – EXECUTION**

### **3.01 EXAMINATION**

- A. Examine elements and surfaces to receive enclosed switches and circuit breakers for compliance with installation tolerances and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

### **3.02 INSTALLATION**

- A. Install individual wall-mounted switches and circuit breakers with tops at uniform height unless otherwise indicated.
- B. Comply with mounting and anchoring requirements specified in Section 260548 "Seismic Controls for Electrical Systems."
- C. Temporary Lifting Provisions: Remove temporary lifting eyes, channels, and brackets and temporary blocking of moving parts from enclosures and components.
- D. Install fuses in fusible devices.
- E. Comply with NECA 1.

## SECTION 262816 – ENCLOSED SWITCHES AND CIRCUIT BREAKERS

### 3.03 IDENTIFICATION

- A. Comply with requirements in Section 260553 "Identification for Electrical Systems."
  - 1. Identify field-installed conductors, interconnecting wiring, and components; provide warning signs.
  - 2. Label each enclosure with engraved metal or laminated-plastic nameplate.

### 3.04 FIELD QUALITY CONTROL

- A. Testing Agency: a qualified testing agency to perform tests and inspections.
- B. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect, test, and adjust components, assemblies, and equipment installations, including connections.
- C. Perform tests and inspections.  
Manufacturer's Field Service: Engage a factory-authorized service representative to inspect components, assemblies, and equipment installations, including connections, and to assist in testing.
- D. Acceptance Testing Preparation:
  - 1. Test insulation resistance for each enclosed switch and circuit breaker, component, connecting supply, feeder, and control circuit.
  - 2. Test continuity of each circuit.
- E. Tests and Inspections:
  - 1. Perform each visual and mechanical inspection and electrical test stated in NETA Acceptance Testing Specification. Certify compliance with test parameters.
  - 2. Correct malfunctioning units on-site, where possible, and retest to demonstrate compliance; otherwise, replace with new units and retest.
  - 3. Perform the following infrared scan tests and inspections and prepare reports:
    - a. Initial Infrared Scanning: After Substantial Completion, but not more than 60 days after Final Acceptance, perform an infrared scan of each enclosed switch and circuit breaker. Remove front panels so joints and connections are accessible to portable scanner.

## **SECTION 262816 – ENCLOSED SWITCHES AND CIRCUIT BREAKERS**

- b. Follow-up Infrared Scanning: Perform an additional follow-up infrared scan of each enclosed switch and circuit breaker 11 months after date of Substantial Completion.
  - c. Instruments and Equipment: Use an infrared scanning device designed to measure temperature or to detect significant deviations from normal values. Provide calibration record for device.
4. Test and adjust controls, remote monitoring, and safeties. Replace damaged and malfunctioning controls and equipment.
- F. Enclosed switches and circuit breakers will be considered defective if they do not pass tests and inspections.
- G. Prepare test and inspection reports, including a certified report that identifies enclosed switches and circuit breakers and that describes scanning results. Include notation of deficiencies detected, remedial action taken, and observations after remedial action.

### **3.05 ADJUSTING**

Adjust moving parts and operable components to function smoothly, and lubricate as recommended by manufacturer.

**END OF SECTION**

## SECTION 26 2726 WIRING DEVICES

### PART 1 - GENERAL

#### 1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract apply to this Section.
- B. Unless noted otherwise, install wiring devices as specified on the drawings or approved equivalent. Coordinate and obtain approval for type finish with Owner or Architect.

#### 1.02 SUMMARY

##### A. Section Includes:

1. Receptacles, receptacles with integral GFI, and associated device plates.
2. Wall-box motion sensors.
3. Wall-box dimmers.
4. Solid-state fan speed controls.
5. Communications outlets.
6. Cord and plug sets.

#### 1.03 DEFINITIONS

- A. EMI: Electromagnetic interference.
- B. GFI: Ground-fault circuit interrupter.
- C. RFI: Radio-frequency interference.
- D. UTP: Unshielded twisted pair.

#### 1.04 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: List of legends and description of materials and process used for pre-marking wall plates.
- C. Field quality-control test reports.
- D. Operation and Maintenance Data: For wiring devices to include in all manufacturers' packing label warnings and instruction manuals that include labeling conditions.

## SECTION 26 2726 WIRING DEVICES

### 1.05 QUALITY ASSURANCE

- A. Source Limitations: Obtain each type of wiring device and associated wall plate through one source from a single manufacturer. Insofar as they are available, obtain all wiring devices and associated wall plates from a single manufacturer and one source.
- B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- C. Comply with NFPA 70

### 1.06 COORDINATION

- A. Receptacles for Owner-Furnished Equipment: Match plug configurations.  
Cord and Plug Sets: Match equipment requirements.

## PART 2 - PRODUCTS

### 2.01 MANUFACTURERS

- A. Manufacturers' Names:
  - 1. Cooper Wiring Devices; a division of Cooper Industries, Inc. (Cooper).
  - 2. Hubbell Incorporated; Wiring Device-Kellems (Hubbell).
  - 3. Or Approved Equal

### 2.02 STRAIGHT BLADE RECEPTACLES

- A. Convenience Receptacles, 125 V, 20 A: Comply with NEMA WD 1, NEMA WD 6 configuration 5-20R, and UL 498.
  - 1. Products: Subject to compliance with requirements, provide one of the following:
    - a. Cooper; 5351 (single), 5352 (duplex).
    - b. Hubbell; HBL5351 (single), CR5352 (duplex).
    - c. Or Approved Equal
- B. Tamper-Resistant Convenience Receptacles, 125 V, 20 A: Comply with NEMA WD 1, NEMA WD 6 configuration 5-20R, and UL 498.

## SECTION 26 2726 WIRING DEVICES

1. Products: Subject to compliance with requirements, provide one of the following:
  - a. Cooper; TR8300.
  - b. Hubbell; HBL8300SG.
  - c. Or Approved Equal

### 2.03 GFI RECEPTACLES

A. General Description: Straight blade, feed through type. Comply with NEMA WD 1, NEMA WD 6, UL 498, and UL 943, Class A, and include indicator light that is lighted when device is tripped. Device shall fit in a 2-3/4 inch deep outlet box without an adapter. Non feed-through type GFI unit may be selected where no protection of downstream receptacles is required.

B. Duplex GFI Convenience Receptacles, 125 V, 20 A:

1. Products: Subject to compliance with requirements, provide one of the following feed through types:
  - a. Cooper; GF20.
  - b. Leviton; 6598.
  - c. Or Approved Equal

### 2.04 WALL-BOX DIMMERS

Dimmer Switches: As specified on plans or Approved Equal

### 2.05 FAN SPEED CONTROLS

A. Modular, 120-V, full-wave, solid-state units with integral, quiet on-off switches and audible frequency and EMI/RFI filters. Comply with UL 1917.

Continuously adjustable slider, toggle switch, and rotary knob 5 A.

### 2.06 OCCUPANCY SENSORS

A. Wall-Switch Sensors:

Products: As specified on plans or Approved Equal

B. Exterior Occupancy Sensors:

Products: As specified on plans or Approved Equal.

### 2.07 COMMUNICATIONS OUTLETS

## SECTION 26 2726 WIRING DEVICES

### A. Telephone Outlet:

1. Products: Subject to compliance with requirements, provide one of the following:
  - a. Cooper; 3560-6.
  - b. Leviton; 40649.
  - c. Or Approved Equal
2. Description: Single RJ-45 jack for terminating 100-ohm, balanced, four-pair UTP; TIA/EIA-568-B.1; complying with Category 5e. Comply with UL 1863.

### B. Combination TV and Telephone Outlet:

1. Products: Subject to compliance with requirements, provide one of the following:
  - a. Cooper; 3562.
  - b. Leviton; 40595.
  - c. Or Approved Equal
2. Description: Single RJ-45 jack for 100-ohm, balanced, four-pair UTP; TIA/EIA-568- B.1; complying with Category 5e; and one Type F coaxial cable connector.

## 2.08 WALL PLATES

### A. Single and combination types to match corresponding wiring devices.

1. Plate-Securing Screws:
  - a. Metal with head color to match plate finish.
  - b. Stainless steel for stainless steel plates, aluminum plates and exterior applications.
  - c. Solid brass for brass plates.
  - d. Chrome plated steel for chrome plated plates.
  - e. Galvanized steel for galvanized plates.
2. Material for Finished Spaces: Smooth, high-impact thermoplastic, 0.035-inch(1-mm-) thick, or As selected by Architect or Owner.
3. Material for Unfinished Spaces: Smooth, high-impact thermoplastic.

## SECTION 26 2726 WIRING DEVICES

4. Material for Damp Locations: Thermoplastic with spring-loaded lift cover, and listed and labeled for use in "wet locations."
- B. Wet-Location, Weatherproof Cover Plates: NEMA 250, complying with type 3R weather-resistant, thermoplastic with lockable cover.

### 2.09 FINISHES

- A. Color: Wiring device catalog numbers in Section Text do not designate device color.
1. Wiring Devices Connected to Normal Power System: Ivory, White, or As selected by Architect or Owner, unless otherwise indicated or required by NFPA 70 or device listing.
  2. Wiring Devices Connected to Emergency Power System: Red.

## PART 3 - EXECUTION

### 3.01 INSTALLATION

- A. Comply with NECA 1, including the mounting heights listed in that standard, unless otherwise noted.
- B. Coordination with Other Trades:
1. Take steps to insure that devices and their boxes are protected. Do not place wall finish materials over device boxes and do not cut holes for boxes with routers that are guided by riding against outside of the boxes.
  2. Keep outlet boxes free of plaster, drywall joint compound, mortar, cement, concrete, dust, paint, and other material that may contaminate the raceway system, conductors, and cables.
  3. Install device boxes in brick or block walls so that the cover plate does not cross a joint unless the joint is troweled flush with the face of the wall.
  4. Install wiring devices after all wall preparation, including painting, is complete.
- C. Conductors:
1. Do not strip insulation from conductors until just before they are spliced or terminated on devices.
  2. Strip insulation evenly around the conductor using tools designed for the purpose. Avoid scoring or nicking of solid wire or cutting strands from stranded wire.

## SECTION 26 2726 WIRING DEVICES

3. The length of free conductors at outlets for devices shall meet provisions of NFPA 70, Article 300, without pigtails.
4. Existing Conductors:
  - a. Cut back and pigtail, or replace all damaged conductors.
  - b. Straighten conductors that remain and remove corrosion and foreign matter.
  - c. Pigtailing existing conductors is permitted provided the outlet box is large enough.

### D. Device Installation:

1. Replace all devices that have been in temporary use during construction or that show signs that they were installed before building finishing operations were complete.
2. Keep each wiring device in its package or otherwise protected until it is time to connect conductors.
3. Do not remove surface protection, such as plastic film and smudge covers, until the last possible moment.
4. Protect devices and assemblies during painting. Remove any paint that accidentally comes in contact with devices and assemblies.
5. Connect devices to branch circuits using pigtails that are not less than 6 inches (152 mm) in length.
6. When there is a choice, use side wiring with binding-head screw terminals. Wrap solid conductor tightly clockwise, 2/3 to 3/4 of the way around terminal screw.
7. Use a torque screwdriver when a torque is recommended or required by the manufacturer.
8. When conductors larger than No. 12 AWG are installed on 15- or 20-A circuits, splice No. 12 AWG pigtails for device connections.
9. Tighten unused terminal screws on the device.
10. When mounting into metal boxes, remove the fiber or plastic washers used to hold device mounting screws in yokes, allowing metal-to-metal contact.

### E. Receptacle Orientation:

Install ground pin of vertically mounted receptacles down, and on horizontally mounted receptacles to the right.

## SECTION 26 2726 WIRING DEVICES

F. Device Plates: Do not use oversized or extra-deep plates. Repair wall finishes and remount outlet boxes when standard device plates do not fit flush or do not cover rough wall opening.

G. Dimmers:

1. Install dimmers within terms of their listing.
2. Verify that dimmers used for fan speed control are listed for that application.
3. Install unshared neutral conductors on line and load side of dimmers according to manufacturers' device listing conditions in the written instructions.

H. Arrangement of Devices: Unless otherwise indicated, mount flush, with long dimension vertical and with grounding terminal of receptacles on top. Group adjacent switches under single, multigang wall plates.

I. Adjust locations of floor service outlets and service poles to suit arrangement of partitions and furnishings.

### 3.02 CONNECTIONS

A. Connect wiring device grounding terminal to branch-circuit equipment grounding conductor.

B. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

### 3.03 IDENTIFICATION

A. Comply with Division 26 Section "Identification for Electrical Systems."

### 3.04 FIELD QUALITY CONTROL

A. Perform tests and inspections and prepare test reports.

1. Test Instruments: Use instruments that comply with UL 1436.
2. Test Instrument for Convenience Receptacles: Digital wiring analyzer with digital readout or illuminated LED indicators of measurement.
3. Test wiring devices for proper polarity and ground continuity. Operate each device at least six times.
4. Test GFI operation with both local and remote fault simulations according to manufacturer's written instructions.

B. Tests for Convenience Receptacles:

## SECTION 26 2726 WIRING DEVICES

1. Line Voltage: Acceptable range is 105 to 132 V.
2. Percent Voltage Drop under 15-A Load: A value of 6 percent or higher is not acceptable.
3. Ground Impedance: Values of up to 2 ohms are acceptable.
4. GFI Trip: Test for tripping values specified in UL 1436 and UL 943.
5. Using the test plug, verify that the device and its outlet box are securely mounted.
6. The tests shall be diagnostic, indicating damaged conductors, high resistance at the circuit breaker, poor connections, inadequate fault current path, defective devices, or similar problems. Correct circuit conditions, remove malfunctioning units and replace with new ones, and retest as specified above.

C. Replace damaged or defective components.

### 3.05 CLEANING

Internally clean devices, device outlet boxes, and enclosures. Replace stained or improperly painted wall plates or devices.

**END OF SECTION 262726**

## SECTION 26 2416 PANELBOARDS

### PART 1 - GENERAL

#### 1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract apply to this Section.

#### 1.02 SUMMARY

A. Section Includes:

Lighting and appliance branch-circuit panelboards.

#### 1.03 DEFINITIONS

GFCI: Ground-fault circuit interrupter.

#### 1.04 SUBMITTALS

A. Product Data: For each type of panelboard, overcurrent protective device, accessory, and component indicated. Include dimensions and manufacturers' technical data on features, performance, electrical characteristics, ratings, and finishes.

B. Shop Drawings: For each panelboard and related equipment.

1. Dimensioned plans, elevations, sections, and details. Show tabulations of installed devices, equipment features, and ratings. Include the following:
  - a. Enclosure types and details for types other than NEMA 250, Type 1.
  - b. Bus configuration, current, and voltage ratings.
  - c. Short-circuit current rating of panelboards and overcurrent protective devices.
  - d. UL listing for series rating of installed devices.
  - e. Features, characteristics, ratings, and factory settings of individual overcurrent protective devices and auxiliary components.

2. Wiring Diagrams: Power, signal, and control wiring.

C. Qualification Data: For testing agency.

D. Field quality-control test reports including the following:

1. Test procedures used.

## SECTION 26 2416 PANELBOARDS

2. Test results that comply with requirements.
  3. Results of failed tests and corrective action taken to achieve test results that comply with requirements.
- E. Panelboard Schedules: For installation in panelboards. Submit final versions after load balancing.
- F. Operation and Maintenance Data: For panelboards and components to include in emergency, operation, and maintenance manuals. In addition to items specified in Division 01 Section "Operation and Maintenance Data," include the following:
1. Manufacturer's written instructions for testing and adjusting overcurrent protective devices.
  2. Time-current curves, including selectable ranges for each type of overcurrent protective device.

### 1.05 QUALITY ASSURANCE

- A. Testing Agency Qualifications: An independent agency, with the experience and capability to conduct the testing indicated, that is a nationally recognized testing laboratory (NRTL) as defined by OSHA in 29 CFR 1910.7.
- B. Source Limitations: Obtain panelboards, overcurrent protective devices, components, and accessories through one source from a single manufacturer.
- C. Product Options: Drawings indicate size, profiles, and dimensional requirements of panelboards and are based on the specific system indicated. Refer to Division 01 Section "Product Requirements."
- D. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- E. Comply with NEMA PB 1.
- F. Comply with NFPA 70.

### 1.06 PROJECT CONDITIONS

- A. Environmental Limitations: Rate equipment for continuous operation under the following conditions, unless otherwise indicated:
1. Ambient Temperature: Not below -22 deg F (-30 deg C) and not exceeding 104 deg F (40 deg C).
  2. Altitude: Not exceeding 6600 feet (2000 m).

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B. Service Conditions: NEMA PB 1, usual service conditions, as follows:

1. Ambient temperatures within limits specified.
2. Altitude not exceeding 6600 feet (2000 m).

C. Interruption of Existing Electric Service: Do not interrupt electric service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary electric service according to requirements indicated:

1. Notify Architect, Construction Manager, and Owner no fewer than seven days in advance of proposed interruption of electrical service.
2. Do not proceed with interruption of electrical service without Architect's, Construction Manager's, or Owner's written permission.

### 1.07 COORDINATION

Coordinate layout and installation of panelboards and components with other construction that penetrates walls or is supported by them, including electrical and other types of equipment, raceways, piping, and encumbrances to workspace clearance requirements.

## PART 2 - PRODUCTS

### 2.01 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Panelboards, Overcurrent Protective Devices, Controllers, Contactors, and Accessories:
  - a. Eaton Corporation; Cutler-Hammer Products.
  - b. Square D.
  - c. Or Approved Equal

### 2.02 MANUFACTURED UNITS

A. Fabricate and test panelboards according to IEEE 344 to withstand seismic forces.

B. Enclosures: Flush and Surface mounted cabinets. NEMA PB 1, Type 1.

1. Rated for environmental conditions at installed location.
  - a. Outdoor Locations: NEMA 250, Type 3R.

## SECTION 26 2416 PANELBOARDS

- b. Kitchen Areas: NEMA 250, Type 4X, stainless steel.
  - c. Other Wet or Damp Indoor Locations: NEMA 250, Type 4.
  - d. Hazardous Areas Indicated on Drawings: NEMA 250, Type 7C.
2. Front: Secured to box with concealed trim clamps. For surface-mounted fronts, match box dimensions; for flush-mounted fronts, overlap box.
  3. Skirt for Surface-Mounted Panelboards: Same gage and finish as panelboard front with flanges for attachment to panelboard, wall, and ceiling or floor.
  4. Gutter Extension and Barrier: Same gage and finish as panelboard enclosure; integral with enclosure body. Arrange to isolate individual panel sections.
  5. Finish: Manufacturer's standard enamel finish over corrosion-resistant treatment or primer coat.
  6. Directory Card: With transparent protective cover, mounted in metal frame, inside panelboard door.
- C. Phase and Ground Buses:
1. Equipment Ground Bus: Adequate for feeder and branch-circuit equipment ground conductors; bonded to box.
  2. Material: Hard-drawn copper, 98 percent conductivity, or Tin-plated aluminum if acceptable to authority having jurisdiction.
  3. Extra-Capacity Neutral Bus: Neutral bus rated 200 percent of phase bus and UL listed as suitable for nonlinear loads.
  4. Split Bus: Vertical buses divided into individual vertical sections.
- D. Conductor Connectors: Suitable for use with conductor material.
1. Main and Neutral Lugs: Compression or Mechanical type.
  2. Ground Lugs and Bus Configured Terminators: Compression type.
  3. Feed-Through Lugs: Compression or Mechanical type suitable for use with conductor material. Locate at opposite end of bus from incoming lugs or main device.
  4. Extra-Capacity Neutral Lugs: Rated 200 percent of phase lugs mounted on extra-capacity neutral bus.

## SECTION 26 2416 PANELBOARDS

- E. Service Equipment Label: UL labeled for use as service equipment for panelboards with main service disconnect switches.

### 2.03 PANELBOARD SHORT-CIRCUIT RATING

- A. UL label indicating series-connected rating with integral or remote upstream overcurrent protective devices. Include size and type of upstream device allowable, branch devices allowable, and UL series-connected short-circuit rating.
- B. Fully rated to interrupt symmetrical short-circuit current available at terminals.

### 2.04 DISTRIBUTION

#### PANELBOARDS

- A. Doors: Secured with vault-type latch with tumbler lock; keyed alike.
- B. Main Overcurrent Protective Devices: Circuit breaker.
- C. Branch Overcurrent Protective Devices:
  - Bolt-on circuit breakers; plug-in circuit breakers where individual positive-locking device requires mechanical release for removal.

### 2.05 LIGHTING AND APPLIANCE BRANCH-CIRCUIT PANELBOARDS

- A. Branch Overcurrent Protective Devices: Bolt-on circuit breakers, replaceable without disturbing adjacent units.
- B. Doors: Concealed hinges; secured with flush latch with tumbler lock; keyed alike.

### 2.06 OVERCURRENT PROTECTIVE DEVICES

- A. Molded-Case Circuit Breaker: UL 489, with series-connected rating or interrupting capacity to meet available fault currents.
  - 1. Thermal-Magnetic Circuit Breakers: Inverse time-current element for low-level overloads, and instantaneous magnetic trip element for short circuits. Adjustable magnetic trip setting for circuit-breaker frame sizes 250 A and larger.
  - 2. Adjustable Instantaneous-Trip Circuit Breakers: Magnetic trip element with front-mounted, field-adjustable trip setting.
  - 3. Electronic trip-unit circuit breakers shall have RMS sensing; field-replaceable rating plug; and with the following field-adjustable settings:

## SECTION 26 2416 PANELBOARDS

- a. Instantaneous trip.
  - b. Long- and short-time pickup levels.
  - c. Long- and short-time time adjustments.
  - d. Ground-fault pickup level, time delay, and I<sup>2</sup>t response.
4. Current-Limiting Circuit Breakers: Frame sizes 400 A and smaller; let-through ratings less than NEMA FU 1, RK-5.
  5. Integrally Fused Circuit Breakers: Thermal-magnetic trip element with integral limiter-style fuse listed for use with circuit breaker; trip activation on fuse opening or on opening of fuse compartment door.
  6. GFCI Circuit Breakers for protection of personnel: Single- and two-pole configurations with 5-mA trip sensitivity.
  7. Ground Fault Protection for Equipment: Single- and two-pole configurations with 30-mA trip sensitivity.
- B. Molded-Case Circuit-Breaker Features and Accessories: Standard frame sizes, trip ratings, and number of poles.
1. Lugs: Mechanical or Compression style, suitable for number, size, trip ratings, and conductor materials.
  2. Application Listing: Appropriate for application; Type SWD for switching fluorescent lighting loads; Type HACR for heating, air-conditioning, and refrigerating equipment.
  3. Ground-Fault Protection: Integrally mounted or Remote-mounted relay and trip unit with adjustable pickup and time-delay settings, push-to-test feature, and ground-fault indicator.
  4. Communication Capability: Circuit-breaker-mounted, Universal-mounted, Integral, or Din-rail-mounted communication module with functions and features compatible with power monitoring and control system specified in Division 26 Section "Electrical Power Monitoring and Control."
  5. Shunt Trip: 120-V trip coil energized from separate circuit, set to trip at 55, or 75 percent of rated voltage.
  6. Undervoltage Trip: Set to operate at 35 to 75 percent of rated voltage without intentional, or with field-adjustable 0.1- to 0.6-second time delay.
  7. Auxiliary Contacts: One SPDT switch or Two SPDT switches with "a" and "b" contacts; "a" contacts mimic circuit-breaker contacts, "b" contacts operate in reverse of circuit-breaker contacts.

## SECTION 26 2416 PANELBOARDS

8. Key Interlock Kit: Externally mounted to prohibit circuit-breaker operation; key shall be removable only when circuit breaker is in off position.
9. Zone-Selective Interlocking: Integral with electronic trip unit; for interlocking ground-fault protection function.
10. Multipole units enclosed in a single housing or factory-assembled to operate as a single unit.

### 2.07 ACCESSORY COMPONENTS AND FEATURES

- A. Furnish accessory set including tools and miscellaneous items required for overcurrent protective device test, inspection, maintenance, and operation.
- B. Furnish portable test set to test functions of solid-state trip devices without removal from panelboard.
- C. Fungus Proofing: Permanent fungicidal treatment for panelboard interior, including overcurrent protective devices and other components.

## PART 3 – EXECUTION

### 3.01 INSTALLATION

- A. Install panelboards and accessories according to NEMA PB 1.1.
- B. Comply with mounting and anchoring requirements.
- C. Mount top of trim 74 inches (1880 mm) above finished floor, unless otherwise indicated.
- D. Mount plumb and rigid without distortion of box. Mount recessed panelboards with fronts uniformly flush with wall finish.
- E. Install overcurrent protective devices and controllers.
- F. Install filler plates in unused spaces.
- G. Stub four 1-inch (27-GRC) empty conduits from panelboard into accessible ceiling space or space designated to be ceiling space in the future. Stub four 1-inch (27-GRC) empty conduits into raised floor space or below slab not on grade.
- H. Arrange conductors in gutters into groups and bundle and wrap with wire ties after completing load balancing.

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### 3.02 IDENTIFICATION

- A. Identify field-installed conductors, interconnecting wiring, and components; provide warning signs as specified in Division 26 Section "Identification for Electrical Systems."
- B. Create a directory to indicate installed circuit loads after balancing panelboard loads. Obtain approval before installing. Use a computer or typewriter to create directory; handwritten directories are not acceptable.
- C. Panelboard Nameplates: Label each panelboard with engraved metal or laminated-plastic nameplate mounted with corrosion-resistant screws.

### 3.03 FIELD QUALITY CONTROL

- A. Prepare for acceptance tests as follows:
  - 1. Test insulation resistance for each panelboard bus, component, connecting supply, feeder, and control circuit.
  - 2. Test continuity of each circuit.
- B. Perform the following field tests and inspections and prepare test reports:
  - 1. Perform each electrical test and visual and mechanical inspection stated in NETA ATS, Section 7.5 for switches and Section 7.6 for molded-case circuit breakers. Certify compliance with test parameters.
  - 2. Correct malfunctioning units on-site, where possible, and retest to demonstrate compliance; otherwise, replace with new units and retest.
- C. Load Balancing: After Substantial Completion, but not more than 60 days after Final Acceptance, measure load balancing and make circuit changes.
  - 1. Measure as directed during period of normal system loading.
  - 2. Perform load-balancing circuit changes outside normal occupancy/working schedule of the facility and at time directed. Avoid disrupting critical 24-hour services such as fax machines and on-line data processing, computing, transmitting, and receiving equipment.
  - 3. After circuit changes, recheck loads during normal load period. Record all load readings before and after changes and submit test records.

## SECTION 26 2416 PANELBOARDS

4. Tolerance: Difference exceeding 20 percent between phase loads, within a panelboard, is not acceptable. Rebalance and recheck as necessary to meet this minimum requirement.

D. Infrared Scanning: After Substantial Completion, but not more than 60 days after Final Acceptance, perform an infrared scanning of each panelboard. Remove panel fronts so joints and connections are accessible to portable scanner.

1. Follow-up Infrared Scanning: Perform an additional follow-up infrared scan of each panelboard 11 months after date of Substantial Completion.
2. Instrument: Use an infrared scanning device designed to measure temperature or to detect significant deviations from normal values. Provide calibration record for device.
3. Record of Infrared Scanning: Prepare a certified report that identifies panelboards checked and describes scanning results. Include notation of deficiencies detected, remedial action taken, and observations after remedial action.

### 3.04 CLEANING

On completion of installation, inspect interior and exterior of panelboards. Remove paint splatters and other spots. Vacuum dirt and debris; do not use compressed air to assist in cleaning. Repair exposed surfaces to match original finish.

END OF SECTION 26 2416

## **SECTION 26 0553 IDENTIFICATION FOR ELECTRICAL SYSTEMS**

### **PART 1 - GENERAL**

#### **1.01 RELATED DOCUMENTS**

Drawings and general provisions of the Contract apply to this Section.

#### **1.02 SUMMARY**

##### **A. Section Includes:**

1. Identification for raceway and metal-clad cable.
2. Identification for conductors and communication and control cable.
3. Underground-line warning tape.
4. Warning labels and signs.
5. Instruction signs.
6. Equipment identification labels.
7. Miscellaneous identification products.

#### **1.03 QUALITY ASSURANCE**

A. Comply with ANSI A13.1 and ANSI C2.

B. Comply with NFPA 70.

C. Comply with 29 CFR 1910.145.

#### **1.04 COORDINATION**

A. Coordinate identification names, abbreviations, colors, and other features with requirements in the Contract Documents, Shop Drawings, manufacturer's wiring diagrams, and the Operation and Maintenance Manual, and with those required by codes, standards, and 29 CFR 1910.145. Use consistent designations throughout Project.

B. Coordinate installation of identifying devices with completion of covering and painting of surfaces where devices are to be applied.

C. Coordinate installation of identifying devices with location of access panels and doors.

D. Install identifying devices before installing acoustical ceilings and similar concealment.

## SECTION 26 0553 IDENTIFICATION FOR ELECTRICAL SYSTEMS

### PART 2 - PRODUCTS

#### 2.01 RACEWAY 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. Color for Printed Legend:
  - 1. Power Circuits: Black letters on an orange field.
  - 2. Legend: Indicate system or service and voltage, if applicable.
- 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. Snap-Around Labels: Slit, pretensioned, flexible, preprinted, color-coded acrylic sleeves, 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: Slit, pretensioned, flexible, solid-colored acrylic sleeves, 2 inches (50 mm) long, with diameter sized to suit diameter of raceway or cable it identifies and to stay in place by gripping action.
- F. Self-Adhesive Vinyl Tape: Colored, heavy duty, waterproof, fade resistant; 2 inches (50 mm) wide; compounded for outdoor use.

#### 2.02 CONDUCTOR AND COMMUNICATION- AND CONTROL-CABLE IDENTIFICATION MATERIALS

- A. Color code secondary service, feeder, and branch circuit conductors with field applied identification where factory applied color is not readily available.
- B. Color-Coding Conductor Tape: Colored, self-adhesive vinyl tape not less than 3 mils (0.08 mm) thick by 1 to 2 inches (25 to 50 mm) wide.
- C. Marker Tapes: Vinyl or vinyl-cloth, self-adhesive wraparound type, with circuit identification legend machine printed by thermal transfer or equivalent process.
- D. Aluminum Wraparound Marker Labels: Cut from 0.014-inch (0.35 mm) thick aluminum sheet, with stamped, embossed, or scribed legend, and fitted with tabs and matching slots for permanently securing around wire or cable jacket or around groups of conductors.
- E. Metal Tags: Brass or aluminum, 2 by 2 by 0.05 inch (50 by 50 by 1.3 mm), with stamped legend, punched for use with self-locking nylon tie fastener.

## SECTION 26 0553 IDENTIFICATION FOR ELECTRICAL SYSTEMS

- F. Write-On Tags: Polyester tag, 0.010 inch (0.25 mm) or 0.015 inch (0.38 mm) thick, with corrosion-resistant grommet and polyester or nylon tie for attachment to conductor or cable.

Marker for Tags: Permanent, waterproof, black ink marker recommended by tag manufacturer.

### 2.03 UNDERGROUND-LINE WARNING TAPE

- A. Description: Permanent, bright-colored, continuous-printed, polyethylene tape.
1. Not less than 6 inches (150 mm) wide by 4 mils (0.102 mm) thick.
  2. Compounded for permanent direct-burial service.
  3. Embedded continuous metallic strip or core.
  4. Printed legend shall indicate type of underground line.

### 2.04 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: Preprinted aluminum signs, punched or drilled for fasteners, with colors, legend, and size required for application. 1/4-inch (6.4mm) grommets in corners for mounting. Nominal size, 7 by 10 inches (180 by 250 mm).
- D. Metal-Backed, Butyrate Warning Signs: Weather-resistant, nonfading, preprinted, cellulose acetate butyrate signs with 0.0396-inch (1 mm) galvanized-steel backing; and with colors, legend, and size required for application. 1/4-inch (6.4 mm) grommets in corners for mounting. Nominal size, 10 by 14 inches (250 by 360 mm).
- 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 "42 INCHES FOR 0 - 150V."

## SECTION 26 0553 IDENTIFICATION FOR ELECTRICAL SYSTEMS

### 3. Multiple Service Warning:

"Warning – This building is served by multiple services. Service #1 (utility) supplies the building main service switchboard. Service #2 (photovoltaic system) is connected to the main service switchboard.

### 2.05 INSTRUCTION SIGNS

A. Engraved, laminated acrylic or melamine plastic, minimum 1/16 inch (1.6 mm) thick for signs up to 20 sq. in. (129 sq. cm) and 1/8 inch (3.2 mm) 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.

### 2.06 EQUIPMENT IDENTIFICATION LABELS

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 (10 mm).

### 2.07 MISCELLANEOUS IDENTIFICATION PRODUCTS

A. Cable Ties: Fungus-inert, self-extinguishing, 1-piece, self-locking, Type 6/6 nylon cable ties.

1. Minimum Width: 3/16 inch (5 mm).
2. Tensile Strength: 50 lb (22.6 kg), minimum.
3. Temperature Range: Minus 40 to plus 185 deg F (Minus 40 to plus 85 deg C).
4. Color: Black, except where used for color-coding.

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 APPLICATION

A. Accessible Raceways and Metal-Clad Cables, 600 V or Less, for Service, Feeder, and Branch Circuits More Than 30A. Identify with orange self-adhesive vinyl label or self-adhesive vinyl tape applied in bands.

