CITY OF VINELAND

VINELAND, NEW JERSEY

SPECIFICATIONS

FOR

VINELAND MUNICIPAL WATER UTILITY
CLEARWELL'S 2 & 3 IMPROVEMENTS

COV BID # 2025-22

BID OPENING: TUESDAY, AUGUST 12, 2025
PREVAILING TIME: 2:00 P.M.

DEPARTMENT OF FINANCE
DIVISION OF PURCHASING
640 E WOOD STREET
P.O. BOX 1508
VINELAND, NJ 08362-1508

Jeanine N. Meneghetti, QPA
Purchasing Agent
(856) 794-4040 Phone
(856) 405-4605 Facsimile
jmeneghetti@vinelandcity.org

CITY OF
VINELAND
WHERE IT'S ALWAYS GROWING SEASON

640 E. WOOD STREET
P.O. BOX 1508
VINELAND, NJ 08362-1508

DEPARTMENT OF FINANCE
DIVISION OF PURCHASING
JEANINE N. MENEGHETTI, QPA
PURCHASING AGENT

PHONE: (856) 794-4040
FAX: (856) 405-4605

NOTICE TO BIDDERS

Sealed bids will be received by the Purchasing Agent of the City of Vineland on Tuesday, August 12, 2025 at 2:00 p.m. prevailing time in the Purchasing Department, 5th Fl., City Hall, 640 E. Wood Street, Vineland, New Jersey 08360, at which time and place bids will be opened and read in public for the furnishing of:

COV BID 2025-22 VINELAND MUNICIPAL WATER UTILITY
CLEARWELL'S 2 & 3 IMPROVEMENTS

Bid must be submitted in **duplicate** and shall be enclosed in an opaque sealed envelope, addressed to "Division of Purchasing, c/o City Clerk, City of Vineland, 640 E. Wood Street, PO Box 1508, Vineland, NJ 08362-1508"

Bidders shall comply with the requirements of N.J.S.A. 10:5-31 and N.J.A.C. 17-27 et seq.

You must submit paper documents as your bid package. We cannot accept electronic copies. The documents to be submitted start with the Check List. (**PLEASE DO NOT SUBMIT THE SPECIFICATIONS WITH YOUR BID PACKAGE.**) **Original signatures must be on one document**. (Please use **blue** ink for the signatures.) The duplicate can be a photocopy.

If you have any questions, please contact the Purchasing Agent at the above number or email PurchasingOffice@vinelandcity.org

DO NOT STAPLE DOCUMENTS
NO DOUBLE SIDED COPIES

CITY OF VINELAND
GENERAL INSTRUCTIONS
(CONSTRUCTION)

I. SUBMISSION OF BIDS

A. Sealed bids shall be received in accordance with public advertisement as required by law, with a copy of said notice being attached hereto and made a part of these specifications.

B. Each bid shall be submitted on the proposal form attached and shall be submitted in a clearly marked sealed envelope addressed to:

If delivered:	If mailed:
DIVISION OF PURCHASING **640 E. WOOD STREET** **5TH FLOOR** **VINELAND NJ 08360**	**DIVISION OF PURCHASING** **640 E. WOOD STREET 5TH FL** **PO BOX 1508** **VINELAND NJ 08362-1508**

* Do not use PO Box on Overnight Delivery Services, i.e. (Fed-Ex)

Bidder's name, address, bid category, and due date must appear on the outside of the BID ENVELOPE containing the bid.

C. Sealed bids will be received by the Purchasing Agent or designated representative, at the time and location as stated in the Notice to Bidders, and at such time and place will be publicly opened and read aloud.

D. It is the bidder's responsibility to see that bids are presented to the Purchasing Agent on the hour **and at the place designated. Bids may be hand delivered or mailed; however, the City disclaims any** responsibility for bids forwarded by regular or express mail. If the bid is sent by express mail service, the designation in sub-section B, above, must also appear on the outside of the express mail envelope. Bids received after the designated time and date will be returned unopened. The City of Vineland shall not be responsible for late postal or overnight delivery, nor shall postmark dates or overnight dates be considered in honoring of bids. The City of Vineland shall not be responsible for bidder's hand delivering bids who arrive late or to the wrong location.

E. Sealed bids forwarded to the City before the time of opening of bids may be withdrawn upon written application of the bidder who shall be required to produce evidence showing that the individual is or represents the principal or principals involved in the bid. Once bids have been opened, they shall remain firm for a period of sixty (60) calendar days.

F. All prices and amounts must be written in ink or preferably machine-printed. Bids containing any conditions, omissions, unexplained erasures or alterations, items not called for in the bid proposal form, attachment of additive information not required by the specifications, or irregularities of any kind, may be rejected by the City. Any changes, whiteouts, strikeouts, etc. in the bid must be initialed in ink by the person signing the bid.

G. Bids will be received only on the bidding forms attached to this specification or a true copy thereof with all notations to be done in ink or typed and signatures must be done in ink. **ONLY ORIGINAL SIGNATURES ON ALL DOCUMENTS WILL BE ACCEPTED. RUBBER STAMPS, COMPUTER GENERATED SIGNATURES, COPIER GENERATED SIGNATURES, OR ANY OTHER ARTIFICIAL SIGNATURES SHALL NOT BE ACCEPTABLE AND SHALL BE REASON FOR REJECTION.** City of Vineland will not be held responsible for any erroneous pages or pages missing from this bid document if it is obtained from a source other than the Purchasing Department of the City of Vineland. City of Vineland will not be held responsible if bidders (vendors) fail to receive any updates or addenda to the specification, if they haven't contacted the Purchasing Department.

H. Each bid proposal form must give the full business address, business phone, fax, the contact person of the bidder, and be signed by an authorized representative as follows:

- Bids by partnerships must furnish the full name of all partners and must be signed in the partnership name by one of the members of the partnership or by an authorized representative, followed by the signature and designation of the person signing.
- Bids by corporations must be signed in the legal name of the corporation, followed by the name of the State in which incorporated and must contain the signature and designation of the president, secretary or other person authorized to bind the corporation in the matter.
- Bids by sole-proprietorship shall be signed by the proprietor.
- When requested, satisfactory evidence of the authority of the officer signing shall be furnished.

I. Bidder should be aware of the following statutes that represent "Truth in Contracting" laws:

- N.J.S.A. 2C:21-34, et seq. governs false claims and representations by bidders. It is a serious crime for the bidder to knowingly submit a false claim and/or knowingly make material misrepresentation.
- N.J.S.A. 2C:27-10 provides that a person commits a crime if said person offers a benefit to a public servant for an official act performed or to be performed by a public servant, which is a violation of official duty.
- N.J.S.A. 2C:27-11 provides that a bidder commits a crime if said person, directly or indirectly, confers or agrees to confer any benefit not allowed by law to a public servant.
- Bidder should consult the statutes or legal counsel for further information.

J. Potential bidders are hereby cautioned that they are bidding at their own risk and that the specifications/bid packages may or may not be complete if the specifications/bid packages were provided by a third party supplier.

The City shall not be responsible for third party supplied specifications/bid packages.

K. The City reserves the right to reject individual and/or all bids in accordance with law.

L. Any prospective bidder who wishes to challenge a bid specification shall file such challenge in writing with the Purchasing Agent no less than three (3) business days prior to the opening of the bids. Challenges filed after that time shall be considered void and having no impact on the contracting unit or the award of a contract; N.J.S.A. 40A: 11-13 (e).

M. Contracts shall be awarded to the lowest responsive and responsible bidder. City Council reserves the right to reject any and all bids and to waive minor discrepancies therein. City Council also reserves the right to split bids, award individual items, or to award groups of items and categories of items.

N. Questions concerning this bid shall be directed in writing to the Division of Purchasing, Attention: Jeanine N. Meneghetti, Purchasing Agent, either by facsimile at (856) 405-4605 or by email at PurchasingOffice@vinelandcity.org Last day for questions is noon Tuesday, July 22, 2025.

II. BID SECURITY AND BONDING REQUIREMENTS

The following provisions if indicated by an (X), shall be applicable to this bid and be made a part of the bid documents:

[X] A. BID GUARANTEE

Bidder shall submit with the bid a certified check, cashier's check or a bid bond in the amount of ten percent (10%) of the total price bid, but not in excess of $20,000, payable unconditionally to the City.

When submitting a Bid Bond, it shall contain Power of Attorney for full amount of Bid Bond from a surety company authorized to do business in the State of New Jersey and acceptable to the City.

The check or bond of the unsuccessful bidder(s) shall be returned pursuant to N.J.S.A. 40A:11-24a. The check or bond of the bidder to whom the contract is awarded shall be retained until a contract is executed and the required performance bond or other security is submitted.

The check or bond of the successful bidder shall be forfeited if the bidder fails to enter into a contract pursuant to N.J.S.A. 40A:11-21.

Failure to submit a bid guarantee shall result in rejection of the bid.

[X] B. CONSENT OF SURETY

Bidder shall submit with the bid a Certificate (Consent of Surety) with Power of Attorney for full amount of bid price from a Surety Company authorized to do business in the State of New Jersey and acceptable to the City stating that it will provide said bidder with a Performance Bond in the full amount of the bid. This certificate shall be obtained in order to confirm that the bidder to whom the contract is awarded will furnish Performance and Payment Bonds from an acceptable surety company on behalf of said bidder, any or all subcontractors or by each respective subcontractor or by any combination thereof which results in performance security equal to the total amount of the contract, pursuant to N.J.S.A. 40A:11-22.

Failure to submit a consent of surety shall result in rejection of the bid.

[X] C. PERFORMANCE BOND

Successful bidder shall simultaneously with the delivery of the executed contract, submit an executed bond in the amount of one hundred percent (100%) of the acceptable bid as security for the faithful performance of this contract.

The performance bond provided shall not be released until final acceptance of the whole work and then only if any liens or claims have been satisfied. The surety on such bond or bonds shall be a duly authorized surety company authorized to do business in the State of New Jersey pursuant to N.J.S.A. 17:31-5.

Failure to submit this with the executed contract shall be cause for declaring the contract null and void pursuant to N.J.S.A. 40A:11-22.

[ ] D. LABOR AND MATERIAL (PAYMENT) BOND

Bidder shall with the delivery of the performance bond submit an executed payment bond to guarantee payment to laborers and suppliers for the labor and material used in the work performed under the contract.

Failure to submit a labor and material bond with the performance bond shall be cause for declaring the contract null and void.

[X] E. MAINTENANCE BOND

Upon acceptance of the work by the City, the contractor shall submit a maintenance bond (N.J.S.A. 40A:11-16.3) in an amount not to exceed **100%** of the project costs guaranteeing against defective quality of work or materials for the period of:

_____ 1 year
___X__ 2 years

III. INTERPRETATION AND ADDENDA

A. The bidder understands and agrees that its bid is submitted on the basis of the specifications prepared by the City. The bidder accepts the obligation to become familiar with these specifications.

B. Bidders are expected to examine the specifications and related bid documents with care and observe all their requirements. Ambiguities, errors or omissions noted by bidders should be promptly reported in writing to the Purchasing Agent. Any prospective bidder who wishes to challenge a bid specification shall file such challenges in writing with the contracting agent no less than three business days prior to the opening of the bids. Challenges filed after that time shall be considered void and having no impact on the contracting unit or the award of a contract pursuant to N.J.S.A. 40A:11-13. In the event the bidder fails to notify the City of such ambiguities, errors or omissions, the bidder shall be bound by the requirements of the specifications and the bidder's submitted bid.

C. No oral interpretation and or clarification of the meaning of the specifications for any goods and services will be made to any bidder. Such request shall be in writing, addressed to the Purchasing Agent. In order to be given consideration, a written request must be received at least ten (10) business days prior to the date fixed for the opening of the bid for goods and services.

All interpretations, clarifications and any supplemental instructions will be in the form of written addenda to the specifications, and will be distributed to all prospective bidders. All addenda so issued shall become part of the specification and bid documents, and shall be acknowledged by the bidder in the bid. The City's interpretations or corrections thereof shall be final.

When issuing addenda, the City shall provide required notice prior to the official receipt of bids to any person who has submitted a bid or who has received a bid package pursuant to N.J.S.A. 40A:11-23c.1.

D. Discrepancies in Bids

1. Ditto marks are not considered writing or printing and shall not be used.

2. In the event that there is a discrepancy between the unit prices and the extended totals, the unit prices shall prevail. In the event there is an error of the summation of the extended totals, the computation by the City of the extended totals shall govern.

E. Pre-Bid Conference

If stated in the Notice to Bidders:

[X] A Pre-Bid Conference is not required for this bid.

[ ] A non-mandatory pre-bid conference for this proposal will be held on_____, 10:00 am at_____. Attendance is not mandatory, but is strongly recommended. Failure to attend does not relieve the bidder of any obligations or requirements. A site visit will immediately follow the pre-bid.

IV. BRAND NAMES, STANDARDS OF QUALITY AND PERFORMANCE

A. Brand names and/or descriptions used in these specifications are to acquaint bidders with the types of goods and services desired and will be used as a standard by which goods and services offered as equivalent will be evaluated.

B. Variations between the goods and services described and the goods and services offered are to be fully identified and described by the bidder on a separate sheet and submitted with the bid proposal form. Vendor literature WILL NOT suffice in explaining exceptions to these specifications. In the absence of any exceptions by the bidder, it will be presumed and required that the goods and services as described in the bid specification be provided or performed.

C. It is the responsibility of the bidder to document and/or demonstrate the equivalency of the goods and services offered. The City reserves the right to evaluate the equivalency of the goods and services.

D. In submitting its bid, the bidder certifies that the goods and services to be furnished will not infringe upon any valid patent or trademark and that the successful bidder shall, at its own expense, defend any and all actions or suits charging such infringement, and will save the City harmless from any damages resulting from such infringement.

E. Only manufactured and farm products of the United States, wherever available, shall be used pursuant to N.J.S.A. 40A:11-18.

F. The contractor shall guarantee any or all goods and services supplied under these specifications. Defective or inferior goods shall be replaced at the expense of the contractor. The contractor will be responsible for return freight or restocking charges.

V. INSURANCE AND INDEMNIFICATION

The insurance documents as listed below shall include but are not limited to the following coverage's. (where insurance requirements are listed under other sections of these specifications, the higher limits will prevail.)

A. INSURANCE REQUIREMENTS

1. Worker's Compensation Insurance

Workers Compensation insurance shall be maintained in full force during the life of the contract, covering all employees engaged in performance of the contract pursuant to N.J.S.A. 34:15-12(a) and N.J.A.C. 12:235-1.6. Statutory Limit for Workers' Compensation and $500,000 for Employer's Liability.

2. General Liability Insurance

General liability insurance shall be provided with limits of not less than $1,000,000 any one person/any one accident for bodily injury and property damage and $3,000,000 aggregate, and shall be maintained in full force during the life of the contract.

3. Automobile Liability Insurance

Automobile liability insurance covering contractor for claims arising from owned, hired and non-owned vehicles with limits of not less than $1,000,000 any one person / any one accident for bodily injury and property damage, and shall be maintained in full force during the life of the contract.

4. Other Forms of Insurance Required

B. CERTIFICATES OF THE REQUIRED INSURANCE

Certificates of Insurance for those policies required above shall be submitted with the contract. Such coverage shall be with an insurance company authorized to do business in the State of New Jersey and shall name the City of Vineland as an additional insured.

Self-insured contractors shall submit an affidavit attesting to their self-insured coverage and shall name the City of Vineland as an additional insured.

C. INDEMNIFICATION

Bidder shall indemnify and hold harmless the City of Vineland from all claims, suits or actions, and damages or costs of every name and description to which the City of Vineland may be subjected or put by reason of injury to the person or property of another, or the property of the City of Vineland resulting from negligent acts or omissions on the part of the contractor, the contractor's agents, servants or subcontractors in the delivery of goods and services, or in the performance of the work under the contract.

VI. PRICING INFORMATION FOR PREPARATION OF BIDS

A. The City of Vineland is exempt from any local, state or federal sales, use or excise tax.

B. Estimated Quantities (Open-End Contracts): The City has attempted to identify the item(s) and the estimated amounts of each item bid to cover its requirements; however, past experience shows that the amount ordered may be different than that submitted for bidding. The right is reserved to decrease or increase the quantities specified in the specifications pursuant to N.J.A.C. 5:30-11.2 and 11.10. NO MINIMUM PURCHASE IS IMPLIED OR GUARANTEED.

C. Contractor shall be responsible for obtaining any applicable permits or licenses from any government entity that has jurisdiction to require the same. All bids submitted shall have included this cost.

D. Bidders shall insert prices for furnishing goods and services required by these specifications. Prices shall be net, including any charges for packing, crating, containers, etc. All transportation charges shall be fully prepaid by the contractor, F.O.B. destination and placement at locations specified by the City. As specified, placement may require inside deliveries. No additional charges will be allowed for any transportation costs resulting from partial shipments made for the contractor's convenience.

VII. STATUTORY AND OTHER REQUIREMENTS

The following are mandatory requirements of this bid and contract.

A. MANDATORY AFFIRMATIVE ACTION CERTIFICATION

No firm may be issued a contract unless it complies with the affirmative action provisions of N.J.S.A. 10:5-31 et seq. and N.J.A.C. 17:27-1 et seq. The following information summarizes the full, required regulatory text, which is included as Exhibit A of this bid specification.

1. Goods and Services (including professional services) Contracts

Each contractor shall submit to the public agency, after notification of award but prior to execution of a goods and services contract, one of the following three documents:

i. A photocopy of a valid letter that the contractor is operating under an existing Federally approved or sanctioned affirmative action program (good for one year from the date of the letter); or

ii. A photocopy of a Certificate of Employee Information Report approval, issued in accordance with N.J.A.C. 17:27-4; or

iii. A photocopy of an Employee Information Report (Form AA 302) provided by the Division and distributed to the public agency to be completed by the contractor in accordance with N.J.A.C. 17:27-4.

2. Maintenance/Construction Contracts

After notification of award, but prior to signing the contract, the contractor shall submit to the public agency compliance officer and the Division of Contract Compliance and Equal Employment Opportunity in Public Contracts (Division) an initial project workforce report (Form AA201) provided to the public agency by the Division for distribution to and completion by the contractor, in accordance with N.J.A.C. 17:27-7.

The contractor shall also submit a copy of the Monthly Project Workforce Report once a month thereafter for the duration of the contract to the Division and to the public agency compliance officer. The contractor shall also cooperate with the public agency in the payment of budgeted funds, as is necessary, for on-the job and/or off-the-job programs for outreach and training of minorities and women.

B. AMERICANS WITH DISABILITIES ACT OF 1990

Discrimination on the basis of disability in contracting for the purchase of goods and services is prohibited. Bidders are required to read Americans with Disabilities language that is included as Appendix A of this specification and agree that the provisions of Title II of the Act are made a part of the contract. The contractor is obligated to comply with the Act and to hold the City harmless.