## SECTION 26 0553 IDENTIFICATION FOR ELECTRICAL SYSTEMS

B. Accessible Raceways and Cables of Auxiliary Systems: Identify the following systems with color-coded, self-adhesive vinyl tape applied in bands:

1. Fire Alarm System: Red.
2. Fire-Suppression Supervisory and Control System: Red and yellow.
3. Combined Fire Alarm and Security System: Red and blue.
4. Security System: Blue and yellow.
5. Mechanical and Electrical Supervisory System: Green and blue.
6. Telecommunication System: Green and yellow.
7. Control Wiring: Green and red.

C. Power-Circuit Conductor Identification: For primary and secondary conductors No. 1/0 AWG and larger in vaults, pull and junction boxes, manholes, and handholes use color-coding conductor tape, marker tape, aluminum wraparound marker labels, metal tags, or write-on tags. Identify source and circuit number of each set of conductors. For single conductor cables, identify phase in addition to the above.

D. Branch-Circuit Conductor Identification: Where there are conductors for more than three branch circuits in same junction or pull box, use color-coding conductor tape, marker tape, aluminum wraparound marker labels, metal tags, or write-on tags. Identify each ungrounded conductor according to source and circuit number.

E. Conductors to Be Extended in the Future: Attach write-on tags or marker tape to conductors and list source and circuit number.

F. Auxiliary Electrical Systems Conductor Identification: Identify field-installed alarm, control, signal, sound, intercommunications, voice, and data 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 Operation and Maintenance Manual.

G. Locations of Underground Lines: Identify with underground-line warning tape for power, lighting, communication, and control wiring and optical fiber

## SECTION 26 0553 IDENTIFICATION FOR ELECTRICAL SYSTEMS

cable. Install underground-line warning tape for both direct-buried cables and cables in raceway.

H. Warning Labels for Indoor Cabinets, Boxes, and Enclosures for Power and Lighting: Comply with 29 CFR 1910.145 and apply self-adhesive warning labels or metal-backed, butyrate warning signs. Identify system voltage with black letters on an orange background. Apply to exterior of door, cover, or other access.

1. 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.
2. Equipment Requiring Workspace Clearance According to NFPA 70: Apply to outside of door or cover of equipment.

I. Instruction Signs:

1. Operating Instructions: 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.
2. Emergency Operating Instructions: Install instruction signs with white legend on a red background with minimum 3/8-inch (10mm) high letters for emergency instructions at equipment used for power transfer or load shedding.

J. Equipment Identification Labels: On each unit of equipment, install unique designation label that is consistent with wiring diagrams, schedules, and 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. Provide a single line of text with 1/2-inch (13 mm) high letters on 1-1/2-inch (38 mm) high label; where 2 lines of text are required, use labels 2 inches (50 mm) high.
  - b. Outdoor Equipment: Engraved, laminated acrylic or melamine label.
  - c. Elevated Components: Increase sizes of labels and letters to those appropriate for viewing from the floor.

## SECTION 26 0553 IDENTIFICATION FOR ELECTRICAL SYSTEMS

2. Equipment to be Labeled:
  - a. Panelboards, electrical cabinets, and enclosures.
  - b. Access doors and panels for concealed electrical items.
  - c. Disconnect switches.
  - d. Enclosed circuit breakers.
  - e. Motor starters.
  - f. Contactors.
  - g. Remote-controlled switches, dimmer modules, and control devices.
  - h. Voice and data cable terminal equipment.
  - i. Television/audio components, racks, and controls.
  - j. Security and intrusion-detection control stations, control panels, terminal cabinets, and racks.
  - k. Monitoring and control equipment.

### 3.02 INSTALLATION

- A. Location: Install identification materials and devices at locations for most convenient viewing without interference with operation and maintenance of equipment.
- B. Apply identification devices to surfaces that require finish after completing finish work.
- C. Verify identity of each item before installing identification products.
- D. Self-Adhesive Identification Products: Clean surfaces before application, using materials and methods recommended by manufacturer of identification device.
- E. System Identification Color Banding for Raceways and Cables: Each color 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 (15 m) maximum intervals in straight runs, and at 25 foot (7.6 m) maximum intervals in congested areas.
- F. Color-Coding for Phase and Voltage Level, Identification, 600 V and Less: Use the colors listed below for ungrounded service, feeder, and branch-circuit conductors.

## SECTION 26 0553 IDENTIFICATION FOR ELECTRICAL SYSTEMS

1. Color shall be factory applied or, for sizes larger than No. 10 AWG if authorities having jurisdiction permit, field applied.
  2. Colors for 208/120-V Circuits:
    - a. Phase A: Black.
    - b. Phase B: Red.
    - c. Phase C: Blue.
    - d. Neutral: White.
    - e. Ground: Green.
  3. Field-Applied, Color-Coding Conductor Tape: Apply in half-lapped turns for a minimum distance of 6 inches (150 mm) 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.
- G. Aluminum Wraparound Marker Labels and Metal Tags: Secure tight to surface of conductor or cable at a location with high visibility and accessibility.
- H. Underground-Line Warning Tape: During backfilling of trenches install continuous underground-line warning tape directly above line at 6 to 8 inches (150 to 200 mm) below finished grade. Use multiple tapes where width of multiple lines installed in a common trench or concrete envelope exceeds 16 inches (400 mm) overall.
- I. Painted Identification: Prepare surface and apply paint according to Section 09 9000 Painting and Coating.

**END OF SECTION 260553**

**SECTION 260548 -  
VIBRATION AND SEISMIC CONTROLS FOR ELECTRICAL SYSTEMS**

**PART 1 - GENERAL**

**1.01 SCOPE DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions, apply to this Section.

**1.02 SUMMARY**

- A. Section Includes:
  - 1. Isolation Pads.
  - 2. Channel Support Systems.
  - 3. Restraint Cables.
  - 4. Hanger Rod Stiffeners.
  - 5. Anchorage Bushings and Washers.

**1.03 DEFINITIONS**

- A. The IBC: International Building Code.
- B. ICC-ES Evaluation Service.

**1.04 QUALITY ASSURANCE**

- A. Comply with seismic-restraint requirements in the IBC unless requirements in this Section are more stringent.
- B. Welding: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."
- C. Seismic-restraint devices shall have horizontal and vertical load testing and analysis and shall bear anchorage preapproval by agency acceptable to authorities having jurisdiction, showing maximum seismic-restraint ratings. Ratings based on independent testing are preferred to ratings based on calculations. If preapproved ratings are not available, submittals based on independent testing are preferred. Calculations (including combining shear and tensile loads) to support seismic-restraint designs must be signed and sealed by a qualified professional engineer.
- D. Comply with NFPA 70.

**SECTION 260548 -  
VIBRATION AND SEISMIC CONTROLS FOR ELECTRICAL SYSTEMS**

**PART 2 - PRODUCTS**

**2.01 VIBRATION ISOLATORS**

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. Ace Mountings Co., Inc.
  - 2. Mason Industries.
  - 3. California Dynamic Corporations.
  
- B. Pads: Arrange in single or multiple layers of sufficient stiffness for uniform loading over pad area, molded with a nonslip pattern and galvanized-steel baseplates, and factory cut to sizes that match requirements of supported equipment.
  - 1. Resilient Material: Oil and water-resistant, neoprene, rubber, or hermetically sealed compressed fiberglass.

**2.02 SEISMIC-RESTRAINT DEVICES**

- A. General Requirements for Restraint Components: Rated strengths, features, and application requirements shall be as defined in reports by an agency acceptable to authorities having jurisdiction.
  - 1. California Dynamics Corporation.
  - 2. Cooper B-Line, Inc.; a division of Cooper Industries.
  - 3. Manson Industries.
  
- B. Structural Safety Factor: Allowable strength in tension, shear, and pullout force of components shall be at least four times the maximum seismic forces to which they will be subjected.
  
- C. Channel Support System: MFMA-3, shop- or field-fabricated support assembly made of slotted steel channels with accessories for attachment to braced component at one end and to building structure at the other end and other matching components and with corrosion-resistant coating; and rated in tension, compression, and torsion forces.
  
- D. Restraint Cables: ASTM A 603 galvanized or ASTM A 492 stainless-steel cables with end connections made of steel assemblies with thimbles, brackets, swivels, and bolts designed for restraining cable service; and with a minimum of two clamping bolts for cable engagement.

**SECTION 260548 -  
VIBRATION AND SEISMIC CONTROLS FOR ELECTRICAL SYSTEMS**

- E. Hanger Rod Stiffener: Steel tube or steel slotted-support-system sleeve with internally bolted Connections to hanger rod. Do not weld stiffeners to rods.
- F. Bushings for Floor-Mounted Equipment Anchor: Neoprene bushings designed for rigid equipment mountings, and matched to type and size of anchors and studs.
- G. Bushing Assemblies for Wall-Mounted Equipment Anchorage: Assemblies of neoprene elements and steel sleeves designed for rigid equipment mountings, and matched to type and size of attachment devices.
- H. Resilient Isolation Washers and Bushings: One-piece, molded, oil- and water-resistant neoprene, with a flat washer face.
- I. Mechanical Anchor: Drilled-in and stud-wedge or female-wedge type in zinc-coated steel for interior applications and stainless steel for exterior applications. Select anchors with strength required for anchor and as tested according to ASTM E 488. Minimum length of eight times diameter.
- J. Adhesive Anchor: Drilled-in and capsule anchor system containing polyvinyl or urethane methacrylate-based resin and accelerator, or injected polymer or hybrid mortar adhesive. Provide anchor bolts and hardware with zinc-coated steel for interior applications and stainless steel for exterior applications. Select anchor bolts with strength required for anchor and as tested according to ASTM E 488.

**2.03 FACTORY FINISHES**

- A. Finish: Manufacturer's standard paint applied to factory-assembled and tested equipment before shipping.
  - 1. Powder coating on springs and housings.
  - 2. All hardware shall be galvanized. Hot-dip galvanize metal components for exterior use.
  - 3. Baked enamel or powder coat for metal components on isolators for interior use.
  - 4. Color-code or otherwise mark vibration isolation and seismic-control devices to indicate capacity range.

**PART 3 – EXECUTION**

**SECTION 260548 -  
VIBRATION AND SEISMIC CONTROLS FOR ELECTRICAL SYSTEMS**

**3.01 EXAMINATION**

- A. Examine areas and equipment to receive vibration isolation and seismic control devices for Compliance with requirements for installation tolerances and other conditions affecting performance.
- B. Examine roughing-in of reinforcement and cast-in-place anchors to verify actual locations before installation.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

**3.02 APPLICATIONS**

- A. Multiple Raceways or Cables: Secure raceways and cables to trapeze member with clamps approved for application by an agency acceptable to authorities having jurisdiction.
- B. Hanger Rod Stiffeners: Install hanger rod stiffeners where indicated or scheduled on Drawings to receive them and where required to prevent buckling of hanger rods due to seismic forces.
- C. Strength of Support and Seismic-Restraint Assemblies: Where not indicated, select sizes of components so strength will be adequate to carry present and future static and seismic loads within specified loading limits.

**3.03 SEISMIC-RESTRAINT DEVICE INSTALLATION**

- A. Equipment and Hanger Restraints:
  - 1. Install restrained isolators on electrical equipment.
  - 2. Install resilient, bolt-isolation washers on equipment anchor bolts where clearance between anchor and adjacent surface exceeds 0.125 inch (3.2 mm).
  - 3. Install seismic-restraint devices using methods approved by an agency acceptable to authorities having jurisdiction required submittals for component.
- B. Install bushing assemblies for mounting bolts for wall-mounted equipment, arranged to provide resilient media where equipment or equipment-mounting channels are attached to wall.
- C. Attachment to Structure: If specific attachment is not indicated, anchor bracing to structure at flanges of beams, at upper truss chords of bar joists, or at concrete members.

**SECTION 260548 -  
VIBRATION AND SEISMIC CONTROLS FOR ELECTRICAL SYSTEMS**

**D. Drilled-in Anchors:**

1. Identify position of reinforcing steel and other embedded items prior to drilling holes for anchors. Do not damage existing reinforcing or embedded items during coring or drilling. Notify the structural engineer if reinforcing steel or other embedded items are encountered during drilling. Locate and avoid prestressed tendons, electrical and telecommunications conduit, and gas lines.
2. Do not drill holes in concrete or masonry until concrete, mortar, or grout has achieved full design strength.
3. Wedge Anchors: Protect threads from damage during anchor installation. Heavy-duty sleeve anchors shall be installed with sleeve fully engaged in the structural element to which anchor is to be fastened.
4. Adhesive Anchors: Clean holes to remove loose material and drilling dust prior to installation of adhesive. Place adhesive in holes proceeding from the bottom of the hole and progressing toward the surface in such a manner as to avoid introduction of air pockets in the adhesive.
5. Set anchors to manufacturer's recommended torque, using a torque wrench.
6. Install zinc-coated steel anchors for interior and stainless-steel anchors for exterior applications.

**3.04 ACCOMMODATION OF DIFFERENTIAL SEISMIC MOTION**

- A. Install flexible connections in runs of raceways, cables, wireways, cable trays, and busways where they cross seismic joints, where adjacent sections or branches are supported by different structural elements, and where they terminate with connection to equipment that is anchored to a different structural element from the one supporting them as they approach equipment.

**3.05 FIELD QUALITY CONTROL**

- A. Perform tests and inspections.
- B. Tests and Inspections:
  1. Schedule test with Owner, through Architect, before connecting anchorage device to restrained component (unless postconnection

**SECTION 260548 -  
VIBRATION AND SEISMIC CONTROLS FOR ELECTRICAL SYSTEMS**

testing has been approved), and with at least seven days' advance notice.

2. Obtain Architect's approval before transmitting test loads to structure. Provide temporary load-spreading members.
  3. If a device fails test, modify all installations of same type and retest until satisfactory results are achieved.
- C. Remove and replace malfunctioning units and retest as specified above.
- D. Prepare test and inspection reports.

**3.06 ADJUSTING**

- A. Adjust restraints to permit free movement of equipment within normal mode of operation.

**END OF SECTION 260548**

## **SECTION 26 0533 RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS**

### **PART 1 - GENERAL**

#### **1.01 RELATED DOCUMENTS**

Drawings and general provisions of the Contract apply to this Section.

#### **1.02 SUMMARY**

A. Section Includes:

1. Raceways.
2. Fittings.
3. Boxes.
4. Enclosures.
5. Cabinets for electrical wiring.

#### **1.03 SUBMITTALS**

Provide cut sheets and product data for review.

#### **1.04 DEFINITIONS**

- A. EPDM: Ethylene-propylene-diene terpolymer rubber.
- B. NBR: Acrylonitrile-butadiene rubber.

#### **1.05 QUALITY ASSURANCE**

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- B. Comply with NFPA 70.

#### **1.06 COORDINATION**

- A. Coordinate layout and installation of raceways, boxes, enclosures, cabinets, and suspension system with other construction that penetrates ceilings or is supported by them, including light fixtures, HVAC equipment, fire-suppression system, and partition assemblies.
- B. Coordinate layout and installation of raceway and boxes with other construction elements to ensure maximum headroom, working clearance, and access.

## SECTION 26 0533 RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS

### PART 2 - PRODUCTS

#### 2.01 METAL CONDUIT AND TUBING

- A. Available Manufacturers: Provide products that comply with requirements.
- B. Rigid Steel Conduit: ANSI C80.1.
- C. IMC: ANSI C80.6.
- D. PVC-Coated Steel Conduit: PVC-coated rigid steel conduit, IMC.
  - 1. Comply with NEMA RN 1.
  - 2. Coating Thickness: 0.040 inch (1 mm), minimum.
- E. EMT: ANSI C80.3.
- F. FMC: Zinc-coated steel or aluminum.
- G. LFMC: Flexible steel conduit with PVC jacket.
- H. Fittings for Conduit and Cable: NEMA FB 1; listed for type and size raceway with which used, and for application and environment in which installed.
  - 1. Conduit Fittings for Hazardous (Classified) Locations: Comply with UL 886.
  - 2. Fittings for EMT: Steel, setscrew or compression type.
  - 3. Coating for Fittings for PVC-Coated Conduit: Minimum thickness, 0.040 inch (1 mm), with overlapping sleeves protecting threaded joints.

#### 2.02 NONMETALLIC CONDUIT AND TUBING

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. AFC Cable Systems, Inc.
  - 2. Anamet Electrical, Inc.; Anaconda Metal Hose.
  - 3. Or Approved Equal
- B. ENT: NEMA TC 13.
- C. RNC: NEMA TC 2.
- D. LFNC: UL 1660.

## **SECTION 26 0533 RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS**

E. Fittings for ENT and RNC: NEMA TC 3; match to conduit or tubing type and material.

F. Fittings for LFNC: UL 514B.

### **2.03 OPTICAL FIBER/COMMUNICATIONS CABLE RACEWAY AND FITTINGS**

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Arcco Corporation.
2. Endot Industries Inc.
3. Or Approved Equal

B. Description: Comply with UL 2024; flexible type, approved for plenum, riser, or general-use installation.

### **2.04 METAL WIREWAYS**

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Cooper B-Line, Inc.
2. Hoffman.
3. Square D; Schneider Electric.

B. Description: Sheet metal sized and shaped as indicated, NEMA 250, Type 1, 12, or 3R, unless otherwise indicated.

C. Fittings and Accessories: Include 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.

D. Wireway Covers: Hinged type, Screw-cover type, Flanged-and-gasketed type, or as indicated on plans.

E. Finish: Manufacturer's standard enamel finish.

### **2.05 NONMETALLIC WIREWAYS**

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Hoffman.
2. Lamson & Sessions; Carlon Electrical Products.

## SECTION 26 0533 RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS

3. Or Approved Equal

B. Description: Fiberglass polyester, extruded and fabricated to size and shape indicated, with no holes or knockouts. Cover is gasketed with oil-resistant gasket material and fastened with captive screws treated for corrosion resistance. Connections are flanged, with stainless-steel screws and oil-resistant gaskets.

C. Fittings and Accessories: Include 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.

### 2.06 SURFACE RACEWAYS

A. Surface Metal Raceways: Galvanized steel with snap-on covers. Manufacturer's standard enamel finish in color selected by Architect or Prime coating, ready for field painting.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

- a. Thomas & Betts Corporation.
- b. Walker Systems, Inc.; Wiremold Company (The).
- c. Or Approved Equal

B. Surface Nonmetallic Raceways: Two-piece construction, manufactured of rigid PVC with texture and color selected by Architect from manufacturer's standard or custom colors.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

- a. Butler Manufacturing Company; Walker Division.
- b. Hubbell Incorporated; Wiring Device-Kellems Division.
- c. Or Approved Equal

### 2.07 BOXES, ENCLOSURES, AND CABINETS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Cooper Crouse-Hinds; Div. of Cooper Industries, Inc.
2. EGS/Appleton Electric.
3. Or Approved Equal

## SECTION 26 0533 RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS

- B. Sheet Metal Outlet and Device Boxes: NEMA OS 1.
- C. Cast-Metal Outlet and Device Boxes: NEMA FB 1, aluminum, Type FD, with gasketed cover.
- D. Nonmetallic Outlet and Device Boxes: NEMA OS 2.
- E. Metal Floor Boxes: Cast or sheet metal, fully adjustable or semi-adjustable, rectangular.
- F. Nonmetallic Floor Boxes: Nonadjustable, round.
- G. Multiple Service Floor Boxes: Cast Metal, Formed Steel fully adjustable, four compartment, multiple service (typical of Walker RFB Series).
- H. Small Sheet Metal Pull and Junction Boxes: NEMA OS 1.
- I. Cast-Metal Access, Pull, and Junction Boxes: NEMA FB 1, cast aluminum, galvanized, cast iron with gasketed cover.
- J. Hinged-Cover Enclosures: NEMA 250, Type 1, with continuous-hinge cover with flush latch.
  - 1. Metal Enclosures: Steel.
  - 2. Nonmetallic Enclosures: Plastic, finished inside with radio-frequency-resistant paint.
- K. Cabinets:
  - 1. NEMA 250, Type 1, galvanized-steel box with removable interior panel and removable front.
  - 2. Hinged door in front cover with flush latch and concealed hinge.
  - 3. Key latch to match panelboards.
  - 4. Metal barriers to separate wiring of different systems and voltage.
  - 5. Accessory feet where required for freestanding equipment.

### 2.08 FACTORY FINISHES

Finish: For enclosure or cabinet components, provide manufacturer's standard finish inside and prime-coat finish ready for field painting on outside of enclosure or cabinet. Use marine grade primers and paint.

## SECTION 26 0533 RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS

### PART 3 - EXECUTION

#### 3.01 RACEWAY APPLICATION

A. Outdoors: Apply raceway products as specified below, unless otherwise indicated:

1. Exposed Conduit: Rigid steel conduit, IMC, RNC, Type EPC-80-PVC.
2. Concealed Conduit, Aboveground: Rigid steel conduit, IMC, RNC.
3. Underground Conduit: RNC, Type EPC-40, 80-PVC, direct buried.
4. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): LFMC.
5. Boxes and Enclosures, Aboveground: NEMA 250, Type 3R, 4.

B. Comply with the following indoor applications, unless otherwise indicated:

1. Exposed, Not Subject to Physical Damage: EMT or RNC.
2. Exposed and Subject to Physical Damage: Rigid steel conduit, IMC, or RNC, Type EPC-80-PVC. Including but not limited to raceways in the following locations:
  - a. Corridors.
  - b. Mechanical rooms.
3. Concealed in Ceilings and Interior Walls and Partitions: EMT, ENT, or RNC.
4. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): FMC, except use LFMC in damp or wet locations.
5. Damp or Wet Locations: Rigid steel conduit.
6. Raceways for Optical Fiber or Communications Cable in Spaces Used for Environmental Air: Plenum-type, optical fiber/communications cable raceway, EMT.
7. Raceways for Optical Fiber or Communications Cable Risers in Vertical Shafts: Riser-type, optical fiber/communications cable raceway, EMT.

## SECTION 26 0533 RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS

8. Raceways for Concealed General Purpose Distribution of Optical Fiber or Communications Cable: General-use, optical fiber/communications cable raceway; Riser-type, optical fiber/communications cable raceway; Plenum-type, optical fiber/communications cable raceway; EMT.
9. Boxes and Enclosures: NEMA 250, Type 1, except use NEMA 250, Type 4, stainless steel nonmetallic in damp or wet locations.

D. Minimum Raceway Size: 1/2-inch (16-mm) trade size.

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.
2. PVC Externally Coated, Rigid Steel Conduits: Use only fittings listed for use with that material. Patch and seal all joints, nicks, and scrapes in PVC coating after installing conduits and fittings. Use sealant recommended by fitting manufacturer.

F. Install nonferrous conduit or tubing for circuits operating above 60 Hz. Where aluminum raceways are installed for such circuits and pass through concrete, install in nonmetallic sleeve.

G. Do not install aluminum conduits in contact with concrete.

### 3.02 INSTALLATION

- A. Comply with NECA 1 for installation requirements applicable to products specified in Part 2 except where requirements on Drawings or in this Article are stricter.
- B. Keep raceways at least 6 inches (150 mm) away from parallel runs of flues and steam or hot-water pipes. Install horizontal raceway runs above water and steam piping.
- C. Complete raceway installation before starting conductor installation.
- D. Support raceways as specified in Division 26 0500 "Common Work Results for Electrical."
- E. Arrange stub-ups so curved portions of bends are not visible above the finished slab.
- F. Install no more than the equivalent of three 90-degree bends in any conduit run except for communications conduits, for which fewer bends are allowed.

## SECTION 26 0533 RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS

G. Conceal conduit and EMT within finished walls, ceilings, and floors, unless otherwise indicated.

H. Raceways Embedded in Slabs:

1. Run conduit larger than 1-inch (27-mm) trade size, parallel or at right angles to main reinforcement. Where at right angles to reinforcement, place conduit close to slab support.
2. Arrange raceways to cross building expansion joints at right angles with expansion fittings.

I. 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.

J. Install pull wires in empty raceways. Use polypropylene or monofilament plastic line with not less than 200-lb (90-kg) tensile strength. Leave at least 12 inches (300 mm) of slack at each end of pull wire.

K. Raceways for Optical Fiber and Communications Cable: Install raceways, metallic and nonmetallic, rigid and flexible, as follows:

1. 3/4-Inch (19-mm) Trade Size and Smaller: Install raceways in maximum lengths of 50 feet (15 m).
2. 1-Inch (25-mm) Trade Size and Larger: Install raceways in maximum lengths of 75 feet (23 m).
3. Install with a maximum of two 90-degree bends or equivalent for each length of raceway unless Drawings show stricter requirements. Separate lengths with pull or junction boxes or terminations at distribution frames or cabinets where necessary to comply with these requirements.

L. Install raceway sealing fittings at suitable, approved, and accessible locations 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. Install raceway sealing fittings 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.

M. Expansion-Joint Fittings for RNC: Install in each run of aboveground conduit that is located where environmental temperature change may exceed 30 deg F (17 deg C), and that has straight-run length that exceeds 25 feet (7.6 m).

## SECTION 26 0533 RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS

1. Install expansion-joint fittings for each of the following locations, and provide type and quantity of fittings that accommodate temperature change listed for location:
    - a. Outdoor Locations Not Exposed to Direct Sunlight: 125 deg F (70 deg C) temperature change.
    - b. Outdoor Locations Exposed to Direct Sunlight: 155 deg F (86 deg C) temperature change.
    - c. Indoor Spaces: Connected with the Outdoors without Physical Separation: 125 deg F (70 deg C) temperature change.
    - d. Attics: 135 deg F (75 deg C) temperature change.
  2. Install fitting(s) that provide expansion and contraction for at least 0.00041 inch per foot of length of straight run per deg F (0.06 mm per meter of length of straight run per deg C) of temperature change.
  3. Install each expansion-joint fitting with position, mounting, and piston setting selected according to manufacturer's written instructions for conditions at specific location at the time of installation.
- N. Flexible Conduit Connections: Use maximum of 72 inches (1830 mm) of flexible conduit for recessed and semirecessed lighting fixtures, equipment subject to vibration, noise transmission, or movement; and for transformers and motors.
1. Use LFMC in damp or wet locations subject to severe physical damage.
  2. Use LFMC or LFNC in damp or wet locations not subject to severe physical damage.
- O. Set metal floor boxes level and flush with finished floor surface.
- P. Set nonmetallic floor boxes level. Trim after installation to fit flush with finished floor surface.
- Q. Provide floor boxes with number of compartments required for services indicated.

### 3.03 PROTECTION

- A. Provide final protection and maintain conditions that ensure coatings, finishes, and cabinets are without damage or deterioration at time of Substantial Completion.
1. Repair damage to galvanized finishes with zinc-rich paint recommended by manufacturer.

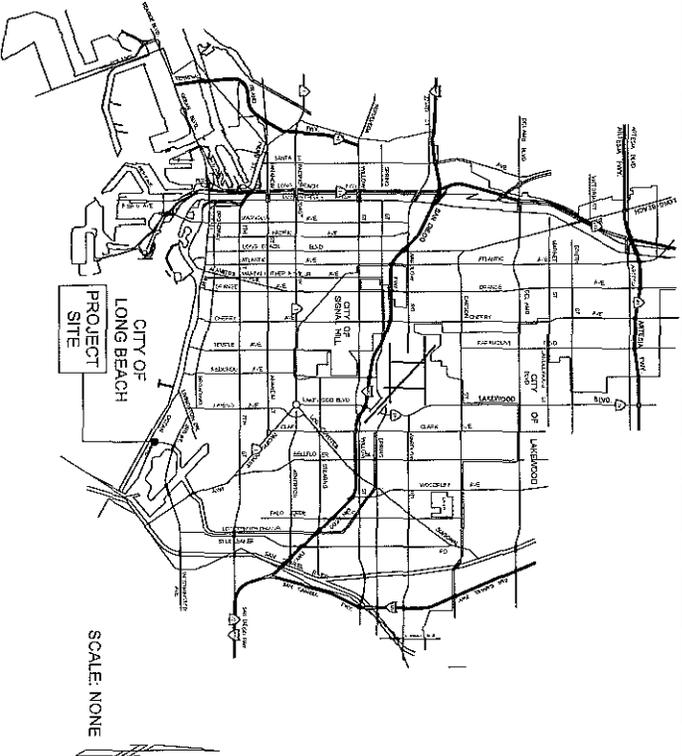
**SECTION 26 0533 RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS**

2. Repair damage to PVC or paint finishes with matching touchup coating recommended by manufacturer.

**END OF SECTION 260533**

# BAYSHORE LIFE GUARD STATION

VICINITY MAP



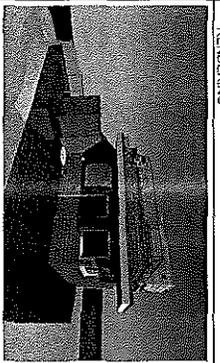
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## SHEET INDEX

SHEET #

DATE	TITLE	SHEET #
G-1	TITLE GENERAL NOTES	1
C-1.0	GRADING AND PAVING PLAN	2
C-2.0	UTILITY PLAN	3
C-3.0	EROSION CONTROL PLAN	4

## RENDERING



## PROJECT DESCRIPTION

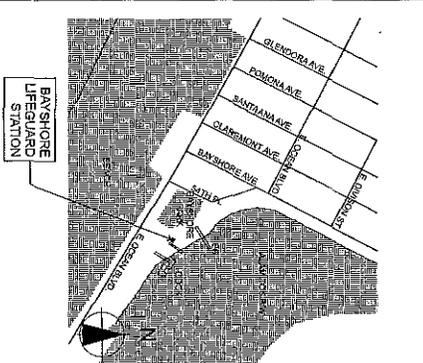
THE LIFE GUARD STATION IS ONE STORY WITH A BERRY HATCH HALL, STAIRS, AS WELL AS A BREAK AREA, CHANGING ROOMS AND STORAGE SPACE FOR BOATS AND OTHER EQUIPMENT. THESE ARE ALSO ACCESSIBLE TO THE BOAT DECK FROM THE BOAT DECK.

## PROJECT INFORMATION

PROJECT ADDRESS: 5415 E. OCEAN BLVD, LONG BEACH, CALIFORNIA  
 FLOOD ZONE: AE  
 ZONING: P  
 CONSTRUCTION TYPE: NOT REQUIRED  
 FIRE ALARM SYSTEM: NOT REQUIRED  
 SPOKES: 1  
 PROPOSED HEIGHT: 22'-4"

REVISION	DATE	BY	DESCRIPTION
1	08/17/11	AS	ISSUED FOR PERMITS
2	08/17/11	AS	REVISIONS
3	08/17/11	AS	REVISIONS
4	08/17/11	AS	REVISIONS

## LOCATION MAP



APPLICABLE CODES	SEPARATE PERMITS	PROJECT TEAM
BUILDING PLANS AND CALCULATIONS SHALL BE IN COMPLIANCE WITH: 2010 CALIFORNIA ELECTRICAL CODE 2010 CALIFORNIA MECHANICAL CODE 2010 CALIFORNIA PLUMBING CODE 2010 CALIFORNIA ENERGY CODE 2010 CALIFORNIA FIRE AND LIFE SAFETY CODE 2010 CALIFORNIA GREEN BUILDING STANDARDS CODE LONG BEACH MUNICIPAL CODE, TITLE 18	SEPARATE PERMITS ARE REQUIRED FOR THE FOLLOWING: 1. MECHANICAL 2. ELECTRICAL 3. PLUMBING 4. SCANS	<b>PROJECT:</b> BAYSHORE LIFE GUARD STATION 5415 E. OCEAN BLVD, LONG BEACH, CA 90803 <b>OWNER:</b> CITY OF LONG BEACH 333 W. OCEAN BLVD, 7TH FLOOR LONG BEACH, CA 90802 <b>ARCHITECT:</b> BAYSHORE ARCHITECTURE, INC. 6501 485 710 10000 BOYER STREET LONG BEACH, CA 90803 <b>CM:</b> JACO 228 WEST CRESTVIEW LONG BEACH, CA 90803 <b>STRUCTURAL:</b> HAS STRUCTURAL ENGINEERS 3000 BOYER STREET LONG BEACH, CA 90803 <b>MEP:</b> GENIALI SMOULANDASCOPIER, INC. 675 485 5500 CONTRACT: TERRY PENLAND

## PROJECT NARRATIVE

This building is located in an unincorporated area of Long Beach, California. The building is located on the east side of Ocean Blvd, between Santa Monica Ave and Glendora Ave. The building is a one-story structure with a flat roof and a hatched roof section. The building is surrounded by residential streets and a parking lot. The building is to be used as a lifeguard station and will include a break area, changing rooms, and storage space for boats and other equipment. The building is also accessible to the boat deck from the boat deck.