C. STOCKHOLDER DISCLOSURE

N.J.S.A. 52:25-24.2 provides that no corporation, partnership, limited partnership, limited liability corporation, limited liability partnership, Subchapter S corporation or sole proprietorship, shall be awarded any contract for the performance of any work or the furnishing of any goods and services, unless, prior to the receipt of the bid or accompanying the bid of said corporation, partnership, limited partnership, limited liability corporation, limited liability partnership, Subchapter S corporation or sole proprietorship, bidders shall submit a statement setting forth the names and addresses of all stockholders in the corporation or partnership who own (10%) ten percent or more of its stock of any class, or of all individual partners in the partnership who own a ten percent or greater interest therein. The included Statement of ownership shall be completed and attached to the bid proposal. This requirement applies to all forms of corporations and partnerships, including, but not limited to, limited partnerships, limited liability corporations, limited liability partnerships and Subchapter S corporations. Failure to submit a stockholder disclosure document shall result in rejection of the bid.

D. PROOF OF BUSINESS REGISTRATION

N.J.S.A. 52:32-44 requires that each bidder (contractor) submit proof of business registration. Certificate must be submitted prior to award of the contract and the bidder had to have obtained the BRC prior to receipt of bids. A BRC is obtained from the New Jersey Division of Revenue. Information on obtaining a BRC is available on the internet at www.nj.gov/njbgs or by phone at (609) 292-1730. N.J.S.A. 52:32-44 imposes the following requirements on contractors and all subcontractors that **knowingly** provide goods or perform services for a contractor fulfilling this contract:

1) The contractor shall provide written notice to its subcontractors and suppliers to submit proof of business registration to the contractor;
2) Prior to receipt of final payment from a contracting agency, a contractor must submit to the contacting agency an accurate list of all subcontractors or attest that none was used;
3) During the term of this contract, the contractor and its affiliates shall collect and remit, and shall notify all subcontractors and their affiliates that they must collect and remit to the Director, New

Jersey Division of Taxation, the use tax due pursuant to the Sales and Use Tax Act, (N.J.S.A. 54:32B-1 et seq.) on all sales of tangible personal property delivered into this State.

A contractor, subcontractor or supplier who fails to provide proof of business registration or provides false business registration information shall be liable to a penalty of $25 for each day of violation, not to exceed $50,000 for each business registration not properly provided or maintained under a contract with a contracting agency. Information on the law and its requirements is available by calling (609) 292-1730.

If boxes of the following items are checked, they are mandatory requirements of the bid proposal and contract.

☐ E. NEW JERSEY WORKER AND COMMUNITY RIGHT TO KNOW ACT

The manufacturer or supplier of chemical substances or mixtures shall label them in accordance with the N.J. Worker and Community Right to Know Law (N.J.S.A. 34:5A-1 et seq., and N.J.A.C 8:59-2 et seq.,). Containers that the law and rules require to be labeled shall show the Chemical Abstracts Service number of all the components and the chemical name. Further, all applicable Material Safety Data Sheets (MSDS) - hazardous substance fact sheet - must be furnished.

☒ F. PREVAILING WAGE ACT

Pursuant to N.J.S.A. 34:11-56.25 et seq., contractors on projects for public work shall adhere to all requirements of the New Jersey Prevailing Wage Act. The contractor shall be required to submit a certified payroll record to the City within ten (10) days of the payment of the wages. The contractor is also responsible for obtaining and submitting all subcontractors' certified payroll records within the aforementioned time period. The contractor shall submit said certified payrolls in the form set forth in N.J.A.C. 12:60-6.1(c). It is the contractor's responsibility to obtain any additional copies of the certified payroll form to be submitted by contacting the New Jersey Department of Labor and Workforce Development, Division of Workplace Standards. Bidders are cautioned to take into consideration statutory legal requirements, particularly, the payment of prevailing wages. It is Bidder's sole responsibility for determining the correct labor classification(s) and paying the correct and proper wage and benefits and it is imperative that the Contractor familiarize itself with the current wage and benefit rates before submitting bids based on these specifications. **NOTE: Additional information and current wage rates are available at:** http://lwd.state.nj.us/labor/wagehour/wagehour_index.html.

G. THE PUBLIC WORKS CONTRACTOR REGISTRATION ACT

☒

N.J.S.A. 34:11-56.48 et seq. requires that a general or prime contractor and any listed subcontractors named in the contractor's bid proposal shall possess a certificate *at the time the bid proposal is submitted.* After bid proposals are received and prior to award of contract, the successful contractor shall submit a copy of the contractor's certification along with those of all listed subcontractors. All non-listed subcontractors and lower tier sub-subcontractors shall be registered prior to starting work on the project. It is the general contractor's responsibility that all non-listed sub-contractors at any tier have their certificate prior to starting work on the job.

Under the law a "contractor" is "a person, partnership, association, joint stock company, trust, corporation or other legal business entity or successor thereof who enters into a contract" which is subject to the provisions of the New Jersey Prevailing Wage Act [N.J.S.A. 34:11-56.25, et seq.] It applies to contractors based in New Jersey or in another state.

The law defines "public works projects" as contracts for "public work" as defined in the Prevailing Wage statute [N.J.S.A. 34:11-56.26(5)]. The term means:

- "Construction, reconstruction, demolition, alteration, or repair work, or maintenance work, including painting and decorating, done under contract and paid for in whole or in part out of the funds of a public body, except work performed under a rehabilitation program.

- "Public work" shall also mean construction, reconstruction, demolition, alteration, or repair work, done on any property or premises, whether or not the work is paid for from public funds..."
- "Maintenance work" means the repair of existing facilities when the size, type or extent of such facilities is not thereby changed or increased. While "maintenance" includes painting and decorating and is covered under the law, it does not include work such as routine landscape maintenance or janitorial services.

To register, a contractor must provide the State Department of Labor with a full and accurately completed application form. The form is available online at **http://lwd.state.nj.us/labor/wagehour/regperm/pw_cont_reg.html**

N.J.S.A. 34:11-56.55 specifically prohibits accepting applications for registration as a substitute for a certificate of registration.

☐ H. NON-COLLUSION AFFIDAVIT **(Not Applicable)**

The Affidavit shall be properly executed and submitted with the bid proposal.

I. PAY TO PLAY

Starting in January, 2007, business entities are advised of their responsibility to file an annual disclosure statement of political contributions with the New Jersey Election Law Enforcement Commission (ELEC) pursuant to N.J.S.A. 19:44A-20.27 if they receive contracts in excess of $50,000 from public entities in a calendar year.

Business entities are responsible for determining if filing is necessary. Additional information on this requirement is available from ELEC at 888-313-3532 or at www.elec.state.nj.us.

J. NJ ONE CALL

By presenting a bid, contractor declares that he is aware of and, if required, will comply with the requirements of the "Underground Facility Protection Act (Public Law 1994, Chapter 118)" prior to commencing any intended excavation. The telephone number to call is 1-800-272-1000. The successful bidder will be required to show compliance with the requirement by submitting to the appropriate project coordinator the confirmation number obtained from ONE-CALL before any excavation is undertaken.

VIII. METHOD OF CONTRACT AWARD

A. The length of the contract shall be stated in the technical specifications. Pursuant to requirements of N.J.A.C. 5:30-5.1 et seq., any contract resulting from this bid shall be subject to the availability and appropriation of sufficient funds annually. Please see Section X, Termination of Contract, Sub-section E, for additional information.

B. If the award is to be made on the basis of a base bid only, it shall be made to that responsible bidder submitting the lowest base bid.

C. If the award is to be made on the basis of a combination of a base bid with selected options, it shall be made to that responsible bidder submitting the lowest net bid.

D. The City may also elect to award the contract on the basis of unit prices.

E. The form of contract shall be submitted by the City to the successful bidder. Terms of the specifications/bid package prevail. Bidder exceptions must be formally accepted by the City.

F. **Choice of Law:** The agreement with the successful bidder shall be construed in accordance with the laws of the State of New Jersey. In the event of litigation or other legal proceedings commenced to enforce the terms of the agreement, the venue of such litigation shall be the Superior Court of New Jersey, Cumberland County.

IX. CAUSES FOR REJECTING BIDS

Bids may be rejected for any of the following reasons:

A. All bids pursuant to N.J.S.A. 40A:11-13.2;

B. If more than one bid is received from an individual, firm or partnership, corporation or association under the same name;

C. Multiple bids from an agent representing competing bidders;

D. The bid is inappropriately unbalanced;

E. The bidder is determined to possess, pursuant to N.J.S.A. 40A:11-4b, Prior Negative Experience; or,

F. If the successful bidder fails to enter into a contract within 21 days, Sundays and holidays excepted, or as otherwise agreed upon by the parties to the contract. In this case at its option, the City may accept the bid of the next lowest responsible bidder. (N.J.S.A. 40A:11-24b)

X. TERMINATION OF CONTRACT

A. If, through any cause, the contractor shall fail to fulfill in a timely and proper manner obligations under the contract or if the contractor shall violate any of the requirements of the contract, the City shall there upon have the right to terminate the contract by giving written notice to the contractor of such termination and specifying the effective date of termination. Such termination shall relieve the City of any obligation for balances to the contractor of any sum or sums set forth in the contract. City will pay only for goods and services accepted prior to termination.

B. Notwithstanding the above, the contractor shall not be relieved of liability to the City for damages sustained by the City by virtue of any breach of the contract by the contractor and the City may withhold any payments to the contractor for the purpose of compensation until such time as the exact amount of the damage due the City from the contractor is determined.

C. The contractor agrees to indemnify and hold the City harmless from any liability to subcontractors/suppliers concerning payment for work performed or goods supplied arising out of the lawful termination of the contract by the City under this provision.

D. In case of default by the contractor, the City may procure the goods or services from other sources and hold the contractor responsible for any excess cost.

E. Continuation of the terms of the contract beyond the fiscal year is contingent on availability of funds in the following year's budget. In the event of unavailability of such funds, the City reserves the right to cancel the contract.

F. ACQUISITION, MERGER, SALE AND/OR TRANSFER OF BUSINESS, ETC.

It is understood by all parties that if, during the life of the contract, the contractor disposes of his/her business concern by acquisition, merger, sale and or/transfer or by any means convey his/her interest(s) to another party, all obligations are transferred to that new party. In this event, the new City(s) will be required to submit all documentation/legal instruments that were required in the original bid/contract. Any change shall be approved by the City.

G. The contractor will not assign any interest in the contract and shall not transfer any interest in the same without the prior written consent of the City.

H. The City may terminate the contract for convenience by providing 60 calendar days advanced notice to the contractor.

XI. PAYMENT

A. No payment will be made unless duly authorized by the City's authorized representative and accompanied by proper documentation. The City is not permitted to pay down payments or deposits on contracts.

B. Payment will be made in accordance with the City's policy and procedures.

XII. W-9

A. Bidder shall complete W-9 form and submit to the City of Vineland Division of Purchasing prior to contract award. This form is available at the following link: http://www.irs.gov/pub/irs-pdf/fw9.pdf?portlet=3

XIII. Contract Records

As per N.J.A.C. 17:44-2.2 Vendor shall maintain all documentation related to products, transactions or services under this contract for a period of five years from the date of final payment. Such records shall be made available to the New Jersey Office of the State Comptroller upon request.

PERMISSION FOR BIDDER TO WITHDRAW A BID DUE TO A MISTAKE IN CERTAIN CIRCUMSTANCES

(N.J.S.A. 40A:11-23.3)

N.J.S.A. 40A:11-23.3 authorizes a bidder to request withdrawal of a public works bid due to a mistake on the part of the bidder. A mistake is defined by N.J.S.A. 40A:11-2(42) as a clerical error that is an **unintentional and substantial computational error or an unintentional omission of a substantial quantity of labor, material, or both, from the final bid computation.**

A bidder claiming a mistake under N.J.S.A. 40A:11-23.3 must submit a request for withdrawal, in writing, by certified or registered mail to Jeanine Meneghetti, Purchasing Agent, 640 E. Wood Street, P.O. Box 1508, Vineland, NJ 08361-1508, Vineland, NJ 08361-1508. The bidder must request withdrawal of a bid due to a mistake, as defined by the law, within five business days after the receipt and opening of the bids. Since the bid withdrawal request shall be effective as of the postmark of the certified or registered mailing, Miguel Mercado, Purchasing Agent, may contact all bidders, after bids are opened, to ascertain if any bidders wish to, or already have exercised a request to withdraw their bid pursuant to N.J.S.A. 40A:11-23.3.

A bidder's request to withdraw the bid shall contain evidence, including any pertinent documents, demonstrating that a mistake was made. Such documents and relevant written information shall be reviewed and evaluated by the City of Vineland's designated staff pursuant to the statutory criteria of N.J.S.A. 40A:11-23.3.

The City of Vineland will not consider any written request for a bid withdrawal for a mistake, as defined by N.J.S.A. 40A:11-2(42), by a bidder in the preparation of a bid proposal unless the postmark of the certified or registered mailing is within the five business days following the opening of bids.

LOWEST BIDDER PREVAILING WAGE CERTIFICATION

In the case of a Bidder making the lowest bid for this contract by at least ten percent (10%) under the amount of the next lowest bidder, they shall be required to certify to the City of Vineland prior to the award of a contract that the prevailing wage rates required pursuant to the Prevailing Wage Act shall be paid in performing the work under the contract. In the event that the Bidder does not provide the certification prior to the award of the contract, the City of Vineland shall award the contract to the next lowest responsible and responsive bidder.

NEW JERSEY ANTI-DISCRIMINATION PROVISIONS
NJ.S.A.10:2-1 ET SEQ.

Pursuant to NJ.S.A. 10:2-1, if awarded a contract, the contractor agrees that:

a. In the hiring of persons for the performance of work under this contract or any subcontract hereunder, or for the procurement, manufacture, assembling or furnishing of any such materials, equipment, supplies or services to be acquired under this contract, no contractor, nor any person acting on behalf of such contractor or subcontractor, shall, by reason of race, creed, color, national origin, ancestry, marital status, gender identity or expression, affectional or sexual orientation or sex, discriminate against any person who is qualified and available to perform the work to which the employment relates;

b. No contractor, subcontractor, nor any person on his behalf shall, in any manner, discriminate against or intimidate any employee engaged in the performance of work under this contract or any subcontract hereunder, or engaged in the procurement, manufacture, assembling or furnishing of any such materials, equipment, supplies or services to be acquired under such contract, on account of race, creed, color, national origin, ancestry, marital status, gender identity or expression, affectional or sexual orientation or sex;

c. There may be deducted from the amount payable to the contractor by the contracting public agency, under this contract, a penalty of $50.00 for each person for each calendar day during which such person is discriminated against or intimidated in violation of the provisions of the contract; and

d. This contract may be canceled or terminated by the contracting public agency, and all money due or to become due hereunder may be forfeited, for any violation of this section of the contract occurring after notice to the contractor from the contracting public agency of any prior violation of this section of the contract.

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Provisions Concerning Changed Conditions in Construction Contracts
(N.J.S.A. 40A:11-16.7)

(1) If the contractor encounters differing site conditions during the progress of the work of the contract, the contractor shall promptly notify the contracting unit in writing of the specific differing site conditions encountered before the site is further disturbed and before any additional work is performed in the impacted area.

(2) Upon receipt of a differing site conditions notice in accordance with paragraph (1) of this subsection, or upon the contracting unit otherwise learning of differing site conditions, the contracting unit shall promptly undertake an investigation to determine whether differing site conditions are present.

(3) If the contracting unit determines different site conditions that may result in additional costs or delays exist, the contracting unit shall provide prompt written notice to the contractor containing directions on how to proceed.

(4) (a) The contracting unit shall make a fair and equitable adjustment to the contract price and contract completion date for increased costs and delays resulting from the agreed upon differing site conditions encountered by the contractor.

(b) If both parties agree that the contracting unit's investigation and directions decrease the contractor's costs or time of performance, the contracting unit shall be entitled to a fair and equitable downward adjustment of the contract price or time of performance.

(c) If the contracting unit determines that there are no differing site conditions present that would result in additional costs or delays, the contracting unit shall so advise the contractor, in writing, and the contractor shall resume performance of the contract, and shall be entitled to pursue a differing site conditions claim against the contracting unit for additional compensation or time attributable to the alleged differing site conditions.

(5) Execution of the contract by the contractor shall constitute a representation that the contractor has visited the site and has become generally familiar with the local conditions under which the work is to be performed.

(6) As used in this subsection, "differing site conditions" mean physical conditions at the contract work site that are subsurface or otherwise concealed and which differ materially from those indicated in the contract documents or are of such an unusual nature that the conditions differ materially from those ordinarily encountered and generally recognized as inherent in the work of the character provided for in the contract.

b. A contract subject to this section shall include the following suspension of work provisions:

(1) The contracting unit shall provide written notice to the contractor in advance of any suspension of work lasting more than 10 calendar days of the performance of all or any portion of the work of the contract.

(2) If the performance of all or any portion of the work of the contract is suspended by the contracting unit for more than 10 calendar days due to no fault of the contractor or as a consequence of an occurrence beyond the contracting unit's control, the contractor shall be entitled to compensation for any resultant delay to the project completion or additional contractor expenses, and to an extension of time, provided that, to the extent feasible, the contractor, within 10 calendar days following the conclusion of the suspension, notifies the contracting unit, in writing, of the nature and extent of the suspension of work. The notice shall include available supporting information, which information may thereafter be supplemented by the contractor as needed and as may be reasonably requested by the contracting unit. Whenever a work suspension exceeds 60 days, upon seven days' written notice, either party shall have the option to terminate the contract for cause and to be fairly and equitably compensated therefor.

(3) Upon receipt of the contractor's suspension of work notice in accordance with paragraph (2) of this subsection, the contracting unit shall promptly evaluate the contractor's notice and promptly advise the contractor of its determination on how to proceed in writing.

(4) (a) If the contracting unit determines that the contractor is entitled to additional compensation or time, the contracting unit shall make a fair and equitable upward adjustment to the contract price and contract completion date.

(b) If the contracting unit determines that the contractor is not entitled to additional compensation or time, the contractor shall proceed with the performance of the contract work, and shall be entitled to pursue a suspension of work claim against the contracting unit for additional compensation or time attributable to the suspension.

(5) Failure of the contractor to provide timely notice of a suspension of work shall result in a waiver of a claim if the contracting unit can prove by clear and convincing evidence that the lack of notice or delayed notice by the contractor actually prejudiced the contracting unit's ability to adequately investigate and defend against the claim.

c. A contract subject to this section shall include the following change in character of work provisions:

(1) If the contractor believes that a change directive by the contracting unit results in a material change to the contract work, the contractor shall so notify the contracting unit in writing. The contractor shall continue to perform all work on the project that is not the subject of the notice.