BAYSHORE ARCHITECTURE, INC.  
 100 Glendora Ave  
 Long Beach, CA 90802, USA  
 562.485.7110  
 bayshorearch.com

TITLE GENERAL NOTES  
 1  
 42

CITY OF LONG BEACH - TIDELANDS CAPITAL IMPROVEMENT DIVISION - CITY MANAGER'S OFFICE  
 BAYSHORE LIFE GUARD STATION  
 5415 E. OCEAN BLVD.  
 LONG BEACH, CA 90803



REVISION	DATE	BY	DESCRIPTION
1	08/17/11	AS	ISSUED FOR PERMITS
2	08/17/11	AS	REVISIONS
3	08/17/11	AS	REVISIONS
4	08/17/11	AS	REVISIONS

APPROVALS	DATE	BY
ARCHITECT		
ENGINEER		
CONTRACTOR		



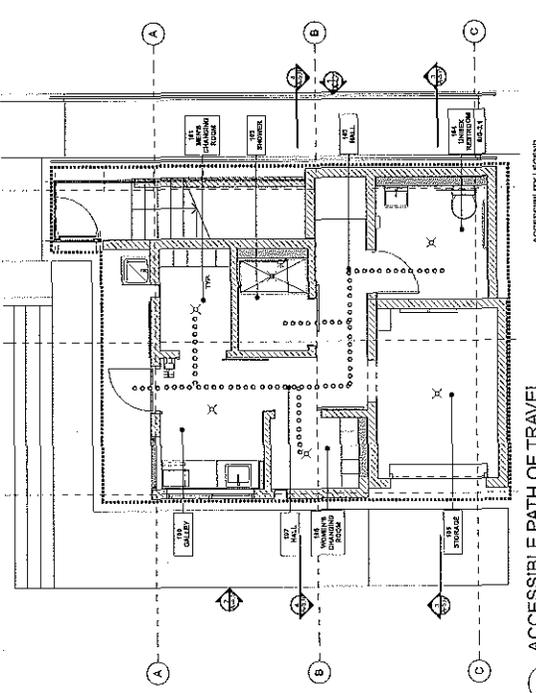




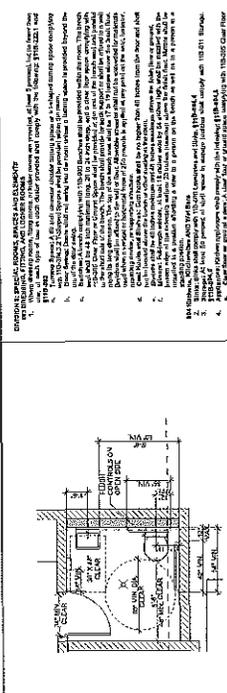








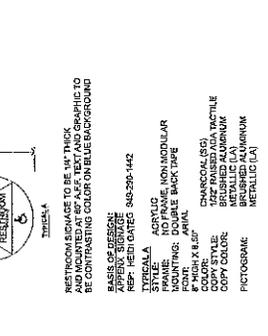
**5 ACCESSIBLE PATH OF TRAVEL**  
 SCALE: 1/8" = 1'-0"



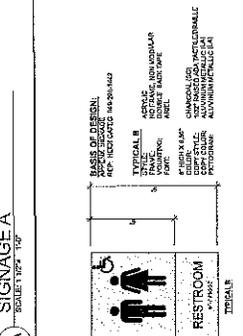
**6 UNISEX RESTROOM**  
 SCALE: 1/8" = 1'-0"

- RESTROOM TYPICAL NOTES:**
- INSTALL ALL RESTROOM COMPONENTS PER ACCESSIBILITY SHEET.
  - VERIFY ALL DIMENSIONS IN FIELD.
  - ALL RESTROOM WALLS TO BE PROVIDED WITH MOISTURE RESISTANT GYPSUM BOARD.
  - PROVIDE BACKING FOR GRAB BARS AND ROLLS AS REQUIRED.
  - PROVIDE ACCESSIBLE SIGNAGE PER ACCESSIBILITY SHEET.
  - MAXIMUM SLOPE OF THE FLOOR SHALL BE 2%. PROVIDE FLOOR DRAIN IN EACH RESTROOM. GRATE OPENINGS SHALL BE 1/4" MAXIMUM.
  - SHOWER FLOOR SHALL BE SLOPED FLUSH WITH THE SHOWER CURTAIN TRACK.
  - IF SHOWER CURTAINS SHALL BE OF A SINGLE LEVER DESIGN, OPERABLE WITH ONE HAND, AND SHALL NOT REQUIRE TIGHT GRASPING, PULLING, OR TWISTING OF THE HANDLE. THE HANDLE SHALL BE LOCATED AT 30" TO 48" ABOVE THE SHOWER FLOOR. THE SHOWER CURTAIN SHALL BE NO GREATER THAN 1.18" (30.2118.0004).

- RESTROOM SIGNAGE TO BE 1/4" THICK AND MOUNTED AT 54" MINIMUM HEIGHT TO CONTRASTING COLOR ON BLUE BACKGROUND**
- BASE OF SIGNAGE TO BE 1/4" THICK AND MOUNTED AT 54" MINIMUM HEIGHT TO CONTRASTING COLOR ON BLUE BACKGROUND**
- RESTROOM SIGNAGE TO BE 1/4" THICK AND MOUNTED AT 54" MINIMUM HEIGHT TO CONTRASTING COLOR ON BLUE BACKGROUND**
- RESTROOM SIGNAGE TO BE 1/4" THICK AND MOUNTED AT 54" MINIMUM HEIGHT TO CONTRASTING COLOR ON BLUE BACKGROUND**
- RESTROOM SIGNAGE TO BE 1/4" THICK AND MOUNTED AT 54" MINIMUM HEIGHT TO CONTRASTING COLOR ON BLUE BACKGROUND**

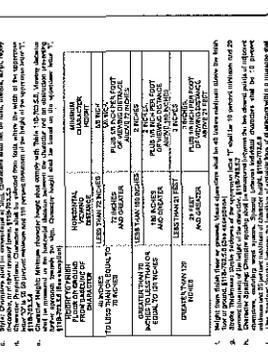


**4A SIGNAGE A**  
 SCALE: 1/8" = 1'-0"

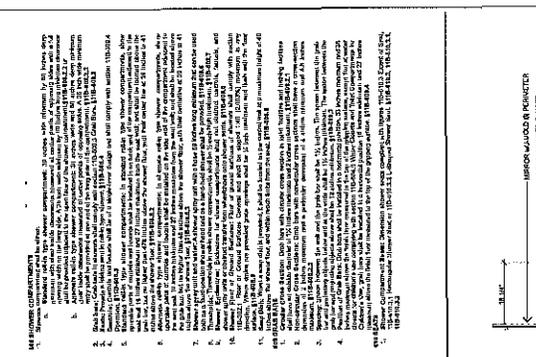


**4B SIGNAGE B**  
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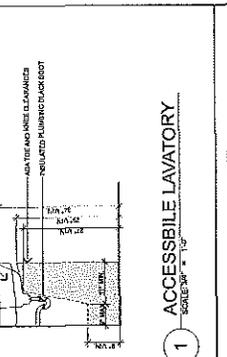
- RESTROOM IDENTIFICATION**



**3 RESTROOM IDENTIFICATION**  
 SCALE: 1/8" = 1'-0"



**1 ACCESSIBLE LAVATORY**  
 SCALE: 1/8" = 1'-0"



**2 ACCESSIBLE SHOWER**  
 SCALE: 1/8" = 1'-0"

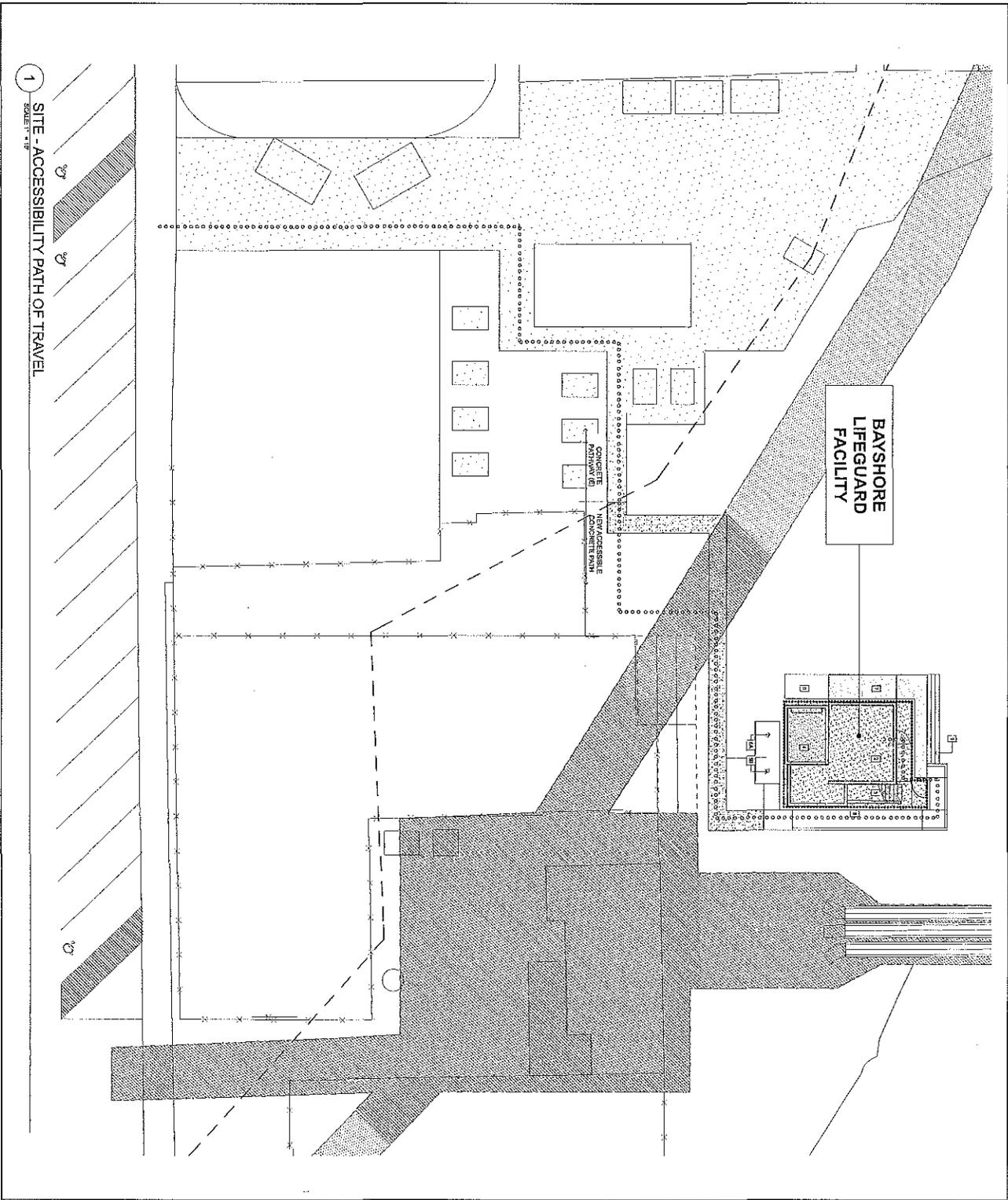
- RESTROOM IDENTIFICATION**

**3 RESTROOM IDENTIFICATION**  
 SCALE: 1/8" = 1'-0"

**ENVIRON ARCHITECTURE, INC.**  
 200 Deshaugas  
 Suite P-200  
 Long Beach, CA 90802, USA  
 T. 562.465.7110  
 enviro@enviroarch.com

PROJECT: ACCESSIBILITY  
 CLIENT: ENVIRON ARCHITECTURE, INC.  
 DATE: 28 JULY 2015

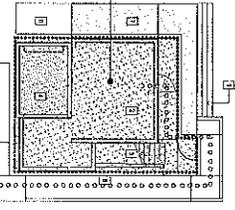
DRAWING NO. 8-42



1 SITE - ACCESSIBILITY PATH OF TRAVEL  
SCALE: 1/8" = 1'-0"

BAYSHORE  
LIFEGUARD  
FACILITY

CONCRETE  
REMOVAL  
BELOW  
SAND



**ACCESSIBILITY LEGEND**  
 - - - - - ACCESSIBILITY PATH OF TRAVEL  
 - - - - - CONCRETE REMOVAL BELOW SAND  
 - - - - - APPROXIMATE LOCATION  
 - - - - - CONCRETE CASTING SLAB PERMANENT

**GENERAL NOTES:**  
 A. REFER TO EXISTING AREA SITE PLAN FOR  
 CONTEXT INFORMATION (SHEET A-3)

**NAVION**  
ARCHITECTURE  
 Evelyn Architecture, Inc.  
 100 Deshaugh  
 Suite 750  
 Alameda, CA 94601, USA  
 T 510.426.1700  
 e@navionarch.com

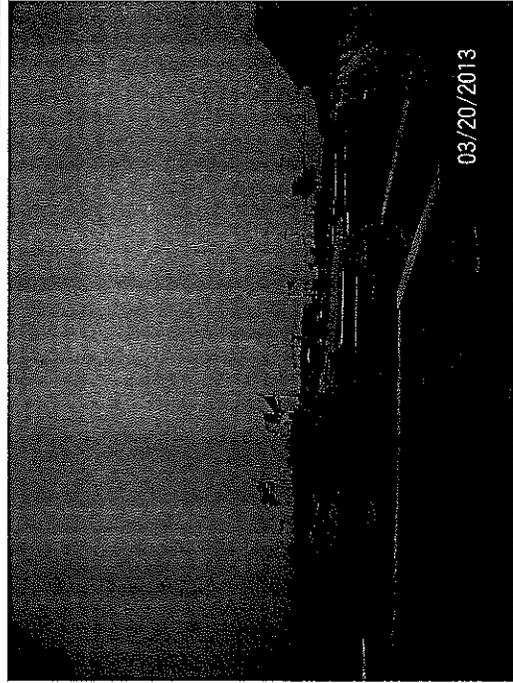
2013.18  
**ACCESSIBILITY**  
 G-3.2

**BAYSHORE LIFEGUARD STATION**  
 5415 E. OCEAN BLVD.  
 LONG BEACH, CA 90803

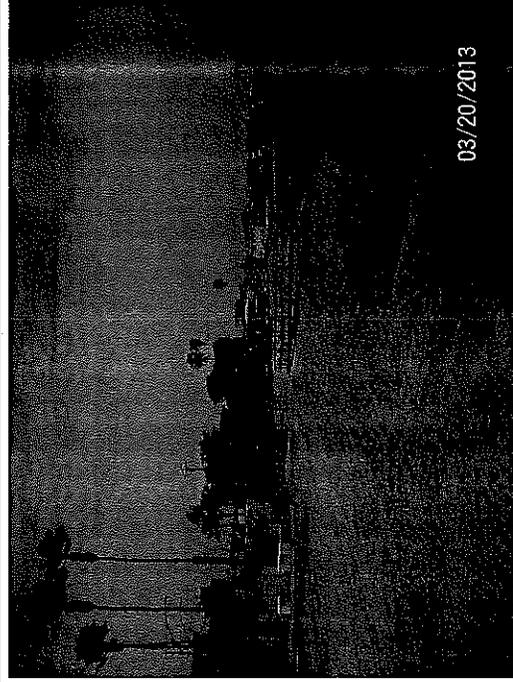
DESIGNER: LM	DATE:	BY:	APPROVAL:	GROUP:
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DESIGNED BY: AB				
DESIGNED BY: AB				

DATE: 07/06/06  
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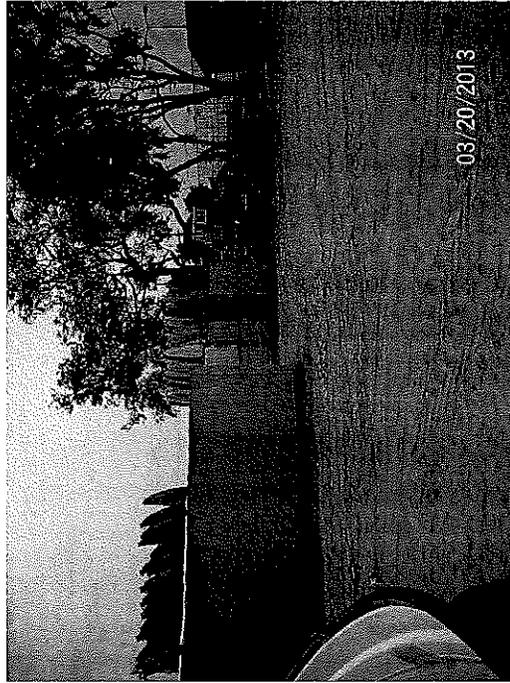




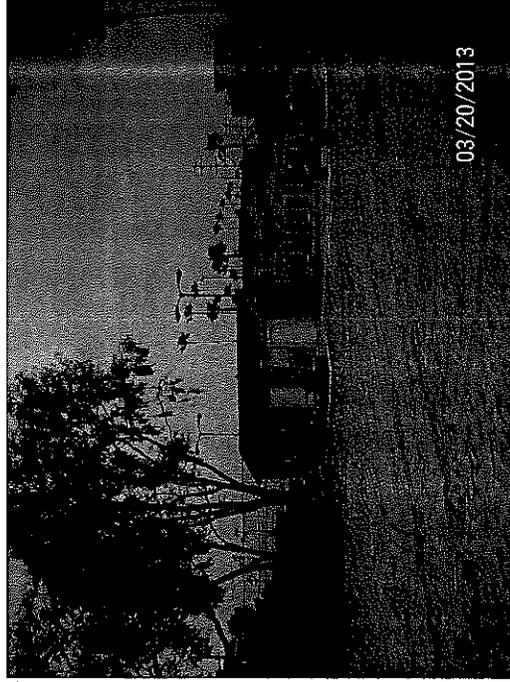
1 VIEW OF DOCK



2 VIEW OF PIER



3 VIEW OF STORAGE CONTAINERS AND PICNIC TABLE AREA



4 VIEW OF CHILD CARE BUILDING

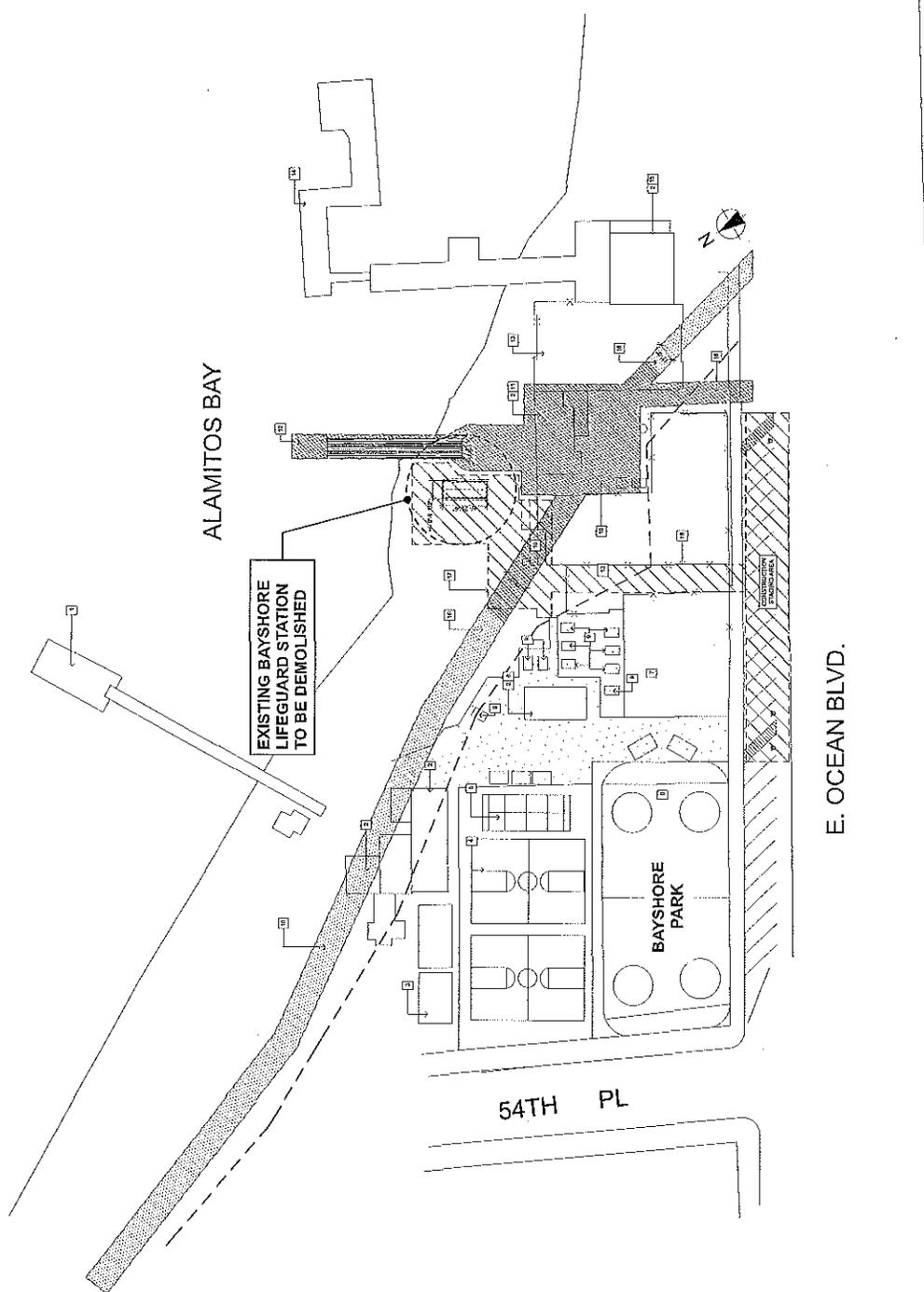
PROJECT		DATE	
BAYSHORE LIFEGUARD STATION		03/20/2013	
DRAWN BY		DATE	
LM		03/20/2013	
CHECKED BY		DATE	
AB		03/20/2013	
SCALE		DATE	
AS SHOWN		03/20/2013	
SHEET NO.		DATE	
11		03/20/2013	
TOTAL SHEETS		DATE	
42		03/20/2013	



BAYSHORE LIFEGUARD STATION  
 5415 E. OCEAN BLVD.  
 LONG BEACH, CA 90803


 Davilton Architecture, Inc.  
 480117 2013.03.08  
 EXISTING PHOTOS  
 A-0-2  
 Davilton Architecture, Inc.  
 480117 2013.03.08  
 Long Beach, CA 90802, USA  
 T. 562.485.7119  
 info@daviltonarch.com

- SITE LEGEND**
- KEYNOTE
  - EXISTING UTILITY BASIN
  - CONCRETE SEAWALL BELOW SAND APPROXIMATE LOCATION
  - CONSTRUCTION AREA
- SITE PLAN KEY NOTES**
1. PER (E)
  2. ONE STORY BUILDING (E)
  3. BASKETBALL COURTS (E)
  4. BASKETBALL COURTS (E)
  5. HANDBALL COURT (E)
  6. HANDBALL COURT (E)
  7. CHILDREN'S PLAYGROUND (E)
  8. PICNIC TABLE (E)
  9. LONG BEACH (E)
  10. LONG BEACH (E) - WILL BE REMOVED BY CITY OF LONG BEACH
  11. PUMP STATION (E)
  12. BOARD STORAGE (E)
  13. BOARD STORAGE (E)
  14. BOARD STORAGE (E)
  15. BOARD STORAGE (E)
  16. BOARD STORAGE (E)
  17. BOARD STORAGE (E)
  18. LOS ANGELES COUNTY DRAINAGE EASEMENT (E)
  19. LOS ANGELES COUNTY DRAINAGE EASEMENT (E)
  20. NEW 5' FT. HIGH FENCE



1 EXISTING SITE PLAN AREA  
SCALE: 1" = 30'

DATE: 2013.08		PROJECT: 46517		SHEET: 13 of 42	
DRAWN BY: [blank]		CHECKED BY: [blank]		SCALE: A-0.4	
PROJECT: BAYSHORE LIFE GUARD STATION		LOCATION: 5415 E OCEAN BLVD, LONG BEACH, CA 90803		CLIENT: [blank]	
DATE: 2013.08		PROJECT: 46517		SHEET: 13 of 42	
DRAWN BY: [blank]		CHECKED BY: [blank]		SCALE: A-0.4	
PROJECT: BAYSHORE LIFE GUARD STATION		LOCATION: 5415 E OCEAN BLVD, LONG BEACH, CA 90803		CLIENT: [blank]	
DATE: 2013.08		PROJECT: 46517		SHEET: 13 of 42	
DRAWN BY: [blank]		CHECKED BY: [blank]		SCALE: A-0.4	
PROJECT: BAYSHORE LIFE GUARD STATION		LOCATION: 5415 E OCEAN BLVD, LONG BEACH, CA 90803		CLIENT: [blank]	

**DEMOLITION LEGEND**

KEYNOTE: [Symbol]

DEMOLITION: [Symbol]

EXISTING UTILITY EASEMENT: [Symbol]

CONCRETE SPALLS BELOW SAND, APPROXIMATE LOCATION: [Symbol]

**GENERAL NOTES**

A. GENERAL CONTRACTOR SHALL VERIFY ALL INFORMATION IN FIELD.

B. ABANDONED OR UNUSED POWERPOLES SHALL BE PULLED BACK TO SOURCE AND CAPPED.

C. UBOO INSURON WALLS AND NETWORK, V.I.E.

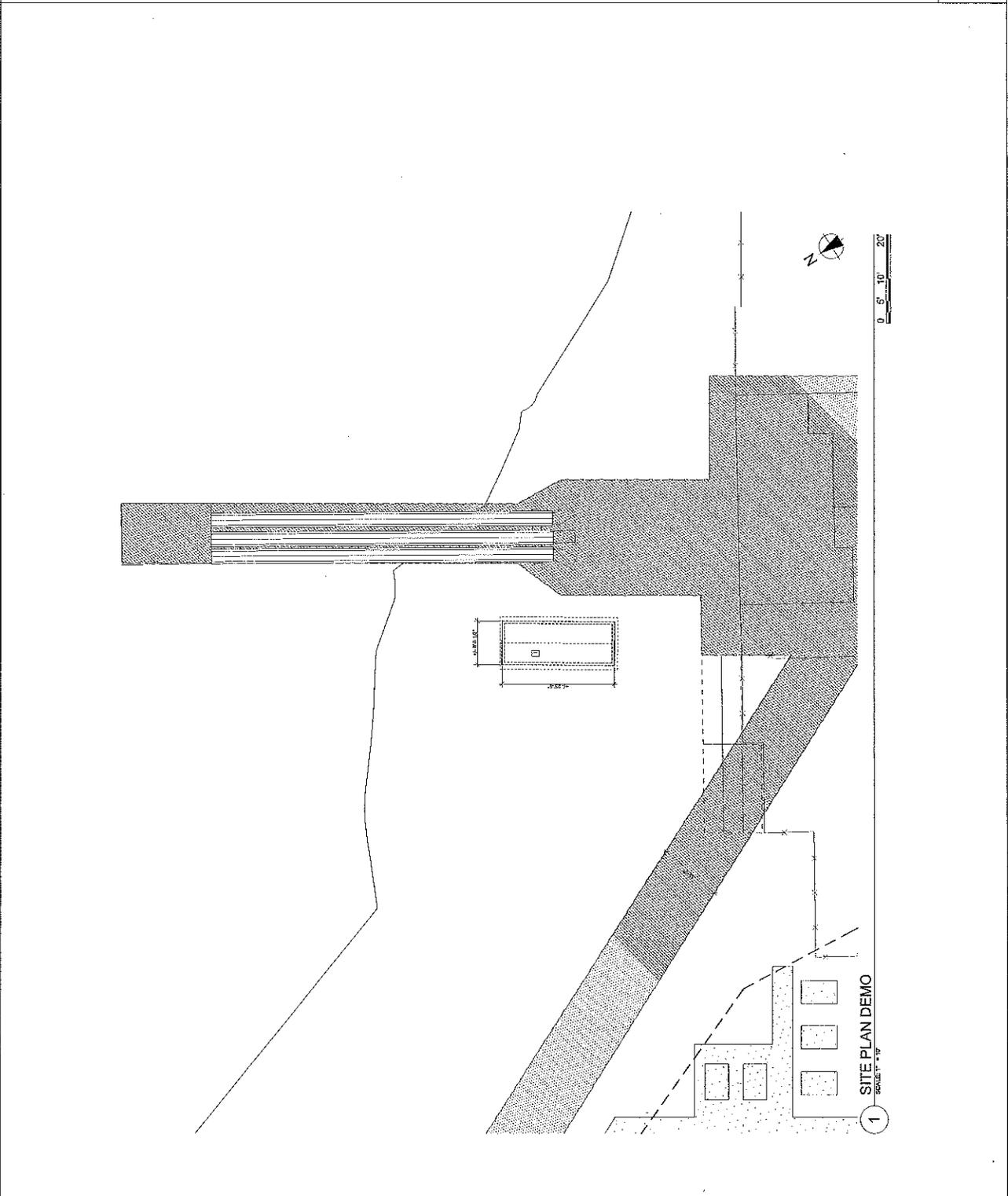
**DEMO PLAN KEY NOTES**

1. DEMOLISH EXISTING LIFE GUARD STATION INCLUDING FOUNDATION AND ALL ASSOCIATED CONSTRUCTION.

2. REMOVE EXISTING UTILITIES TO P.O.C.

**Demolition**

Eniron Architecture, Inc.  
100 Chesapeake  
Suite 400 CA 90801, USA  
Tel: 562.465.7118  
www.enironarch.com



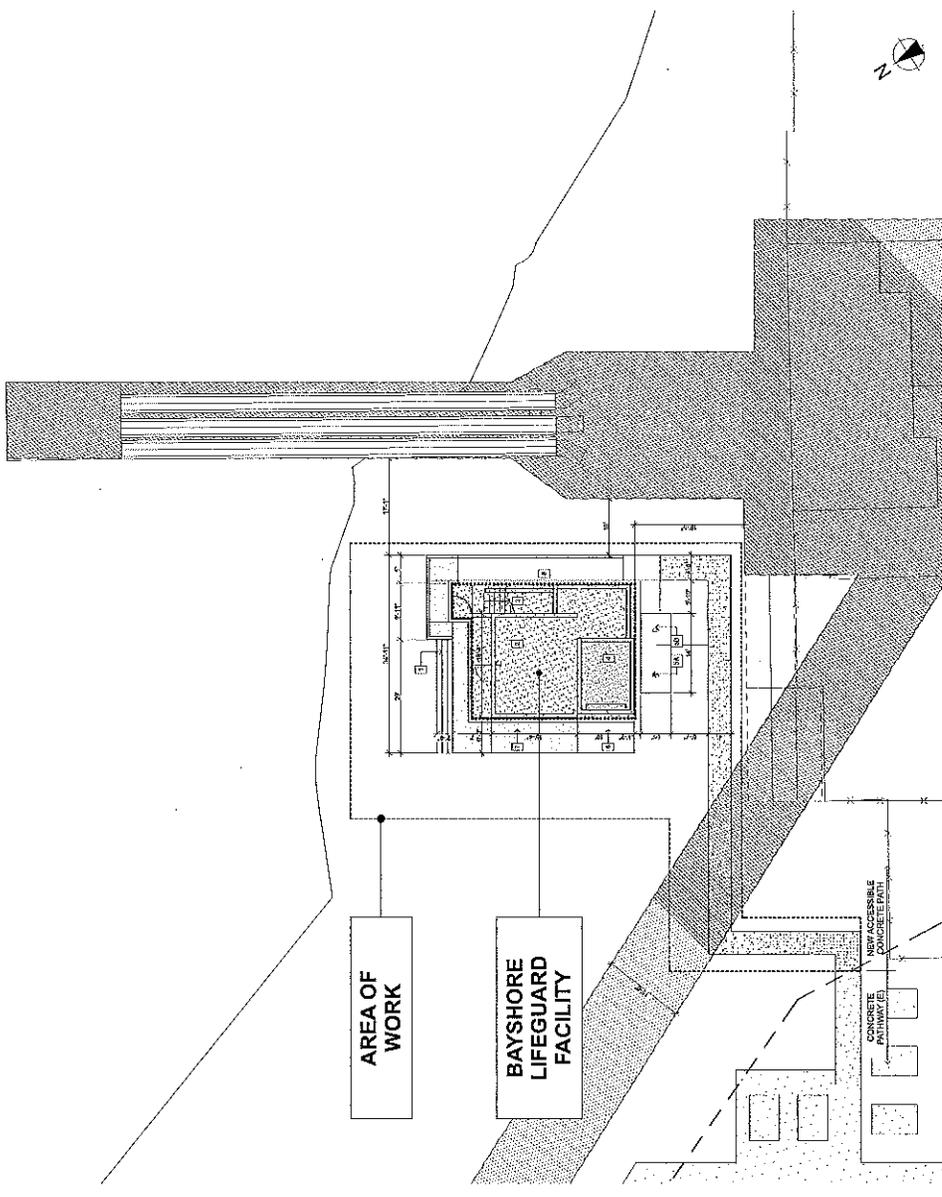
1 SITE PLAN DEMO  
SCALE: 1/8"



**BAYSHORE LIFEGUARD STATION**  
 5415 E. OCEAN BLVD.  
 LONG BEACH, CA 90803

DATE	01/15/2008
PROJECT	BAYSHORE LIFEGUARD STATION
CLIENT	LONG BEACH POLICE DEPARTMENT
ARCHITECT	DAVIDSON ARCHITECTURE
SCALE	A-1.0

- KEYNOTE**
- EXISTING UTILITY EASEMENT
  - CONCRETE PATHWAY (E)
  - NEW ACCESSIBLE CONCRETE PATH
  - CONCRETE SEAWALL BELOW SAND APPROXIMATE LOCATION
  - CONCRETE CASTING SLAB PER MANUF.
- GENERAL NOTES**
- A. FOR ADDITIONAL SITE INFORMATION REFER TO CIVIL AND PLUMBING DRAWINGS.
- SITE PLAN KEY NOTES**
1. CONCRETE STEPS
  2. DECK
  3. EXTERIOR STAIRS
  4. OUTDOOR RINSE STATION
  - 5A. OUTDOOR RINSE STATION
  - 5B. OUTDOOR RINSE STATION
  6. RAMP
  7. ACCESSIBLE CONCRETE RAMP (CAN.17)