(2) Upon receipt of the contractor's change in character notice in accordance with paragraph (1) of this subsection, the contracting unit shall promptly evaluate the contractor's notice and promptly advise the contractor of its determination on how to proceed in writing.

(3) (a) If the contracting unit determines that a change to the contractor's work caused or directed by the contracting unit materially changes the character of any aspect of the contract work, the contracting unit shall make a fair and equitable upward adjustment to the contract price and contract completion date. The basis for any such price adjustment shall be the difference between the cost of performance of the work as planned at the time of contracting and the actual cost of such work as a result of its change in character, or as otherwise mutually agreed upon by the contractor and the contracting unit prior to the contractor performing the subject work.

(b) If the contracting unit determines that the contractor is not entitled to additional compensation or time, the contractor shall continue the performance of all contract work, and shall be entitled to pursue a claim against the contracting unit for additional compensation or time attributable to the alleged material change.

(4) As used in this subsection, "material change" means a character change which increases or decreases the contractor's cost of performing the work, increases or decreases the amount of time by which the contractor completes the work in relation to the contractually required completion date, or both.

d. A contract subject to this section shall include the following change in quantity provisions:

(1) The contracting unit may increase or decrease the quantity of work to be performed by the contractor.

(2) (a) If the quantity of a pay item is cumulatively increased or decreased by 20 percent or less from the bid proposal quantity, the quantity change shall be considered a minor change in quantity.

(b) If the quantity of a pay item is increased or decreased by more than 20 percent from the bid proposal quantity, the quantity change shall be considered a major change in quantity.

(3) For any minor change in quantity, the contracting unit shall make payment for the quantity of the pay item performed at the bid price for the pay item.

(4) (a) For a major increase in quantity, the contracting unit or contractor may request to renegotiate the price for the quantity in excess of 120 percent of the bid proposal quantity. If a mutual agreement cannot be reached on a negotiated price for a major quantity increase, the contracting unit shall pay the actual costs plus an additional 10 percent for overhead and an additional 10 percent for profit, unless otherwise specified in the original bid.

(b) For a major decrease in quantity, the contracting unit or contractor may request to renegotiate the price for the quantity of work performed. If a mutual agreement cannot be reached on a negotiated price for a major quantity decrease, the contracting unit shall pay the actual costs plus an additional 10 percent for overhead and an additional 10 percent for profit, unless otherwise specified in the original bid; provided, however, that the contracting unit shall not make a payment in an amount that exceeds 80 percent of the value of the bid price multiplied by the bid proposal quantity.

(5) As used in this subsection, the term "bid proposal quantity" means the quantity indicated in the bid proposal less the quantities designated in the project plans as "if and where directed.

City of Vineland

Revised Contract Language for BRC Compliance

Good and Services Contracts (including purchase orders)

*Construction Contracts (including public works related purchase orders)

N.J.S.A 52:32-44 imposes the following requirements on contractors and all subcontractors that knowingly provide goods or perform services for a contractor fulfilling this contract:

1. the contractor shall provide written notice to its subcontractors and suppliers to submit proof of business registration to the contractor;
2. subcontractors through all tiers of a project must provide written notice to their subcontractors and suppliers to submit proof of business registration and subcontractors shall collect such proofs of business registration and maintain them on file;
3. prior to receipt of final payment from a contracting agency, a contractor must submit to the contacting agency an accurate list of all subcontractors and suppliers* or attest that none was used;
4. during the term of this contract, the contractor and its affiliates shall collect and remit, and shall notify all subcontractors and their affiliates that they must collect and remit to the Director, New Jersey Division of Taxation, the use tax due pursuant to the Sales and Use Tax Act, (N.J.S.A> 54:32B-1 et seq.) on all sales of tangible personal property delivered into this State.

Pursuant to N.J.S.A. 54:49-4.1, a business organization that fails to provide a copy of a business registration as required, or that provides false business registration information, shall be liable for a penalty of $25 for each day of violation, not to exceed $50,000, for each proof of business registration not properly provided under a contract with a contracting agency. Information on the law and its requirements is available by calling (609) 292-9292.

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NEW JERSEY BUSINESS REGISTRATION

Pursuant to P.L. 2004, c.57, all consultants (both in-state and out-of-state) must obtain a Business Registration Certificate (BRC) from the New Jersey Department of the Treasury, Division of Revenue prior to conducting business with the NJTPA. A consultant or sub-consultant who fails to submit a copy of a valid BRC in accordance with the statue will be held liable for monetary penalties in accordance with N.J.S.A. 54-49-4.1. Questions regarding how to obtain a BRC can be directed to the New Jersey Division of Revenue at (609) 292-1730. The business registration form (Form NJ-REG) can be found online at:

http://www.state.nj.us/treasury/revenue/busregcert.shtml, or

http://www.state.nj.us/treasury/revenue/gettingregistered.shtml.

Sample New Jersey Business Registration Certificates:

STATE OF NEW JERSEY
BUSINESS REGISTRATION CERTIFICATE
FOR STATE AGENCY AND CASINO SERVICE CONTRACTORS

TAXPAYER NAME: TAX REGISTRATION TEST ACCOUNT

TAXPAYER IDENTIFICATION#: [illegible]

ADDRESS: [illegible] TRENTON NJ [illegible]

TRADE NAME: [illegible]

ISSUANCE DATE: 07/14/04

STATE OF NEW JERSEY
BUSINESS REGISTRATION CERTIFICATE

Taxpayer Name:	TAX REG TEST ACCOUNT
Trade Name:	
Address:	847 ROEBLING AVE TRENTON NJ 08611
Certificate Number:	[illegible]
Date of Issuance:	October 14, 2004

For Office Use Only:

20041014112823533

THIS PROJECT REQUIRES A

CERTIFICATE FOR PUBLIC WORKS

CONTRACTOR REGISTRATION

FOR GENERAL CONTRACTORS

AND SUBCONTRACTORS

IN ACCORDANCE WITH PL 1999, C. 238

For questions or information about PL 1999, C.238, please call Contractor Registration Unit, New Jersey Department of Labor, Division of Wage and Hour Compliance, 609-292-9464 or e-mail: contreg@dol.state.nj.us.

The website is http://lwd.state.nj.us/labor/wagehour/regperm/reg_and_permits.html

CERTIFICATE MUST BE SUBMITTED TO THE CITY OF VINELAND PURCHASING AGENT PRIOR TO CONTRACT AWARD. CERTIFICATES MUST ALSO BE SUBMITTED FOR ANY/ALL OF THE COMPANIES/INDIVIDUALS LISTED ON THE SUBCONTRACTORS LIST AS THE PRIME SUBCONTRACTORS (AS REQUIRED BY NJSA40A:11-16).

The City of Vineland cannot accept applications. We cannot award a contract if the certificate was not issued to the contractor/subcontractor prior to submission of the bid.

Certificate Number

Expiration Date: VOID

State of New Jersey

Department of Labor

Division of Wage and Hour Compliance

Public Works Contractor Registration Act

Pursuant to Public Law 1999 Chapter 238, the Public Works Contractor Registration Act, this certificate of registration, for purposes of bidding on and engaging in public work is issued to

V O I D

This certificate may not be transferred or assigned and may be revoked for cause by the Commissioner of Labor

ALBERT C. KROLL, Commissioner
Department of Labor

NON TRANSFERABLE

S A M P L E

MANDATORY EQUAL EMPLOYMENT OPPORTUNITY LANGUAGE
N.J.S.A. 10:5-31 et seq. (P.L.1975, c.127)
N.J.A.C. 17:27-1.1 et seq.

CONSTRUCTION CONTRACTS

During the performance of this contract, the contractor agrees as follows:

The contractor or subcontractor, where applicable, will not discriminate against any employee or applicant for employment because of age, race, creed, color, national origin, ancestry, marital status, affectional or sexual orientation, gender identity or expression, disability, nationality or sex. Except with respect to affectional or sexual orientation and gender identity or expression, the contractor will ensure that equal employment opportunity is afforded to such applicants in recruitment and employment, and that employees are treated during employment, without regard to their age, race, creed, color, national origin, ancestry, marital status, affectional or sexual orientation, gender identity or expression, disability, nationality or sex. Such equal employment opportunity shall include, but not be limited to the following: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided by the Public Agency Compliance Officer setting forth provisions of this nondiscrimination clause.

The contractor or subcontractor, where applicable will, in all solicitations or advertisements for employees placed by or on behalf of the contractor, state that all qualified applicants will receive consideration for employment without regard to age, race, creed, color, national origin, ancestry, marital status, affectional or sexual orientation, gender identity or expression, disability, nationality or sex.

The contractor or subcontractor will send to each labor union, with which it has a collective bargaining agreement, a notice, to be provided by the agency contracting officer, advising the labor union or workers' representative of the contractor's commitments under this act and shall post copies of the notice in conspicuous places available to employees and applicants for employment.

The contractor or subcontractor, where applicable, agrees to comply with any regulations promulgated by the Treasurer, pursuant to N.J.S.A. 10:5-31 et seq., as amended and supplemented from time to time and the Americans with Disabilities Act.

When hiring or scheduling workers in each construction trade, the contractor or subcontractor agrees to make good faith efforts to employ minority and women workers in each construction trade consistent with the targeted employment goal prescribed by N.J.A.C. 17:27-7.2; provided, however, that the Dept. of LWD, Construction EEO Monitoring Program, may, in its discretion, exempt a contractor or subcontractor from compliance with the good faith procedures prescribed by the following provisions, A, B, and C, as long as the Dept. of LWD, Construction EEO Monitoring Program is satisfied that the contractor or subcontractor is employing workers

provided by a union which provides evidence, in accordance with standards prescribed by the Dept. of LWD, Construction EEO Monitoring Program, that its percentage of active "card carrying" members who are minority and women workers is equal to or greater than the targeted employment goal established in accordance with N.J.A.C. 17:27-7.2. The contractor or subcontractor agrees that a good faith effort shall include compliance with the following procedures:

(A) If the contractor or subcontractor has a referral agreement or arrangement with a union for a construction trade, the contractor or subcontractor shall, within three business days of the contract award, seek assurances from the union that it will cooperate with the contractor or subcontractor as it fulfills its affirmative action obligations under this contract and in accordance with the rules promulgated by the Treasurer pursuant to N.J.S.A. 10:5-31 et. seq., as supplemented and amended from time to time and the Americans with Disabilities Act. If the contractor or subcontractor is unable to obtain said assurances from the construction trade union at least five business days prior to the commencement of construction work, the contractor or subcontractor agrees to afford equal employment opportunities minority and women workers directly, consistent with this chapter. If the contractor's or subcontractor's prior experience with a construction trade union, regardless of whether the union has provided said assurances, indicates a significant possibility that the trade union will not refer sufficient minority and women workers consistent with affording equal employment opportunities as specified in this chapter, the contractor or subcontractor agrees to be prepared to provide such opportunities to minority and women workers directly, consistent with this chapter, by complying with the hiring or scheduling procedures prescribed under (B) below; and the contractor or subcontractor further agrees to take said action immediately if it determines that the union is not referring minority and women workers consistent with the equal employment opportunity goals set forth in this chapter.

(B) If good faith efforts to meet targeted employment goals have not or cannot be met for each construction trade by adhering to the procedures of (A) above, or if the contractor does not have a referral agreement or arrangement with a union for a construction trade, the contractor or subcontractor agrees to take the following actions:

(1) To notify the public agency compliance officer, the Dept. of LWD, Construction EEO Monitoring Program, and minority and women referral organizations listed by the Division pursuant to N.J.A.C. 17:27-5.3, of its workforce needs, and request referral of minority and women workers;

(2) To notify any minority and women workers who have been listed with it as awaiting available vacancies;

(3) Prior to commencement of work, to request that the local construction trade union refer minority and women workers to fill job openings, provided the contractor or subcontractor has a referral agreement or arrangement with a union for the construction trade;

(4) To leave standing requests for additional referral to minority and women workers with the local construction trade union, provided the contractor or subcontractor has a referral agreement or arrangement with a union for the construction trade, the State Training and Employment Service and other approved referral sources in the area;

(5) If it is necessary to lay off some of the workers in a given trade on the construction site, layoffs shall be conducted in compliance with the equal employment opportunity and non-discrimination standards set forth in this regulation, as well as with applicable Federal and State court decisions;

(6) To adhere to the following procedure when minority and women workers apply or are referred to the contractor or subcontractor:

(i) The contactor or subcontractor shall interview the referred minority or women worker.

(ii) If said individuals have never previously received any document or certification signifying a level of qualification lower than that required in order to perform the work of the construction trade, the contractor or subcontractor shall in good faith determine the qualifications of such individuals. The contractor or subcontractor shall hire or schedule those individuals who satisfy appropriate qualification standards in conformity with the equal employment opportunity and non-discrimination principles set forth in this chapter. However, a contractor or subcontractor shall determine that the individual at least possesses the requisite skills, and experience recognized by a union, apprentice program or a referral agency, provided the referral agency is acceptable to the Dept. of LWD, Construction EEO Monitoring Program. If necessary, the contractor or subcontractor shall hire or schedule minority and women workers who qualify as trainees pursuant to these rules. All of the requirements, however, are limited by the provisions of (C) below.

(iii) The name of any interested women or minority individual shall be maintained on a waiting list, and shall be considered for employment as described in (i) above, whenever vacancies occur. At the request of the Dept. of LWD, Construction EEO Monitoring Program, the contractor or subcontractor shall provide evidence of its good faith efforts to employ women and minorities from the list to fill vacancies.

(iv) If, for any reason, said contractor or subcontractor determines that a minority individual or a woman is not qualified or if the individual qualifies as an advanced trainee or apprentice, the contractor or subcontractor shall inform the individual in writing of the reasons for the determination, maintain a copy of the determination in its files, and send a copy to the public agency compliance officer and to the Dept. of LWD, Construction EEO Monitoring Program.

(7) To keep a complete and accurate record of all requests made for the referral of workers in any trade covered by the contract, on forms made available by the Dept. of LWD, Construction EEO Monitoring Program and submitted promptly to the Dept. of LWD, Construction EEO Monitoring Program upon request.

(C) The contractor or subcontractor agrees that nothing contained in (B) above shall preclude the contractor or subcontractor from complying with the union hiring hall or apprenticeship policies in any applicable collective bargaining agreement or union hiring hall arrangement, and, where required by custom or agreement, it shall send journeymen and trainees to the union for referral, or to the apprenticeship program for admission, pursuant to such agreement or arrangement. However, where the practices of a union or apprenticeship program will result in the exclusion of minorities and women or the failure to refer minorities and women consistent with the targeted county employment goal, the contractor or subcontractor shall consider for employment persons referred pursuant to (B) above without regard to such agreement or arrangement; provided further, however, that the contractor or subcontractor shall not be required to employ women and minority advanced trainees and trainees in numbers which result in the employment of advanced trainees and trainees as a percentage of the total workforce for the construction trade, which percentage significantly exceeds the apprentice to journey worker ratio specified in the applicable collective bargaining agreement, or in the absence of a collective bargaining agreement, exceeds the ratio established by practice in the area for said construction trade. Also, the contractor or subcontractor agrees that, in implementing the procedures of (B) above, it shall, where applicable, employ minority and women workers residing within the geographical jurisdiction of the union.

After notification of award, but prior to signing a construction contract, the contractor shall submit to the public agency compliance officer and the Dept. of LWD, Construction EEO Monitoring Program an initial project workforce report (Form AA-201) electronically provided to the public agency by the Dept. of LWD, Construction EEO Monitoring Program, through its website, for distribution to and completion by the contractor, in accordance with N.J.A.C. 17:27-7. The contractor also agrees to submit a copy of the Monthly Project Workforce Report once a month thereafter for the duration of this contract to the Dept. of LWD, Construction EEO Monitoring Program, and to the public agency compliance officer.

The contractor agrees to cooperate with the public agency in the payment of budgeted funds, as is necessary, for on-the-job and/or off-thejob programs for outreach and training of minorities and women.

(D) The contractor and its subcontractors shall furnish such reports or other documents to the Dept. of LWD, Construction EEO Monitoring Program as may be requested by the Dept. of LWD, Construction EEO Monitoring Program from time to time in order to carry out the purposes of these regulations, and public agencies shall furnish such information as may be requested by the Dept. of LWD, Construction EEO Monitoring Program for conducting a compliance investigation pursuant to N.J.A.C. 17:27-1.1 et seq.

AMERICANS WITH DISABILITIES ACT OF 1990
Equal Opportunity for Individuals with Disability

The contractor and the City of Vineland, (hereafter "City") do hereby agree that the provisions of title 11of the Americans With Disabilities Act of 1990 (the "Act") (42 U.S.C. S121 01 et seq.), which prohibits discrimination on the basis of disability by public entities in all services, programs, and activities provided or made available by public entities, and the rules and regulations promulgated pursuant there unto, are made a part of this contract. In providing any aid, benefit, or service on behalf of the City of Vineland pursuant to this contract, the contractor agrees that the performance shall be in strict compliance with the Act. In the event that the contractor, its agents, servants, employees, or subcontractors violate or are alleged to have violated the Act during the performance of this contract, the contractor shall defend the City in any action or administrative proceeding commenced pursuant to this Act The contractor shall indemnity, protect, and save harmless the City, its agents, servants, and employees from and against any and all suits, claims, losses, or damages, of whatever kind or nature arising out of or claimed to arise out of the alleged violation. The contractor shall, at its own expense, appear, defend, and pay any and all charges for legal services and any all costs and other expenses arising from such action or administrative proceeding or incurred in connection therewith. In any and all complaints brought pursuant to the City's grievance procedure, the contractor agrees to abide by any decision of the City which is rendered pursuant to said grievance procedure. If any action or administrative proceeding results in an award of damages against the City of Vineland or if the City of Vineland incurs any expense to cure a violation of the ADA which has been brought pursuant to its grievance procedure, the contractor shall satisfy and discharge the same at its own expense.

The City shall, as soon as practicable after a claim bas been made against it, give written notice thereof to the contractor along with full and complete particulars of the claim. If any action or administrative proceedings is brought against the City of Vineland, or any of its agents, servants, and employees, the City shall expeditiously forward or have forwarded to the contractor every demand, complaint, notice, summons, pleading, or other process received by the City or its representatives.

It is expressly agreed and understood that any approval by the City of the services provided by the contractor pursuant to this contract will not relieve the contractor of the obligation to comply with the Act and to defend, indemnify, protect, and save harmless the City pursuant to this paragraph.

It is further agreed and understood that the City of Vineland assumes no obligation to indemnify or save harmless the contractor, its agents, servants, employees and servants, employees and subcontractors for any claim which may arise out of their performance of this Agreement. Furthermore, the contractor expressly understands and agrees that the provisions of this indemnification clause shall in no way limit the contractors obligations assumed in this Agreement, nor shall they be construed to relieve the contractor from any liability, nor preclude the City from taking any other actions available to it under any other provisions of the Agreement or otherwise at law.

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SCOPE OF WORK

1.01 DESCRIPTION

In general, the work on this project consists of removement and replacement of the roof system and repair of existing structure at the Wells 2 and 3 Treatment Facility Clearwell for the City of Vineland Municipal Water Utility, located in the City of Vineland, New Jersey

Project location: 311 West Ave, Vineland, NJ 08360

1.02 WORK COVERED BY CONTRACT DOCUMENTS

A. Owner Identification: City of Vineland Municipal Water Utility
330 East Walnut Rd
Vineland, NJ 08360

B. Engineer Identification: Remington & Vernick Engineers
2059 Springdale Road,
Cherry Hill, NJ 08003

C. Contract Documents:

These specifications and Drawings indicate the extent of the Contract. Contract Documents were prepared for the Project by Remington & Vernick Engineers, 2059 Springdale Road, Cherry Hill, NJ 08003.

D. General:

1. Review of all existing site conditions is strongly recommended to fully understand the scope of work. Access to the facility will be arranged by the Facilities Superintendent, William Kennedy (856) 794-4056, for a (1) week window during bidding. The structure is a permit required confined space entry and will require the contractor to provide their own entry team.

2. This Project includes a single prime Contract.

3. The Contractor is responsible and obligated to successfully complete the entire Project and to complete each necessary detail of every item specified and/or is required to complete the specified work regardless of whether or not a particular detail is specifically mentioned in these Specifications.

4. The Contractor will be required to submit upon award a proposed work schedule that shall be finalized to reflect actual project milestones after Contract award. The project schedule shall follow the requirements of these Specifications. Strict adherence to the agreed upon final work schedule will be required for this project. The schedule shall be generated by the Contractor in a Microsoft Project format and shall be updated weekly. Progress reports including the updated schedule (Gantt Chart) will be submitted to the Engineer on a weekly basis.

5. A Pre-Construction Meeting between the Vineland Water Department, the Engineer, and the Contractor will be required prior to start of construction at a site chosen by the Owner. All allowances/costs for the pre-construction meeting must be included in the Contractor's

proposal pricing and submitted with the bid. No additional payments will be made by the Owner for the pre-construction meeting.

6. Contracts:

   a. The Project will be constructed under a single Prime Contracting arrangement.

   b. The Contract will be awarded to one Contractor for the work required at the facility contained herein. Contract award will be based on the sum of a Contractor's pricing for the entire facility.

   c. The Contractor's completed bid form shall reflect the actual amount of work required at the facility. The amounts on the Contractor's bid form as submitted with their bid will be used to generate the project schedule of values for payment purposes.

   d. The Specifications & Drawings indicate the extent of the Contract Documents.

   e. The quantities described in the Specifications are for the convenience of the Contractor only. Items will be paid on a unit price/lump sum basis, and no additional payment will be made if as-built quantities exceed plan quantities.

   f. Only major items of work are given in the Bid Form, but it is the intent of the specifications to secure a completely interconnected and functioning system, and if any workmanship or materials be required which are obviously necessary to carry out the full intent and meaning of the Plans and Specifications or to be reasonably inferred there from, the cost of such workmanship or materials shall be included in the unit price bid for the major items of work.

   g. Local custom and trade-union jurisdictional settlements do not control the Scope of Work included in the Prime Contract. When a potential jurisdictional dispute or similar interruption of work is first identified or threatened, the affected Prime Contractor shall promptly negotiate a reasonable settlement to avoid interruption and delays at no additional cost to the Owner

7. This Scope of Work outlines the general items and distribution of work and shall not be construed as being all-inclusive

8. The Contractor shall be responsible for applying for and obtaining any and all permits required to satisfactorily complete this construction project. Any costs related to obtaining permits shall be included in the proposal.

E. Scope of Work

BASE BID work on this project will consist of the following:

1. Coordinate draining and removal of service of the existing Clearwell with the City of Vineland Municipal Water Utility. The City will be responsible for the draining of the existing Clearwell to floor level. Contractor shall assist the City with the final removal of any residual water up to 6" above the floor slab.

2. Remove and dispose of three (3) existing abandoned 12" gate valves located at floor level in the Clearwell. Install new 12" ductile iron blind flanges at end of pipes following removal of valves.

3. Remove and completely dispose of existing abandoned steel slat tray aerator and all appurtenances located at head of Clearwell.

4. Remove and reinstall level transducer and backup water level floats (to be reinstalled upon completion of rehabilitation work). Install new 2" PVC stilling well.

5. Remove and properly dispose of the existing Clearwell roofing system, including roof hatches, vent pipes, lead flashings, and penetrations, as indicated in the Contract Documents. Contractor is to take proper precautions in removal and disposal of lead flashings.

6. Install new precast hollowcore plank roof, including roof hatches and penetrations, as indicated in the Contract Documents. Provide sanitary seals (water- and bug-tight) for all penetrations.

7. Install new multi-ply bitumen roofing system, including tapered insulation, flashing, metal drip edges, and gutters, and all other appurtenances as indicated in the Contract Documents.

8. Furnish and install new fiberglass door as indicated in the Contract Documents.

9. Furnish and install new type 304 stainless steel access ladder as indicated in the Contract Documents.

10. Furnish and install sanitary seals at lime and chlorine feed pipe penetrations. Pipes must be able to be removed monthly for cleaning.

11. Remove and properly dispose of existing louvers. Infill openings as indicated in the Contract Documents.

12. Repair shallow spalls in exterior and interior concrete walls with hand applied repair mortar (Sikatop 123 Plus, or equal), including sawcutting, cleaning, and surface preparation substrate (Sika Armatec 110, or equal).

13. Repair spalls in exterior concrete walls where reinforcing steel is exposed with hand applied repair mortar (Sikatop 123 Plus, or equal), including sawcutting, cleaning, sandblasting, surface preparation substrate (Sika Armatec 110, or equal), and rebar splicing.

14. Repair cracks greater than 1/4" in exterior concrete walls with hand applied repair mortar (Sikatop 123 Plus, or equal), including sawcutting, cleaning, and surface preparation

substrate (Sika Armatec 110, or equal).

15. Repair cracks smaller than 1/4" in exterior concrete walls with pressure injected polymer repair compound (Sikadur 35, or equal), including cleaning, drilling, and preparation.

16. Apply epoxy lining to interior slab, walls, and ceiling surfaces (SikaTop-123 Plus, or other ANSI/NSF Standard 61 compliant equal). The Contractor shall be responsible for cleaning and preparing all surfaces prior to application.

17. The Contractor is responsible for coordinating all work with the Owner.

18. The Contractor shall be responsible for work site protection and debris containment throughout the duration of the project. The work area is to be protected to prevent damage from debris.

19. Disinfect all interior surfaces of rehabilitated Clearwell in accordance with AWWA Standards C652-11, et. seq., Disinfection of Water Storage Facilities.

20. Following completion of disinfection, complete coliform bacteria and VOC analysis for safe drinking water requirements. All water analysis to be completed by the City of Vineland's contracted laboratory. The City of Vineland will pay for the initial laboratory fees. If, following the water analysis that additional disinfection is required, or any other work, additional rechlorination and laboratory analysis fees shall be the responsibility of the Contractor.

ALTERNATE BID #1:

1. Repair shallow spalls in concrete on interior walls and slab with hand applied repair mortar (Sikatop 123 Plus, or equal), including sawcutting, cleaning, and surface preparation substrate (Sika Armatec 110, or equal).

2. Repair spalls in concrete on interior walls and slab where reinforcing steel is exposed with hand applied repair mortar (Sikatop 123 Plus, or equal), including sawcutting, cleaning, sandblasting, surface preparation substrate (Sika Armatec 110, or equal), and rebar splicing.

3. Repair cracks greater than 1/4" in interior concrete walls and slab with hand applied repair mortar (Sikatop 123 Plus, or equal), including sawcutting, cleaning, and surface preparation substrate (Sika Armatec 110, or equal).

4. Repair cracks smaller than 1/4" in interior concrete walls and slab with pressure injected polymer repair compound (Sikadur 35, or equal), including cleaning, drilling, and preparation.

5. Paint all exposed exterior concrete as indicated in project documents.

1.03 SPECIAL CONDITIONS

1. Notice to proceed anticipated beginning of October 2025. Proposed concrete coatings to begin in March 2026 (weather permitting) with anticipated 100% completion date May 1st, 2026.

2. The Contractor shall be responsible for coordinating all work with the Engineer and the Owner.

3. Prior to bidding, the Contractor shall visit the site and include all costs for a complete demolition, including review of existing site conditions. The Owner is not responsible for additional costs based on the contractor failure to properly inspect the existing conditions and include all costs in his bid.

4. The existing building plans are provided in the project plans for the contractor's reference only. The contractor is responsible for verifying all existing information.

5. The Contractor is to ensure all materials not specified on drawings that must be installed on the interior surface of the Clearwell are certified safe for contact with drinking water.

6. All work not specifically described or listed in the specifications that are incidental to work completion shall be considered as included within scope.

7. Extra work allowance is only to be used at the owner's/engineer's discretion.

8. A preconstruction video or photographs is required.

9. Contractor is responsible for clean-up of site and shall provide dumpsters as required.

10. Contractor shall be responsible for applying and obtaining the required permits from the City of Vineland for this work, including permit fees.

11. All coating/painting work to be completed at temperatures compliant with manufacturer's requirements.

1.04 The above Scope of Work outlines the general items and distribution of work and shall not be construed as being all-inclusive.

END OF SCOPE

SECTION 010000

GENERAL REQUIREMENTS

1.01 GENERAL

A. Only major items of work are given in the Bid Form, but it is the intent of the specifications to secure a completely interconnected and functioning system, and if any workmanship or materials be required which are obviously necessary to carry out the full intent and meaning of the plans and specifications or to be reasonably inferred therefrom, the cost of such workmanship or materials shall be included in the unit price bid for the major items of work.

B. Reproducible As-built drawings must be furnished by the Contractor to the Engineer prior to final payment in accordance with Section 010100.

C. Contractor shall notify all utility companies prior to construction of utilities by contacting 1-800-272-1000.

D. Prior to any excavation, the Contractor shall have all utilities marked and shall excavate or otherwise determine the exact location and elevations of said utilities. The Contractor shall notify the Engineer of any conflicts. The Contractor shall arrange for any necessary utility relocations or plan changes and shall reschedule his operations appropriately.

E. The Contractor, in the construction of any project, shall not stockpile materials or his equipment on any private property; except areas designated by the drawings as directed by the Engineer. If so required, the Engineer may direct the Contractor to have his equipment removed from any project during weekend hours.

F. All work of refilling sunken ditches, repaving over trenches and keeping streets and sidewalks in passable condition shall be done to the satisfaction of the Engineer during the construction of the above work as well as during the maintenance period. If any work is not done within five (5) days after written notice is given by the Engineer, the work may be done by the Owner and charged to the Contractor.

G. Special care shall be taken to prevent contamination, siltation, or interfering in any way with the stream flows or ponds along the line of work. No waste matter of any kind will be allowed to discharge into the stream flows or impounded water of any ponds or other bodies of water.

H. The Contractor shall apply and pay for all local permits that may be required for any of the work involved with this project.

I. All notes on drawings shall be made a part of the specifications.

J. Contractor shall notify Engineer at least forty-eight (48) hours in advance of any work on Saturdays. There will be no work permitted on Sundays or holidays. This project will receive inspection and the normal working hours for the Inspector are from 7:30 AM to 4:00 PM, Monday through Friday. Any overtime inspection costs which are not specifically mentioned in the drawings and specifications will be reimbursed by the Contractor. Holidays are New Years Day, Memorial Day, Fourth of July, Labor Day, Thanksgiving and Christmas.

1.02 PUBLIC UTILITIES

A. The contract drawings indicate the approximate location of existing overhead and subsurface utilities in the vicinity of the work. The bidder is advised to ascertain for himself all the facts concerning the location of these utilities.

B. The Contractor shall cooperate with the utility owners in the adjustment of their facilities and shall notify the utility owners not less than five (5) days in advance of the time he proposes to perform any work that will endanger or affect their facilities.

C. The Contractor shall permit the owners of utilities, or their agents, access to the site of the work at all times in order to relocate, construct or protect their lines and he shall cooperate with them in performing this work.

D. Separate payments will not be made for the coordination and cooperation of the Contractor with the utility companies, nor for the protection or replacement of utilities for the resequencing or delay of work due to a utility company and the bidder shall include all such costs in the prices bid for the various related items of work in the Bid Form.

E. The Contractor is responsible for repairing all located utilities (water, sewer, storm sewer, gas lines, etc.) which are broken or damaged during construction.

1.03 PHOTOGRAPHS & VIDEO TAPES

The Contractor shall video tape in digital format the construction site prior to the commencement of construction. Two copies of the digital recording shall be forwarded and kept by Remington and Vernick Engineers to resolve any disputes arising over the restoration of all curbs, sidewalks, driveways, fences, lawns, landscaped areas, or any other items that may be disturbed during construction.

1.04 TESTING MATERIALS

A. Except as may be provided elsewhere, test or analysis of materials which are usually tested after delivery to the site, such as concrete aggregate, mixed and placed concrete, and similar materials; will be performed by the Engineer or test laboratories which will be approved by the Engineer and selected and paid for by the Contractor. The preliminary testing of concrete mixtures and test or analysis of other materials, samples of which are to be submitted prior to delivery, will also be performed by the laboratory and paid for by the Contractor at the Engineer's request.

B. If the Engineer orders sampling and analysis or tests of materials which are usually accepted on Certification of the manufacturer but which appear defective or not conforming to the requirements of the Specifications, the Contractor will bear the reasonable costs of sampling, transportation, test and analysis.

END OF SECTION

SECTION 010100

AS-BUILT DRAWINGS

1.01 GENERAL

The Contractor shall provide a set of reproducible as-built drawings prior to final payment.

2.01 MATERIALS

A. As-builts shall be a reproducible of the original contract drawings including any additional sheets required. All deviations from the original contract drawings shall be on the as-builts. The drawings shall be legible, neat, and of a quality acceptable to the Engineer.

B. The Engineer shall provide a set of reproducibles at the beginning of the project.

3.01 EXECUTION

A. The Contractor shall be responsible for keeping the as-built up-to-date as the project progresses.

B. Building Construction: Actual installation with all items clearly identified shall be indicated. Location of installed items and any deviations from contract documents shall be so shown with boxes around the as-built numbers or labels.

C. This section is intended to provide a minimum level of acceptance. Any section with more stringent requirements shall have precedence over this section.

4.01 PAYMENT

No separate payment will be made for work performed under this section.

END OF SECTION

SECTION 017400

CLEANING AND RESTORATIONS

1.01 DESCRIPTION

A. Contractor shall provide all equipment, labor & materials required to clear the site of all debris to match the natural grade conditions. Backfill shall be provided as required to provide positive drainage from any disturbed areas so that there is no ponding water on the site. All disturbed areas shall be seeded to establish vegetation and prevent erosion.

B. Maintain premises and public properties free from accumulations of waste, debris and rubbish caused by work operations.

C. At completion of work, remove waste materials, rubbish, tools, equipment, machinery and surplus materials; clean all sight exposed surfaces; leave project clean and ready for occupancy.

D. At completion of work, restore or replace, when and as directed by the Engineer, any public or private property disturbed or damaged by Contractor's work operations to a condition at least equal to that existing prior to beginning work, or as otherwise specified. Materials, equipment and methods shall be approved by the Engineer.

2.01 MATERIALS

A. For restorations all materials shall comply with the following Articles of the New Jersey Department of Transportation Standard Specifications latest revision and these specifications.

B. Pavement restorations: See Section 903 "Bituminous Concrete".

C. Restoration of curbs and other concrete structures:

1. Concrete:
   a. Shall conform to Section 605 for Curbs, Section 607 for sidewalks and driveways, and Section 405 for concrete surface course.

   b. Compressive Strength: 4,000 psi at 28 days.

   c. Air-entrained.

2. Joint Fillers: Section 908, bituminous cellular type.

3. Curing Compound: Section 905.03, white-pigmented liquid.

D. Driveway Restoration: Driveway Aprons shall be replaced in kind with Portland Cement Concrete, Bituminous Concrete or 3/4 inch stone. Dirt driveway aprons are to be upgraded to stone.

E. All other Materials: As approved by the Engineer or authorities having jurisdiction.

3.01 METHODS OF CONDUCTING WORK – CLEANING

A. Requirements of regulatory agencies:

The Contractor shall comply with all Federal, State, and local anti-pollution laws, ordinances, codes and regulations when disposing of waste materials, debris and rubbish. All excess material shall be removed from the site and disposed of by the Contractor. Cost to be included in the unit price bid for all items.

The disposal site shall be in permanently established licensed OSWA (Office of Solid Waste Administration, New Jersey Department of Environmental Protection) landfills or a NJDEP certified recycling center if applicable.

B. Cleaning during construction:

Provide periodic cleaning to keep the work, the site, and adjacent properties free from accumulations of waste materials, rubbish and windblown debris resulting from construction operations.

The Contractor is responsible for street sweeping as directed by the Engineer or Owner. The Contractor shall keep all public roadways free of dirt and debris from any trucks entering or leaving the demolition site.

Provide on-site containers for the collection of waste materials, debris and rubbish. Maintain containers as required.

C. Dust Control:

The Contractor will be required to maintain all excavations, embankments, stockpiles, haul roads, permanent access roads, plant sites, waste areas, borrow areas, and all other work areas within or without the project boundaries free from dust which would cause a hazard or nuisance to others. Approved temporary methods of stabilization consisting of sprinkling, chemical treatment, light bituminous treatment or similar methods will be permitted to control dust. Sprinkling, to be approved, must be repeated at such intervals as to keep all parts of the disturbed area at least damp at all times, and the Contractor must have sufficient competent equipment on the job to accomplish this if sprinkling is used. Dust control shall be performed as the work proceeds and whenever a dust nuisance or hazard occurs. If any dust control is not done within twenty-four (24) hours after written notice is given by the Engineer, the work may be done by Owner and charged to the Contractor.

3.02 METHODS OF CONDUCTING WORK - RESTORATIONS

A. General: All existing structures, unpaved areas and paved areas disturbed or damaged during the work under this contract shall be restored or replaced to a condition at least equal to that existing prior to beginning work, or as otherwise specified. The methods of conducting this work shall, as a minimum, conform to the New Jersey Department of Transportation Standard Specifications, latest revision.

B. Pavement Restorations:

The methods of construction employed shall conform to the requirements set forth in Section 208, 304, 305 & 404 of the Standard Specifications as applicable to the type of material being utilized.

Restoration type and thickness shall be as shown on the contract drawings.

C. Restorations of Curbs and Other Concrete Structures:

1. Curbs: Section 605

2. Other concrete structures: Restore in accordance with applicable Sections of the Standard Specifications.

D. Fence Restorations:

Contractor shall remove all concrete from existing fence posts and appurtenances before reinstalling fence in kind.