**1 SITE PLAN**  
 SCALE: 1/4" = 1'-0"

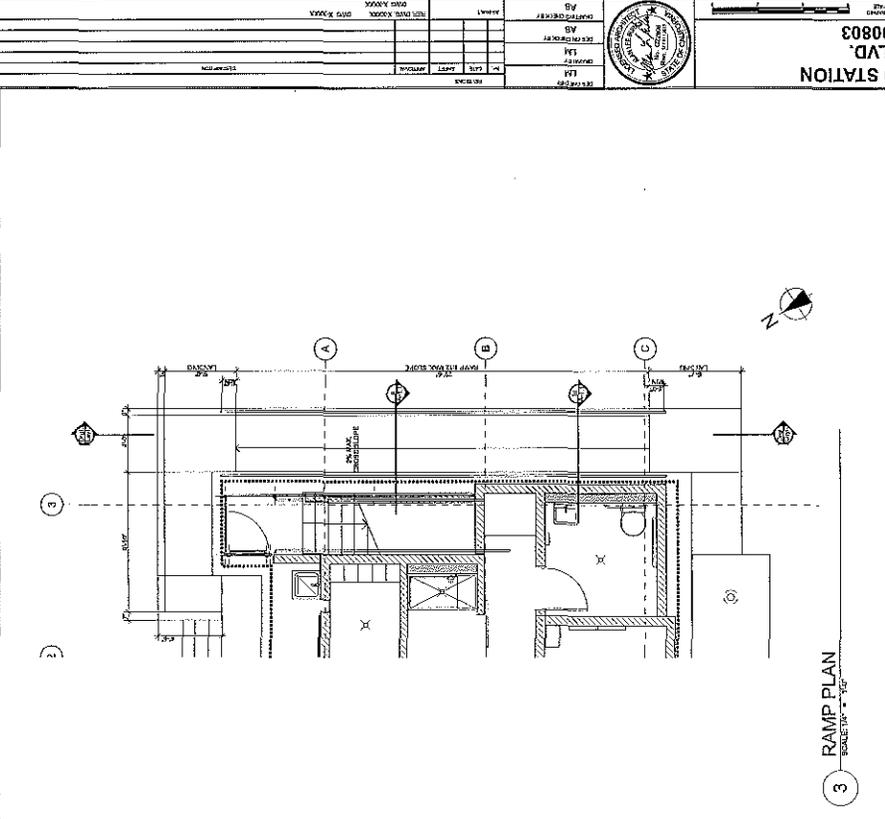


**BAYSHORE LIFEGUARD STATION**  
 5415 E. OCEAN BLVD.  
 LONG BEACH, CA 90803

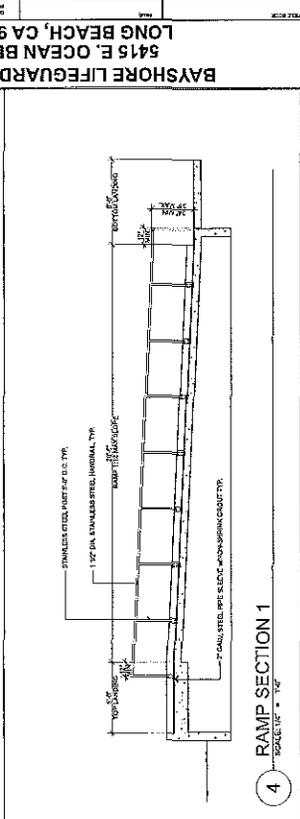
DATE	2011.03.18
NO.	48877
SCALE	AS SHOWN
PROJECT	15-42
ISSUED FOR	CONTRACT

**ENVIRONMENTAL ARCHITECTURE**  
 1000 Beach Blvd., Suite 200  
 Long Beach, CA 90802, USA  
 Tel: 562.595.2100  
 Fax: 562.595.2101  
 www.environmentalarch.com

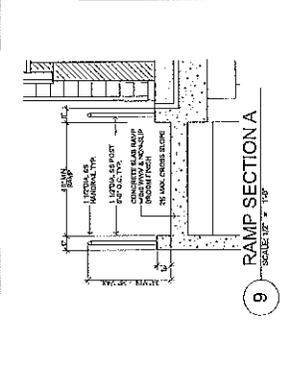
**ENVIRONMENTAL ARCHITECTURE**  
 48877  
 SITE DETAILS  
 A-1.1



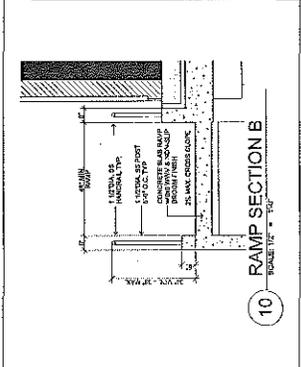
3 RAMP PLAN  
 SCALE 1/4" = 1'-0"



4 RAMP SECTION 1  
 SCALE 1/4" = 1'-0"



9 RAMP SECTION A  
 SCALE 1/4" = 1'-0"



10 RAMP SECTION B  
 SCALE 1/4" = 1'-0"





**BAYSHORE LIFE GUARD STATION**  
**5415 E. OCEAN BLVD.**  
**LONG BEACH, CA 90803**

DATE	17	NO.	42
PROJECT	ROOF PLAN		
SCALE	A-3.0		

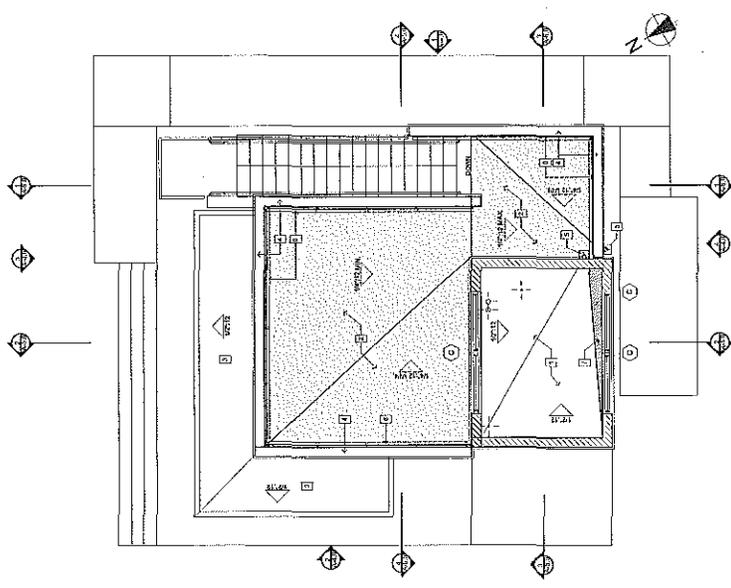
Environ Architecture, Inc.  
 401177 2015.03.01  
 1100 S. Orange  
 Long Beach, CA 90807, USA  
 T. 562.405.7116  
 ARCHITECTURE email@environarch.com

- ROOF LEGEND**
- ROOF SLOPE DOWN
  - KEYNOTE
  - ROOF VENT

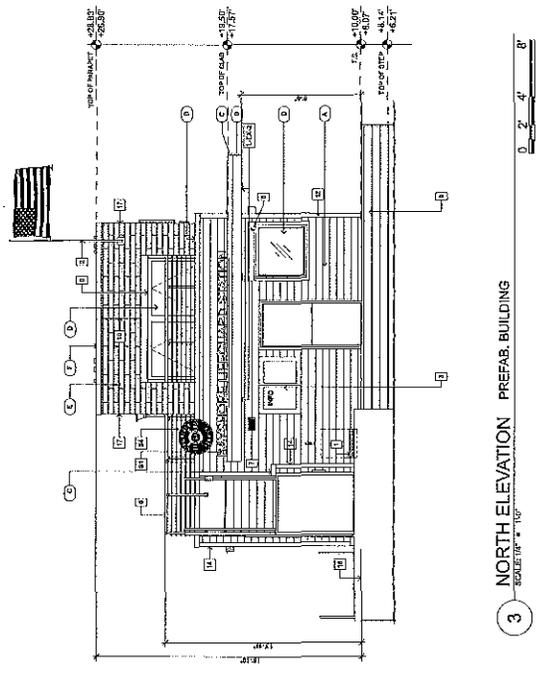
**GENERAL NOTES**

- A. REFER TO FLOOR PLANS FOR DIMENSIONS NOT SHOWN.
- B. REFER TO FLOOR PLANS FOR NUMBER IDENTIFICATION.
- C. PROTECTION OF JOINTS/PENETRATIONS/PRESTATED WOOD SHALL BE AS SHOWN AND SHALL BE DETAILED FROM VIEW UNLESS NOTED OTHERWISE.

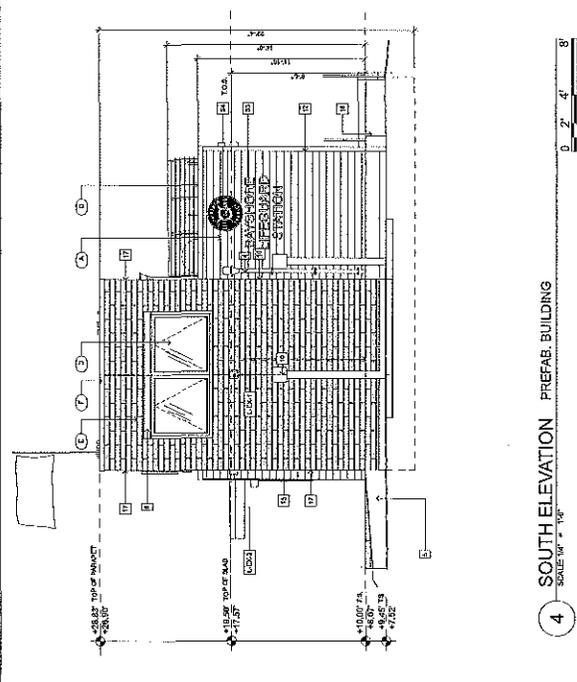
- KEYNOTES**
1. ROOFING - CLASS A (BA&R)
  2. DECK (SA&S)
  3. CANOPY (TS&ALU)
  4. PARAPET WALL (104/116-0)
  5. SCUPPER (HA&R)
  6. CLAMP RAIL (SA&R)
  7. CRICKET



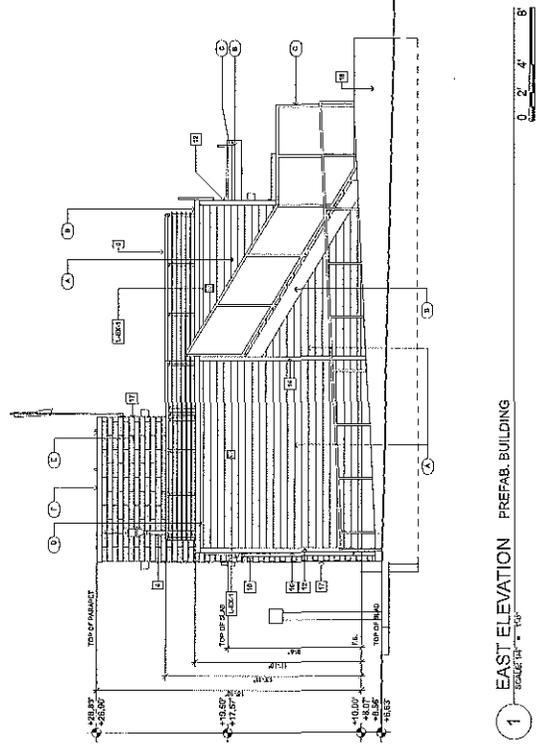
2 DECK - ROOF FLOOR PLAN  
 SCALE: 1/8" = 1'-0"



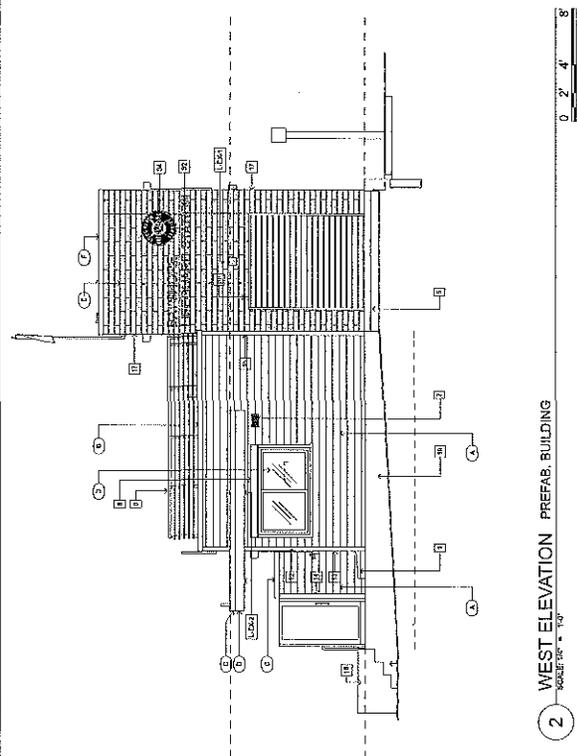
3 NORTH ELEVATION PREFAB. BUILDING  
SCALE: 1/8" = 1'-0"



4 SOUTH ELEVATION PREFAB. BUILDING  
SCALE: 1/8" = 1'-0"



1 EAST ELEVATION PREFAB. BUILDING  
SCALE: 1/8" = 1'-0"



2 WEST ELEVATION PREFAB. BUILDING  
SCALE: 1/8" = 1'-0"

- EXTERIOR LEGEND**
- EXTERIOR COLORS & MATERIALS**
- 1 FINISH: PINK GRANITE
  - 2 FINISH: BLACK LAP SIDING
  - 3 FINISH: WHITE SIDING
  - 4 FINISH: WHITE SIDING
  - 5 FINISH: WHITE SIDING
  - 6 FINISH: WHITE SIDING
  - 7 FINISH: WHITE SIDING
  - 8 FINISH: WHITE SIDING
  - 9 FINISH: WHITE SIDING
  - 10 FINISH: WHITE SIDING
  - 11 FINISH: WHITE SIDING
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  - 97 FINISH: WHITE SIDING
  - 98 FINISH: WHITE SIDING
  - 99 FINISH: WHITE SIDING
  - 100 FINISH: WHITE SIDING

- GENERAL NOTES**
1. SIGNAGE UNDER SEPARATE PERMIT
  2. PROVIDE ELECTRICAL CONNECTIONS FOR SIGNAGE. VERIFY W/OWNER PRIOR TO CONSTRUCTION.
- ELEVATION KEYNOTES**
1. CONCRETE FLOOR SLAB w/ FRAGILE LOCK (10A-10B)
  2. FLAG
  3. METAL BOARD CABINET - OUTDOOR, MORSICO, INC. APPROX. 2 DOORS WITH 4 PARTITION COLOR SILVER
  4. CONCRETE RAMP
  5. GUARD RAIL
  6. WINDOW SECURITY SHUTTER, ENVIRONMENTAL SURFACE MOUNT, SAT. CODE, AIR, BUDE RAIL TRACK: 11" W/ 1" CLEARANCE AT THE COLOR TBS
  7. CONCRETE STEPS
  8. CONCRETE STEPS
  9. CONCRETE STEPS
  10. CONCRETE STEPS
  11. WALL CANTY-MATCH WALL COLOR
  12. SIGN OUTSIDE CORNER TRIM COLOR (E) (10A-10B)
  13. SIGN TRIM - TRIM COLOR (B) (10A-10B)
  14. SIGN TRIM - TRIM COLOR (B) (10A-10B)
  15. TILE TO SIGN (10A-10B)
  16. TILE TO SIGN (10A-10B)
  17. TILE AT CORNER (10A-10B)
  18. CONCRETE APRON
  19. CONCRETE APRON

- PROPOSED SIGNAGE LOCATIONS**
- S-1 SIGNAGE AT CANOPY (10A-10B)
  - S-2 SIGNAGE AT WEST ELEVATION (10A-10B)
  - S-3 SIGNAGE AT SOUTH ELEVATION (10A-10B)
  - S-4 3" THICK LIFE GUARD LOGO - HEIGHT: 30" DIAMETER

- PROPOSED LIGHTING**
- 1 L-EX1 WALL MOUNTED
  - 2 L-EX2 DOWNLIGHT CANOPY



**BAYSHORE LIFE GUARD STATION**  
5415 E OCEAN BLVD.  
LONG BEACH, CA 90803

DATE: 10/15/2013  
SCALE: 1/8" = 1'-0"

**2013.09**

**ELEVATIONS**

Environ Architecture, Inc.  
100 Broadway  
Suite #200  
Long Beach, CA 90802, USA  
T. 562.435.2116  
info@environarch.com

PROJECT NO.: 18-42  
DATE: 10/15/2013  
DRAWN BY: [Name]

**A-4.0**

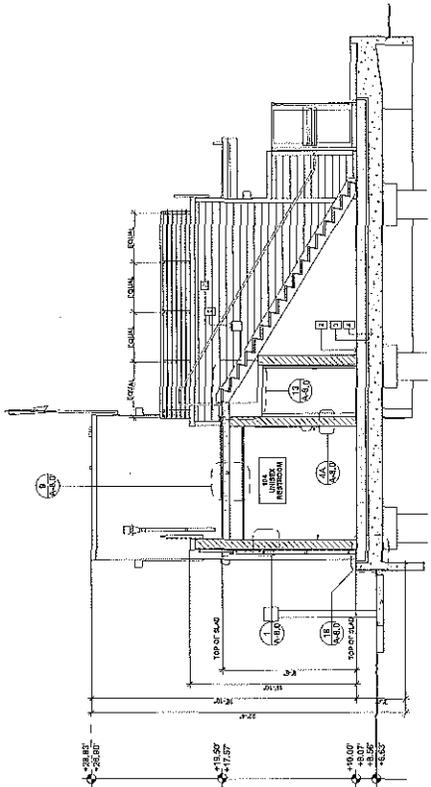


**ENTRIN ARCHITECTURE, INC.**  
 5415 E. OCEAN BLVD.  
 LONG BEACH, CA 90803, USA  
 T. 562.496.7174  
 E. info@entrin.com

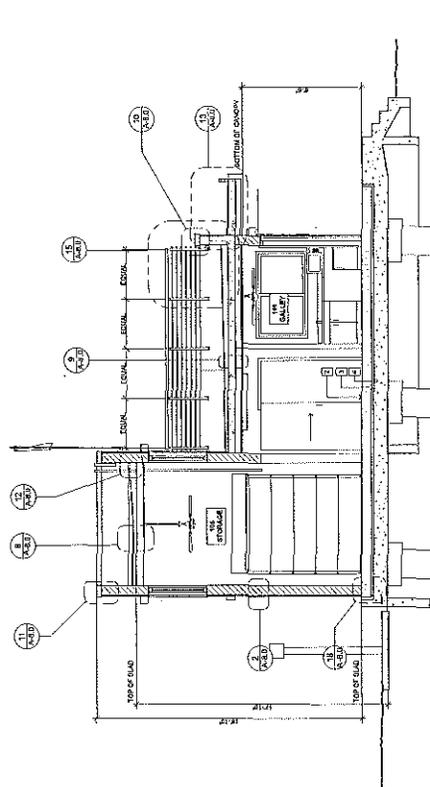
**ENTRIN ARCHITECTURE**

SECTION A-5.0

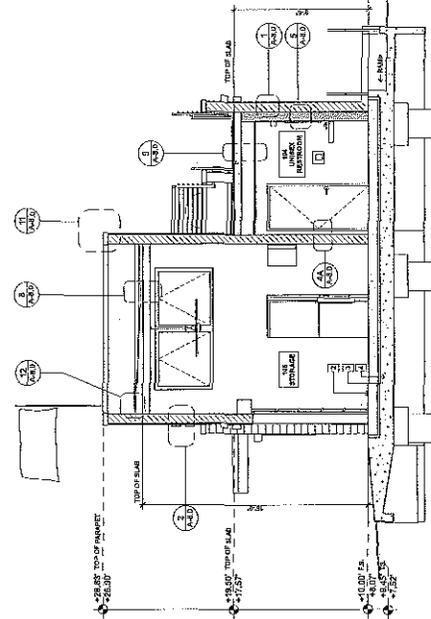
- SECTION LEGEND**
- DRAWING IN COLOR
  - DRAWING IN BLACK AND WHITE
- KEYNOTE**
- KEYNOTE
- GENERAL NOTES:**
- A. PROVIDE FLUID APPLIED WATERPROOFING TO ALL EXTERIOR WALLS, FLOORS, AND CEILING. USE A QUALITY MEMBRANE AND SYSTEM AS PER MANUFACTURER'S INSTRUCTIONS.
  - B. SEE STRUCTURAL DRAWINGS FOR ADDITIONAL INFORMATION.
- SECTION KEYNOTES**
1. WALL CAP - MATCH WALL COLOR
  2. CONCRETE CASTING SLAB PER MANUAL
  3. NON-SHRINK GROUT
  4. CONCRETE MAT



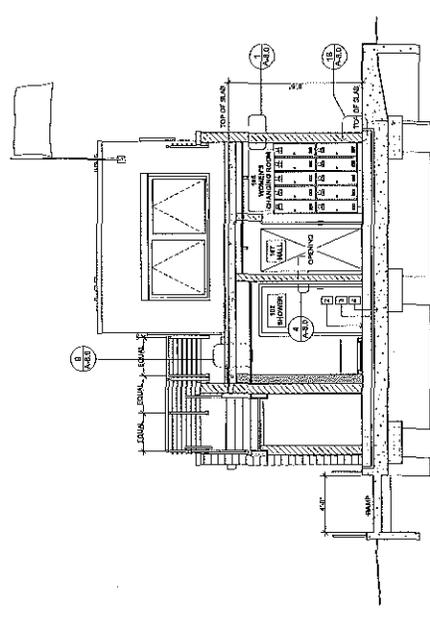
1 SECTION  
SCALE: 1/8" = 1'-0"



2 SECTION  
SCALE: 1/8" = 1'-0"



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

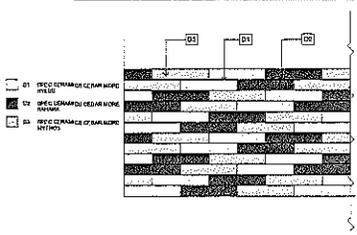


4 SECTION  
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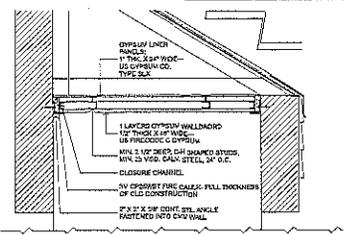




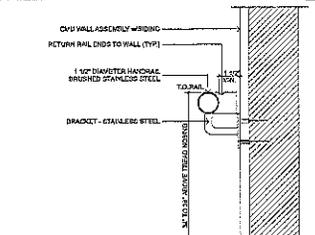




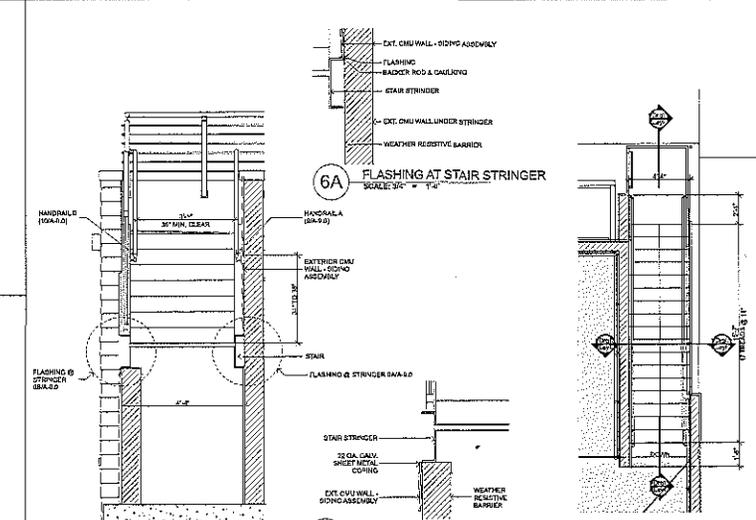
**17 TILE PATTERN**  
SCALE: 1/2" = 1'-0"



**13 1 HR CEILING**  
SCALE: 1" = 1'-0"

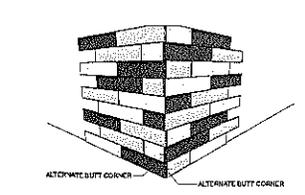


**9 HANDRAIL A**  
SCALE: 3" = 1'-0"

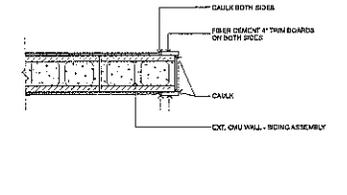


**2 STAIR SECTION B**  
SCALE: 1/2" = 1'-0"

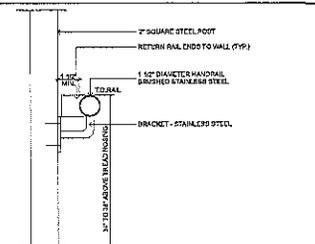
**2 STAIR FLOOR PLAN**  
SCALE: 1/4" = 1'-0"



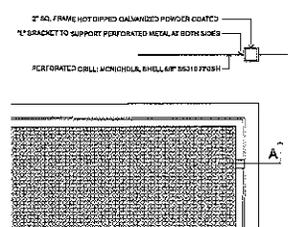
**18 TILE CORNER**  
SCALE: 1/2" = 1'-0"



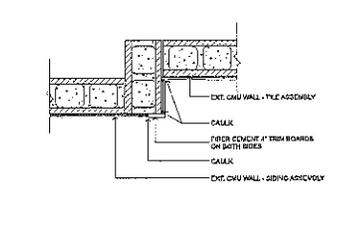
**14 SIDING TRIM**  
SCALE: 1" = 1'-0"



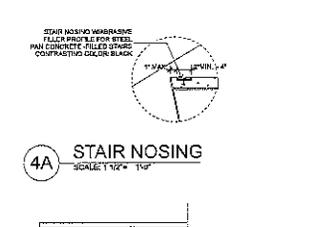
**10 HANDRAIL B**  
SCALE: 3" = 1'-0"



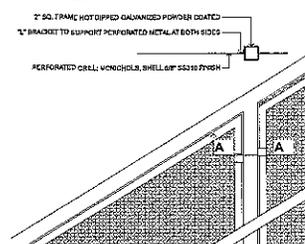
**19 MESH AT FENCE**  
SCALE: 1/2" = 1'-0"



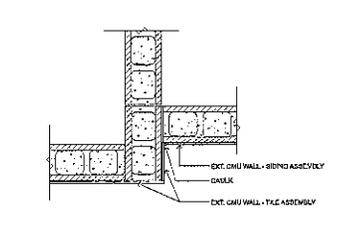
**15 SIDING TO TILE**  
SCALE: 1" = 1'-0"



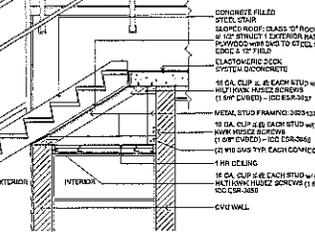
**4A STAIR NOSING**  
SCALE: 1/2" = 1'-0"



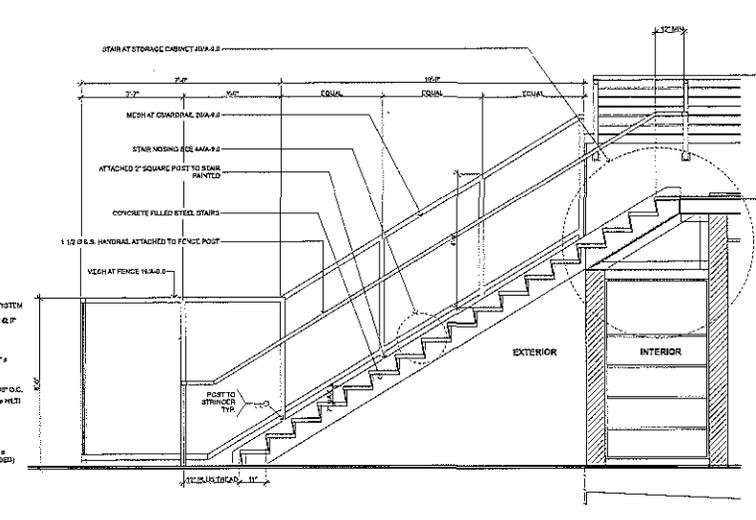
**20 MESH AT GUARDRAIL**  
SCALE: 1/2" = 1'-0"



**16 TILE TO SIDING**  
SCALE: 1" = 1'-0"



**4B STAIR @ CABINET**  
SCALE: 1/2" = 1'-0"



**4 STAIR SECTION A (EXTERIOR)**  
SCALE: 1/2" = 1'-0"

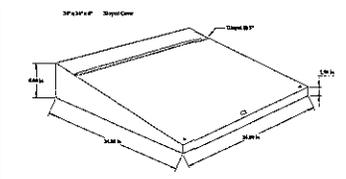
PROJECT NO.	DATE	BY	CHECKED	SCALE
17	11/11/11	JM	ML	1/2" = 1'-0"
18	11/11/11	JM	ML	1/2" = 1'-0"
19	11/11/11	JM	ML	1/2" = 1'-0"
20	11/11/11	JM	ML	1/2" = 1'-0"
13	11/11/11	JM	ML	1" = 1'-0"
9	11/11/11	JM	ML	3" = 1'-0"
14	11/11/11	JM	ML	1" = 1'-0"
10	11/11/11	JM	ML	3" = 1'-0"
4A	11/11/11	JM	ML	1/2" = 1'-0"
4B	11/11/11	JM	ML	1/2" = 1'-0"
2	11/11/11	JM	ML	1/2" = 1'-0"

**BAYSHORE LIFEGUARD STATION**  
5415 E. OCEAN BLVD.  
LONG BEACH, CA 90803

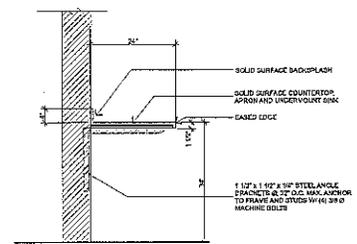
**Environ Architecture, Inc.**  
100 Oceanview  
Suite P-206  
Long Beach, CA 90802, USA  
T. 562.455.7110  
en@environarch.com

**4/8/17** 2013.58  
**DETAILS**  
A-9.0

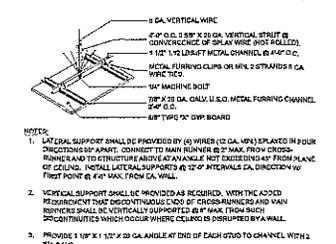
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JOB NO.: 53002  
SHEET: 23 OF 42  
SCALE: A-9.0



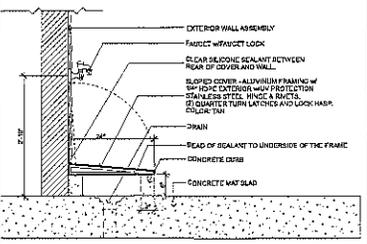
9 S-1 SIGNAGE  
SCALE: 3/4" = 1'-0"



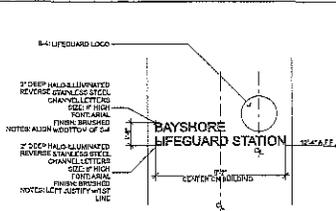
5 COUNTER  
SCALE: 3/4" = 1'-0"



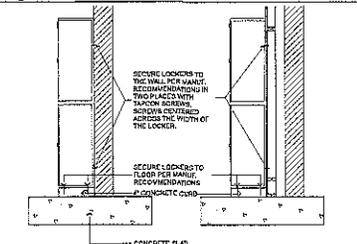
1 SUSPENDED GYP. BOARD  
SCALE: 3/4" = 1'-0"



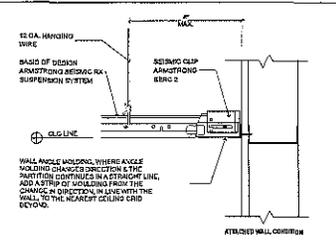
14 CONCRETE FLOOR SINK  
SCALE: 3/4" = 1'-0"



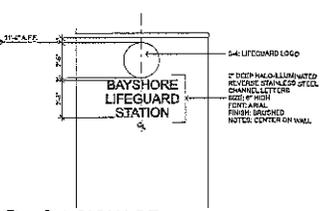
10 S-2 SIGNAGE  
SCALE: 3/4" = 1'-0"



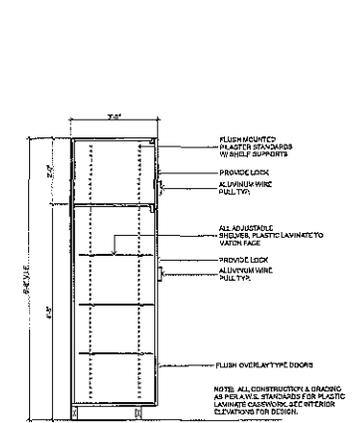
6 LOCKERS  
SCALE: 3/4" = 1'-0"



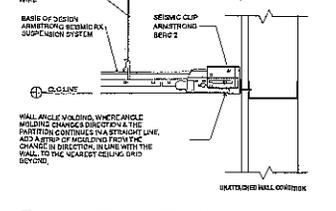
2 ATTACHED WALL  
SCALE: 3/4" = 1'-0"



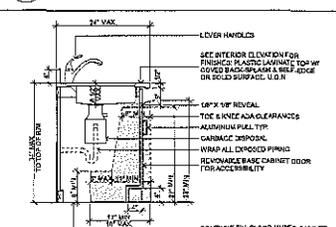
11 S-3 SIGNAGE  
SCALE: 3/4" = 1'-0"



8 STORAGE CABINET  
SCALE: 3/4" = 1'-0"



3 UNATTACHED WALL  
SCALE: 3/4" = 1'-0"



4 SINK CABINET  
SCALE: 3/4" = 1'-0"

PROJECT NO.	2013.51
DATE	4/8/17
SCALE	AS SHOWN
DESIGNER	ENVIRON ARCHITECTURE
DRAWN BY	UN
CHECKED BY	UN
APPROVED BY	UN
DATE	4/8/17
PROJECT NAME	BAYSHORE LIFEGUARD STATION
PROJECT ADDRESS	5415 E. OCEAN BLVD., LONG BEACH, CA 90803
CLIENT	UNIVERSITY OF CALIFORNIA
ARCHITECT	ENVIRON ARCHITECTURE
SCALE	AS SHOWN

Environ Architecture, Inc.  
 100 Oceanview  
 Suite F-200  
 Long Beach, CA 90802, USA  
 T. 562.485.7110  
 info@environarch.com

4/8/17 2013.51  
**DETAILS**  
 A-10.0

JOB NO.	420002
NO.	067004
SHEET	24
TOTAL SHEETS	42
DATE PLOTTED	4/16/17 10:46 AM
SCALE	AS SHOWN

APPENDIX A - ACRONYMS AND ABBREVIATIONS

Table with 2 columns: ACRONYM and DESCRIPTION. Includes entries for AIA, AISC, AASHTO, etc.