E. All Other Restorations:

Restore in accordance with applicable Sections of the Standard Specifications, or as approved by the Engineer or authorities having jurisdiction.

END OF SECTION

SECTION 024100

BUILDING DEMOLITION

1.01 DESCRIPTION

A. The existing structures to be demolished, in general, consist of the following:

1. Removal of existing roofing system, including but not limited to roofing membrane, concrete channels, roof hatches, insulation & flashing.

2. Removal of existing louvers.

3. Removal of slat tray aeration structure.

B. Adjacent areas required to remain shall be left in a safe condition, and shall not be defaced, marred, or jeopardized in any way and any damage done to them shall be repaired or restored to the satisfaction of the Engineer, without additional compensation.

C. Contractor shall remove all equipment and excess materials during the process of demolition. This material shall be disposed of by the Contractor at his expense.

D. The Contractor shall employ all possible methods to minimize the noise. All construction equipment powered by internal combustion engines shall be equipped with a properly maintained muffler. Air powered equipment shall be fitted with pneumatic exhaust silencers. Equipment powered by an internal combustion shall not be operated within 150 feet of residential properties without portable noise barriers placed between the equipment and the noise sensitive sites.

1.02 PERMITS

A. Contractor is responsible to complete and file all required Uniform Construction Code and Township demolition permit applications, if required. No demolition work shall commence without a permit being issued.

2.01 EXECUTION

A. Inspection:

Verify that areas of demolition work are unoccupied.

2.02 PREPARATION

A. Prior to commencement of demolition operations, arrange for, and verify shut off of utility services, including electric, gas, telephone, water, and sewer, if required.

2.03 DEMOLITION

A. Demolition of structures shall be in accordance with the demolition procedures submitted to and accepted by the Engineer.

B. Suitable barriers shall be erected and maintained around all operations as long as such operations constitute a hazard or dangerous condition. "Keep Out" signs shall be maintained in places and locations where the placing of protective devices are warranted.

C. Only methods of demolition will be permitted which will ensure that all phases of demolition are confined within the limits of the demolition area and without hazard to adjacent areas or to the public.

D. Adjacent areas shall be left in a safe condition, and shall not be defaced, marred, or jeopardized in any way and any damage done to them shall be repaired or restored to the satisfaction of the Engineer, without additional compensation.

E. Any additional materials required for repairs shall be furnished without any additional cost to the Owner.

F. All materials, including fixtures and equipment, as well as debris and rubbish, except personal property belonging to Owners shall be removed as it accumulates and not stored on the Project. Materials and debris shall not be placed or stored within the limits of any existing streets.

3.01 QUANTITY AND PAYMENT

All costs for clearing and restorations shall be included in the prices bid for the various scheduled items in the Bid Form and no separate payment will be made thereto.

END OF SECTION

SECTION 030130

EPOXY-INJECTED CRACK REPAIR

PART 1 – GENERAL

1.01 SUMMARY

A. This specification describes the pressure injection of cracks with an epoxy resin adhesive.

1.02 QUALITY ASSURANCE

A. Manufacturing qualifications: The manufacturer of the specified product shall be ISO 9001/9002 certified and have in existence a recognized ongoing quality assurance program independently audited on a regular basis.

B. Contractor qualifications: Contractor shall be qualified in the field of concrete repair and protection with a successful track record of 5 years or more. Contractor shall maintain qualified personnel who have received product training by a manufacturer's representative.

C. Install materials in accordance with all safety and weather conditions required by the manufacturer, or as modified by applicable rules and regulations of local, state and federal authorities having jurisdiction. Consult Material Safety Data Sheets for complete handling recommendations.

1.03 DELIVERY, STORAGE, AND HANDLING

A. All materials must be delivered in original, unopened containers with the manufacturer's name, labels, product identification, and batch numbers. Damaged material must be removed from the site immediately.

B. Store all materials off the ground and protect from rain, freezing or excessive heat until ready for use.

C. Condition the specified product as recommended by the manufacturer.

1.04 JOB CONDITIONS

A. Environmental Conditions: Do not apply material if it is raining or snowing or if such conditions appear to be imminent. Minimum application temperature 40ºF (5ºC) and rising.

B. Protection: Precautions should be taken to avoid damage to any surface near the work zone due to mixing and handling of the specified product.

1.05 SUBMITTALS

A. Submit two copies of manufacturer's literature, to include: Product Data Sheets, and appropriate Material Safety Data Sheets (MSDS).

1.06 WARRANTY

A. Provide a written warranty from the manufacturer against defects of materials for a period of one (1) years, beginning with date of substantial completion of the project.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Sikadur 35 Hi-Mod LV, as manufactured by Sika Corporation, 1682 Marion Williamsport Road, Marion, Ohio 43302 is considered to conform to the requirements of this specification.

B. Sikadur Injection Gel, as manufactured by Sika Corporation, 1682 Marion Williamsport Road, Marion, Ohio 43302 is considered to conform to the requirements of this specification

C. Approved Equal.

2.02 MATERIALS

A. Epoxy resin adhesive for pressure injection of cracks shall be Sikadur 35 Hi-Mod LV:

1. Component “A” shall be a modified epoxy resin of the diglycidiether bisphenol A Type containing suitable viscosity control agents. It shall not contain butyl glycidyl ether.
2. Component “B” shall be primarily a reaction product of a selected amine blend with an epoxy resin of the diglycidiether bisphenol A Type containing suitable viscosity control agents, pigments, and accelerators.
3. The ratio of component A: componet B shall be 2:1 by volume
4. The material shall not contain asbestos.

B. Epoxy resin adhesive for sealing of cracks & porting devices shall be Sikadur Injection Gel:

1. Component “A” shall be a modified epoxy resin of the diglycidiether bisphenol A Type containing suitable viscosity control agents. It shall not contain butyl glycidyl ether.
2. Component “B” shall be primarily a reaction product of a selected amine blend with an epoxy resin of the diglycidiether bisphenol A Type containing suitable viscosity control agents, pigments, and accelerators.
3. The ratio of component A: componet B shall be 1:1 by volume
4. The material shall not contain asbestos.

C. Porting devices as required for either manual or automated application. Porting devices for automated application shall be supplied from maufacturer of the pressure injection equipment.

2.03 PERFORMANCE CRITERIA

A. Properties of the mixed epoxy resin adhesive used for the pressure injection grouting:

1. Pot Life: 25 minutes (60 gram mass) @ 73° F
2. Tack-FreeTime: 90°F (32°C) 1.5 to 2 hours
   75°F (24°C) 3 to 3.5 hours

40°F (5°C) 14-16 hours

3. Viscosity: Approx. 375 cps. (mixed)
4. Color: Clear, pale yellow

B. Properties of the cured epoxy resin adhesive used for pressure injection grout:

1. Compressive Strength (ASTM D-695)
   a 3 day: 10,700 psi (73.8 MPa)
   b. 7 day: 11,000 psi (75.8 MPa)
   c. 28 day: 13,000 psi (89.6 MPa)
2. Compressive Modulus, psi : .min.
   a. 7 day: 320,000 psi (2,200 Mpa)
3. Shear Strength (ASTM D-732)
   a. 14 day: 5,100 psi (35 MPa)
4. Flexural Strength (ASTM D-790)
   a. 14 day: 14,000 psi (97.0 MPa)
5. Tangent Modulus of Elasticity in Bending .min.
   a. 14 day: 370,000 psi (2,600 Mpa)
6. Bond Strength (ASTM C-882) 14 days (moist cure)
   a. Hardened Concrete to Hardened Concrete 2,900 psi (20 Mpa)
7. Water Absorption (ASTM D-570), 7day
   a. 24 hour immersion 0.27%
8. Tensile Properties (ASTM D-638) min.
   a. 7 day Tensile Strength 8,900 psi (61 Mpa)
   Elongation at Break 5.4%
   b. 14 day Modulus of Elasticity 410,000 psi (2800 Mpa)

A. Properties of the mixed epoxy resin adhesive used for sealing of cracks & porting devices:

1. Pot Life: min. 30 minutes (60 gram mass) @ 73° F
2. Tack-FreeTime: 75°F (24°C) 2 to 3.5 hours
   40°F (5°C) 14-16 hours
3. Consistency: Smooth, Non-sag paste
4. Color: Gray

B. Properties of the cured epoxy resin adhesive used for sealing of cracks & porting devices:

1. Compressive Strength (ASTM D-695) @ 73F
   a 1 day: 8,000 psi (55.1 MPa)
   b. 3 day: 10,000 psi (68.9 MPa)
   c. 28 day: 10,000 psi (68.9 MPa)
   Compressive Modulus, psi : .min.
   a. 7 day: 270,000 psi (Mpa)
2. Shear Strength (ASTM D-732)
   a. 14 day: 3,700 psi (25.5 MPa)
3. Flexural Strength (ASTM D-790)
   a. 14 days: 6,700 psi (46.2 MPa)
   Tangent Modulus of Elasticity in Bending .min.
   b. 14 days: 750,000 psi
4 Bond Strength ASTM C-882 14 days (moist cure) min.
   a. Hardened Concrete to Hardened Concrete 2,600 psi (17.9 Mpa)

5. Water Absorption (ASTM D-570), 7 day
    a. 24 hour immersion 0.11%
6. Tensile Properties (ASTM D-638) min.
    a. 7 day Tensile Strength 4,300 psi (29.7 Mpa)
    Elongation at Break 1.3%
    b. 14 day Modulus of Elasticity 410,000 psi (2800 Mpa)

PART 3 - EXECUTION

3.01 MIXING AND APPLICATION

A. Mixing the epoxy resin adhesive for sealing the cracks & porting devices: Premix each component. Proportion one parts by volume of Component "A" to one part Component "B" into a clean, dry mixing pail. Mix thoroughly for 3 minutes with a jiffy paddle on a low-speed (400-600 rpm) drill or dispense from a ready to use prepackaged coaxil cartridge. Mix only that quantity of material that can be used within its potlife (25-35 minutes 73F).

B. Mixing of the epoxy resin adhesive used for the pressure injection grouting:
Manual: Premix each component. Proportion two parts by volume of Component "A" to one part Component "B" into a clean, dry mixing pail. Mix thoroughly for 3 minutes with a jiffy paddle on a low-speed (400-600 rpm) drill. Mix only that quantity of material that can be used within its potlife (20-30 minutes 73F).

C. Placement procedure:

1. The epoxy resin adhesive for sealing the cracks & porting device: Set the porting devices as required by the epuipment manufacturer. Spacing of the porting devices shall be accomplished as required to achieve the travel of the epoxy resin for the pressure injection grouting between ports and fill the cracks to the maximum. On structures open on both sides, provide porting devices on opposite sides at staggered elevations. Apply the mixed epoxy resin adhesive for sealing over cracks and around each porting device to provide an adequate seal to prevent the escape of the epoxy resin adhesive for the injection grouting. Where required by the Engineer, apply the epoxy resin adhesive for sealing in such a manner that minimal defacing or discoloration of the substrate shall result.
2. The epoxy resin adhesive for the pressure injection grouting:
Manual: Load the mixed epoxy resin adhesive for grouting into a disposable caulking cartridge or bulk-loading caulking gun. Inject the prepared cracks with a consant pressure in order to achieve maximum filling & penetration without the inclusion of air pockets or voids in the epoxy resin adhesive. Begin the pressure injection at the widest part of the crack being injected and continue until there is the appearance of epoxy resin adhesive at an adjacent port, thus indicating travel. When travel is indicated, the decision to discontinue or continue the pressure injection from that port should be made by the contractor based on his experience, with the approval of the Engineer. Continue procedure until pressure injectable cracks has been filled.
Automated: Dispense the epoxy resin adhesive for grouting under constant pressure in accordance with prcedures recommended by the equipment manufacturerer as required to achieve maximum filling and penetration of the prepared cracks without the inclusion of air pockets or voids in the epoxy resin adhesive. The pressure injection of single or multiple ports, by use of a manifold system, is possible. This decision should

be made by the Contractor, with the approval of the Engineer. Continue the approved procedure until all pressure injectable cracks have been filled.

D. If penetration of any cracks is impossible, consult the Engineer before discontinuing the injection procedure. If modification of the proposed procedure is required to fill the cracks, submit said modification in writing to the Engineer for acceptance prior to proceeding.

E. Adhere to all limitations and cautions for the epoxy resin adhesive in the manufacturers current printed literature.

3.02 CLEANING

A. After the epoxy resin adhesive for grouting has cured, the epoxy resin adhesive for sealing cracks and porting devices shall be removed as required by the Engineer. Clean the substrate in a manner to produce a finish appearance acceptable to the owner.

B. The uncured epoxy resin adhesive can be cleaned from tools with approved solvent. The cured epoxy resin adhesive can only be removed mechanically.

C. Leave finished work and work area in a neat, clean condition without evidence of spillovers onto adjacent areas.

END OF SECTION

SECTION 033000

CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Cast-in-place concrete, including concrete materials, mixture design, placement procedures, and finishes.

1.2 DEFINITIONS

A. Cementitious Materials: Portland cement alone or in combination with one or more of the following: blended hydraulic cement, fly ash, slag cement, other pozzolans, and silica fume; materials subject to compliance with requirements.

B. Water/Cement Ratio (w/cm): The ratio by weight of water to cementitious materials.

1.3 ACTION SUBMITTALS

A. Product Data: For each of the following.

1. Portland cement.
2. Fly ash.
3. Slag cement.
4. Blended hydraulic cement.
5. Silica fume.
6. Performance-based hydraulic cement
7. Aggregates.
8. Admixtures:

a. Include limitations of use, including restrictions on cementitious materials, supplementary cementitious materials, air entrainment, aggregates, temperature at time of concrete placement, relative humidity at time of concrete placement, curing conditions, and use of other admixtures.

b. Include limitations of use. Admixtures that do not comply with reference ASTM International requirements must be submitted with test data for approval.

9. Color pigments.
10. Fiber reinforcement.
11. Vapor retarders.
12. Floor and slab treatments.
13. Liquid floor treatments.

14. Curing materials.

    a. Include documentation from color pigment manufacturer, indicating that proposed methods of curing are recommended by color pigment manufacturer.

15. Joint fillers.
16. Repair materials.

B. Design Mixtures: For each concrete mixture, include the following:

1. Mixture identification.
2. Minimum 28-day compressive strength.
3. Durability exposure class.
4. Maximum w/cm.
5. Calculated equilibrium unit weight, for lightweight concrete.
6. Slump limit.
7. Air content.
8. Nominal maximum aggregate size.
9. Steel-fiber reinforcement content.
10. Synthetic micro-fiber content.
11. Indicate amounts of mixing water to be withheld for later addition at Project site if permitted.
12. Include manufacturer's certification that permeability-reducing admixture is compatible with mix design.
13. Include certification that dosage rate for permeability-reducing admixture matches dosage rate used in performance compliance test.
14. Intended placement method.
15. Submit alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.

C. Shop Drawings:

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

    a. Location of construction joints is subject to approval of the Engineer.

D. Concrete Schedule: For each location of each Class of concrete indicated in "Concrete Mixtures" Article, including the following:

1. Concrete Class designation.
2. Location within Project.
3. Exposure Class designation.
4. Formed Surface Finish designation and final finish.
5. Final finish for floors.
6. Curing process.
7. Floor treatment if any.

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For the following:

1. Installer: Include copies of applicable ACI certificates.
2. Ready-mixed concrete manufacturer.
3. Testing agency: Include copies of applicable ACI certificates.

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

1. Cementitious materials.
2. Admixtures.
3. Fiber reinforcement.
4. Curing compounds.
5. Floor and slab treatments.
6. Bonding agents.
7. Adhesives.
8. Vapor retarders.
9. Semirigid joint filler.
10. Joint-filler strips.
11. Repair materials.

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

1. Portland cement.
2. Fly ash.
3. Slag cement.
4. Blended hydraulic cement.
5. Silica fume.
6. Performance-based hydraulic cement.
7. Aggregates.
8. Admixtures:

a. Permeability-Reducing Admixture: Include independent test reports, indicating compliance with specified requirements, including dosage rate used in test.

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

E. Research Reports:

1. For concrete admixtures in accordance with ICC's Acceptance Criteria AC198.
2. For sheet vapor retarder/termite barrier, showing compliance with ICC AC380.

F. Preconstruction Test Reports: For each mix design.

G. Field quality-control reports.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: A qualified installer who employs Project personnel qualified as an ACI-certified Flatwork Technician and Finisher and a supervisor who is a certified ACI Flatwork Concrete Finisher/Technician or an ACI Concrete Flatwork Technician with experience installing and finishing concrete, incorporating permeability-reducing admixtures.

1. Post-Installed Concrete Anchors Installers: ACI-certified Adhesive Anchor Installer.

B. Ready-Mixed Concrete Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C94/C94M requirements for production facilities and equipment.

1. Manufacturer certified in accordance with NRMCA's "Certification of Ready Mixed Concrete Production Facilities."

C. Laboratory Testing Agency Qualifications: A testing agency qualified in accordance with ASTM C1077 and ASTM E329 for testing indicated and employing an ACI-certified Concrete Quality Control Technical Manager.

1. Personnel performing laboratory tests to be an ACI-certified Concrete Strength Testing Technician and Concrete Laboratory Testing Technician, Grade I. Testing agency laboratory supervisor to be an ACI-certified Concrete Laboratory Testing Technician, Grade II.

D. Field Quality-Control Testing Agency Qualifications: An independent agency, qualified in accordance with ASTM C1077 and ASTM E329 for testing indicated.

1. Personnel conducting field tests to be qualified as an ACI Concrete Field Testing Technician, Grade 1, in accordance with ACI CPP 610.1 or an equivalent certification program.

1.6 PRECONSTRUCTION TESTING

A. Preconstruction Testing Service: Engage a qualified testing agency to perform preconstruction testing on each concrete mixture.

1. Include the following information in each test report:

a. Admixture dosage rates.
b. Slump.
c. Air content.
d. Seven-day compressive strength.
e. 28-day compressive strength.
f. Permeability.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Comply with ASTM C94/C94M and ACI 301.

1.8 FIELD CONDITIONS

A. Cold-Weather Placement: Comply with ACI 301 and ACI 306.1 and as follows.

1. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.
2. When average high and low temperature is expected to fall below 40 deg F for three successive days, maintain delivered concrete mixture temperature within the temperature range required by ACI 301.
3. Do not use frozen materials or materials containing ice or snow.
4. Do not place concrete in contact with surfaces less than 35 deg F, other than reinforcing steel.
5. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in mixture designs.

B. Hot-Weather Placement: Comply with ACI 301 and ACI 305.1, and as follows:

1. Maintain concrete temperature at time of discharge to not exceed 95 deg F.
2. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade uniformly moist without standing water, soft spots, or dry areas.