GENERAL CONTRACTOR NOTES

- 1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE LOCAL, STATE AND FEDERAL AGENCIES...

REINFORCING

- 1. ALL REINFORCING SHALL BE PROVIDED BY THE CONTRACTOR AND SHALL BE INSTALLED IN ACCORDANCE WITH THE REINFORCING SCHEDULE AND THE REINFORCING NOTES...

CONCRETE

- 1. ALL CONCRETE SHALL BE PLACED AND FINISHED IN ACCORDANCE WITH THE CONCRETE SCHEDULE AND THE CONCRETE NOTES...

REINFORCING

- 1. ALL REINFORCING SHALL BE PROVIDED BY THE CONTRACTOR AND SHALL BE INSTALLED IN ACCORDANCE WITH THE REINFORCING SCHEDULE AND THE REINFORCING NOTES...

CONCRETE

- 1. ALL CONCRETE SHALL BE PLACED AND FINISHED IN ACCORDANCE WITH THE CONCRETE SCHEDULE AND THE CONCRETE NOTES...

REINFORCING

- 1. ALL REINFORCING SHALL BE PROVIDED BY THE CONTRACTOR AND SHALL BE INSTALLED IN ACCORDANCE WITH THE REINFORCING SCHEDULE AND THE REINFORCING NOTES...

Professional Engineer Seal for M. J. H. ENGINEERS, INC. License No. 40017, State of California.

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Project Information: BAYSHORE LIFE GUARD STATION, 5415 E. OCEAN BLVD, LONG BEACH, CA 90803.

Structural Notes: 2013.08, 40017, STRUCTURAL NOTES, 25 of 42.

Architectural Information: Envision Architecture, Inc., 100 Douglas, Suite 200, Long Beach, CA 90801, USA.

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Professional Engineer Seal for M. J. H. ENGINEERS, INC. License No. 40017, State of California.

Professional Engineer Seal for M. J. H. ENGINEERS, INC. License No. 40017, State of California.



**GENERAL NOTES**

1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE LOCAL AND STATE AGENCIES PRIOR TO THE COMMENCEMENT OF CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE LOCAL AND STATE AGENCIES PRIOR TO THE COMMENCEMENT OF CONSTRUCTION.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE LOCAL AND STATE AGENCIES PRIOR TO THE COMMENCEMENT OF CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE LOCAL AND STATE AGENCIES PRIOR TO THE COMMENCEMENT OF CONSTRUCTION.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE LOCAL AND STATE AGENCIES PRIOR TO THE COMMENCEMENT OF CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE LOCAL AND STATE AGENCIES PRIOR TO THE COMMENCEMENT OF CONSTRUCTION.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE LOCAL AND STATE AGENCIES PRIOR TO THE COMMENCEMENT OF CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE LOCAL AND STATE AGENCIES PRIOR TO THE COMMENCEMENT OF CONSTRUCTION.

**REQUIRED VERIFICATION AND INSPECTION OF STEEL CONSTRUCTION OTHER THAN STRUCTURAL STEEL PER SECTION 15422**

VERIFICATION AND INSPECTION	CONTINUOUSLY MONITORED	PROVISIONALLY MONITORED	INTERMITTENTLY MONITORED	CONTRACTOR'S RESPONSIBILITY	REFERENCE TO SECTION
1. VERIFICATION AND INSPECTION OF STEEL CONNECTIONS OTHER THAN STRUCTURAL STEEL PER SECTION 15422					
2. VERIFICATION AND INSPECTION OF STEEL CONNECTIONS OTHER THAN STRUCTURAL STEEL PER SECTION 15422					
3. VERIFICATION AND INSPECTION OF STEEL CONNECTIONS OTHER THAN STRUCTURAL STEEL PER SECTION 15422					
4. VERIFICATION AND INSPECTION OF STEEL CONNECTIONS OTHER THAN STRUCTURAL STEEL PER SECTION 15422					

**REQUIRED VERIFICATION AND INSPECTION OF OTHER DEEP FOUNDATION ELEMENTS PER SECTION 15427**

VERIFICATION AND INSPECTION	CONTINUOUSLY MONITORED	PROVISIONALLY MONITORED	INTERMITTENTLY MONITORED	CONTRACTOR'S RESPONSIBILITY	REFERENCE TO SECTION
1. VERIFICATION AND INSPECTION OF OTHER DEEP FOUNDATION ELEMENTS PER SECTION 15427					
2. VERIFICATION AND INSPECTION OF OTHER DEEP FOUNDATION ELEMENTS PER SECTION 15427					
3. VERIFICATION AND INSPECTION OF OTHER DEEP FOUNDATION ELEMENTS PER SECTION 15427					
4. VERIFICATION AND INSPECTION OF OTHER DEEP FOUNDATION ELEMENTS PER SECTION 15427					

**REQUIRED VERIFICATION AND INSPECTION OF CONCRETE CONSTRUCTION PER SECTION 15423**

VERIFICATION AND INSPECTION	CONTINUOUSLY MONITORED	PROVISIONALLY MONITORED	INTERMITTENTLY MONITORED	CONTRACTOR'S RESPONSIBILITY	REFERENCE TO SECTION
1. VERIFICATION AND INSPECTION OF CONCRETE CONSTRUCTION PER SECTION 15423					
2. VERIFICATION AND INSPECTION OF CONCRETE CONSTRUCTION PER SECTION 15423					
3. VERIFICATION AND INSPECTION OF CONCRETE CONSTRUCTION PER SECTION 15423					
4. VERIFICATION AND INSPECTION OF CONCRETE CONSTRUCTION PER SECTION 15423					

SECTION 15423 - SPECIAL REQUIREMENTS FOR SPECIAL INSPECTION AND TESTING OF CONCRETE SHALL BE THE SAME AS FOR SPECIAL INSPECTION AND TESTING OF CONCRETE PER SECTION 15423. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE LOCAL AND STATE AGENCIES PRIOR TO THE COMMENCEMENT OF CONSTRUCTION.

**REQUIRED VERIFICATION AND INSPECTION OF MASONRY CONSTRUCTION PER SECTION 15424**

VERIFICATION AND INSPECTION	CONTINUOUSLY MONITORED	PROVISIONALLY MONITORED	INTERMITTENTLY MONITORED	CONTRACTOR'S RESPONSIBILITY	REFERENCE TO SECTION
1. VERIFICATION AND INSPECTION OF MASONRY CONSTRUCTION PER SECTION 15424					
2. VERIFICATION AND INSPECTION OF MASONRY CONSTRUCTION PER SECTION 15424					
3. VERIFICATION AND INSPECTION OF MASONRY CONSTRUCTION PER SECTION 15424					
4. VERIFICATION AND INSPECTION OF MASONRY CONSTRUCTION PER SECTION 15424					

SECTION 15424 - SPECIAL REQUIREMENTS FOR SPECIAL INSPECTION AND TESTING OF MASONRY SHALL BE THE SAME AS FOR SPECIAL INSPECTION AND TESTING OF MASONRY PER SECTION 15424. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE LOCAL AND STATE AGENCIES PRIOR TO THE COMMENCEMENT OF CONSTRUCTION.

**REQUIRED VERIFICATION AND INSPECTION OF WELDING PER SECTION 15425**

VERIFICATION AND INSPECTION	CONTINUOUSLY MONITORED	PROVISIONALLY MONITORED	INTERMITTENTLY MONITORED	CONTRACTOR'S RESPONSIBILITY	REFERENCE TO SECTION
1. VERIFICATION AND INSPECTION OF WELDING PER SECTION 15425					
2. VERIFICATION AND INSPECTION OF WELDING PER SECTION 15425					
3. VERIFICATION AND INSPECTION OF WELDING PER SECTION 15425					
4. VERIFICATION AND INSPECTION OF WELDING PER SECTION 15425					

SECTION 15425 - SPECIAL REQUIREMENTS FOR SPECIAL INSPECTION AND TESTING OF WELDING SHALL BE THE SAME AS FOR SPECIAL INSPECTION AND TESTING OF WELDING PER SECTION 15425. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE LOCAL AND STATE AGENCIES PRIOR TO THE COMMENCEMENT OF CONSTRUCTION.

**REQUIRED VERIFICATION AND INSPECTION OF WELDING PER SECTION 15426**

VERIFICATION AND INSPECTION	CONTINUOUSLY MONITORED	PROVISIONALLY MONITORED	INTERMITTENTLY MONITORED	CONTRACTOR'S RESPONSIBILITY	REFERENCE TO SECTION
1. VERIFICATION AND INSPECTION OF WELDING PER SECTION 15426					
2. VERIFICATION AND INSPECTION OF WELDING PER SECTION 15426					
3. VERIFICATION AND INSPECTION OF WELDING PER SECTION 15426					
4. VERIFICATION AND INSPECTION OF WELDING PER SECTION 15426					

SECTION 15426 - SPECIAL REQUIREMENTS FOR SPECIAL INSPECTION AND TESTING OF WELDING SHALL BE THE SAME AS FOR SPECIAL INSPECTION AND TESTING OF WELDING PER SECTION 15426. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE LOCAL AND STATE AGENCIES PRIOR TO THE COMMENCEMENT OF CONSTRUCTION.

**REQUIRED VERIFICATION AND INSPECTION OF WELDING PER SECTION 15427**

VERIFICATION AND INSPECTION	CONTINUOUSLY MONITORED	PROVISIONALLY MONITORED	INTERMITTENTLY MONITORED	CONTRACTOR'S RESPONSIBILITY	REFERENCE TO SECTION
1. VERIFICATION AND INSPECTION OF WELDING PER SECTION 15427					
2. VERIFICATION AND INSPECTION OF WELDING PER SECTION 15427					
3. VERIFICATION AND INSPECTION OF WELDING PER SECTION 15427					
4. VERIFICATION AND INSPECTION OF WELDING PER SECTION 15427					

SECTION 15427 - SPECIAL REQUIREMENTS FOR SPECIAL INSPECTION AND TESTING OF WELDING SHALL BE THE SAME AS FOR SPECIAL INSPECTION AND TESTING OF WELDING PER SECTION 15427. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE LOCAL AND STATE AGENCIES PRIOR TO THE COMMENCEMENT OF CONSTRUCTION.

**BAYSHORE LIFEGUARD STATION**  
 5415 E. OCEAN BLVD.  
 LONG BEACH, CA 90803



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 Fax: 562.595.1112  
 Email: info@environarch.com

**Environ ARCHITECTURE**

2013.05  
**STRUCTURAL NOTES**  
 CONTINUED  
 S-12

DESCRIPTION	REVISION	DATE
PRELIMINARY FOUNDATION	1	05/11
REVISIONS AT PERMITS	2	05/11
REVISIONS AT PERMITS	3	05/11
REVISIONS AT PERMITS	4	05/11
REVISIONS AT PERMITS	5	05/11
REVISIONS AT PERMITS	6	05/11
REVISIONS AT PERMITS	7	05/11
REVISIONS AT PERMITS	8	05/11
REVISIONS AT PERMITS	9	05/11
REVISIONS AT PERMITS	10	05/11

- LIST OF APPLICABLE TYPICAL FOUNDATION DETAILS**
- | DESCRIPTION            | REVISION | DATE  |
|------------------------|----------|-------|
| PRELIMINARY FOUNDATION | 1        | 05/11 |
| REVISIONS AT PERMITS   | 2        | 05/11 |
| REVISIONS AT PERMITS   | 3        | 05/11 |
| REVISIONS AT PERMITS   | 4        | 05/11 |
| REVISIONS AT PERMITS   | 5        | 05/11 |
| REVISIONS AT PERMITS   | 6        | 05/11 |
| REVISIONS AT PERMITS   | 7        | 05/11 |
| REVISIONS AT PERMITS   | 8        | 05/11 |
| REVISIONS AT PERMITS   | 9        | 05/11 |
| REVISIONS AT PERMITS   | 10       | 05/11 |

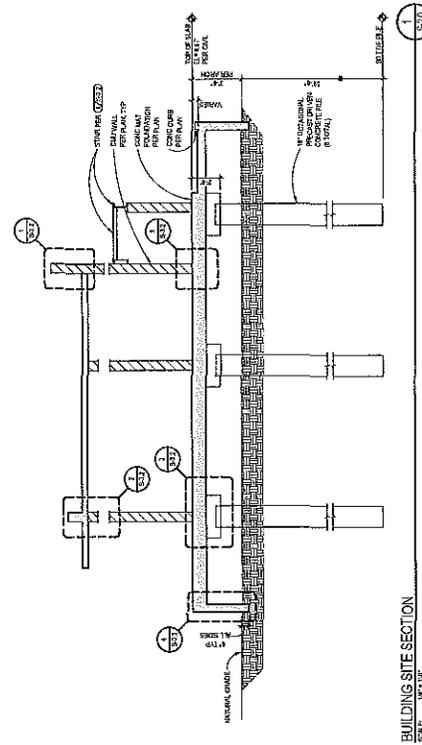
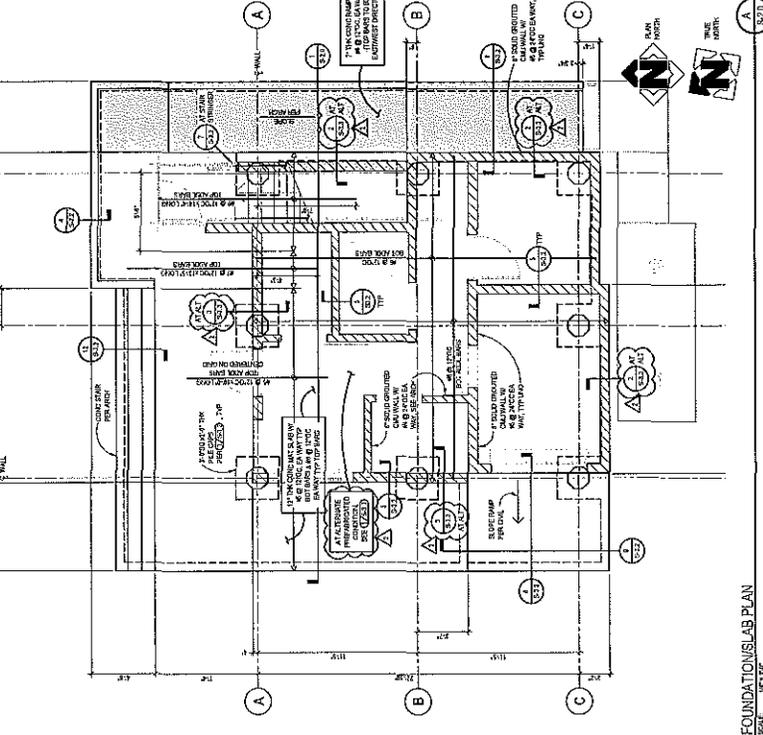
**ALTERNATE PREPARED CMU STRUCTURE**

**ADDITIONAL REQUIREMENTS:**

THIS PLAN IS FOR AN ALTERNATE PREPARED CMU STRUCTURE. THE FOUNDATION SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE REQUIREMENTS OF THE CALIFORNIA BUILDING CODE AND THE CALIFORNIA FOUNDATION CODE. THE FOUNDATION SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE REQUIREMENTS OF THE CALIFORNIA BUILDING CODE AND THE CALIFORNIA FOUNDATION CODE. THE FOUNDATION SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE REQUIREMENTS OF THE CALIFORNIA BUILDING CODE AND THE CALIFORNIA FOUNDATION CODE.

**FOUNDATION PLAN NOTES**

- THE FOUNDATION SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE REQUIREMENTS OF THE CALIFORNIA BUILDING CODE AND THE CALIFORNIA FOUNDATION CODE.
- THE FOUNDATION SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE REQUIREMENTS OF THE CALIFORNIA BUILDING CODE AND THE CALIFORNIA FOUNDATION CODE.
- THE FOUNDATION SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE REQUIREMENTS OF THE CALIFORNIA BUILDING CODE AND THE CALIFORNIA FOUNDATION CODE.
- THE FOUNDATION SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE REQUIREMENTS OF THE CALIFORNIA BUILDING CODE AND THE CALIFORNIA FOUNDATION CODE.
- THE FOUNDATION SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE REQUIREMENTS OF THE CALIFORNIA BUILDING CODE AND THE CALIFORNIA FOUNDATION CODE.
- THE FOUNDATION SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE REQUIREMENTS OF THE CALIFORNIA BUILDING CODE AND THE CALIFORNIA FOUNDATION CODE.
- THE FOUNDATION SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE REQUIREMENTS OF THE CALIFORNIA BUILDING CODE AND THE CALIFORNIA FOUNDATION CODE.
- THE FOUNDATION SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE REQUIREMENTS OF THE CALIFORNIA BUILDING CODE AND THE CALIFORNIA FOUNDATION CODE.
- THE FOUNDATION SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE REQUIREMENTS OF THE CALIFORNIA BUILDING CODE AND THE CALIFORNIA FOUNDATION CODE.
- THE FOUNDATION SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE REQUIREMENTS OF THE CALIFORNIA BUILDING CODE AND THE CALIFORNIA FOUNDATION CODE.



FOUNDATION PLAN  
SCALE: 1/4" = 1'-0"

BUILDING SITE SECTION  
SCALE: 1/4" = 1'-0"

BAYSHORE LIFEGUARD STATION  
5415 E. OCEAN BLVD.  
LONG BEACH, CA 90803

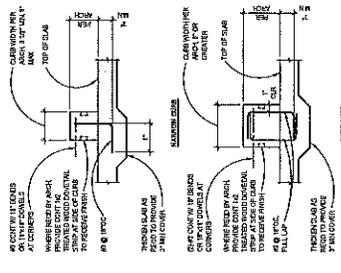


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FOUNDATION  
PLAN & BUILDING  
SECTION  
S-20





**REINFORCING BAR DEVELOPMENT AND LAP SPLICE SCHEDULE**  
SCALE: 1/8" = 1'-0"

**DEVELOPMENT LENGTH (L<sub>d</sub>) FOR TYPICAL BARS:**

BAR SIZE	CONCRETE STRENGTH (f' <sub>c</sub> )	DEVELOPMENT LENGTH (L <sub>d</sub> )
#3	3000	12"
#4	3000	16"
#5	3000	20"
#6	3000	24"
#7	3000	28"
#8	3000	32"
#9	3000	36"
#10	3000	40"
#11	3000	44"
#12	3000	48"
#14	3000	56"
#16	3000	64"
#18	3000	72"
#20	3000	80"
#22	3000	88"
#24	3000	96"
#28	3000	112"
#32	3000	128"
#36	3000	144"
#40	3000	160"
#44	3000	176"
#48	3000	192"
#52	3000	208"
#56	3000	224"
#60	3000	240"
#64	3000	256"
#68	3000	272"
#72	3000	288"
#76	3000	304"
#80	3000	320"
#84	3000	336"
#88	3000	352"
#92	3000	368"
#96	3000	384"
#100	3000	400"

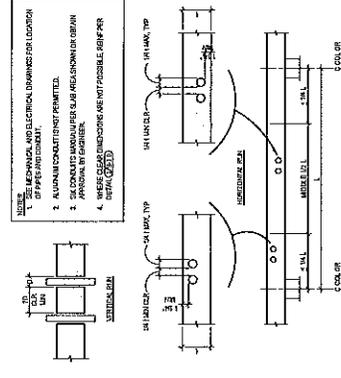
**LAP SPLICE LENGTH (L<sub>s</sub>) FOR TYPICAL BARS:**

BAR SIZE	CONCRETE STRENGTH (f' <sub>c</sub> )	LAP SPLICE LENGTH (L <sub>s</sub> )
#3	3000	12"
#4	3000	16"
#5	3000	20"
#6	3000	24"
#7	3000	28"
#8	3000	32"
#9	3000	36"
#10	3000	40"
#11	3000	44"
#12	3000	48"
#14	3000	56"
#16	3000	64"
#18	3000	72"
#20	3000	80"
#22	3000	88"
#24	3000	96"
#28	3000	112"
#32	3000	128"
#36	3000	144"
#40	3000	160"
#44	3000	176"
#48	3000	192"
#52	3000	208"
#56	3000	224"
#60	3000	240"
#64	3000	256"
#68	3000	272"
#72	3000	288"
#76	3000	304"
#80	3000	320"
#84	3000	336"
#88	3000	352"
#92	3000	368"
#96	3000	384"
#100	3000	400"

**REINFORCING HOOKS:**

REINFORCING HOOKS SHALL BE DEVELOPED AS FOLLOWS:

- 1. TOP OF CURB
- 2. TOP OF WALL
- 3. TOP OF COLUMN



**REINFORCING AT SLAB OPENING**  
SCALE: 1/8" = 1'-0"

**REINFORCING HOOKS:**

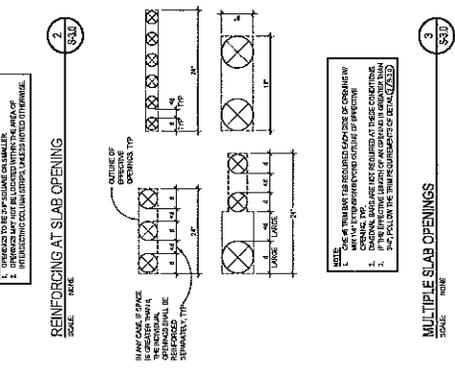
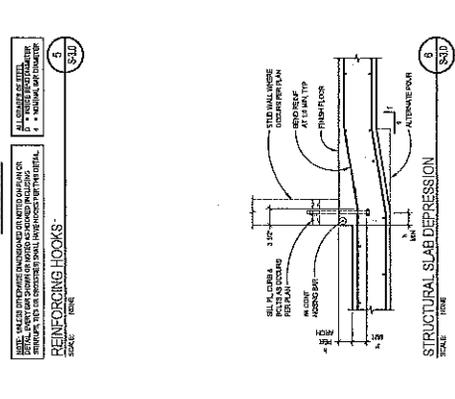
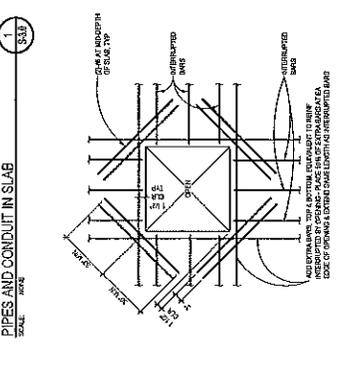
REINFORCING HOOKS SHALL BE DEVELOPED AS FOLLOWS:

- 1. TOP OF CURB
- 2. TOP OF WALL
- 3. TOP OF COLUMN

**REINFORCING AT SLAB OPENING:**

REINFORCING AT SLAB OPENINGS SHALL BE DEVELOPED AS FOLLOWS:

- 1. TOP OF CURB
- 2. TOP OF WALL
- 3. TOP OF COLUMN



**BAYSHORE LIFE GUARD STATION**  
5415 E. OCEAN BLVD.  
LONG BEACH, CA 90803

**MJE**  
MAYOR ENGINEERING  
10000 WILSON BLVD.  
SUITE 200  
LONG BEACH, CA 90803

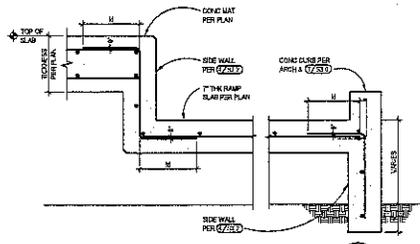
**SECTION AND DETAILS**  
S-3.0

DATE: 08/11/10  
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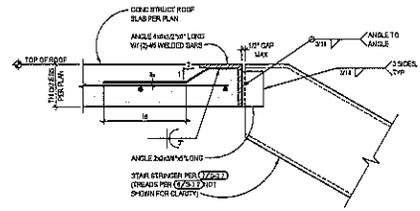
PROJECT: BAYSHORE LIFE GUARD STATION  
SHEET NO.: 30 OF 42  
DRAWN BY: JLD  
CHECKED BY: JLD

ENGINEER: JLD  
ARCHITECTURE: JLD

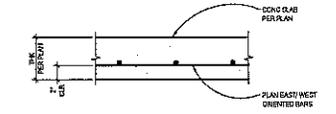




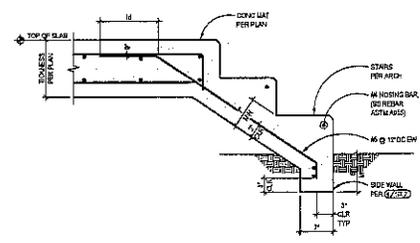
DETAIL  
SCALE: 1" = 1'-0"



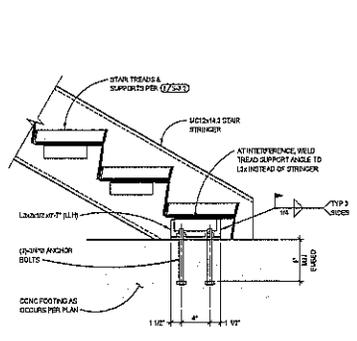
STEEL STAIR TOP CONNECTION  
SCALE: NONE



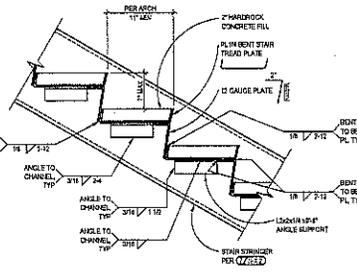
CONCRETE ROOF SLAB SECTION  
SCALE: 1 1/2" = 1'-0"



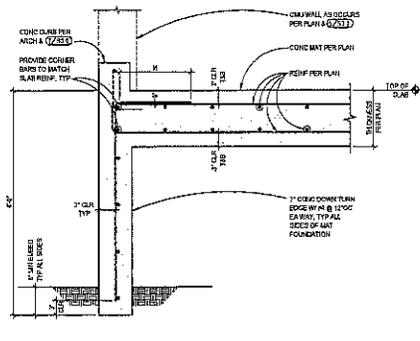
CONCRETE STRUCTURAL STAIR  
SCALE: 1" = 1'-0"



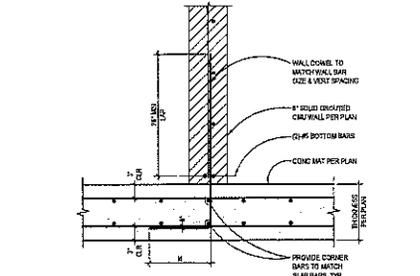
STAIR STRINGER AT BASE  
SCALE: NONE



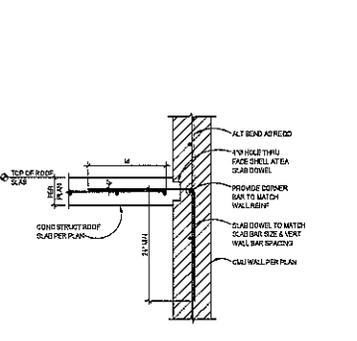
CONCRETE FILLED STEEL STAIR TREADS  
SCALE: NONE



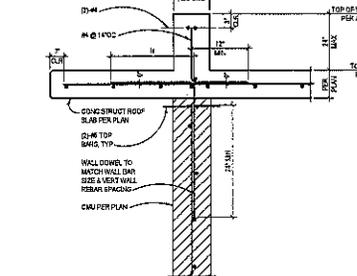
DETAIL  
SCALE: 1" = 1'-0"



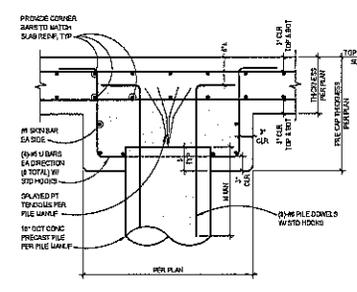
DETAIL  
SCALE: 1" = 1'-0"



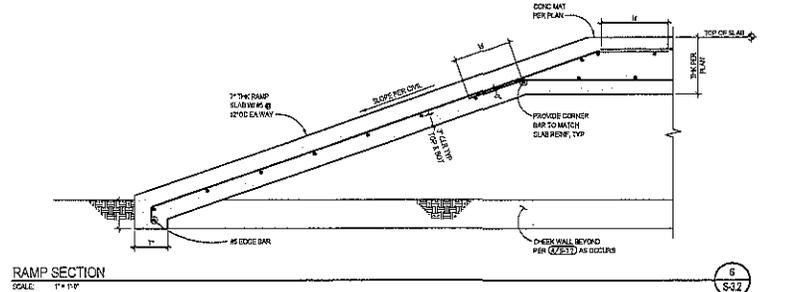
DETAIL  
SCALE: 1" = 1'-0"



DETAIL  
SCALE: 1" = 1'-0"



DETAIL  
SCALE: 1" = 1'-0"



RAMP SECTION  
SCALE: 1" = 1'-0"

NO.	DATE	BY	CHKD	APP'D	REVISION
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					

DESIGNED BY: [Signature]  
CHECKED BY: [Signature]  
APPROVED BY: [Signature]

DATE: 10/17/17

**MHP**  
MIDWEST HARBOR PARTNERS  
ARCHITECTURE

**BAYSHORE LIFEGUARD STATION**  
5415 E. OCEAN BLVD.  
LONG BEACH, CA 90803

PROJECT NO: 134413-00  
SHEET NO: 32 OF 42  
DATE: 10/17/17

**Environ** ARCHITECTURE

Environ Architecture, Inc.  
100 Chaucerway  
Suite P-208  
Long Beach, CA 90802, USA  
T. 562.455.7110  
mail@environarch.com

40177 2013.08

TYPICAL CMU  
DETAILS

S-3.2

















**SECTION 1 - GENERAL INFORMATION**

PROJECT NAME: BAYSHORE LIFE GUARD STATION  
PROJECT ADDRESS: 5415 E OCEAN BLVD., LONG BEACH, CA 90803  
PROJECT CONTACT: [Name], [Phone], [Email]  
DATE: 01/15/2014

**SECTION 2 - PROJECT DESCRIPTION**

1. PROJECT TYPE:  New Construction  Renovation  Addition  Other

2. PROJECT DESCRIPTION: [Detailed description of the project]

3. PROJECT LOCATION: [Address and location details]

4. PROJECT OWNER: [Owner name and contact information]

5. PROJECT SCHEDULE: [Start and end dates]

6. PROJECT BUDGET: [Budget information]

7. PROJECT STATUS:  In Progress  Completed  Other

8. PROJECT NOTES: [Additional notes and comments]

**SECTION 3 - ELECTRICAL SYSTEM**



**SECTION 1: GENERAL INFORMATION**

PROJECT NAME: **BAYSHORE LIFEGUARD STATION**

PROJECT NO.: **14022**

DATE: **04/27/14**

PROJECT LOCATION: **5415 E. OCEAN BLVD., LONG BEACH, CA 90803**

CLIENT: **AVK GROUP INC.**

DESIGNER: **AVK GROUP INC.**

DATE OF ISSUE: **04/27/14**

PROJECT STATUS: **AS BUILT**

PROJECT TYPE: **POWER ALLOWANCES**

PROJECT DESCRIPTION: **POWER ALLOWANCES FOR BAYSHORE LIFEGUARD STATION**

PROJECT LOCATION: **5415 E. OCEAN BLVD., LONG BEACH, CA 90803**

PROJECT NO.: **14022**

DATE OF ISSUE: **04/27/14**

PROJECT STATUS: **AS BUILT**

PROJECT TYPE: **POWER ALLOWANCES**

PROJECT DESCRIPTION: **POWER ALLOWANCES FOR BAYSHORE LIFEGUARD STATION**

**SECTION 2: ELECTRICAL SYSTEMS**

2.1. **GENERAL INFORMATION**

2.1.1. **SYSTEMS TO BE INSTALLED**

2.1.2. **SYSTEMS TO BE REMOVED**

2.1.3. **SYSTEMS TO BE MODIFIED**

2.2. **LOADS TO BE INSTALLED**

2.2.1. **GENERAL INFORMATION**

2.2.2. **LOADS TO BE INSTALLED**

2.3. **LOADS TO BE REMOVED**

2.3.1. **GENERAL INFORMATION**

2.3.2. **LOADS TO BE REMOVED**

2.4. **LOADS TO BE MODIFIED**

2.4.1. **GENERAL INFORMATION**

2.4.2. **LOADS TO BE MODIFIED**

**SECTION 3: ELECTRICAL SYSTEMS**

3.1. **GENERAL INFORMATION**

3.1.1. **SYSTEMS TO BE INSTALLED**

3.1.2. **SYSTEMS TO BE REMOVED**

3.1.3. **SYSTEMS TO BE MODIFIED**

3.2. **LOADS TO BE INSTALLED**

3.2.1. **GENERAL INFORMATION**

3.2.2. **LOADS TO BE INSTALLED**

3.3. **LOADS TO BE REMOVED**

3.3.1. **GENERAL INFORMATION**

3.3.2. **LOADS TO BE REMOVED**

3.4. **LOADS TO BE MODIFIED**

3.4.1. **GENERAL INFORMATION**

3.4.2. **LOADS TO BE MODIFIED**

**SECTION 4: ELECTRICAL SYSTEMS**

4.1. **GENERAL INFORMATION**

4.1.1. **SYSTEMS TO BE INSTALLED**

4.1.2. **SYSTEMS TO BE REMOVED**

4.1.3. **SYSTEMS TO BE MODIFIED**

4.2. **LOADS TO BE INSTALLED**

4.2.1. **GENERAL INFORMATION**

4.2.2. **LOADS TO BE INSTALLED**

4.3. **LOADS TO BE REMOVED**

4.3.1. **GENERAL INFORMATION**

4.3.2. **LOADS TO BE REMOVED**

4.4. **LOADS TO BE MODIFIED**

4.4.1. **GENERAL INFORMATION**

4.4.2. **LOADS TO BE MODIFIED**

**SECTION 5: ELECTRICAL SYSTEMS**

5.1. **GENERAL INFORMATION**

5.1.1. **SYSTEMS TO BE INSTALLED**

5.1.2. **SYSTEMS TO BE REMOVED**

5.1.3. **SYSTEMS TO BE MODIFIED**

5.2. **LOADS TO BE INSTALLED**

5.2.1. **GENERAL INFORMATION**

5.2.2. **LOADS TO BE INSTALLED**

5.3. **LOADS TO BE REMOVED**

5.3.1. **GENERAL INFORMATION**

5.3.2. **LOADS TO BE REMOVED**

5.4. **LOADS TO BE MODIFIED**

5.4.1. **GENERAL INFORMATION**

5.4.2. **LOADS TO BE MODIFIED**

**SECTION 6: ELECTRICAL SYSTEMS**

6.1. **GENERAL INFORMATION**

6.1.1. **SYSTEMS TO BE INSTALLED**

6.1.2. **SYSTEMS TO BE REMOVED**

6.1.3. **SYSTEMS TO BE MODIFIED**

6.2. **LOADS TO BE INSTALLED**

6.2.1. **GENERAL INFORMATION**

6.2.2. **LOADS TO BE INSTALLED**

6.3. **LOADS TO BE REMOVED**

6.3.1. **GENERAL INFORMATION**

6.3.2. **LOADS TO BE REMOVED**

6.4. **LOADS TO BE MODIFIED**

6.4.1. **GENERAL INFORMATION**

6.4.2. **LOADS TO BE MODIFIED**

**SECTION 7: ELECTRICAL SYSTEMS**

7.1. **GENERAL INFORMATION**

7.1.1. **SYSTEMS TO BE INSTALLED**

7.1.2. **SYSTEMS TO BE REMOVED**

7.1.3. **SYSTEMS TO BE MODIFIED**

7.2. **LOADS TO BE INSTALLED**

7.2.1. **GENERAL INFORMATION**

7.2.2. **LOADS TO BE INSTALLED**

7.3. **LOADS TO BE REMOVED**

7.3.1. **GENERAL INFORMATION**

7.3.2. **LOADS TO BE REMOVED**

7.4. **LOADS TO BE MODIFIED**

7.4.1. **GENERAL INFORMATION**

7.4.2. **LOADS TO BE MODIFIED**

**SECTION 8: ELECTRICAL SYSTEMS**

8.1. **GENERAL INFORMATION**

8.1.1. **SYSTEMS TO BE INSTALLED**

8.1.2. **SYSTEMS TO BE REMOVED**

8.1.3. **SYSTEMS TO BE MODIFIED**

8.2. **LOADS TO BE INSTALLED**

8.2.1. **GENERAL INFORMATION**

8.2.2. **LOADS TO BE INSTALLED**

8.3. **LOADS TO BE REMOVED**

8.3.1. **GENERAL INFORMATION**

8.3.2. **LOADS TO BE REMOVED**

8.4. **LOADS TO BE MODIFIED**

8.4.1. **GENERAL INFORMATION**

8.4.2. **LOADS TO BE MODIFIED**

**SECTION 9: ELECTRICAL SYSTEMS**

9.1. **GENERAL INFORMATION**

9.1.1. **SYSTEMS TO BE INSTALLED**

9.1.2. **SYSTEMS TO BE REMOVED**

9.1.3. **SYSTEMS TO BE MODIFIED**

9.2. **LOADS TO BE INSTALLED**

9.2.1. **GENERAL INFORMATION**

9.2.2. **LOADS TO BE INSTALLED**

9.3. **LOADS TO BE REMOVED**

9.3.1. **GENERAL INFORMATION**

9.3.2. **LOADS TO BE REMOVED**

9.4. **LOADS TO BE MODIFIED**

9.4.1. **GENERAL INFORMATION**

9.4.2. **LOADS TO BE MODIFIED**

**AVK Group Inc.**  
CONSULTING ELECTRICAL ENGINEERS  
14022  
TITLE 24 ENERGY COMPLIANCE FORMS  
42  
E3.3

**BAYSHORE LIFEGUARD STATION**  
5415 E. OCEAN BLVD.  
LONG BEACH, CA 90803



AVK GROUP INC.  
REGISTERED ELECTRICAL ENGINEER  
NO. 14022  
DATE OF EXPIRATION: 04/27/14

NO.	DATE	DESCRIPTION
1	04/27/14	ISSUED FOR PERMIT
2	04/27/14	ISSUED FOR CONSTRUCTION
3	04/27/14	ISSUED FOR AS BUILT

**ATTACHMENT A**

**Debarment, Suspension, Ineligibility and Voluntary Exclusion  
Certification**



**Acceptance of Certification**

1. This bid/agreement/proposal or like document has the potential to be a recipient of Federal funds. In order to be in compliance with Code of Federal Regulations, the City requires this completed form. By signing and submitting this document, the prospective bidder/proposer is providing the certification and acknowledgement as follows:
2. The terms "covered transaction," "debarred," "suspended," "ineligible," "lower tier covered transaction," "participant," "person," "primary covered transaction," "principal," "proposal," and "voluntarily excluded," as used in this clause, have the meanings set out in the Definitions and Coverage sections of rules implementing Executive Order 12549.
3. The certification in this clause is a material representation of fact upon which reliance was placed when this transaction was entered into. If it is later determined that the prospective recipient of Federal assistance funds knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the department or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.
4. The potential recipient of Federal assistance funds agrees by submitting this bid/agreement/proposal or like document that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency with which this transaction originated.

**Instructions for completing the form,  
Attachment –Debarment Certification**

1. The City of Long Beach sometimes receives Federal funding on certain purchases/projects. To ensure that the City is in compliance with Federal regulations we require this form to be completed.
2. The City of Long Beach checks the System for Award Management at [www.sam.gov](http://www.sam.gov) to make sure that Contractors who are awarded City contracts and/or purchase orders are not debarred or suspended. Prospective contractors should perform a search on this website for your company and or persons associated with your business.
3. If your business is in compliance with the conditions in the form, please have the appropriate person complete and sign this form and return with your bid/proposal/agreement.
4. If at any time, your business or persons associated with your business become debarred or suspended, we require that you inform us of this change in status.
5. If there are any exceptions to the certification, please include an attachment. Exceptions will not necessarily result in denial of award, but will be considered in determining bidder responsibility. For any exception, indicate to whom it applies, initiating agency and dates of action.
6. Note: Providing false information may result in criminal prosecution or administrative sanctions.

***If you have any questions on how to complete this form, please contact the Purchasing Division in the City of Long Beach Business Relations Bureau at 562-57-6200***

**ATTACHMENT B**

**REFERENCE LIST**



City of Long Beach  
 Purchasing Division  
 333 W Ocean Blvd/7<sup>th</sup> Floor  
 Long Beach CA 90802

**Reference Information Form**

Client/Contractor Name City of Long Beach, CA / Thomasville Construction, Inc.

Project Manager/Contact Name Lorrie Viola E-mail lviola@lalinks.net Ph. No. 714.980.0189

Address 2760 Studebaker Road, Long Beach, CA 90815

Project Description Design, Build, & Install Prefabricated Restroom Building at Bixby Park, 130 Cherry Avenue, Long Beach, CA

Project Dates (Start and End) 1/2015 - 12/2015 Contract Term(s) 90 days from receipt of state approved plans Contract Amount \$221,601

Client/Contractor Name City of Riverside, CA

Project Manager/Contact Name Randy McDaniel E-mail mcDaniel@riversideca.gov Ph. No. 951.826.2000

Address 6927 Magnolia Avenue, Riverside, CA 92506

Project Description Design, Build & Install Prefabricated Restroom at Don Jones Park, 3995 Jefferson St., Riverside, CA

Project Dates (Start and End) 2/2015-9/2015 Contract Term(s) 90 days from receipt of approved plans Contract Amount \$114,282

Client/Contractor Name City of Rialto, CA

Project Manager/Contact Name Perry Brents E-mail pbrents@rialto.ca.gov Ph. No. 909.820.2525

Address 150 S. Palm Avenue, Rialto, CA 92376

Project Description Design, Build, & Install Restroom/Concession Building at Bud Bender Park, 235 Lilac Ave., Rialto, CA

Project Dates (Start and End) 9/2015-3/2016 Contract Term(s) 90 days from receipt of state approved plans Contract Amount \$335,547

Client/Contractor Name City of Coachella, CA

Project Manager/Contact Name Gordon Fisher E-mail gfisher@coachella.org Ph. No. 760.501.8130

Address 1515 Sixth Street, Coachella, CA 92236

Project Description Design, Build, & Install Prefabricated Restroom Building at Veterans Park, 1515 6th St., Coachella, CA

Project Dates (Start and End) 4/2016-10/2016 Contract Term(s) 90 days from receipt of state approved plans Contract Amount \$274,146

Client/Contractor Name Riverside County Regional Park & Open-Space District, CA

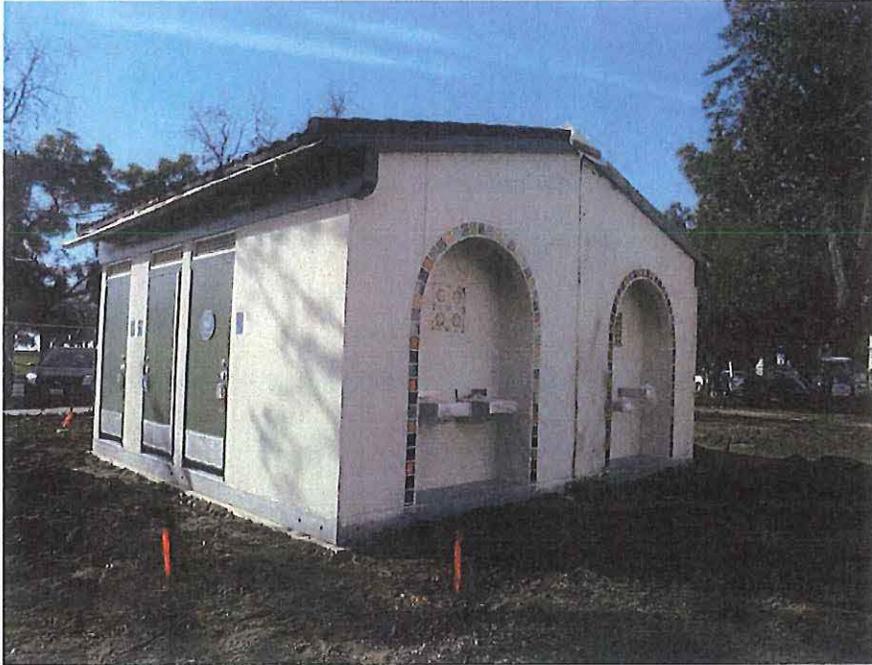
Project Manager/Contact Name Marc Brewer E-mail mbrewer@rivcoparks.org Ph. No. 951.955.4316

Address 4600 Crestmore Road, Riverside, CA 92509

Project Description Design, Build, & Install Restroom/Shower Building at Mayflower Park, 4980 Colorado River Rd., Blythe, CA

Project Dates (Start and End) 5/2016-11/2016 Contract Term(s) 120 days from receipt of state approved plans Contract Amount \$288,614

## Reference Photos



**Bixby Park, City of Long Beach, CA 12/2015**



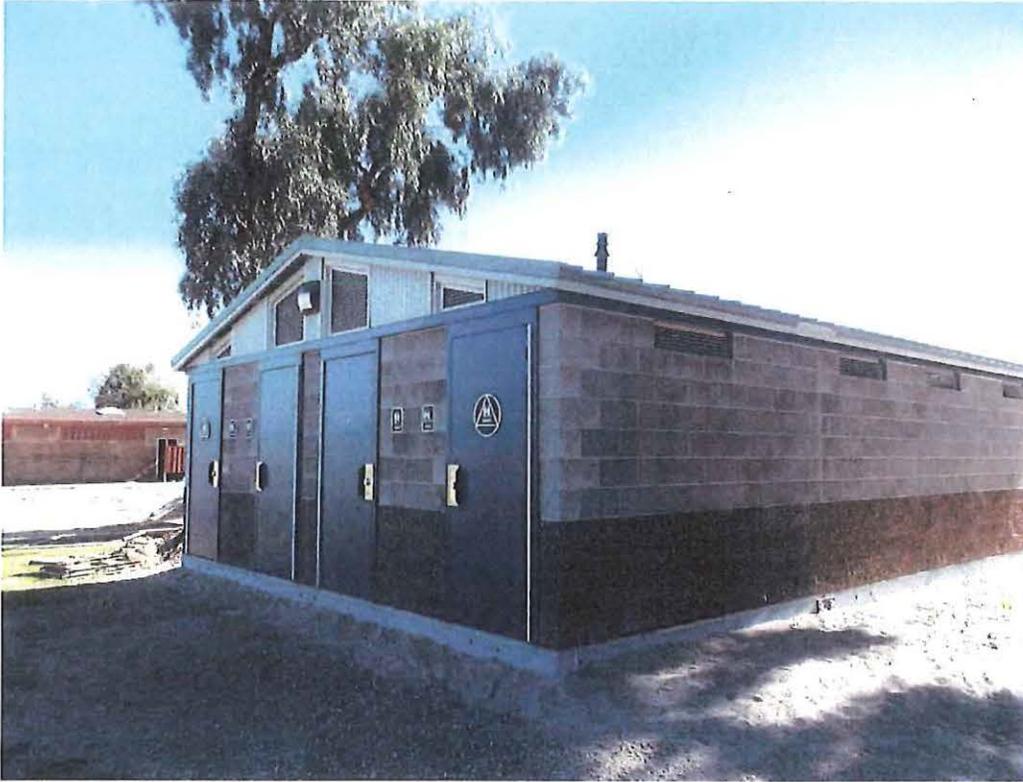
**Don Jones Park, City of Riverside, CA 09/2015**



**Bud Bender Park, City of Rialto, CA - 03/2016**



**Veterans Park, City of Coachella, CA - 10/2016**



Mayflower Park, County of Riverside, CA (Blythe, CA) - 11/2016

**ATTACHMENT C**

**W-9 Request for Taxpayer  
Identification Number and Certification**

Form-Fillable PDF available at <http://www.irs.gov/pub/irs-pdf/fw9.pdf>



**ATTACHMENT D**

**Equal Benefits Ordinance (EBO) Form**

## EQUAL BENEFITS ORDINANCE DISCLOSURE FORM

As a condition of being awarded a contract with the City of Long Beach ("City"), the selected Contractor/Vendor ("Contractor") may be required during the performance of the Contract, to comply with the City's nondiscrimination provisions of the Equal Benefits Ordinance ("EBO") set forth in the Long Beach Municipal Code section 2.73 et seq. The EBO requires that during the performance of the contract, the Contractor shall provide equal benefits to its employees with spouses and employees with domestic partners. Benefits include but are not limited to, health benefits, bereavement leave, family medical leave, membership and membership discounts, moving expenses, retirement benefits and travel benefits. A cash equivalent payment is permitted if an employer has made all reasonable efforts to provide domestic partners with access to benefits but is unable to do so. A situation in which a cash equivalent payment might be used if where the employer has difficulty finding an insurance provider that is willing to provide domestic partner benefits.

### The EBO is applicable to the following employers:

- For-profit employers that have a contract with the City for the purchase of goods, services, public works or improvements and other construction projects in the amount of \$100,000 or more
- For-profit entities that generate \$350,000 or more in annual gross receipts leasing City property pursuant to a written agreement for a term exceeding 29 days in any calendar year

Contractors who are subject to the EBO must certify to the City before execution of the contract that they are in compliance with the EBO by completing the EBO Certification Form, attached, or that they have been issued a waiver by the City. Contractors must also allow authorized City representatives access to records so the City can verify compliance with the EBO.

The EBO includes provisions that address difficulties associated with implementing procedures to comply with the EBO. Contractors can delay implementation of procedures to comply with the EBO in the following circumstances:

- 1) By the first effective date after the first open enrollment process following the contract start date, not to exceed two years, if the Contractor/vendor submits evidence of taking reasonable measures to comply with the EBO; or
- 2) At such time that the administrative steps can be taken to incorporate nondiscrimination in benefits in the Contractor/vendor's infrastructure, not to exceed three months; or
- 3) Upon expiration of the contractor's current collective bargaining agreement(s).

### Compliance with the EBO

If a contractor has not received a waiver from complying with the EBO and the timeframe within which it can delay implementation has expired but it has failed to comply with the EBO,

the Contractor may be deemed to be in material breach of the Contract. In the event of a material breach, the City may cancel, terminate or suspend the City agreement, in whole or in part. The City also may deem the Contractor an irresponsible bidder and disqualify the Contractor from contracting with the City for a period of three years. In addition, the City may assess liquidated damages against the Contractor which may be deducted from money otherwise due the Contractor. The City may also pursue any other remedies available at law or in equity.

By my signature below, I acknowledge that the Contractor understands that to the extent it is subject to the provisions of the Long Beach Municipal Code section 2.73, the Contractor shall comply with this provision.

Printed Name: Charles E. Kaufman Title: President  
Signature:  Date: 7/12/17  
Business Entity Name: The Public Restroom Company

**CERTIFICATION OF COMPLIANCE WITH THE  
EQUAL BENEFITS ORDINANCE**

**Section 1. CONTRACTOR/VENDOR INFORMATION**

Name: The Public Restroom Company Federal Tax ID No                       
Address: 2587 Business Parkway  
City: Minden State: NV ZIP: 89434  
Contact Person: Charles E. Kaufman Telephone: 888.888.2060 X101  
Email: chuck@publicrestroomcompany.com Fax: 888.888.1448

**Section 2. COMPLIANCE QUESTIONS**

- A. The EBO is inapplicable to this Contract because the Contractor/Vendor has no employees.        Yes   X   No
- B. Does your company provide (or make available at the employees' expense) any employee benefits?   X   Yes        No  
(If "yes," proceed to Question C. If "no," proceed to section 5, as the EBO does not apply to you.)
- C. Does your company provide (or make available at the employees' expense) any benefits to the spouse of an employee?  
  X   Yes        No
- D. Does your company provide (or make available at the employees' expense) any benefits to the domestic partner of an employee?  
  X   Yes        No (If you answered "no" to both questions C and D, proceed to section 5, as the EBO is not applicable to this contract. If you answered "yes" to both Questions C and D, please continue to Question E. If you answered "yes" to Question C and "no" to Question D, please continue to section 3.)
- E. Are the benefits that are available to the spouse of an employee identical to the benefits that are available to the domestic partner of an employee?   X   Yes        No  
(If "yes," proceed to section 4, as you are in compliance with the EBO. If "no," continue to section 3.)

**Section 3. PROVISIONAL COMPLIANCE**

- A. Contractor/vendor is not in compliance with the EBO now but will comply by the following date:

       By the first effective date after the first open enrollment process following the contract start date, not to exceed two years, if the Contractor/vendor submits evidence of taking reasonable measures to comply with the EBO; or

       At such time that the administrative steps can be taken to incorporate nondiscrimination in benefits in the Contractor/vendor's infrastructure, not to exceed three months; or

\_\_\_\_\_ Upon expiration of the contractor's current collective bargaining agreement(s).

- B. If you have taken all reasonable measures to comply with the EBO but are unable to do so, do you agree to provide employees with a cash equivalent? (The cash equivalent is the amount of money your company pays for spousal benefits that are unavailable for domestic partners.)

\_\_\_\_ Yes \_\_\_\_ No

Section 4. REQUIRED DOCUMENTATION

At time of issuance of purchase order or contract award, you may be required by the City to provide documentation (copy of employee handbook, eligibility statement from your plans, insurance provider statement, etc.) to verify that you do not discriminate in the provision of benefits.

Section 5. CERTIFICATION

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct and that I am authorized to bind this entity contractually. By signing this certification, I further agree to comply with all additional obligations of the Equal Benefits Ordinance that are set forth in the Long Beach Municipal Code and in the terms of the contract of purchase order with the City.

Executed this 12 day of July, 20 17, at Minden, NV

Name Charles E. Kaufman

Signature Charles E. Kaufman

Title President

Federal Tax ID No. ██████████

**ATTACHMENT E**  
**INSURANCE REQUIREMENT**



City of Long Beach  
Purchasing Division  
333 w. Ocean Blvd 7<sup>th</sup> Floor  
Long Beach, CA 90802

### INSURANCE REQUIREMENTS

Contractor shall submit proof of insurability from an insurance company with an: 8 rating (as specified in City AR 8-27) from AM Best Company with bid. Successful bidder shall be required to submit proof of insurance if award is made and notice given by the City. Failure to submit this proof within ten (10) calendar days after notice of award may disqualify the bid.

- Successful bidder shall obtain and maintain at its expense until completion of performance and acceptance by the City, from an insurer:
  - Admitted (Licensed) in the State of California with a current financial responsibility rating of an Excellent or better and a current financial size category (FSC) of V (Capital Surplus and Conditional Surplus Funds of greater than \$10 million) or greater rating as reported by AM Best Company or equivalent, unless waived in writing by the City's Risk Manager, or
  - Non-admitted in the State of California with a current financial responsibility rating of an Excellent or better and a current financial size category (FSC) of VIII (Capital Surplus Funds or greater than \$100 million) or greater rating as reported by AM Best Company or equivalent, unless waived in writing by City's Risk Manager.
  - Comprehensive General Liability naming City, its Officials, Employees, and Agents as additional insureds for injury to or death of persons or damage to or loss of property arising from or connected to vendor's performance here-under \$1,000,000 combined single limit for each occurrence and \$2,000,000 General Aggregate.
  - Automobile Liability: \$500,000 combined single limit per accident for bodily injury and property damage covering owned, non-owned and hired vehicles.
  - Worker's Compensation: As required by California Labor Code.
- Self-insurance of self-insured retention must be approved in writing by City and protect City in same manner and extent as if policies had not contained retention. Each policy must be endorsed to state that coverage shall not be cancelled by either party or reduced in coverage except after 30 days prior written notice to City. Vendor must furnish to City before performance certificates of insurance and original endorsements, with the original signature of one authorized by the insurer to bind coverage on its behalf, for approval as to sufficiency and form. This insurance shall not be deemed to limit vendor's liability hereunder.
- Contractor shall maintain at its expense, until completion of performance and acceptance by City, from an insurer:



City of Long Beach  
Purchasing Division  
333 w. Ocean Blvd 7<sup>th</sup> Floor  
Long Beach, CA 90802

- Admitted (licensed) in the State of California with a current financial responsibility rating of A (Excellent) or better and a current financial size category (FSC) of V (capital surplus and conditional surplus funds of greater than \$10 million) or greater rating as reported by A.M. Best Company or equivalent, unless waived in writing by City's Risk Manager, or
  - Non-admitted in the State of California with a current financial responsibility rating of A (Excellent) or better and a current financial size category (FSC) of VIII (capital surplus and conditional surplus funds of greater than \$100 million) or greater rating as reported by A.M. Best Company or equivalent, unless waived in writing by the City's Risk Manager.
- All coverages for Subcontractors shall be subject to the requirements stated herein and shall be maintained at no expense to the City.
  - Contractor shall furnish the City with certificates of insurance and original endorsements providing coverage as required above. The certificates and endorsements for each insurance policy are to be signed by a person authorized by that insurer to bind coverage on its behalf.
  - Before any of Contractor's or Subcontractor's employees shall do any work on the City's property, Contractor shall furnish the City with the required certificates evidencing that such insurance is being maintained. Such certificates shall specify the date when such insurance expires. Such insurance shall be maintained until after the Work under the Contract has been completed and accepted.
  - Such insurance as required herein or in any other documents to be considered a part hereof shall not be deemed to limit Contractor's liability under this Contract.
  - Contractor shall defend, indemnify and hold harmless the City, its officials and employees from and against any and all liability for claims for bodily injury and property damage arising out of negligent acts, omissions or errors of any employee of Contractor at the Site.
  - Contractor shall list the name and location of the place of business of each Subcontractor who will perform work, labor or services for Contractor, or who specially fabricates and installs a portion of the Work or improvement in an amount in excess of one-half of one percent of Contractor's total contract cost. The Subcontractor list shall be submitted with Contractor's Bid.

By submitting a signature below, Bidder agrees that insurance requirements can be provided as requested.

Printed Name: Charles E. Kaufman Title: President  
Signature: *Charles E. Kaufman* Date: 2/12/17



PUBLRES-01

KHANLEY

# CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY)  
05/04/2017

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

**IMPORTANT:** If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must have ADDITIONAL INSURED provisions or be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER Warren G. Bender Co. 516 Gibson Drive Suite 240 Roseville, CA 95678	CONTACT NAME:	
	PHONE (A/C, No, Ext): (916) 380-5300	FAX (A/C, No): (916) 380-5206
E-MAIL ADDRESS:		
INSURER(S) AFFORDING COVERAGE		NAIC #
INSURER A: Valley Forge Insurance Company		20508
INSURER B: AmTrust Insurance Company of Kansas, Inc.		
INSURER C: The Continental Insurance Company		35289
INSURER D: Granite State Insurance Co.		23809
INSURER E:		
INSURER F:		

INSURED  
Public Restroom Company  
2587 Business Pkwy  
Minden, NV 89423

COVERAGES                      CERTIFICATE NUMBER:                      REVISION NUMBER:

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

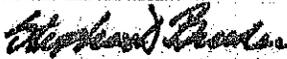
INSR LTR	TYPE OF INSURANCE	ADDL INSD	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS
A	<input checked="" type="checkbox"/> COMMERCIAL GENERAL LIABILITY <input type="checkbox"/> CLAIMS-MADE <input checked="" type="checkbox"/> OCCUR	X	X	6045717573	11/15/2016	11/15/2017	EACH OCCURRENCE \$ 1,000,000 DAMAGE TO RENTED PREMISES (Ea occurrence) \$ 100,000 MED EXP (Any one person) \$ 15,000 PERSONAL & ADV INJURY \$ 1,000,000 GENERAL AGGREGATE \$ 2,000,000 PRODUCTS - COMP/OP AGG \$ 2,000,000
GEN'L AGGREGATE LIMIT APPLIES PER: <input type="checkbox"/> POLICY <input checked="" type="checkbox"/> PROJECT <input type="checkbox"/> LOC OTHER:							
B	AUTOMOBILE LIABILITY <input checked="" type="checkbox"/> ANY AUTO OWNED AUTOS ONLY <input type="checkbox"/> SCHEDULED AUTOS <input type="checkbox"/> HIRED AUTOS ONLY <input type="checkbox"/> NON-OWNED AUTOS ONLY	X	X	KPP102373302	11/15/2016	11/15/2017	COMBINED SINGLE LIMIT (Ea accident) \$ 1,000,000 BODILY INJURY (Per person) \$ BODILY INJURY (Per accident) \$ PROPERTY DAMAGE (Per accident) \$
C	<input checked="" type="checkbox"/> UMBRELLA LIAB <input checked="" type="checkbox"/> OCCUR <input type="checkbox"/> EXCESS LIAB <input type="checkbox"/> CLAIMS-MADE DED <input checked="" type="checkbox"/> RETENTION \$ 10,000			6045711000	11/15/2016	11/15/2017	EACH OCCURRENCE \$ 4,000,000 AGGREGATE \$ 4,000,000
D	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? (Mandatory in NH) <input type="checkbox"/> Y/N If yes, describe under DESCRIPTION OF OPERATIONS below	N/A	X	013013907	04/01/2017	04/01/2018	<input checked="" type="checkbox"/> PER STATUTE <input type="checkbox"/> OTHER E.L. EACH ACCIDENT \$ 1,000,000 E.L. DISEASE - EA EMPLOYEE \$ 1,000,000 E.L. DISEASE - POLICY LIMIT \$ 1,000,000

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (ACORD 101, Additional Remarks Schedule, may be attached if more space is required)

Evidence of Insurance  
WC WOS CA

### CERTIFICATE HOLDER

### CANCELLATION

Evidence of Insurance Evidence of Insurance	SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.  AUTHORIZED REPRESENTATIVE 
--	---

ACORD 25 (2016/03)

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# ATTACHMENT F

## SECRETARY OF STATE CERTIFICATION PRINTOUT

<https://businesssearch.sos.ca.gov/>

**Alex Padilla**  
California Secretary of State

**Business Entities (BE)**

**Business Search**

This search provides access to available information for corporations, limited liability companies and limited partnerships of record with the California Secretary of State, including free uncertified PDF copies of the most recent Statements of Information filed for corporations and limited liability companies, if the statements have been imaged. Please note: This search is not intended to serve as a name availability search. For information on checking or reserving a name, refer to [Name Availability](#).

To conduct a search:

- Select the applicable search type.
- In the "Search Criteria" box, enter the entity name or number you wish to search. Note: If entering the entity number of a corporation, the number must begin with the letter C.
- Select the search filter you wish to use to locate the entity if searching for an entity name.
- Select the Search button.
- For help with searching an entity name or number, refer to [Search Tips](#).

All fields marked with an asterisk (\*) are required.

Search Type \*  
 Search by Corporation Name    Search by LP/LLC Name    Search by Entity Number

Search Criteria \*   Search Filter   Keyword ▾

Search

Disclaimer: This tool allows you to search the Secretary of State's California Business Search database for abstracts of information for domestic stock, domestic nonprofit and qualified foreign corporations, limited liability companies and limited partnerships that have filed with this office. This search tool groups corporations separately from limited liability companies and limited partnerships and returns all entities for the search criteria in the respective groups regardless of the current status.

Although every attempt has been made to ensure that the information contained in the database is accurate, the Secretary of State's office is not responsible for any loss, consequence, or damage resulting directly or indirectly from reliance on the accuracy, reliability, or timeliness of the information that is provided. All such information is provided "as is." For information on ordering copies of the official business entity records for a particular entity, please refer to [Information Requests](#).

**Online Services**

- E-File Statements of Information for Corporations
- Business Search
- Processing Times
- Disclosure Search

**Service Options**

- Name Availability

**Forms, Samples & Fees**

**Statements of Information (annual/biennial reports)**

**Filing Tips**

**Information Requests (certificates, copies & status reports)**

**Service of Process**

**FAQs**

**Contact Information**

**Resources**

- Business Resources
- Tax Information
- Starting A Business

**Customer Alerts**

- Business Identity Theft
- Misleading Business Solicitations

Please include a printout from this website with your bid.  
*Individual and Sole Proprietor businesses are exempt.*

Alex Padilla  
California Secretary of State

## Business Search - Entity Detail

The California Business Search is updated daily and reflects work processed through Tuesday, July 4, 2017. Please refer to document [Processing Times](#) for the received dates of filings currently being processed. The data provided is not a complete or certified record of an entity. Not all images are available online.

C2492360 THE PUBLIC RESTROOM COMPANY

<b>Registration Date:</b>	01/21/2003
<b>Jurisdiction:</b>	NEVADA
<b>Entity Type:</b>	FOREIGN STOCK
<b>Status:</b>	ACTIVE
<b>Agent for Service of Process:</b>	HAROLD M JAFFE 3521 GRAND AVE OAKLAND CA 94610
<b>Entity Address:</b>	2587 BUSINESS PKWY MINDEN NV 89423
<b>Entity Mailing Address:</b>	2587 BUSINESS PKWY MINDEN NV 89423

A Statement of Information is due EVERY year beginning five months before and through the end of January.

Document Type	↑↓ File Date	↓ PDF
SI-NO CHANGE	02/02/2017	
SI-COMPLETE	04/24/2015	
REGISTRATION	01/21/2003	

\* Indicates the information is not contained in the California Secretary of State's database.

- If the status of the corporation is "Surrender," the agent for service of process is automatically revoked. Please refer to California Corporations Code [section 2114](#) for information relating to service upon corporations that have surrendered.
- For information on checking or reserving a name, refer to [Name Availability](#).
- If the image is not available online, for information on ordering a copy refer to [Information Requests](#).
- For information on ordering certificates, status reports, certified copies of documents and copies of documents not currently available in the Business Search or to request a more extensive search for records, refer to [Information Requests](#).
- For help with searching an entity name, refer to [Search Tips](#).
- For descriptions of the various fields and status types, refer to [Frequently Asked Questions](#).