1.9 WARRANTY

A. Manufacturer's Warranty: Manufacturer agrees to furnish replacement sheet vapor retarder/termite barrier material and accessories for sheet vapor retarder/ termite barrier and accessories that do not comply with requirements or that fail to resist penetration by termites within specified warranty period.

1. Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 CONCRETE, GENERAL

A. ACI Publications: Comply with ACI 301 unless modified by requirements in the Contract Documents.

2.2 CONCRETE MATERIALS

A. Source Limitations:

1. Obtain all concrete mixtures from a single ready-mixed concrete manufacturer for entire Project.
2. Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant.
3. Obtain aggregate from single source.
4. Obtain each type of admixture from single source from single manufacturer.

B. Cementitious Materials:

1. Portland Cement: ASTM C150/C150M, Type I Type II,.
2. Fly Ash: ASTM C618, Class C or F.
3. Slag Cement: ASTM C989/C989M, Grade 100 or 120.

C. Normal-Weight Aggregates: ASTM C33/C33M, Class 3S coarse aggregate or better, graded. Provide aggregates from a single source.

1. Maximum Coarse-Aggregate Size: 3/4 inch nominal.
2. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.

D. Air-Entraining Admixture: ASTM C260/C260M.

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

1. Water-Reducing Admixture: ASTM C494/C494M, Type A.
2. Retarding Admixture: ASTM C494/C494M, Type B.
3. Water-Reducing and -Retarding Admixture: ASTM C494/C494M, Type D.
4. High-Range, Water-Reducing Admixture: ASTM C494/C494M, Type F.
5. High-Range, Water-Reducing and -Retarding Admixture: ASTM C494/C494M, Type G.
6. Plasticizing and Retarding Admixture: ASTM C1017/C1017M, Type II.
7. 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 C494/C494M, Type C.

8. 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.

2.3 VAPOR RETARDERS

A. Sheet Vapor Retarder, Class A: ASTM E1745, Class A; not less than 6 mils thick.

2.4 FLOOR AND SLAB TREATMENTS

A. Slip-Resistive Emery Aggregate Finish: Factory-graded, packaged, rustproof, nonglazing, abrasive, crushed emery aggregate containing not less than 50 percent aluminum oxide and not less than 20 percent ferric oxide; unaffected by freezing, moisture, and cleaning materials.

B. Slip-Resistive Aluminum Granule Finish: Factory-graded, packaged, rustproof, nonglazing, abrasive aggregate of not less than 95 percent fused aluminum-oxide granules.

2.5 LIQUID FLOOR TREATMENTS

A. Penetrating Liquid Floor Treatment: Clear, chemically reactive, waterborne solution of inorganic silicate or siliconate materials and proprietary components; odorless; that penetrates, hardens, and densifies concrete surfaces.

2.6 CURING MATERIALS

A. Clear, Solvent-Borne, Membrane-Forming, Curing and Sealing Compound: ASTM C1315, Type 1, Class A.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

    a. ChemMasters, Inc.
    b. Concrete Sealers USA.
    c. Kaufman Products, Inc.
    d. Approved Equivalent.

2.7 RELATED MATERIALS

A. Expansion- and Isolation-Joint-Filler Strips: ASTM D1751, asphalt-saturated cellulosic fiber.

B. Bonding Agent: ASTM C1059/C1059M, Type II, nonredispersible, acrylic emulsion or styrene butadiene.

C. Epoxy Bonding Adhesive: ASTM C881, two-component epoxy resin, capable of humid curing and bonding to damp surfaces, of class suitable for application temperature and of grade and class to suit requirements, and as follows:

1. Types I and II, nonload bearing Types IV and V, load bearing, for bonding hardened or freshly mixed concrete to hardened concrete.

2.8 REPAIR MATERIALS

A. Repair Underlayment: Cement-based, polymer-modified, self-leveling product that can be applied in thicknesses from 1/8 inch and that can be feathered at edges to match adjacent floor elevations.

1. Cement Binder: ASTM C150/C150M portland cement or hydraulic or blended hydraulic cement, as defined in ASTM C219.
2. Primer: Product of underlayment manufacturer recommended for substrate, conditions, and application.
3. Aggregate: Well-graded, washed gravel, 1/8 to 1/4 inch or coarse sand, as recommended by underlayment manufacturer.
4. Compressive Strength: Not less than 4100 psi at 28 days when tested in accordance with ASTM C109/C109M.

B. Repair Overlayment: Cement-based, polymer-modified, self-leveling product that can be applied in thicknesses from 1/4 inch and that can be filled in over a scarified surface to match adjacent floor elevations.

1. Cement Binder: ASTM C150/C150M portland cement or hydraulic or blended hydraulic cement, as defined in ASTM C219.
2. Primer: Product of topping manufacturer recommended for substrate, conditions, and application.
3. Aggregate: Well-graded, washed gravel, 1/8 to 1/4 inch or coarse sand as recommended by topping manufacturer.
4. Compressive Strength: Not less than 5000 psi at 28 days when tested in accordance with ASTM C109/C109M.

2.9 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, in accordance with ACI 301.

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

B. Cementitious Materials: Limit percentage, by weight, of cementitious materials other than portland cement in concrete as follows:

1. Fly Ash or Other Pozzolans: 25 percent by mass.
2. Slag Cement: 50 percent by mass.
3. Silica Fume: 10 percent by mass.
4. Total of Fly Ash or Other Pozzolans, Slag Cement, and Silica Fume: 50 percent by mass, with fly ash or pozzolans not exceeding 25 percent by mass and silica fume not exceeding 10 percent by mass.
5. Total of Fly Ash or Other Pozzolans and Silica Fume: 35 percent by mass with fly ash or pozzolans not exceeding 25 percent by mass and silica fume not exceeding 10 percent by mass.

C. Admixtures: Use admixtures in accordance with manufacturer's written instructions.

1. Use water-reducing high-range water-reducing or plasticizing admixture in concrete, as required, for placement and workability.
2. Use water-reducing and -retarding admixture when required by high temperatures, low humidity, or other adverse placement conditions.
3. Use corrosion-inhibiting admixture in concrete mixtures where indicated.
4. Use permeability-reducing admixture in concrete mixtures where indicated.

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

2.10 CONCRETE MIXTURES

A. Class A: Normal-weight concrete used for footings, grade beams, and tie beams.

1. Minimum Compressive Strength: 4000 psi at 28 days.
2. Maximum w/cm: .48
3. Slump Limit: 4 inches, plus or minus 1 inch.
4. Air Content:

    a. Exposure Class F1: 5.0 percent, plus or minus 1.5 percent at point of delivery for concrete containing 3/4-inch nominal maximum aggregate size.

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

B. Class B: Normal-weight concrete used for foundation walls.
1. Minimum Compressive Strength: 4000 psi at 28 days.
2. Maximum w/cm: 0.45.
3. Slump Limit: 4 inches, plus or minus 1 inch.
4. Air Content:

    a. Exposure Class F1: 5.0 percent, plus or minus 1.5 percent at point of delivery for concrete containing 3/4-inch nominal maximum aggregate size.

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

C. Class C: Normal-weight concrete used for interior slabs-on-ground.
1. Minimum Compressive Strength: 4000 psi at 28 days.
2. Maximum w/cm: 0.45.
3. Slump Limit: 4 inches, plus or minus 1 inch.
4. Air Content:

    a. Do not use an air-entraining admixture or allow total air content to exceed 3 percent for concrete used in trowel-finished floors.

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

2.11 CONCRETE MIXING

A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete in accordance with ASTM C94/C94M and ASTM C1116/C1116M, and furnish batch ticket information.

B. Project-Site Mixing: Measure, batch, and mix concrete materials and concrete in accordance with ASTM C94/C94M. Mix concrete materials in appropriate drum-type batch machine mixer.

1. For mixer capacity of 1 cu. yd. or smaller, continue mixing at least 1-1/2 minutes, but not more than five minutes after ingredients are in mixer, before any part of batch is released.
2. For mixer capacity larger than 1 cu. yd., increase mixing time by 15 seconds for each additional 1 cu. yd..
3. Provide batch ticket for each batch discharged and used in the Work, indicating Project identification name and number, date, mixture type, mixture time, quantity, and amount of water added. Record approximate location of final deposit in structure.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verification of Conditions:

1. Before placing concrete, verify that installation of concrete forms, accessories, and reinforcement, and embedded items is complete and that required inspections have been performed.
2. Do not proceed until unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Provide reasonable auxiliary services to accommodate field testing and inspections, acceptable to testing agency, including the following:

1. Daily access to the Work.
2. Incidental labor and facilities necessary to facilitate tests and inspections.
3. Secure space for storage, initial curing, and field curing of test samples, including source of water and continuous electrical power at Project site during site curing period for test samples.
4. Security and protection for test samples and for testing and inspection equipment at Project site.

3.3 TOLERANCES

A. Comply with ACI 117.

3.4 INSTALLATION OF EMBEDDED ITEMS

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.

1. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
2. Install anchor rods, accurately located, to elevations required and complying with tolerances in Section 7.5 of ANSI/AISC 303.
3. 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.

3.5 INSTALLATION OF VAPOR RETARDER

A. Sheet Vapor Retarders: Place, protect, and repair sheet vapor retarder in accordance with ASTM E1643 and manufacturer's written instructions.

1. Install vapor retarder with longest dimension parallel with direction of concrete pour.

2. Face laps away from exposed direction of concrete pour.
3. Lap vapor retarder over footings and grade beams not less than 6 inches, sealing vapor retarder to concrete.
4. Lap joints 6 inches and seal with manufacturer's recommended tape.
5. Terminate vapor retarder at the top of floor slabs, grade beams, and pile caps, sealing entire perimeter to floor slabs, grade beams, foundation walls, or pile caps.
6. Seal penetrations in accordance with vapor retarder manufacturer's instructions.
7. Protect vapor retarder during placement of reinforcement and concrete.

    a. Repair damaged areas by patching with vapor retarder material, overlapping damages area by 6 inches on all sides, and sealing to vapor retarder.

B. Bituminous Vapor Retarders: Place, protect, and repair bituminous vapor retarder in accordance with manufacturer's written instructions.

3.6 INSTALLATION OF CAST-IN-PLACE CONCRETE

A. Before placing concrete, verify that installation of formwork, reinforcement, embedded items, and vapor retarder is complete and that required inspections are completed.

1. Immediately prior to concrete placement, inspect vapor retarder for damage and deficient installation, and repair defective areas.
2. Provide continuous inspection of vapor retarder during concrete placement and make necessary repairs to damaged areas as Work progresses.

B. Notify Engineer and testing and inspection agencies 24 hours prior to commencement of concrete placement.

C. Water addition in transit or at the Project site must be in accordance with ASTM C94/C94M and must not exceed the permitted amount indicated on the concrete delivery ticket.

D. 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.

1. If a section cannot be placed continuously, provide construction joints as indicated.
2. Deposit concrete to avoid segregation.
3. Deposit concrete in horizontal layers of depth not to exceed formwork design pressures and in a manner to avoid inclined construction joints.
4. Consolidate placed concrete with mechanical vibrating equipment in accordance with ACI 301.

    a. Do not use vibrators to transport concrete inside forms.
    b. Insert and withdraw vibrators vertically at uniformly spaced locations to rapidly penetrate placed layer and at least 6 inches (150 mm) into preceding layer.
    c. Do not insert vibrators into lower layers of concrete that have begun to lose plasticity.
    d. 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.

E. 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. Do not place concrete floors and slabs in a checkerboard sequence.
2. Consolidate concrete during placement operations, so concrete is thoroughly worked around reinforcement and other embedded items and into corners.
3. Maintain reinforcement in position on chairs during concrete placement.
4. Screed slab surfaces with a straightedge and strike off to correct elevations.
5. Level concrete, cut high areas, and fill low areas.
6. Slope surfaces uniformly to drains where required.
7. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane, before excess bleedwater appears on the surface.
8. Do not further disturb slab surfaces before starting finishing operations.

3.7 JOINTS

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

B. Construction Joints: Coordinate with floor slab pattern and concrete placement sequence.

1. Install so strength and appearance of concrete are not impaired, at locations indicated on Drawings or as approved by Engineer.
2. Place joints perpendicular to main reinforcement.

    a. Continue reinforcement across construction joints unless otherwise indicated.
    b. Do not continue reinforcement through sides of strip placements of floors and slabs.

3. Form keyed joints as indicated. Embed keys at least 1-1/2 inches into concrete.
4. Locate joints for beams, slabs, joists, and girders at third points of spans. Offset joints in girders a minimum distance of twice the beam width from a beam-girder intersection.
5. Locate horizontal joints in walls and columns at underside of floors, slabs, beams, and girders and at the top of footings or floor slabs.
6. Space vertical joints in walls as indicated on Drawings. Unless otherwise indicated on Drawings, locate vertical joints beside piers integral with walls, near corners, and in concealed locations where possible.
7. Use a bonding agent at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.
8. Use epoxy-bonding adhesive at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.

C. Control Joints in Slabs-on-Ground: Form weakened-plane control joints, sectioning concrete into areas as indicated. Construct control joints for a depth equal to at least one-fourth of concrete thickness as follows:

1. Grooved Joints: Form control joints after initial floating by grooving and finishing each edge of joint to a radius of 1/8 inch. Repeat grooving of control joints after applying surface finishes. Eliminate groover tool marks on concrete surfaces.
2. Sawed Joints: Form control joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch-wide joints into concrete when cutting action

does not tear, abrade, or otherwise damage surface and before concrete develops random cracks.

D. Isolation Joints in Slabs-on-Ground: After removing formwork, install joint-filler strips at slab junctions with vertical surfaces, such as column pedestals, foundation walls, grade beams, and other locations, as indicated.

1. Extend joint-filler strips full width and depth of joint, terminating flush with finished concrete surface unless otherwise indicated on Drawings.
2. Terminate full-width joint-filler strips not less than 1/2 inch or more than 1 inch below finished concrete surface, where joint sealants, specified in Section 079200 "Joint Sealants," are indicated.
3. Install joint-filler strips in lengths as long as practicable. Where more than one length is required, lace or clip sections together.

E. Doweled Joints:

1. Install dowel bars and support assemblies at joints where indicated on Drawings.
2. Lubricate or asphalt coat one-half of dowel bar length to prevent concrete bonding to one side of joint.

F. Dowel Plates: Install dowel plates at joints where indicated on Drawings.

3.8 CONCRETE PLACEMENT

A. Before placing concrete, verify that installation of formwork, reinforcement, embedded items, and vapor retarder is complete and that required inspections are completed.

1. Immediately prior to concrete placement, inspect vapor retarder for damage and deficient installation, and repair defective areas.
2. Provide continuous inspection of vapor retarder during concrete placement and make necessary repairs to damaged areas as Work progresses.

B. Notify Engineer and testing and inspection agencies 24 hours prior to commencement of concrete placement.

C. Do not add water to concrete during delivery, at Project site, or during placement unless approved by Engineer in writing, but not to exceed the amount indicated on the concrete delivery ticket.

1. Do not add water to concrete after adding high-range water-reducing admixtures to mixture.

D. Before test sampling and placing concrete, water may be added at Project site, subject to limitations of ACI 301, but not to exceed the amount indicated on the concrete delivery ticket.

1. Do not add water to concrete after adding high-range water-reducing admixtures to mixture.

E. 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.

1. If a section cannot be placed continuously, provide construction joints as indicated.
2. Deposit concrete to avoid segregation.
3. Deposit concrete in horizontal layers of depth not to exceed formwork design pressures and in a manner to avoid inclined construction joints.
4. Consolidate placed concrete with mechanical vibrating equipment in accordance with ACI 301.

    a. Do not use vibrators to transport concrete inside forms.
    b. Insert and withdraw vibrators vertically at uniformly spaced locations to rapidly penetrate placed layer and at least 6 inches into preceding layer.
    c. Do not insert vibrators into lower layers of concrete that have begun to lose plasticity.
    d. 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.

F. 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. Do not place concrete floors and slabs in a checkerboard sequence.
2. Consolidate concrete during placement operations, so concrete is thoroughly worked around reinforcement and other embedded items and into corners.
3. Maintain reinforcement in position on chairs during concrete placement.
4. Screed slab surfaces with a straightedge and strike off to correct elevations.
5. Level concrete, cut high areas, and fill low areas.
6. Slope surfaces uniformly to drains where required.
7. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane, before excess bleedwater appears on the surface.
8. Do not further disturb slab surfaces before starting finishing operations.

3.9 FINISHING FORMED SURFACES

A. As-Cast Surface Finishes:

1. ACI 301 Surface Finish SF-1.0: As-cast concrete texture imparted by form-facing material.

    a. Patch voids larger than 1-1/2 inches wide or 1/2 inch deep.
    b. Remove projections larger than 1 inch.
    c. Tie holes do not require patching.
    d. Surface Tolerance: ACI 117 Class D.
    e. Apply to concrete surfaces not exposed to public view.

2. ACI 301 Surface Finish SF-2.0: As-cast concrete texture imparted by form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams.

    a. Patch voids larger than 3/4 inch wide or 1/2 inch deep.

b. Remove projections larger than 1/4 inch.
c. Patch tie holes.
d. Surface Tolerance: ACI 117 Class B.
e. Locations: Apply to concrete surfaces exposed to public view, to receive a rubbed finish.

3. ACI 301 Surface Finish SF-3.0:

a. Patch voids larger than 3/4 inch wide or 1/2 inch deep.
b. Remove projections larger than 1/8 inch.
c. Patch tie holes.
d. Surface Tolerance: ACI 117 Class A.
e. Locations: Apply to concrete surfaces exposed to public view, to receive a rubbed finish, or to be covered with a coating or covering material applied directly to concrete.

B. Rubbed Finish: Apply the following to as cast surface finishes wherever these type of surfaces are shown on the Drawings:

1. Smooth-Rubbed Finish:

a. Perform no later than one day after form removal.
b. Moisten concrete surfaces and rub with carborundum brick or another abrasive until producing a uniform color and texture.
c. If sufficient cement paste cannot be drawn from the concrete by the rubbing process, use a grout made from the same cementitious materials used in the in-place concrete.
d. Maintain required patterns or variances as shown on Drawings.

2. Grout-Cleaned Rubbed Finish:

a. Clean concrete surfaces after contiguous surfaces are completed and accessible.
b. Do not clean concrete surfaces as Work progresses.
c. Mix 1 part portland cement to 1-1/2 parts fine sand, complying with ASTM C144 or ASTM C404, by volume, with sufficient water to produce a mixture with the consistency of thick paint. Add white portland cement in amounts determined by trial patches, so color of dry grout matches adjacent surfaces.
d. Wet concrete surfaces.
e. Scrub grout into voids and remove excess grout. When grout whitens, rub surface with clean burlap, and keep surface damp by fog spray for at least 36 hours.
f. Maintain required patterns or variances as shown on Drawings.