[Modify Search](#)

[New Search](#)

[Back to Search Results](#)



**State of California  
Secretary of State**

**F**

**Statement of Information  
(Foreign Corporation)**

**FEES (Filing and Disclosure): \$25.00.**

**If this is an amendment, see instructions.**

**IMPORTANT – READ INSTRUCTIONS BEFORE COMPLETING THIS FORM**

**FJ58075**

**FILED**

In the office of the Secretary of State  
of the State of California

**FEB-02 2017**

**1. CORPORATE NAME**

THE PUBLIC RESTROOM COMPANY

**2. CALIFORNIA CORPORATE NUMBER**

C2492360

This Space for Filing Use Only

**No Change Statement** (Not applicable if agent address of record is a P.O. Box address. See instructions.)

3. If there have been any changes to the information contained in the last Statement of Information filed with the California Secretary of State, or no statement of information has been previously filed, this form must be completed in its entirety.

If there has been no change in any of the information contained in the last Statement of Information filed with the California Secretary of State, check the box and proceed to Item 13.

**Complete Addresses for the Following** (Do not abbreviate the name of the city. Items 4 and 5 cannot be P.O. Boxes.)

4. STREET ADDRESS OF PRINCIPAL EXECUTIVE OFFICE CITY STATE ZIP CODE

5. STREET ADDRESS OF PRINCIPAL BUSINESS OFFICE IN CALIFORNIA, IF ANY CITY STATE ZIP CODE

6. MAILING ADDRESS OF THE CORPORATION, IF DIFFERENT THAN ITEM 4 CITY STATE ZIP CODE

**Names and Complete Addresses of the Following Officers** (The corporation must list these three officers. A comparable title for the specific officer may be added; however, the preprinted titles on this form must not be altered.)

7. CHIEF EXECUTIVE OFFICER/ ADDRESS CITY STATE ZIP CODE

8. SECRETARY ADDRESS CITY STATE ZIP CODE

9. CHIEF FINANCIAL OFFICER/ ADDRESS CITY STATE ZIP CODE

**Agent for Service of Process** If the agent is an individual, the agent must reside in California and Item 11 must be completed with a California street address, a P.O. Box address is not acceptable. If the agent is another corporation, the agent must have on file with the California Secretary of State a certificate pursuant to California Corporations Code section 1505 and Item 11 must be left blank.

10. NAME OF AGENT FOR SERVICE OF PROCESS

11. STREET ADDRESS OF AGENT FOR SERVICE OF PROCESS IN CALIFORNIA, IF AN INDIVIDUAL CITY STATE ZIP CODE

**Type of Business**

12. DESCRIBE THE TYPE OF BUSINESS OF THE CORPORATION

13. THE INFORMATION CONTAINED HEREIN IS TRUE AND CORRECT.

02/02/2017 CHARLES E KAUFMAN PRESIDENT  
DATE TYPE/PRINT NAME OF PERSON COMPLETING FORM TITLE SIGNATURE



**State of California  
Secretary of State**

**Statement of Information**

(Foreign Corporation)

FEES (Filing and Disclosure): \$25.00.

If this is an amendment, see instructions.

**IMPORTANT – READ INSTRUCTIONS BEFORE COMPLETING THIS FORM**

**F**

**F557501**

**FILED**

In the office of the Secretary of State  
of the State of California

**APR-24 2015**

This Space for Filing Use Only

**1. CORPORATE NAME**

THE PUBLIC RESTROOM COMPANY

**2. CALIFORNIA CORPORATE NUMBER**

C2492360

**No Change Statement** (Not applicable if agent address of record is a P.O. Box address. See instructions.)

3. If there have been any changes to the information contained in the last Statement of Information filed with the California Secretary of State, or no statement of information has been previously filed, this form must be completed in its entirety.

If there has been no change in any of the information contained in the last Statement of Information filed with the California Secretary of State, check the box and proceed to Item 13.

**Complete Addresses for the Following** (Do not abbreviate the name of the city. Items 4 and 5 cannot be P.O. Boxes.)

4. STREET ADDRESS OF PRINCIPAL EXECUTIVE OFFICE	CITY	STATE	ZIP CODE
2587 BUSINESS PKWY, MINDEN, NV 89423			
5. STREET ADDRESS OF PRINCIPAL BUSINESS OFFICE IN CALIFORNIA, IF ANY	CITY	STATE	ZIP CODE
6. MAILING ADDRESS OF THE CORPORATION, IF DIFFERENT THAN ITEM 4	CITY	STATE	ZIP CODE

**Names and Complete Addresses of the Following Officers** (The corporation must list these three officers. A comparable title for the specific officer may be added; however, the preprinted titles on this form must not be altered.)

7. CHIEF EXECUTIVE OFFICER/	ADDRESS	CITY	STATE	ZIP CODE
CHARLES E KAUFMAN	13300 ARROWSPRINGS DR, RENO, NV 89511			
8. SECRETARY	ADDRESS	CITY	STATE	ZIP CODE
CHARLES E KAUFMAN	13300 ARROWSPRINGS DR, RENO, NV 89511			
9. CHIEF FINANCIAL OFFICER/	ADDRESS	CITY	STATE	ZIP CODE
CHARLES E KAUFMAN	13300 ARROWSPRINGS DR, RENO, NV 89511			

**Agent for Service of Process** If the agent is an individual, the agent must reside in California and Item 11 must be completed with a California street address, a P.O. Box address is not acceptable. If the agent is another corporation, the agent must have on file with the California Secretary of State a certificate pursuant to California Corporations Code section 1505 and Item 11 must be left blank.

**10. NAME OF AGENT FOR SERVICE OF PROCESS**

HAROLD M JAFFE

**11. STREET ADDRESS OF AGENT FOR SERVICE OF PROCESS IN CALIFORNIA, IF AN INDIVIDUAL**

CITY STATE ZIP CODE

3521 GRAND AVE, OAKLAND, CA 94610

**Type of Business**

**12. DESCRIBE THE TYPE OF BUSINESS OF THE CORPORATION**

MANUF & INSTALL RESTROOM BLDGS

**13. THE INFORMATION CONTAINED HEREIN IS TRUE AND CORRECT.**

04/24/2015

JILL B GAUGHAN

MNGR CONTRACT COMPLIANCE & CORPORATE STATE LICENSI

DATE

TYPE/PRINT NAME OF PERSON COMPLETING FORM

TITLE

SIGNATURE



Price Proposal: ITB PW 17-096, Prefabricated Lifeguard Station, City of Long Beach, CA

Date: July 13, 2017

Bid Date: Thursday, July 13, 2017, 11:00 AM, PT

Reference #: 9597

License: Contractor License # 822966B

DIR# 100005303

**Our Offer to Sell:**

1. Prefabricated Building #1 delivered to site @ \$409,674 *CE*

Prefabricated Building (Optional) #2 delivered to site @ \$409,674 *CE*

Public Restroom Company herein bids to furnish (Per attached schematic plans and specifications adapted/customized for modular design and specialized construction), delivered to site with all costs except installation including applicable taxes excluding retention. (Retention is not allowed as this is materials or a product fully assembled before shipment to the site and therefore not subject to retention.)

2. Installation:

Turnkey Installation of Building #1 above @ \$21,275 with retention allowed. *CE*

Turnkey Installation of Building (Optional) #2 above @ \$21,275 with retention allowed. *CE*

Public Restroom Company also includes in this two part quotation our turnkey installation package for this building. Our national factory-authorized installation team will:

- a. Arrive on-site to confirm and verify the owner provided scope of work in preparation for installation including access to the site.
- b. Verify the building pad size, building corners, finished slab elevation, and utility depth and location.
- c. Excavate the utility trenches for placement of our prefabricated underground piping tree for plumbing and electrical, set the kit in place, provide the water test for inspection before backfilling, and then place the site adjacent coarse sand you provide to us alongside the building pad and screed it level for final building placement.
- d. Set the building on the site foundation.
- e. Connect the utility piping stub ups to the building piping stub down building points of connection for water, sewer, and electrical conduit to the building internal electrical panel.

3. Owner Final Tie In of Utilities and other site work:

The exterior utility connections for water, sewer and electrical 6' or less from the footprint of the building are by owner.

4. Total Cost of Prefabricated Building #1 and installation @ \$430,949 *CE*

Total Cost of Prefabricated Building (Optional) #2 and installation @ \$430,949 *CE*

**OWNER SCOPE OF WORK WITH/WITHOUT FOOTINGS:****Owner Scope of Work Background:**

Owner shall survey the site, establish survey for the building pad and prefabricated building slab elevation and front corners, excavate for building footings (if required), locate footing sleeves for electrical, waste, and water, pour the footings (if required), furnish sand base adjacent to subgrade pad, and provide location for utility POC's nominally 6' outside the foundation.

**Preparation of Building Pad:**

Owner is responsible for providing the building foundation per Bid plans with slight dimensional modifications for PRC's pre-cast floor slab.

**Subgrade Foundation Requirements:**

1. Owner shall survey the building site and provide a finished slab elevation for the prefabricated building. The building pad size we require is larger than the final actual building footprint. Provide building front corner stakes with 10' offsets.
2. Owner shall excavate the existing site to the per the required foundation per plans.

**Owner verification of site access to allow Building Delivery:**

1. Owner certifies to PRC that suitable delivery access to the proposed building site is available. Suitable access is defined as 14' minimum width, 16' minimum height, and sufficient turning radius for a crane and 70' tractor-trailer.
2. Our cost is based upon the crane we provide being able to get within 35' from the building center and for the delivery truck to be no more than 35' from the crane center picking point.
3. If the path to the building site traverses curbs, underground utilities, landscaping, sidewalks, or other obstacles that could be damaged, it is the Owner's responsibility for repair and all costs, if damage occurs.
4. If trench plating is required, it shall be the cost responsibility of the Owner.
5. If unseen obstacles are present when site installation begins, it is the Owner's responsibility to properly mark them and verbally notify PRC before installation.



**Installation Notice and Site Availability:**

PRC will provide sufficient notice of delivery of the prefabricated building. The Owner shall make the site available during the delivery period. During the delivery period, on an improved site, Owner should stop site watering several days before delivery to minimize the impact on the soils for the heavy equipment needed for installation.

**Caution:**

*If site is not ready for our field crew to perform their installation and if no notice of delay in readiness from Owner is received, PRC will provide a change order for re-mobilization on a daily basis until the site is ready for us. Ready means that the site pad is completed, the corner required survey stakes are in place, the slab elevation stakes are in place, the location of the front of the building is confirmed on site, and access to the site is available from an improved roadway. Owner shall sign the change order before we will continue delivery.*

Public Restroom Company will “turn-key” set the buildings including the hook up of utilities inside the building (only) when they are available. PRC will use its own factory-trained staff for the installation.

**Utility Connections:**

1. The Owner is responsible for flushing all water service lines before final connection.
2. The Owner is responsible for the final connections of water, sewer, and electrical at the exterior of building POC's.
3. PRC provides a POC for water, a POC DWV waste line with a clean out for your service connection, and an electrical schedule 80 PVC sleeve at an exterior POC.
4. PRC provides and connects the interior building utility connections and the Owner or their subcontractor makes the exterior connections to POC's for services.

**Special Conditions, Permits, and Inspection Fees:**

Follow any published specifications governing local building procedures for applicable building permit fees, health department fees, all inspection fees, site concrete testing fees, and compaction tests, if required by Owner. PRC is responsible for all required State inspections and final State insignia certification of the building, if applicable.

**Jurisdiction for Off-site Work:**

Jurisdiction, for permitting and inspection of this building shall be either the State agency who manages prefabricated building compliance in the state or the local CBO (when the State does not provide certification). If the responsibility for building inspection is the local CBO, we will provide a certified plan set, calculations, and a third party engineer inspection report for any and all closed work the local official cannot see.

## **PUBLIC RESTROOM COMPANY SCOPE OF WORK:**

### **Our In Plant/Off-Site Construction Scheduling System:**

PRC has several off-site manufacturing centers in the United States, strategically located, that have the proper equipment and trained staff to fabricate our custom buildings to our high quality fit and finish standards. PRC manages quality control in our off-site production facility to comply with the approved drawings and provides an inspection certification and photos as required. When proprietary materials, which we have designed and fabricated, are part of the project, PRC supplies the manufacturing centers with these special parts or chemicals. We then schedule the in plant construction process to coordinate with your delivery date through our Operations Division field staff. We guaranty on time at cost delivery weather permitting.

### **Special Payment and Billing Terms:**

We will invoice for our design, engineering, and architectural plans upon our submittal to you. Then, we invoice on a monthly in plant percentage of completion supported by photographs, State third party inspection reports, and State certification.

In the event of project stoppage, additional fees may be assessed for re-mobilization, storage, crane costs, etc. *Our discounted project costs are based upon timely payments. Delays in payment could change delivery schedules and project costs.*

### **Delivery and Installation:**

#### **Site Inspection:**

PRC staff, upon site arrival, will verify the required dimensions of the building pad and the corner locations/elevation. We will also verify the delivery path from an accessible road or street and install the underground utilities to the point of connection nominally 6' from the exterior of the building.

#### **Installation:**

PRC will install the building turn-key, except for any exclusion (listed under "Exclusions," herein.)

#### **Installation of Utilities under the Prefabricated Building:**

We fabricate off-site an underground utilities (water and DWV piping and fittings) preassembled plumbing and electrical tree. Our site staff will set the underground tree in the excavated trench (excavation by owner to the proper depth per local code) into code depth

excavated trenches and our staff will install the coarse concrete sand to bed the piping per our submitted drawing.

Your utility POC's start nominally 6' from the building footprint where we pick up the task and connect your services to the building stub downs. We provide all the under slab piping (including the driven electrical ground rod or lightning rod, if applicable). The Owner brings utility services to within 6' of the pad.

**Connection of Utilities Post Building Placement:**

After placement of the building on the foundation by PRC, our field staff will tie in the water and sewer connection "inside" the building only and terminate at a point of connection (POC) outside the building clearly marked for each utility service. The Owner is responsible for final utility point of service connections at the nominal 6' from building locations.

**Electrical:**

PRC provides the electrical conduit to the POC 6' from the building. The Owner pulls the wire and ties it off on the electrical panel.

**Plumbing:**

PRC provides the POC up to 6' from the building footprint and the Owner connects the water to our stub out location.

**Sewer:**

Some sites depending on the local jurisdiction will require an outside house trap which Owner shall install if needed. PRC will provide you with a sewer point of connection including a clean out to which Owner will terminate the site sewer service.

**Testing of Water, Sewer, and Electrical in Plant and Final Site Utility Connection:**

Before the building leaves the manufacturing center, PRC certifies a pressure water piping test, DWV, and the electrical connections for compliance with code. While the building is fully tested for leaks at the plant before shipment, road vibration may loosen some plumbing slip fittings and require tightening once the building services (water) is completed. Owner is responsible for minor fitting tightening to handle small slip fitting leaks caused by transportation.

**Time of Completion:**

PRC estimates a 90 business day schedule to complete our scope of work from receipt of written notice to proceed together with State of California Housing and Community Development approved plans and calculations.

**Exclusions/Exceptions:**

1. Access issues for delivery of the building when the owner has not provided a proper path to the final site. This exclusion covers sites whose access is limited by trees, inaccessible roadways, overhead power lines at location where crane will lift building, grade changes, berms, or uneven site grades, or when the path of travel is over improvements such as sidewalks, all of which are not within the scope of work by PRC.
2. If weather on site causes site delivery issues the delivery may have to be diverted to an offsite location and the additional costs will be a change order to the bid. Our staff works with the owner in advance to make sure sound decisions for delivery are made to avoid this issue. But sometimes owners take risks for weather but this risk is clearly at the owner's risk, not PRC.
3. Sidewalks outside the building footprint.
4. Any trench plates needed for protection of site soils, sidewalks, or site utilities. Any site soils damage or other site improvements, if damaged during installation are by others.
5. Survey, excavation, and installation of the building pad and footings (if required) per PRC plans.
6. Soil conditions not suitable for bearing 1500 psf. If no soils testing report is available before bid, owner must verify site supporting soils at a minimum of 1000 psf because that's the least we can place our structures on or owner or engineer of record must design a foundation system to meet the imposed loads of site placement.
7. Improper water pressure, an undersized meter, or improper water volume flow to the building may necessitate a change order for the structure to install a 30 gallon pressure tank to provide the minimum flow rate and pressure. Building water service chlorination, post installation, is by others and not PRC.
8. Our crane costs, which are included herein, are based on a maximum 35' radius from the center pin of the crane to center point of the furthest building module roof. If additional distance requires a larger crane, additional costs will be assessed by change order to you.
9. Bonds, building permits, a site survey, special inspection fees, minor trash removal, final utility connections to the onsite water, sewer and electrical are by others. Since the building is fully inspected and tested in plant, minor plumbing leaks (if water is not available when building site work installation is completed,) is by others.
10. The Owner shall be responsible for minor site debris removal or a location for placement on site (nominally one pickup truck of shipping materials).
11. Site Traffic Control, if applicable, shall be by owner not PRC.
12. Gate and fence at bottom of stairs.
13. Foundation.
14. Flag and flag pole.
15. Exterior Signage.
16. Storage cabinet (interior)
17. Final gas line connection at utility chase (for water heater)
18. Microwave and refrigerator

**Insurance and Prevailing Wage Certification:**

PRC shall comply with the required insurance requirements, wage reports, and safety requirements for the project, including OSHA regulations.

**Special Insurance to protect the Building before acceptance:**

As PRC requires payment for each month of off-site construction, and since the building is not on owner property where their insurance will cover the building, we provide a special policy that insures the property even when paid for off-site until the building is finally accepted by the owner. The policy provides the owner as additional insured during this period.

PRC provides the Owner a policy rider to cover the building while it is being built off-site, while in transit to the job site, during and after it is installed on-site until final acceptance. This special policy covers each building module (section) for up to \$200,000. This exceeds the cost of any building module we have offered for sale herein.

**Errors and Omissions Insurance:**

Our firm employs licensed architects, engineers, and drafting staff to provide design of our buildings. Since these buildings are required to meet accessibility standards and building codes on site, and since we are the designer, we carry Errors and Omissions Insurance (E & O) to protect our clients from any errors. The policy covers a limit of up to \$2,000,000 per occurrence and is more clearly explained in the insurance certificates we provide after receipt of a purchase order.

**WARRANTY**

PUBLIC RESTROOM COMPANY (Company) herein warrants that all work under this contract will be free from faulty materials and improper workmanship, except from proper and usual wear, and agrees to replace or repair, without cost to the Owner, all work found to be improper or imperfect, upon proper notice to the address stated below. Our Warranty is valid for 5 years from date of acceptance but shall be extended to 20 years for structural failure.

Our extended warranties shall have no effect on any required Performance and Payment Bonds whose Surety shall assume no liability to the Company, the Owner, or any third parties should the Company fail for any reason to deliver acceptable maintenance warranties beyond the one year period. The warranty extension is solely between the owner and PRC and not the owner, bonding company, or architect/engineer of record.



Our warranty is enforceable only if all work performed by Company has been fully paid, including change orders, if applicable. Company has no responsibility for vandalism, neglect, abuse, or improper maintenance of the final completed building.

The warranties expressed herein are exclusive, and are in lieu of all other warranties expressed or implied, including those of merchantability and fitness. There are no warranties which extend beyond those described on the face of this Warranty. The foregoing shall constitute the full liability of the Company and be the sole remedy to the Owner.

**Term of Offer to Sell and Owner's Acceptance:**

This offer is valid for acceptance within 30 days, or when a part of a public bid for the applicable duration imposed within the Owner's bid documents. Acceptance is by approving our post bid preliminary notice to begin drawings subject to final owner approval of our submittals and receipt of a contract or a purchase order/contract.

**Special Notice of Possible Project Cost Increases as a Result of Late Payments:**

In the event of delayed or late payment, PRC shall have the right to remedies including late charges, overall project total cost increases, and other damages as allowed by applicable law. The contract price quoted herein is a discounted price based upon our receipt of progress payments as invoiced on the agreed billing schedule of PRC. In the event of non-payment, PRC will provide a 5 day written notice to cure and if payment is still not received, the discounted price for the payment due may increase, to an undetermined amount, to cover work stoppage, remobilization, cancellation of materials and subsequent restocking charges, resale of the contracted building to another party, storage fees, additional crane fees, travel and per diem costs for field crews, and any other cost applicable to the project, as allowed by law. Interest if applicable to non-payment will be assessed at the maximum amount allowed by law or 18% whichever is greater.

**Venue for Contract Jurisdiction:**

Public Restroom Company requires all contracts accepted by our firm to hold that the venue for legal jurisdiction for this contract offer and acceptance shall be Douglas County, Nevada. In the event of your default, PRC shall be entitled to the full amount due including reasonable attorney fees, costs, storage, expenses of physical recovery, and statutory interest, as allowed by law.

**No modifications to this offer shall be authorized unless confirmed in writing by the President of PRC.**



SUBMITTAL SPECIFICATION SHEET

DESIGN LOADS

Date: 07/11/17	Size: 22'8" x 26'8"	Floor: Mat Slab
Public Restroom Company	Description: Restroom, Storage, Shower	Wind: 90 C
Location: Long Beach, CA	Building	Roof: 20
Project: Bayshore Lifeguard Station	State Seal: California DOH	

**TYPE OF BUILDING**

Walls to 10'8"	Masonry w/siding or tile full height
MVR - Wood	Wood rafter roof structure,

**FLOOR SYSTEM**

Type	Light weight concrete in primed 6x6 steel angle frame
Floor finish	
Entire bidg	Exposed concrete with light broom finish with water resistant coating
Fiberglass grates	Yes Provide grates for slab openings Qty (3)
Foundation Tie-Downs See note	Yes Provide steel angle tie down plates

Note: (Required for buildings that will be placed on concrete footings)

**WALL SYSTEM (structural)**

**Framing**

Exterior	6" CMU	Precision, all rows, gray
Interior	6" CMU	Precision, gray
Interior Framing		2x6 wood plumbing walls
Upper framing		2x4 wood
Cap beam (all walls)		P.T. sill plate on all CMU walls
Louver		16" x 8" wall grille model 905A with model 170 louver/ intake grille with bird screen
Vents (Mech)		Sunvent Industries model #157 EX w/O.B Damper
Sheathing (framed wall attached to CMU)		None
Sheathing (over CMU - ext only)		3/4" PT plywood (required when cement board siding is installed over CMU)

**WALL FINISHES - Exterior**

CMU	Uncoated
Tile	Caesar "More collection" Nylus 4.5" x 24" on storage mod
Siding	Cement Board (lap), painted- select cedarmill pattern, see elevations for location
Belt board	5/4 Cement Board with custom S.S. flashing above
Corners	Cement Board - painted
Door trim	Cement Board - painted
Mod line trim	Cement Board - painted

**WALL FINISHES - Interior**

All rooms except shower	CMU	Block filler & regular paint
	Wood framed	Regular painted sheetrock - light texture
	Base	4" ruber base on framed walls only
Shower	to ceiling	Tile (12"x12" - American Olean "Concrete Chic")
	Base	None
Upper storage	to ceiling	Regular painted sheetrock - light texture

SUBMITTAL SPECIFICATION SHEET

**ROOF SYSTEM**

Style:	Flat with .5/12 pitch
Roofing:	White - Carlisle 60 mil EPDM over 1/2" Securerock
Framing:	2 x 8 wood rafters
Ridge beam:	3-1/2 painted Glulam
Ceiling:	5/8" Sheetrock - light texture
Insulation:	Tapered rigid on top of sheathing
Insulation:	2 layers of R-15 fiberglass
Sheathing: (top)	5/8" OSB
Sheathing: (bottom)	5/8" OSB
Fascia	Edge of roofing
Roof drains:	Scuppers and downspouts
Observation deck	EPDM walk pads

**DOORS & HARDWARE**

	Qty	Size	1 & 2 Type	3 Hinge	4 Lock	5 a Closer	5 b Pull plate	5 c Thresh	5 d Sweep	6 Notes
Break room	1	3'x7'	FG	Cont	ND73PD	no	no	no	no	6a,b
Changing rooms	2	40"x81"	Barn	no	no	no	B3	no	no	
Shower	1	40"x81"	Barn	no	no	no	B3	no	no	
Mechanical	1	3'x7'	PW/SC	Butt	B660	no	B1	no	no	
Restroom	1	3'x7'	PW/SC	Butt	B660	no	B2	no	no	
Storage	1	8'x8'	Sectional garage door - 20 ga - with cylindrical lock							
Windows	1	4'x4'	Milgard Montecito horizontal slider - dual glazed, SunCoat Low-E / clear 3/32 glass							
Windows	2	6'x3'	Milgard Montecito horizontal slider - dual glazed, SunCoat Low-E / clear 3/32 glass							
Windows	1	3'x4'	Milgard Montecito fixed - dual glazed, SunCoat Low-E / clear 3/32 glass							

1. DOOR TYPES:

- a) BARN: QUIET GLIDE QGRTA0040x81PN PANEL WITH QG1300D08 HARDWARE KIT
- b) PW/SC: WOOD JAMB WITH SOLID CORE PAINT GRADE WOOD DOOR
- c) 20 GA SECTIONAL GARAGE DOOR
- d) FG: FIBERGLASS REINFORCED POLYESTER DOORS & FRAMES

2. ALL FG DOOR FRAMES:

WELDED WITH MASONRY ANCHORS.  
6-3/4" WIDE, TYPICAL  
4" MASONRY HEADERS

3. HINGE SPECS

- a) CONT = PEMKO KCFM-83" HD CONTINUOUS GEAR HINGE
- c) BUTT = PART OF DOOR/FRAME PACKAGE

4. LOCKS

- a) DEADBOLT: SCHLAGE B SERIES 626 WITH LARGE FORMAT TEMPORARY CORE
  - 1) B660J - KEY ONE SIDE, ADA TURN LEVER LOCKS AND UNLOCKS
- b) SCHLAGE ND SERIES LEVER LOCKS
  - 1) ND73PD - CORRIDOR LOCK

5. HARDWARE SPECS:

- a) CLOSER: LCN 4211 (add CUSH ARM for out swing doors)
- b) PULL PLATES:
  - 1) PULL PLATE: TRIMCO 1017-3 (EXT ONLY)
  - 2) PULL PLATE: TRIMCO 1017-3 (BOTH SIDES)
  - 3) PULL HANDLE: QUIET GLIDE QG13990308 (BOTH SIDES)
- c) THRESH: PEMKO
- d) SWEEP: PEMKO 321 SSN

6. OTHER:

- a) MAKE PROVISION TO LOCK OPEN
- b) MAKE THIS DOOR A DUTCH DOOR WITH A LEVER LOCK ON THE LOWER LEAF AND A BARREL BOLT ON THE UPPER LEAF ATTACHING IT TO THE LOWER LEAF

SUBMITTAL SPECIFICATION SHEET

**RESTROOM ACCESSORIES**

ITEM	QTY	SIZE	MANUFACTURER / MODEL #	FINISH	NOTES
Grab Bars	1	18"	Pro Plus	S.S.	
Grab Bars	1	42"	Pro Plus	S.S.	
Grab Bars	2	48"	Pro Plus	S.S.	
Signs - ADA Pictogram 12" circle/triangle "Shower"	1	12"	Sign Elements	Aluminum Blue	
Signs - ADA Pictogram 12" circle/triangle "All Gender RR"	1	12"	PRC (H1305)	Aluminum Blue	
Signs - rectangular room ID ADA - "Shower"	1	6"x8"	Sign Elements	Aluminum Blue	
Signs - rectangular room ID ADA - "All Gender RR"	1	6"x9"	PRC (H1315)	Aluminum Blue	
Toilet Paper Holders	1	3-roll	Royce Rolls TP-3	S.S.	
Hand Dryer	1		Dyson Airblade V	Nickel	Surface mount
Mirrors	1	24"x36"	Bobrick B-1556	S.S.	
Shower seat	1		Bobrick B-5192		
Utility Hook	2		Franklin Brass 5501	S.S.	

**OTHER SPECIALTY ITEMS**

Countertops - break room	1		Plastic laminate on S.S. frame		
Canopies - Mapes	2	20' 9" x 4' 12" 2-3/8" x 4'	Galvanized Metal with factory Kynar finish	Galv.	

**MISC**

Sight screens	n/a
Exhaust fans	Broan L100L (2)
Railing	Steel tube - galvanized and painted (42" high)
Stairs	Concrete steps in galvanized pans, railing, and hand rail
Lifting brackets	None
Shrink wrap	Yes

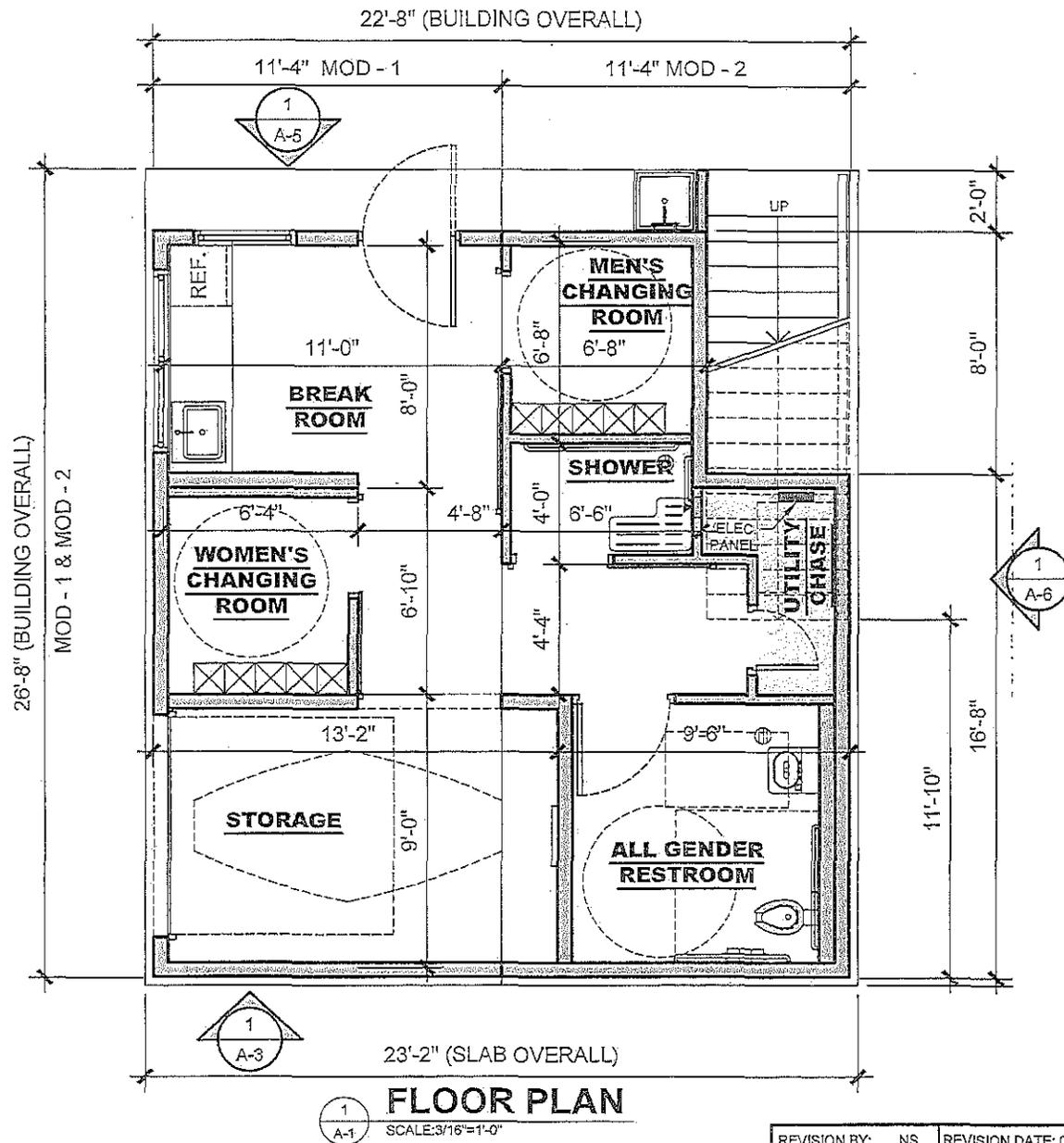
SUBMITTAL SPECIFICATION SHEET

**PLUMBING**

Restrooms			
Fixture type	Vitreous China		
Toilets	Qty: 1	Proflo PF1606PAWH	
Tank		Proflo PF1612PAWH	
Seats	standard	Bemis 1955C (Black)	
Lavs (wall hung)	Qty: 1	Kohler K2007	
Faucets	A/S 7385.004.002 hot & cold		
Floor drains:	Qty: 2	Zurn ZN460-2NH-5B with Proflo PFP-2500 trap primer	
Break room sink	Qty: 1	Elkay PSR22193	
Faucet	Moen 8799		
Mop sink	Qty: 1	Acorn Terrazzo-Ware TSH-24-KF24	
Keyed Faucet	A/S 8344.212.004 (cold only)		
Showers	Qty: 1	Bradley WS-1X-HN (HC)	non coin op
General			
Water heater	Yes	Noritz NCC1991-DV or equal	
Tempering valve	Yes	Watts LFMMV	
Pressure Gauge	Yes	Proflo PFXPG100K	
Check valve	Yes	1-1/2" Proflo PFX31SJ (lead free)	
Expansion tank	Yes	Prep for 26 gallon, install Proflo PFXT5	
Hose bib (interior)	Yes	Woodford 24-PC in mechanical room	
Water	Copper		
Waste	PVC		
Vent cap	Yes	Smith 1748	
Corp stop	Yes	McDonald 73149B 1-1/2"	