C. Related Unformed Surfaces:

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

3.10 FINISHING FLOORS AND SLABS

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

B. Scratch Finish:

1. While still plastic, texture concrete surface that has been screeded and bull-floated or darbied.
2. Use stiff brushes, brooms, or rakes to produce a profile depth of 1/4 inch in one direction.
3. Apply scratch finish to surfaces to receive concrete floor toppings or to receive mortar setting beds for bonded cementitious floor finishes.

C. Float Finish:

1. When bleedwater sheen has disappeared and concrete surface has stiffened sufficiently to permit operation of specific float apparatus, consolidate concrete surface with power-driven floats or by hand floating if area is small or inaccessible to power-driven floats.
2. Repeat float passes and restraightening until surface is left with a uniform, smooth, granular texture and complies with ACI 117 tolerances for conventional concrete.
3. Apply float finish to surfaces to receive trowel finish and to be covered with fluid-applied or sheet waterproofing, built-up or membrane roofing, or sand-bed terrazzo.

D. Trowel Finish:

1. After applying float finish, apply first troweling and consolidate concrete by hand or power-driven trowel.
2. Continue troweling passes and restraighten until surface is free of trowel marks and uniform in texture and appearance.
3. Grind smooth any surface defects that would telegraph through applied coatings or floor coverings.
4. Do not add water to concrete surface.
5. Do not apply hard-troweled finish to concrete, which has a total air content greater than 3 percent.
6. Apply a trowel finish to surfaces exposed to view or to be covered with resilient flooring, carpet, ceramic or quarry tile set over a cleavage membrane, paint, or another thin-film-finish coating system.
7. Finish surfaces to the following tolerances, in accordance with ASTM E1155, for a randomly trafficked floor surface:

    a. Slabs on Ground:

        1) Finish and measure surface so gap at any point between concrete surface and an unleveled, freestanding, 10-ft.- long straightedge resting on two high spots and placed anywhere on the surface does not exceed 1/8 inch and also no more than 1/16 inch in 2 feet.
        2) Specified overall values of flatness, F_F 25; and of levelness, F_L 20; with minimum local values of flatness, F_F 17; and of levelness, F_L 15.
        3) Specified overall values of flatness, F_F 35; and of levelness, F_L 25; with minimum local values of flatness, F_F 24; and of levelness, F_L 17.

4) Specified overall values of flatness, F_F 45; and of levelness, F_L 35; with minimum local values of flatness, F_F 30; and of levelness, F_L 24.
5) Specified overall values of flatness, F_F 50; and of levelness, F_L 25; with minimum local values of flatness, F_F 40; and of levelness, F_L 17.

b. Suspended Slabs:

1) Finish and measure surface so gap at any point between concrete surface and an unleveled, freestanding, 10-ft.- long straightedge resting on two high spots and placed anywhere on the surface does not exceed 1/8 inch.
2) Specified overall values of flatness, F_F 25; and of levelness, F_L 20; with minimum local values of flatness, F_F 17; and of levelness, F_L 15.
3) Specified overall values of flatness, F_F 35; and of levelness, F_L 20; with minimum local values of flatness, F_F 24; and of levelness, F_L 15.
4) Specified overall values of flatness, F_F 45; and of levelness, F_L 35; with minimum local values of flatness, F_F 30; and of levelness, F_L 24.

E. Trowel and Fine-Broom Finish: Apply a first trowel finish to surfaces indicated on Drawings and/or where ceramic or quarry tile is to be installed by either thickset or thin set method. While concrete is still plastic, slightly scarify surface with a fine broom perpendicular to main traffic route.

1. Coordinate required final finish with Engineer before application.
2. Comply with flatness and levelness tolerances for trowel-finished floor surfaces.

F. Broom Finish: Apply a broom finish to exterior concrete platforms, steps, ramps, and locations indicated on Drawings.

1. Immediately after float finishing, slightly roughen trafficked surface by brooming with fiber-bristle broom perpendicular to main traffic route.
2. Coordinate required final finish with Engineer before application.

G. Slip-Resistive Finish: Before final floating, apply slip-resistive aggregate finish to concrete stair treads, platforms, ramps as indicated on Drawings

1. Apply in accordance with manufacturer's written instructions and as follows:

a. Uniformly spread 25 lb/100 sq. ft. of dampened slip-resistive aggregate over surface in one or two applications.
b. Tamp aggregate flush with surface, but do not force below surface.
c. After broadcasting and tamping, apply float finish.
d. After curing, lightly work surface with a steel wire brush or an abrasive stone and water to expose slip-resistive aggregate.

H. Dry-Shake Floor Hardener Finish: After initial floating, apply dry-shake floor hardener to surfaces in accordance with manufacturer's written instructions and as follows:

1. Uniformly apply dry-shake floor hardener at a rate of 100 lb/100 sq. ft. unless greater amount is recommended by manufacturer.
2. Uniformly distribute approximately two-thirds of dry-shake floor hardener over surface by hand or with mechanical spreader, and embed by power floating.

3. Follow power floating with a second dry-shake floor hardener application, uniformly distributing remainder of material, and embed by power floating.
4. After final floating, apply a trowel finish.
5. Cure concrete with curing compound recommended by dry-shake floor hardener manufacturer and apply immediately after final finishing.

3.11 INSTALLATION OF MISCELLANEOUS CONCRETE ITEMS

A. Filling In:

1. Fill in holes and openings left in concrete structures after Work of other trades is in place unless otherwise indicated.
2. Mix, place, and cure concrete, as specified, to blend with in-place construction.
3. Provide other miscellaneous concrete filling indicated or required to complete the Work.

B. Curbs: Provide monolithic finish to interior curbs by stripping forms while concrete is still green and by steel-troweling surfaces to a hard, dense finish with corners, intersections, and terminations slightly rounded.

C. Equipment Bases and Foundations:

1. Coordinate sizes and locations of concrete bases with actual equipment provided.
2. Construct concrete bases 4 inches high unless otherwise indicated on Drawings, and extend base not less than 6 inches in each direction beyond the maximum dimensions of supported equipment unless otherwise indicated on Drawings, or unless required for seismic anchor support.
3. Minimum Compressive Strength: 4000 psi at 28 days.
4. Install dowel rods to connect concrete base to concrete floor. Unless otherwise indicated, install dowel rods on 18-inch centers around the full perimeter of concrete base.
5. For supported equipment, install epoxy-coated anchor bolts that extend through concrete base and anchor into structural concrete substrate.
6. Prior to pouring concrete, place and secure anchorage devices.

    a. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
    b. Cast anchor-bolt insert into bases.
    c. Install anchor bolts to elevations required for proper attachment to supported equipment.

D. Steel Pan Stairs: Provide concrete fill for steel pan stair treads, landings, and associated items.

1. Cast-in inserts and accessories, as shown on Drawings.
2. Screed, tamp, and trowel finish concrete surfaces.

3.12 CONCRETE CURING

A. Protect freshly placed concrete from premature drying and excessive cold or hot temperatures.

1. Comply with ACI 301 and ACI 306.1 for cold weather protection during curing.

2. Comply with ACI 301 and ACI 305.1 for hot-weather protection during curing.
3. Maintain moisture loss no more than 0.2 lb/sq. ft. x h, calculated in accordance with ACI 305.1, before and during finishing operations.

B. Curing Formed Surfaces: Comply with ACI 308.1 as follows:

1. Cure formed concrete surfaces, including underside of beams, supported slabs, and other similar surfaces.
2. Cure concrete containing color pigments in accordance with color pigment manufacturer's instructions.
3. If forms remain during curing period, moist cure after loosening forms.
4. If removing forms before end of curing period, continue curing for remainder of curing period, as follows:

    a. Continuous Fogging: Maintain standing water on concrete surface until final setting of concrete.
    b. Continuous Sprinkling: Maintain concrete surface continuously wet.
    c. Absorptive Cover: Pre-dampen absorptive material before application; apply additional water to absorptive material to maintain concrete surface continuously wet.
    d. Water-Retention Sheeting Materials: Cover exposed concrete surfaces with sheeting material, taping, or lapping seams.
    e. Membrane-Forming Curing Compound: Apply uniformly in continuous operation by power spray or roller in accordance with manufacturer's written instructions.

        1) Recoat areas subject to heavy rainfall within three hours after initial application.
        2) Maintain continuity of coating and repair damage during curing period.

C. Curing Unformed Surfaces: Comply with ACI 308.1 as follows:

1. Begin curing immediately after finishing concrete.
2. Interior Concrete Floors:

    a. Floors to Receive Floor Coverings Specified in Other Sections: Contractor has option of the following:

        1) Absorptive Cover: As soon as concrete has sufficient set to permit application without marring concrete surface, install prewetted absorptive cover over entire area of floor.

            a) Lap edges and ends of absorptive cover not less than 12 inches.
            b) Maintain absorptive cover water saturated, and in place, for duration of curing period, but not less than seven days.

        2) Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches, and sealed by waterproof tape or adhesive.

a) Immediately repair any holes or tears during curing period, using cover material and waterproof tape.
b) Cure for not less than seven days.

3) Ponding or Continuous Sprinkling of Water: Maintain concrete surfaces continuously wet for not less than seven days, utilizing one, or a combination of, the following:

a) Water.
b) Continuous water-fog spray.

b. Floors to Receive Penetrating Liquid Floor Treatments: Contractor has option of the following:

1) Absorptive Cover: As soon as concrete has sufficient set to permit application without marring concrete surface, install prewetted absorptive cover over entire area of floor.

a) Lap edges and ends of absorptive cover not less than 12 inches.
b) Maintain absorptive cover water saturated, and in place, for duration of curing period, but not less than seven days.

2) Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches, and sealed by waterproof tape or adhesive.

a) Immediately repair any holes or tears during curing period, using cover material and waterproof tape.
b) Cure for not less than seven days.

3) Ponding or Continuous Sprinkling of Water: Maintain concrete surfaces continuously wet for not less than seven days, utilizing one, or a combination of, the following:

a) Water.
b) Continuous water-fog spray.

c. Floors to Receive Polished Finish: Contractor has option of the following:

1) Absorptive Cover: As soon as concrete has sufficient set to permit application without marring concrete surface, install prewetted absorptive cover over entire area of floor.

a) Lap edges and ends of absorptive cover not less than 12 inches.
b) Maintain absorptive cover water saturated, and in place, for duration of curing period, but not less than seven days.

2) Ponding or Continuous Sprinkling of Water: Maintain concrete surfaces continuously wet for not less than seven days, utilizing one, or a combination of, the following:

a) Water.
b) Continuous water-fog spray.

d. Floors to Receive Chemical Stain:

1) As soon as concrete has sufficient set to permit application without marring concrete surface, install curing paper over entire area of floor.
2) Install curing paper square to building lines, without wrinkles, and in a single length without end joints.
3) Butt sides of curing paper tight; do not overlap sides of curing paper.
4) Leave curing paper in place for duration of curing period, but not less than 28 days.

e. Floors to Receive Urethane Flooring:

1) As soon as concrete has sufficient set to permit application without marring concrete surface, install prewetted absorptive cover over entire area of floor.
2) Rewet absorptive cover, and cover immediately with polyethylene moisture-retaining cover with edges lapped 6 inches and sealed in place.
3) Secure polyethylene moisture-retaining cover in place to prohibit air from circulating under polyethylene moisture-retaining cover.
4) Leave absorptive cover and polyethylene moisture-retaining cover in place for duration of curing period, but not less than 28 days.

f. Floors to Receive Curing Compound:

1) Apply uniformly in continuous operation by power spray or roller in accordance with manufacturer's written instructions.
2) Recoat areas subjected to heavy rainfall within three hours after initial application.
3) Maintain continuity of coating, and repair damage during curing period.
4) 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.

g. Floors to Receive Curing and Sealing Compound:

1) Apply uniformly to floors and slabs indicated in a continuous operation by power spray or roller in accordance with manufacturer's written instructions.
2) Recoat areas subjected to heavy rainfall within three hours after initial application.
3) Repeat process 24 hours later, and apply a second coat. Maintain continuity of coating, and repair damage during curing period.

3.13 APPLICATION OF LIQUID FLOOR TREATMENTS

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

1. Remove curing compounds, sealers, oil, dirt, laitance, and other contaminants and complete surface repairs.
2. Apply liquid until surface is saturated, scrubbing into surface until a gel forms; rewet; and repeat brooming or scrubbing.
3. Rinse with water; remove excess material until surface is dry.
4. Apply a 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 in accordance with manufacturer's written instructions.

3.14 JOINT FILLING

A. Prepare, clean, and install joint filler in accordance with manufacturer's written instructions.
1. 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 deep in formed joints.

D. Overfill joint, and trim joint filler flush with top of joint after hardening.

3.15 CONCRETE SURFACE REPAIRS

A. Defective Concrete:

1. Repair and patch defective areas when approved by Engineer.
2. Remove and replace concrete that cannot be repaired and patched to Engineer'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 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 in any dimension to solid concrete.

a. Limit cut depth to 3/4 inch.
b. Make edges of cuts perpendicular to concrete surface.
c. Clean, dampen with water, and brush-coat holes and voids with bonding agent.
d. Fill and compact with patching mortar before bonding agent has dried.
e. 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 portland cement and standard portland cement, so that, when dry, patching mortar matches surrounding color.

a. Patch a test area at inconspicuous locations to verify mixture and color match before proceeding with patching.
b. Compact mortar in place and strike off slightly higher than surrounding surface.

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

D. Repairing Unformed Surfaces:

1. Test unformed surfaces, such as floors and slabs, for finish, and verify surface tolerances specified for each surface.

a. Correct low and high areas.
b. Test surfaces sloped to drain for trueness of slope and smoothness; use a sloped template.

2. Repair finished surfaces containing surface defects, including spalls, popouts, honeycombs, rock pockets, crazing, and cracks in excess of 0.01 inch wide or that penetrate to reinforcement or completely through unreinforced sections regardless of width, and other objectionable conditions.
3. After concrete has cured at least 14 days, correct high areas by grinding.
4. Correct localized low areas during, or immediately after, completing surface-finishing operations by cutting out low areas and replacing with patching mortar.

a. Finish repaired areas to blend into adjacent concrete.

5. Correct other low areas scheduled to receive floor coverings with a repair underlayment.

a. Prepare, mix, and apply repair underlayment and primer in accordance with manufacturer's written instructions to produce a smooth, uniform, plane, and level surface.
b. Feather edges to match adjacent floor elevations.

6. Correct other low areas scheduled to remain exposed with repair topping.

a. Cut out low areas to ensure a minimum repair topping depth of 1/4 inch to match adjacent floor elevations.
b. Prepare, mix, and apply repair topping and primer in accordance with manufacturer's written instructions to produce a smooth, uniform, plane, and level surface.

7. Repair defective areas, except random cracks and single holes 1 inch or less in diameter, by cutting out and replacing with fresh concrete.

a. Remove defective areas with clean, square cuts, and expose steel reinforcement with at least a 3/4-inch clearance all around.
b. Dampen concrete surfaces in contact with patching concrete and apply bonding agent.
c. Mix patching concrete of same materials and mixture as original concrete, except without coarse aggregate.
d. Place, compact, and finish to blend with adjacent finished concrete.

e. Cure in same manner as adjacent concrete.

8. Repair random cracks and single holes 1 inch or less in diameter with patching mortar.

a. Groove top of cracks and cut out holes to sound concrete, and clean off dust, dirt, and loose particles.
b. Dampen cleaned concrete surfaces and apply bonding agent.
c. Place patching mortar before bonding agent has dried.
d. Compact patching mortar and finish to match adjacent concrete.
e. Keep patched area continuously moist for at least 72 hours.

E. Perform structural repairs of concrete, subject to Engineer's approval, using epoxy adhesive and patching mortar.

F. Repair materials and installation not specified above may be used, subject to Engineer's approval.

3.16 FIELD QUALITY CONTROL

A. Testing Agency: Engage a qualified testing and inspecting agency to sample materials, perform tests, and submit test reports during concrete placement according to requirements specified in this Article. The scheduling and costs for all testing shall be the responsibility of the contractor.
1. Testing agency to be responsible for providing curing container for composite samples on Site and verifying that field-cured composite samples are cured in accordance with ASTM C31/C31M.
2. Testing agency to immediately report to Engineer, Contractor, and concrete manufacturer any failure of Work to comply with Contract Documents.
3. Testing agency to report results of tests and inspections, in writing, to Owner, Engineer, Contractor, and concrete manufacturer within 48 hours of inspections and tests.

a. Test reports to include reporting requirements of ASTM C31/C31M, ASTM C39/C39M, and ACI 301, including the following as applicable to each test and inspection:

1) Project name.
2) Name of testing agency.
3) Names and certification numbers of field and laboratory technicians performing inspections and testing.
4) Name of concrete manufacturer.
5) Date and time of inspection, sampling, and field testing.
6) Date and time of concrete placement.
7) Location in Work of concrete represented by samples.
8) Date and time sample was obtained.
9) Truck and batch ticket numbers.
10) Design compressive strength at 28 days.
11) Concrete mixture designation, proportions, and materials.
12) Field test results.
13) Information on storage and curing of samples before testing, including curing method and maximum and minimum temperatures during initial curing period.

14) Type of fracture and compressive break strengths at seven days and 28 days.

B. Batch Tickets: For each load delivered, submit three copies of batch delivery ticket to testing agency, indicating quantity, mix identification, admixtures, design strength, aggregate size, design air content, design slump at time of batching, and amount of water that can be added at Project site.

C. Inspections:

1. Headed bolts and studs.
2. Verification of use of required design mixture.
3. Concrete placement, including conveying and depositing.
4. Curing procedures and maintenance of curing temperature.
5. 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 in accordance with ASTM C 172/C 172M to be performed in accordance with the following requirements:

1. Testing Frequency: Obtain one composite sample for each day's pour of each concrete mixture exceeding 5 cu. yd., but less than 25 cu. yd., plus one set for each additional 50 cu. yd. or fraction thereof.

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

2. Slump: ASTM C143/C143M:

    a. 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.
    b. Perform additional tests when concrete consistency appears to change.

3. Slump Flow: ASTM C1611/C1611M:

    a. 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.
    b. Perform additional tests when concrete consistency appears to change.

4. Air Content: ASTM C231/C231M pressure method, for normal-weight concrete;

    a. 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 C1064/C1064M:

    a. One test hourly when air temperature is 40 deg F and below or 80 deg F and above, and one test for each composite sample.

6. Unit Weight: ASTM C567/C567M fresh unit weight of structural lightweight concrete.

a. 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 C31/C31M:

   a. Cast and laboratory cure two sets of two 6-inch by 12-inch or 4-inch by 8-inch cylinder specimens for each composite sample.
   b. Cast, initial cure, and field cure two sets of three standard cylinder specimens for each composite sample.