SUBMITTAL SPECIFICATION SHEET

ELECTRICAL		
Service	100 amp	120/240 volt single phase
Meter base	no - if required, it should be by others	
Panel	100 amp - main breaker	Square D QO112M100
Breakers	Plug on	Square D QO
	( ) Single pole 20 amp	QO120
Raceway	Metallic (EMT in exposed areas & MC Cable where concealed)	
Receptacles	(5) Dedicated GFCI	Leviton GFNT2-I
Switches	(2) Single pole (1 BYPASS)	Leviton 1221-2I
	(6) Occupancy sensor switch	Wattstopper PW-301
	(1) Timeclock	Intermatic ET8015C
Lights - Exterior	(4) 20 watt LED	Luminiare AEL24-20W-120-4000K-DP-BZH
	Controlled by time clock	
	Controlled by BYPASS SWITCH	
Lights - RR	(1) 4' wet location LED	Cree WS4
	Controlled by occupancy sensor switch	
Lights - Break room	(1) Ceiling fan with light	Hanlon 52" stainless steel ceiling fan with LED
Lights - Hallway	(1) 4' wet location LED	Cree WS4
	Controlled by occupancy sensor switch	
Lights - Mechanical	(1) 4' wet location LED	Cree WS4
	Controlled by single pole switch	
Lights - Shower	(1) 4' wet location LED	Cree WS4
	Controlled by occupancy sensor switch	
Lights - Changing rooms	(2) 4' wet location LED	Cree WS4
	Controlled by occupancy sensor switch	
Lights - Storage	(1) Ceiling fan with light	Hanlon 52" stainless steel ceiling fan with LED
	Controlled by occupancy sensor switch	
Lights - Emergency	(3) Emergency lights	Lithonia ELM2
Wire for	(1) Hand dryer	Dyson Airblade V
Wire for	(2) Exhaust fan controlled with lights	Broan L100L
Ship kit	Ground rod and acorn clamp	



**A-1**

REVISION BY: NS      REVISION DATE: 07/13/2017      REVISION # NS



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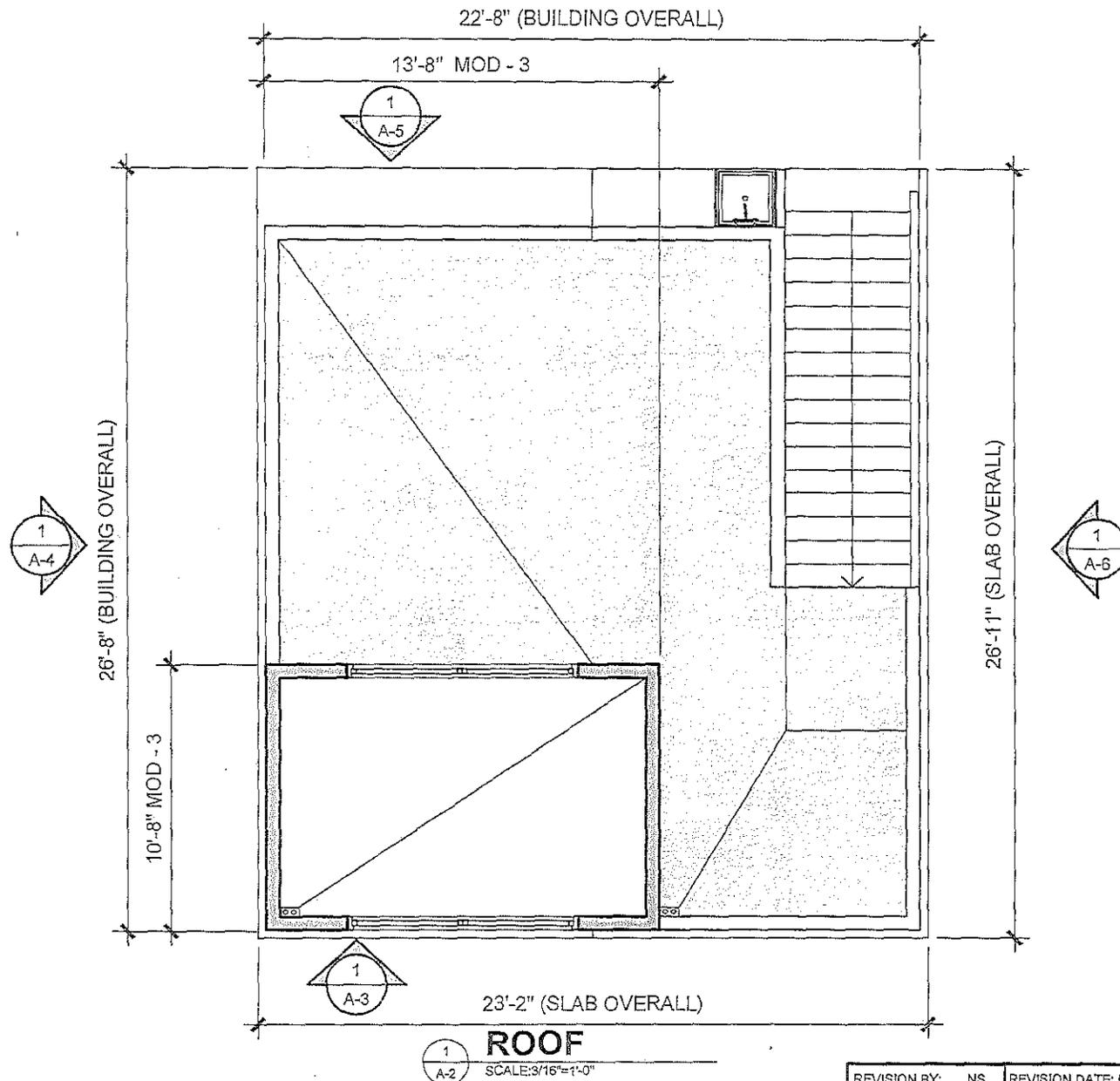
BUILDING TYPE: **LIFEGUARD STATION**

PROJECT: **BAYSHORE LIFEGUARD STATION  
LONG BEACH, CA**

DATE: 03/19/2015      DRAWN BY: NS

PROJECT #: 9587

MAXIMUM PERSON AN HOUR:



**A-2**

REVISION BY: NS REVISION DATE: 07/13/2017 REVISION # NS



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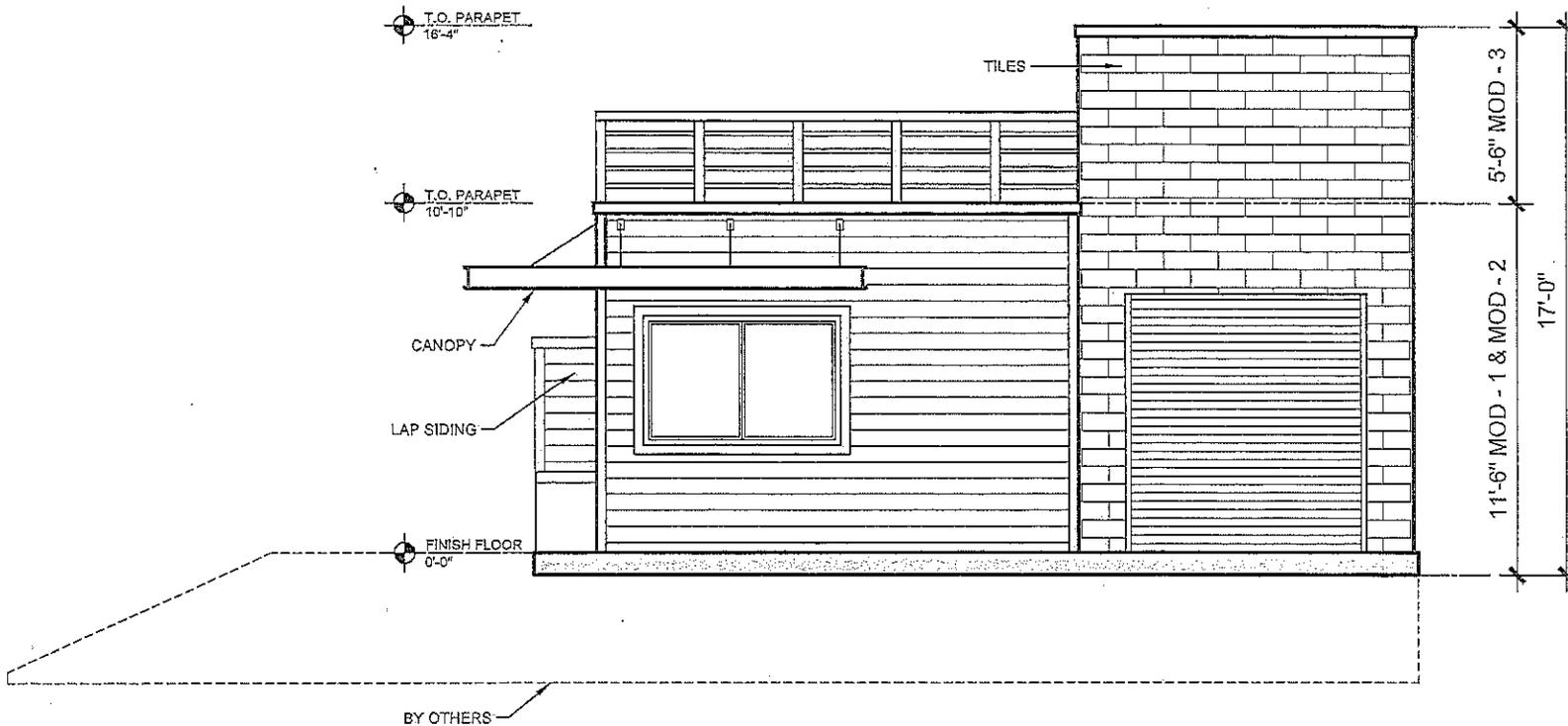
BUILDING TYPE: **LIFEGUARD STATION**

PROJECT: **BAYSHORE LIFEGUARD STATION  
LONG BEACH, CA**

DATE: 03/19/2015 DRAWN BY: NS

PROJECT #: 8597

MAXIMUM PERSON AN HOUR:



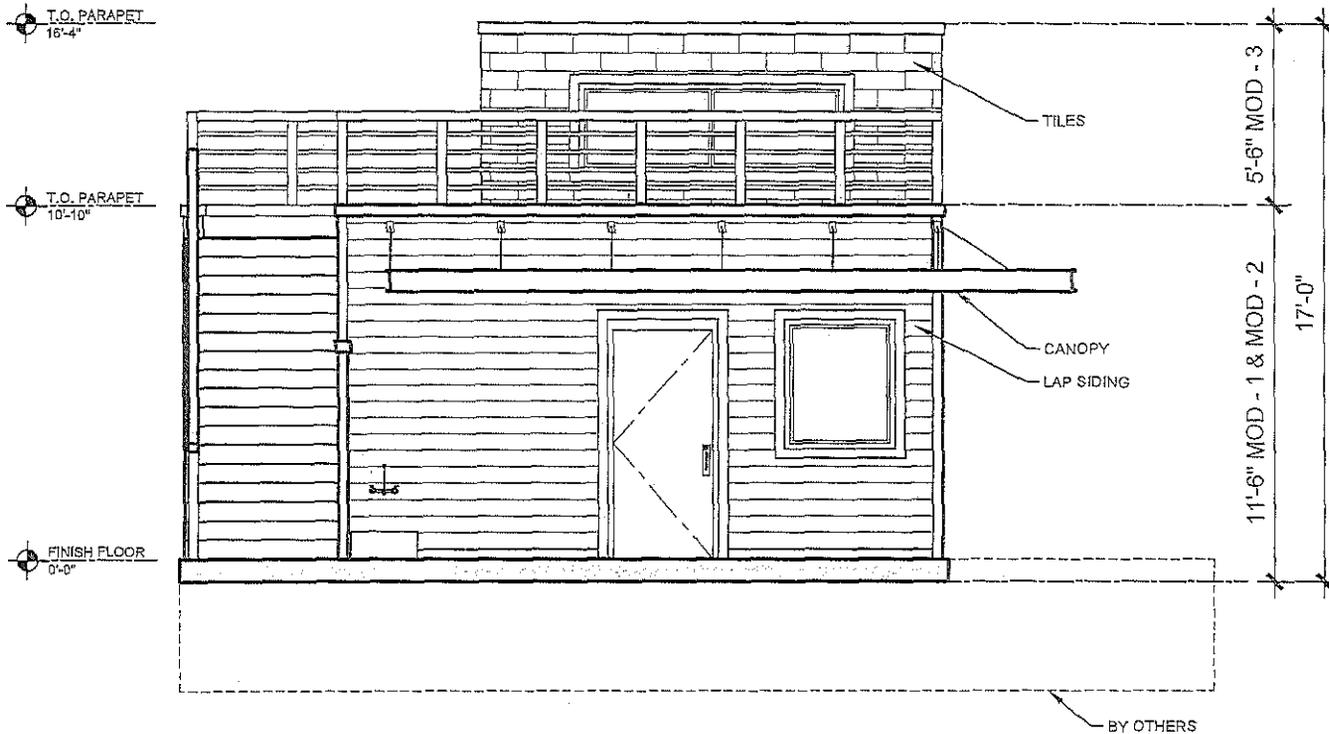
1  
A-3  
**ELEVATION 1**  
SCALE: 3/16"=1'-0"

**A-3**

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		PROJECT:	<b>BAYSHORE LIFEGUARD STATION LONG BEACH, CA</b>	DATE:	03/19/2015	DRAWN BY:	NS			
				PROJECT #:	9597	MAXIMUM PERSON AN HOUR:				

Ph: 888-888-2060 | Fax: 888-888-1449

~NOT FOR CONSTRUCTION ~ PRELIMINARY DESIGN DRAWING ONLY ~ DO NOT SCALE, DIMENSIONS PRESIDE



1  
A-4

## ELEVATION 2

SCALE: 3/16"=1'-0"

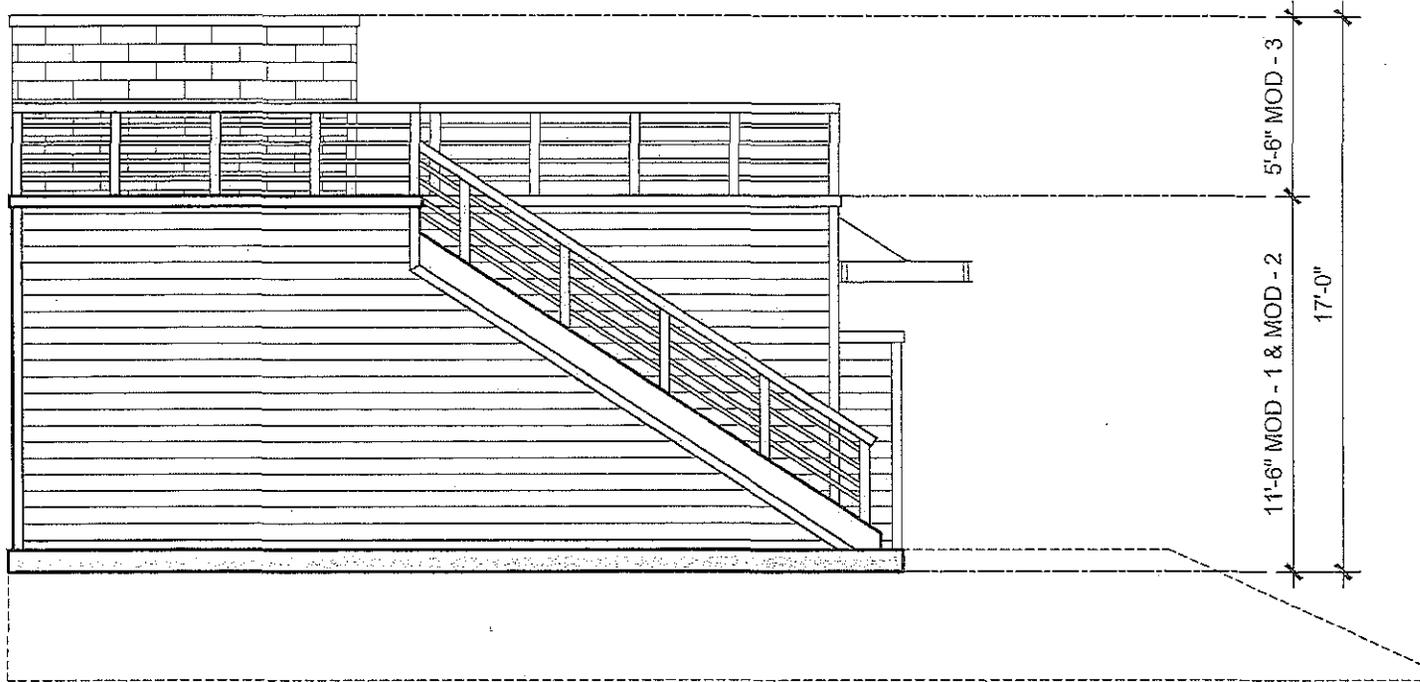
**A-4**

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		PROJECT:	<b>BAYSHORE LIFEGUARD STATION LONG BEACH, CA</b>	DATE:	03/19/2015	DRAWN BY:	NS		
					PROJECT #:	9597	MAXIMUM PERSON AN HOUR:		

T.O. PARAPET  
16'-4"

T.O. PARAPET  
10'-10"

FINISH FLOOR  
0'-0"



BY OTHERS

1  
A-5

### ELEVATION 3

SCALE: 3/16"=1'-0"

# A-5

REVISION BY: NS	REVISION DATE: 07/13/2017	REVISION # NS
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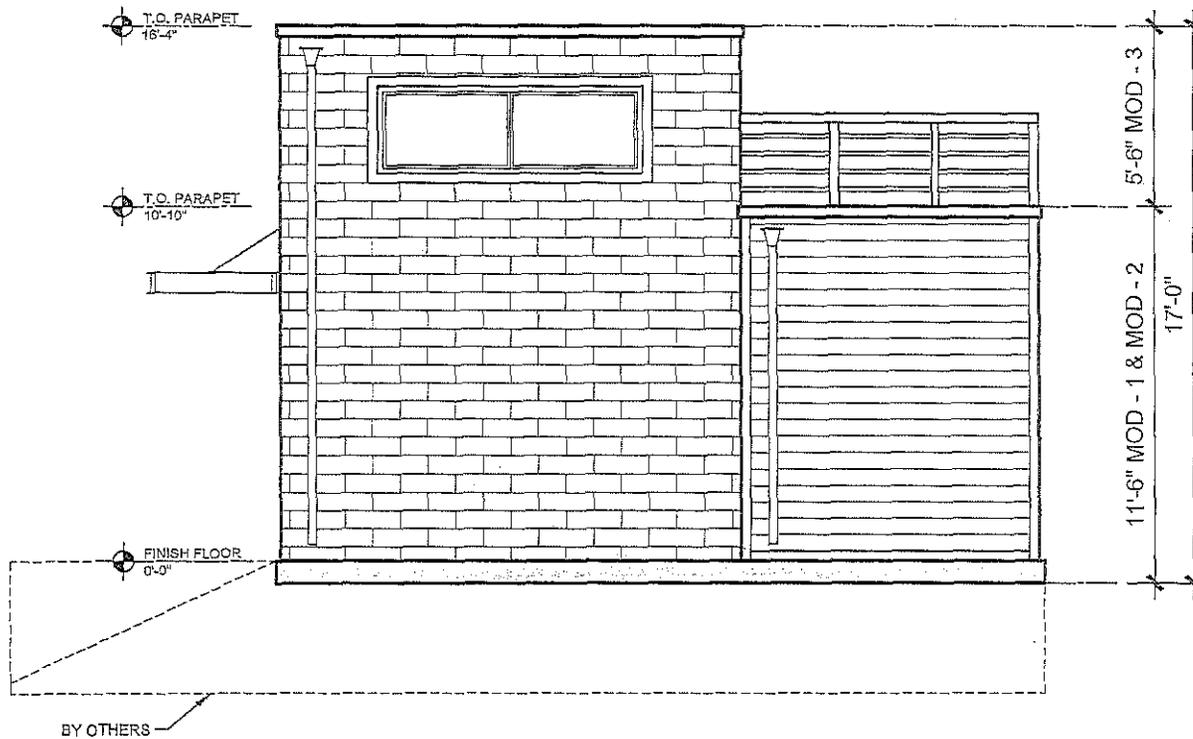
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BUILDING TYPE:	<b>LIFEGUARD STATION</b>
PROJECT:	<b>BAYSHORE LIFEGUARD STATION LONG BEACH, CA</b>

DATE: 03/18/2015	DRAWN BY: NS
PROJECT #: 9597	
MAXIMUM PERSON AN HOUR:	

Ph: 888-888-2060 | Fax: 888-888-1448

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1  
A-6

**ELEVATION 4**

SCALE: 3/16"=1'-0"

**A-6**

REVISION BY: NS REVISION DATE: 07/13/2017 REVISION # NS



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BUILDING TYPE:

**LIFEGUARD STATION**

DATE: 03/19/2015

DRAWN BY:

PROJECT:

**BAYSHORE LIFEGUARD STATION  
LONG BEACH, CA**

PROJECT # 9597

NS

MAXIMUM PERSON AN HOUR:

Ph: 888-888-2060 | Fax: 888-888-1448

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State of California

# Department of Industrial Relations

Law

Cal/OSHA – Safety & Health

Workers' Comp

Self Insurance

Apprenticeship

Director's Office

Public Works Contractor (PWC) Registration Search

## Public Works Contractor (PWC) Registration Search

A listing of current and active PWC registrations pursuant to Division 2, Part 7, Chapter 1 (commencing with section 1720 of the California Labor Code.)

At least one search criteria to display active registered public works contractor(s) matching your selections.

Registration Year:

Registration Number:

Contractor Legal Name:

Contractor License Number:  [Contractor License Lookup](#)

County:

Export as:  Excel

### Results

1 registered contractor found. 1

Contractor Name	Registration Number	County	City	Registration Date	Expiration Date
PUBLIC RESTROOM COMPANY	1000005303	OUT OF STATE	MINDEN	05/16/2017	06/30/2018



State Of California  
CONTRACTORS STATE LICENSE BOARD  
ACTIVE LICENSE



License Number **822966**

Entity **CORP**

Business Name **THE PUBLIC RESTROOM COMPANY**

Class/Class(es) **B**

Expiration Date **08/31/2017**

[www.cslb.ca.gov](http://www.cslb.ca.gov)



STATE OF CALIFORNIA  
Business, Consumer Services and Housing Agency  
Department of Housing and Community Development  
Division of Codes and Standards  
Occupational Licensing Program  
P.O. Box 31  
Sacramento, CA 95812-0031  
Telephone (916) 323-9803



OCCUPATIONAL LICENSE

License Number	License Type	Issue Date	Expiration Date
MF1277003	Manufacturer Commercial Modular	Jun 16, 2017	Aug 31, 2019

VALID ONLY WHEN DISPLAYED AT:

THE PUBLIC RESTROOM COMPANY  
2587 BUSINESS PARKWAY  
MINDEN, NV 89423

THE PUBLIC RESTROOM COMPANY  
2587 BUSINESS PARKWAY  
MINDEN, NV 89423

NOTE: THIS LICENSE SHALL BE POSTED IN A PLACE CONSPICUOUS TO THE PUBLIC.

The license described herein will expire on the date shown. Renewal of the license prior to the expiration date is the RESPONSIBILITY OF THE LICENSEE. Applications for renewal must be received by the Department before the expiration date. Expired licenses may be reinstated provided an application is submitted with renewal and reinstatement fees within 60 days of expiration. Licenses expired over 60 days may not be reinstated.

STATE OF CALIFORNIA  
Business, Consumer Services and Housing Agency  
Department of Housing and Community Development  
Division of Codes and Standards  
Occupational Licensing Program  
P.O. Box 31  
Sacramento, CA 95812-0031  
Telephone (916) 323-9803



**OCCUPATIONAL LICENSE**

License Number	License Type		Issue Date	Expiration Date
DL1109895	Dealer	New, Used	Jan 11, 2017	Jan 31, 2019

**VALID ONLY WHEN DISPLAYED AT:**

THE PUBLIC RESTROOM COMPANY  
2587 BUSINESS PKWY  
MINDEN, NV 89423

THE PUBLIC RESTROOM COMPANY  
3521 GRAND AVE  
OAKLAND, CA 94610

NOTE: THIS LICENSE SHALL BE POSTED IN A PLACE CONSPICUOUS TO THE PUBLIC.

The license described herein will expire on the date shown. Renewal of the license prior to the expiration date is the RESPONSIBILITY OF THE LICENSEE. Applications for renewal must be received by the Department before the expiration date. Expired licenses may be reinstated provided an application is submitted with renewal and reinstatement fees within 60 days of expiration. Licenses expired over 60 days may not be reinstated.



# SMITH-EMERY LABORATORIES

An Independent Commercial Testing Laboratory

781 E. Washington Boulevard - 2nd Floor Los Angeles, California 90021 ♦ (213) 745-5333 ♦ Fax (213) 749-7232

PROJECT No.: 38879-1  
LAB No.: T-13-103

August 02, 2013  
\*Revised and re-issued

CLIENT: CHUCK KAUFMAN  
PUBLIC RESTROOM CO  
\*9390 GATEWAY DRIVE, SUITE 102  
RENO, NV 89521

PROJECT: PUBLIC RESTROOM CO  
CONCRETE TESTING

SUBJECT: Concrete Compression and Absorption Testing      SAMPLE LOCATION: Ritchey Wood No 17878  
STANDARD: ASTM C642 and C39  
SOURCE: Delivered by Client.  
SAMPLE: 4-in by 8-in cylinders  
DATE MADE: 6/20/2013

**Report of Tests:**

**COMPRESSION TEST (ASTM C 39)**

Cylinders were stored in a moisture room then a compressive axial load was applied to molded cylinders until failure occurs

Sample Number	Date of Test	Age	Diameter In	Area, Sq. In.	Max. Load Pounds	Compressive Strength, PSI
1	7/19/2013	29	4.00	12.57	95,820	7,630
2	7/19/2013	29	4.00	12.57	99,760	7,940
3	7/19/2013	29	4.00	12.57	96,900	7,710
Average					97,493	7,760

**WATER ABSORPTION TEST (ASTM C 642)**

Samples were dried in a well ventilated oven for not less than 24 hours at 230 °F to 239 °F then cooled and weighed. The samples were then immersed in distilled water for 48 hours, then boiled for 5 hours and cooled. Samples were removed from water, surface damp dried and immediately reweighed.

Sample Number	Sample Weights (grams)			Absorption, %	Density PCF
	Submerged (D)	SSD (C)	Dry (A)		
4	1618.12	3263.60	3183.92	2.50	120.74
5	1625.50	3273.40	3191.74	2.56	120.86
6	1629.81	3267.86	3186.05	2.57	121.37
Average	1624.48	3268.29	3187.24	2.54	120.99

Respectfully submitted,  
SMITH-EMERY LABORATORIES

G. Janeth Quintero  
Registered Civil Engineer  
Registration Expires: 12-31-14

JQ



- Materials Tested Comply With Specifications.
- Materials Tested Did Not Comply With Specifications.
- No Established Criteria For Acceptable Limits.

PUBLIC RESTROOM CO;SMITH-EMERY LABORATORIES

E:\PHYLAB\2013\38879 PUBLIC RESTROOM CO\job\T-13-103 Compresion and water absorption

ALL REPORTS ARE SUBMITTED AS THE CONFIDENTIAL PROPERTY OF CLIENTS. AUTHORIZATION FOR PUBLICATION OF OUR REPORT, CONCLUSIONS, OR EXTRACTS FROM OR REGARDING THEM IS RESERVED PENDING OUR WRITTEN APPROVAL AS A MUTUAL PROTECTION TO CLIENTS, THE PUBLIC AND OURSELVES.



## WARRANTY

All work performed by PUBLIC RESTROOM COMPANY (called "Company") shall be warranted to the Owner to be of good quality, free of faults and defects in material, workmanship, and title for 5 years from last date of installation if building is installed by Company or 1 year if building is installed by Owner or Owner's agent without on-site supervision by Company. Company warranty on building shell including exterior walls, concrete 8" slab/foundation, and roof system is warranted for 20 years structurally. The Company will repair or replace at their sole option any defects in work upon proper notice to the below stated address below.

This warranty applies only if all work performed by Company has been fully paid for, including change orders if applicable. Company has no responsibility for any neglect, abuse, or improper handling of building product.

**The warranties expressed herein are exclusive, and are in lieu of all other warranties expressed or implied, including those of merchantability and fitness.**

There are no warranties which extend beyond those described on the face of this Warranty. The foregoing shall constitute the full liability of the Company and be the sole remedy to the Owner.

Project Name:

Date of Installation:

Effective Date of Warranty Period for Components:

Effective Date of Warranty Period for Structural:

Warranty Contact: Chuck Kaufman, Public Restroom Company: 888-888-2060 extension 101

Approved: \_\_\_\_\_  
Charles E. Kaufman, President



Building Better Places To Go.<sup>SM</sup>

## COMPANY PROFILE

### OFFICE LOCATION, INFORMATION:

Public Restroom Company  
2587 Business Parkway  
Minden, NV 89423  
Office: 888-888-2060  
Fax: 888-888-1448

**Officers:** Charles E. Kaufman (Ext. 101) President, Secretary, Treasurer

**Public Restroom Company Professional Design Staff:**  
Mark Duran, Chief of Design

**Staff:** 70 employees at this address including in house architectural, engineering, and management staff.

**Main Office Property:** 10.3 acre site with 43,000 square feet of manufacturing and 8,000 square feet of office class A.

**Outsource Locations:** Aumsville, Oregon 30,000 square feet manufacturing.

**Years in Business and Qualified Employee:** Charles Kaufman began the modular restroom industry 49 years ago and has pioneered critical answers that are the foundation of the state of the art buildings with our built in proprietary components and features that maintain our brand. Public Restroom Company began in 2002 to current date.

Email: [chuck@publicrestroomcompany.com](mailto:chuck@publicrestroomcompany.com)

### HISTORY OF FIRM:

Chuck Kaufman, our owner and principal has specialized for over 48 years in the design and off-site construction of public restroom buildings for parks, golf courses, campgrounds and public recreation sites. The experience we have gained in completing \$100's of millions of specialized public restroom projects is unmatched by any other firm, worldwide. The data base of products, sub assemblies, and finishes that truly work in unsupervised parks is valuable in reducing owner vandalism, maintenance costs, and improving public safety. Our client base is architects, landscape architects, and government agencies, nationwide.

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**WEBSITE ADDRESS:**

[www.publicrestroomcompany.com](http://www.publicrestroomcompany.com)

**DETAILS OF ENTITY BUSINESS STRUCTURE:**

Nevada "S" Corporation  
California Foreign Corporation  
California Sales Tax #100154141

**APPLICABLE BIDDER'S NAMES, LICENSES AND CERTIFICATIONS:**

State of California Department of Industrial Relations Registration#1000005303  
Expiration date: June 30, 2018

State of California Contractors State License Board #822966 B  
Expiration date: August 31, 2017

State of California Manufacturer Commercial Modular License #MF1277003  
Expiration date: August 31, 2019

State of California Dealer Occupational License #DL1109895  
Expiration date: January 31, 2019

Bid Results for Prefabricated Lifeguard Station (ITB PW 17-096)						
Issued on 06/07/2017						
Bid Due on July 13, 2017 11:00 AM (Pacific)						
Exported on 07/17/2017						
Line Totals (Unit Price * Quantity)						
					<b>The Public Restroom Company</b>	
					Vendor 1 (Sole Bidder)	
Item	Section	Description	UOM	Qty	Unit Price	Extended Price
1	Prefabricated Restroom Building #1: 5415 E Ocean Blvd	Prefabricated Restroom Building	EA	1	\$400,360.00	\$400,360.00
2	Prefabricated Restroom Building #1: 5415 E Ocean Blvd	Provide full and complete engineered plans for the building and the foundation plans for City permit approval.	EA	5	\$4,300.00	\$21,500.00
3	Prefabricated Restroom Building #1: 5415 E Ocean Blvd	Delivery (no tax on delivery)	EA	1	\$15,750.00	\$15,750.00
4	Prefabricated Restroom Building #1: 5415 E Ocean Blvd	Sales Tax (9.75%)	EA	1	\$41,131.35	\$41,131.35
					<b>Subtotal</b>	<b>\$448,149.00</b>
5	Prefabricated Restroom Building (Optional) #2: 5437 E Ocean Blvd	Prefabricated Restroom Building	EA	1	\$400,360.00	\$400,360.00
6	Prefabricated Restroom Building (Optional) #2: 5437 E Ocean Blvd	Provide full and complete engineered plans for the building and the foundation plans for City permit approval.	EA	5	\$4,300.00	\$21,500.00
7	Prefabricated Restroom Building (Optional) #2: 5437 E Ocean Blvd	Delivery (no tax on delivery)	EA	1	\$15,750.00	\$15,750.00
8	Prefabricated Restroom Building (Optional) #2: 5437 E Ocean Blvd	Sales Tax (9.75%)	EA	1	\$41,131.35	\$41,131.35
					<b>Subtotal</b>	<b>\$478,741.35</b>
					<b>Total</b>	<b>\$926,890.35</b>