8. Compressive-Strength Tests: ASTM C39/C39M.

   a. Test one set of two laboratory-cured specimens at seven days and one set of two specimens at 28 days.
   b. Test one set of two field-cured specimens at seven days and one set of two specimens at 28 days.
   c. A compressive-strength test to 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 to 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 if specified compressive strength is 5000 psi, or no compressive strength test value is less than 10 percent of specified compressive strength if specified compressive strength is greater than 5000 psi.
11. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by Engineer but will not be used as sole basis for approval or rejection of concrete.
12. Additional Tests:

    a. Testing and inspecting agency to 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 Engineer.
    b. Testing and inspecting agency may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C42/C42M or by other methods as directed by Engineer.

       1) Acceptance criteria for concrete strength to be in accordance with ACI 301, Section 1.6.6.3.

13. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
14. 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 in accordance with ASTM E1155 within 48 hours of completion of floor finishing and promptly report test results to Engineer.

3.17 PROTECTION

A. Protect concrete surfaces as follows:

1. Protect from petroleum stains.
2. Diaper hydraulic equipment used over concrete surfaces.
3. Prohibit vehicles from interior concrete slabs.
4. Prohibit use of pipe-cutting machinery over concrete surfaces.
5. Prohibit placement of steel items on concrete surfaces.
6. Prohibit use of acids or acidic detergents over concrete surfaces.
7. 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.
8. Protect concrete surfaces scheduled to receive surface hardener or polished concrete finish using Floor Slab Protective Covering.

PART 4 - MEASUREMENT, QUANTITY & PAYMENT

Cost for work specified in this section shall be paid for under the bid form line items for which they are a part. Costs shall include all excavation, shoring, formwork, finishes, steel reinforcement, reinforcement accessories, concrete materials, admixtures, water stops, vapor barriers, treatments, curing materials, joint fillers, bonding agents, adhesives, repair materials, testing, and all related appurtenances as required per the contract documents.

END OF SECTION 033000

SECTION 033020

BONDING AGENTS FOR CONCRETE

PART 1 - GENERAL

1.01 SUMMARY

A. This specification describes the use of a bonding bridge between new portland-cement mortar or concrete and hardened portland-cement mortar or concrete.

1.02 QUALITY ASSURANCE

A. Manufacturing qualifications: The manufacturer of the specified product shall be ISO 9001 certified and have in existence a recognized ongoing quality assurance program independently audited on a regular basis.

B. Contractor qualifications: Contractor shall be qualified in the field of concrete repair and protection with a successful track record of 5 years or more. Contractor shall maintain qualified personnel who have received product training by a manufacturer's representative.

C. Install materials in accordance with all safety and weather conditions required by manufacturer, or as modified by applicable rules and regulations of local, state and federal authorities having jurisdiction. Consult Material Safety Data Sheets for complete handling recommendations.

1.03 DELIVERY, STORAGE, AND HANDLING

A. All materials must be delivered in original, unopened containers with the manufacturer's name, labels, product identification, and batch numbers. Damaged material must be removed from the site immediately.

B. Store all materials off the ground and protect from rain, freezing or excessive heat until ready for use.

C. Condition the specified product as recommended by the manufacturer.

1.04 JOB CONDITIONS

A. Environmental Conditions: Do not apply material if it is raining or snowing or if such conditions appear to be imminent. Minimum application temperature 40ºF (5ºC) and rising.

B. Protection: Precautions should be taken to avoid damage to any surface near the work zone due to mixing and handling of the specified coating.

1.05 SUBMITTALS

A. Submit six (6) copies of manufacturer's literature, to include: Product Data Sheets, and appropriate Material Safety Data Sheets (MSDS).

1.06 WARRANTY

A. Provide a written warranty from the manufacturer against defects of materials for a period of one (1) year, beginning with date of substantial completion of the project.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Sika Corporation, (Basis of Design)

B. Approved Equal.

2.02 MATERIALS

A. Epoxy resin/portland cement adhesive shall be Sika Armatec 110 EpoCem
   1. Component "A" shall be an epoxy resin/water emulsion containing suitable viscosity control agents. It shall not contain butyl glycidyl ether.
   2. Component "B" shall be primarily a water solution of a polyamine.
   3. Component "C" shall be a blend of selected portland cements and sands.
   4. The material shall not contain asbestos.

2.03 PERFORMANCE CRITERIA

A. Properties of the mixed epoxy resin/portland cement adhesive.
   1. Pot Life: 90 minutes @ 73° F
   2. Contact Time: 95ºF (35ºC) 6 hours
      80-95F (26-35C) 6 Hours
      65-79F (18-26C) 12 Hours
      50-64F (10-17C) 16 Hours
      40-49F (4-9C) wet on wet
   3. Color: dark gray

B. Properties of the cured epoxy resin/portland cement adhesive.
   1. Compressive Strength (ASTM C-109)
      a 3 day: 4500 psi (31.0 MPa)
      b. 7 day: 6500 psi (44.8 MPa)
      c. 28 day: 8500 psi (58.6 MPa)
   2. Splitting Tensile Strength (ASTM C-496)
      a. 28 days: 600 psi (4.1 MPa)
   3. Flexural Strength (ASTM C-348)
      a. 1250 psi (8.6 MPa)
   4. Bond Strength ASTM C-882 at 14 days
      a. Wet on Wet, 0-hr. open time: 2800 psi (19.3 MPa)
      b. 24-hr. open time: 2600 psi (17.9 MPa)
   5. Bond of Steel Reinforcement to Concrete (Pullout Test)
      a. Sika Armatec 110 coated 625-psi (4.3 MPa)
      b. Epoxy coated 508 psi (3.5 MPa)
      c. Plain Reinforcement 573 psi (3.95 MPa)
   6. The epoxy resin/portland cement adhesive shall not produce a vapor barrier.
   7. Material must be proven to prevent corrosion of reinforcing steel when tested under the procedures as set forth by the Federal Highway Administration Program Report No. FHWA/RD86/193. Proof shall be in the form of an independent testing laboratory corrosion report showing prevention of corrosion of the reinforcing steel.

PART 3 - EXECUTION

3.01 MIXING AND APPLICATION

A. Mixing the epoxy resin: Shake contents of Components “A” and Component “B”. Completely empty both components into a clean, dry mixing pail. Mix thoroughly for 30 seconds using a jiffy paddle with a low-speed (400-600 rpm) drill. Slowly add the entire contents of Component “C” while continuing to mix for 3 minutes until uniform with no lumps. Mix only that quantity that can be applied within its pot life.

B. Placement procedure:

1. Apply to prepared surface with a stiff-bristle brush, broom or “hopper type” spray equipment.

    a. For hand-applied mortars - Place fresh, plastic concrete/mortar while the bonding bridge adhesive is “wet” or within open times indicated in section 2.03.A.2.
    b. For machine-applied mortars - Apply while the bonding bridge adhesive is “wet” or within the open times indicated in section 2.03.A.2.

C. Adhere to all limitations and cautions for the epoxy resin/portland cement adhesive in the manufacturers current printed literature.

3.02 CLEANING

A. The uncured epoxy resin/portland cement adhesive can be cleaned from tools with water. The cured epoxy resin/portland cement adhesive can only be removed mechanically.

B. Leave finished work and work area in a neat, clean condition without evidence of spillovers onto adjacent areas.

END OF SECTION

SECTION 034100

PRECAST HOLLOW CORE SLABS

PART 1 – GENERAL

1.1 DESCRIPTION

A. Work included:

1. These specifications cover manufacture, transportation and erection of precast, prestressed concrete hollow core slabs, including grouting of joints between adjacent lab units.

2. Related work specified elsewhere:

   Cast-in place concrete: Section 033000

1.2 QUALITY ASSURANCE

A. The precast concrete manufacturing plant shall be certified by the Prestressed Concrete Institute, Plant Certification Program prior to the start of production.

B. Fabricator qualifications:
   1. Firms which have ten (10) years successful experience in fabrication of precast concrete units similar to units required for this project will be acceptable. Fabricator must have sufficient "in-door" production capacity to produce required units without causing delay in work.
   2. Slabs shall be prestressed, hollow core, machine cast in an enclosed factory with closely controlled mixing, casting and curing conditions. Slab shall be manufactured in nominal widths of eight (8'-0") feet, with special width filler slabs, as required.
   3. Manufacturer shall be listed in U.L. Fire Resistance Directory.

C. Erector qualifications:
   1. Regularly engaged for at least five (5) years in the erection of precast structural concrete similar to the requirement of this project.

D. Welder qualifications:
   1. In accordance with AWS D1.1.

E. Testing:
   1. In general, compliance with applicable provisions of Prestressed Concrete Institute MNL-116, “Manual for Quality Control for Plants and Production of Precast and Prestressed Concrete Products”.

F. Requirements of regulatory agencies:

All local codes, plus the following specifications, standards and codes are a part of these specifications:

1. ACI 318 Building Code Requirements for Reinforced Concrete.
2. AWS D1.1 Structural Welding Code - Steel.
3. AWS D1.4 Structural Welding Code - Reinforcing Steel.
4. ASTM Specifications As referred to in Part 2, PRODUCTS, of this specification.
5. Prestressed Concrete Institute MNL-116, "Manual for Quality Control for Plants and Production of Precast and Prestressed Concrete Products".

1.3 SUBMITTALS

A. Product data:

Submit manufacturer's specifications and instructions for manufactured materials and products. Include manufacturer's certifications and PCI Quality Control Program test reports as required.

B. Shop drawings:

Submit shop drawings showing complete information for fabrication and installation of precast concrete units. Indicate member dimensions and cross-section, location, size and any type of reinforcement, including special reinforcement and lifting devices necessary for handling and erection.

1. Indicate layout, dimensions and identification of each precast unit corresponding to sequence and procedure of installation. Indicate welded connections by AWS standard symbols. Detail inserts, connections and joints, including accessories and construction at openings in precast units.
2. Provide location and details of anchorage devices that are to be embedded in other construction.

PART 2 PRODUCTS

2.1 MATERIALS

A. Portland cement: ASTM C150, Type I

B. Admixtures:
   1. Air-entraining admixtures: ASTM C260
   2. Water reducing, retarding, accelerating, high range water reducing admixtures: ASTM C494

C. Aggregates: ASTM C33

D. Water: Potable or free from foreign materials in amounts harmful to concrete and embedded steel.

E. Reinforcing steel:
   1. Bars:
      Deformed billet-steel: ASTM A615

   2. Wire:
      Cold-drawn steel: ASTM A82

F. Prestressing strand:
   Uncoated, 7-wire strand: ASTM A416 (including supplement), Grade 270K

G. Welding studs:
   In accordance with: AWS D1.1.

H. Structural steel plates and shapes: ASTM A36

I. Cement grout:

   Portland cement, ASTM C150, Type I, and clean, natural sand, ASTM C404. Mix at ratio of 1.0 part cement to 3.0 parts sand, by volume, with water required for placement and hydration.

J. Bearing strips:
   1. Tempered hardboard
   2. Plastic:

   Multi-monomer plastic strips shall be non-leaching and support construction loads with no visible overall expansion.

K. Ceiling caulk:

   Latex type equivalent to Picora AC20 or equal.

L. Feathering material:

   Consisting of fine sand, cement, gypsolite (or equal) mixed with water, latex additive, per manufacturer's recommendation.

2.2 CONCRETE MIXES

A. Twenty-eight (28) day compressive strength: Minimum of 5000 PSI

B. Release strength: Minimum of 3000 PSI

C. Admixtures:

   1. Use air-entraining admixture in concrete, as required.
   2. Use water-reducing admixtures in strict compliance with manufacturer's directions. Use amounts as recommended by admixture manufacturer for climatic conditions prevailing at time of placing. Adjust quantities of admixture as required to maintain quality control.

D. Use of calcium chloride, chloride ions, or other salts are not permitted.

2.3 MANUFACTURE

A. Manufacturing procedures shall be in general compliance with PCI MNL-116.

B. Manufacturing tolerances shall comply with PCI MNL-116 for structural hollow core products.

C. Manufacturer shall plant cast rough openings with a minimum dimension of ten (10") inches in any direction. Openings to be rectangular or square only.

D. Patching: Will be acceptable providing the structural adequacy of the hollow core unit is not impaired.

E. Clean reinforcement of loose rust and mill scale, earth and other materials which reduce or destroy bond with concrete.

F. Accurately position, support and secure reinforcement against displacement by form work, construction, or concrete placement operations. Locate and support reinforcing by metal chairs, runners, bolsters, spacers and hangers, as required.

G. Pretensioning of tendons for prestressed concrete may be accomplished either by single strand tensioning method or multiple-strand tensioning method. Comply with PCI MNL-116 requirements.

H. Plant cast inserts and weld plates shall be monolithically cast in the manufacturing operation.

PART 3 - EXECUTION

3.1 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Delivery and handling:

1. Hollow core slab units shall be lifted and supported during manufacturing, stockpiling, transporting and erection operations only at the lifting or supporting point, or both, as shown on the shop drawings, and with approved lifting devices.
2. Transportation, site handling and erection shall be performed with acceptable equipment and methods, and by qualified personnel.

B. Storage:

1. Store all units off ground.
2. Place stored units so that identification marks are discernible.
3. Separate stacked members by battens across full width of each slab unit.
4. Stack so that lifting devices are accessible and undamaged.

3.2 ERECTION

A. Site access:

The General Contractor shall be responsible for providing suitable access to the building, proper drainage and firm level bearing for the hauling and erection equipment to operate under their own power.

B. Preparation:

The general contractor shall be responsible for:

1. Providing true, level bearing surfaces on all field placed bearing walls and other field placed supporting members.

2. All pipes, stacks, conduits and other such items shall be stubbed off at a level lower than the bearing plane of the prestressed concrete products until after the latter are set.

C. Installation:

Installation of hollow core slab units shall be performed by the manufacturer or a competent erector. Members shall be lifted by means of suitable lifting devices at points provided by the manufacturer. Bearing strips shall be set, where required. Temporary shoring and bracing, if necessary, shall comply with manufacturer's recommendations. Grout keys shall be filled.

D. Furnish and install grout fill at butt ends, ends and sides of hollow core slabs for the depth of the slabs only.

E. Alignment:

Members shall be properly aligned and leveled as required by the approved shop drawings. Variations between adjacent members shall be reasonable leveled out by jacking, loading, or any other feasible method as recommended by the manufacturer.

Any misalignment of joints will be feathered with the feathering material.

F. The underside of hollow core slabs shall be manufactured with a finished surface in accordance with the PCI Guide Specification for Precast Prestressed Concrete (PCI Design Handbook, Section 10-8, Paragraph 2.03-C-1).

3.3 FIELD WELDING

Field welding is to be done by certified welders using equipment and materials compatible to the base material.

3.4 ATTACHMENTS

Subject to approval of the Architect/Engineer, hollow core slab units may be drilled or "shot" provided no contact is made with the prestressing steel. Should spalling occur, it shall be repaired by the trade doing the drilling or the shooting.

END OF SECTION

SECTION 037300

CONCRETE REHABILITATION

PART 1 – GENERAL

1.01 SUMMARY

A. This specification describes the patching or overlay of interior and/or exterior horizontal surfaces with a polymer modified, portland cement mortar/concrete.

1.02 QUALITY ASSURANCE

A. Manufacturing qualifications: The manufacturer of the specified product shall be ISO 9001 certified and have in existence a recognized ongoing quality assurance program independently audited on a regular basis.

B. Contractor qualifications: Contractor shall be qualified in the field of concrete repair and protection with a successful track record of 5 years or more. Contractor shall maintain qualified personnel who have received product training by a manufacturer's representative

C. Install materials in accordance with all safety and weather conditions required by manufacturer or as modified by applicable rules and regulations of local, state and federal authorities having jurisdiction. Consult Material Safety Data Sheets for complete handling recommendations.

1.03 DELIVERY, STORAGE, AND HANDLING

A. All materials must be delivered in original, unopened containers with the manufacturer’s name, labels, product identification, and batch numbers. Damaged material must be removed from the site immediately.

B. Store all materials off the ground and protect from rain, freezing or excessive heat until ready for use.

C. Condition the specified product as recommended by the manufacturer.

1.04 JOB CONDITIONS

A. Environmental Conditions: Do not apply material if it is raining or snowing or if such conditions appear to be imminent. Minimum application temperature 45ºF (7ºC) and rising.

B. Protection: Precautions should be taken to avoid damage to any surface near the work zone due to mixing and handling of the specified material.

1.05 SUBMITTALS

A. Submit six (6) copies of manufacturer’s literature, to include: Product Data Sheets, and appropriate Material Safety Data Sheets (MSDS).

1.06 WARRANTY

A. Provide a written warranty from the manufacturer against defects of materials for a period of one (1) year, beginning with date of substantial completion of the project.

PART 2 - PRODUCTS

2.01 MANUFACTURER

A. Sika Corporation, (Basis of Design)

B. Approved Equal.

2.02 MATERIALS

A. SikaTop 122 Plus Polymer-modified Portland cement mortar:

1. Component A shall be a liquid polymer emulsion of an acrylic copolymer base and additives.
    a. pH: 4.5-6.5
    b. Film Forming Temperature: 73°F max.
    c. Tear Strength: 950-psi min.
    d. Elongation at Break: 500% min.
    e. Particle Size: less than 0.1 micron

2. Component A shall contain an organic, penetrating corrosion inhibitor which has been independently proven to reduce corrosion in concrete via ASTM G3 (half-cell potential tests). The corrosion inhibitor shall not be calcium nitrite, and shall have a minimum of 5 years of independent field testing to document performance on actual construction projects.
3. Component B shall be a blend of selected portland cements, specially graded aggregates, admixtures for controlling setting time, water reducers for workability, and an organic accelerator.
4. The materials shall be non-combustible, both before and after cure.
5. The materials shall be supplied in a factory-proportioned unit.
6. The polymer-modified, portland cement mortar must be placeable from 1/8-in. to 1-in. in depth per lift for horizontal applications.

B. To prepare a polymer-modified portland cement concrete: aggregate shall conform to ASTM C-33. The factory-proportioned unit shall be extended with 42-lb. max. of a 3/8 in. (No.8 distribution per ASTM C-33, Table II) clean, well-graded, saturated surface dry aggregate, having low absorption and high density. Aggregate must be approved for use by the Engineer.

C. SikaTop 123 Plus Polymer-modified Portland cement mortar:
1. Component A shall be a liquid polymer emulsion of an acrylic copolymer base and additives.
    a. pH: 4.5-6.5
    b. Film Forming Temperature: 73°F max.
    c. Tear Strength: 950-psi min.
    d. Elongation at Break: 500% min.
    e. Particle Size: less than 0.1 micron

2. Component A shall contain an organic, penetrating corrosion inhibitor which has been independently proven to reduce corrosion in concrete via ASTM G3 (half-cell potential tests). The corrosion inhibitor shall not be calcium nitrite, and shall have a minimum of 5 years of independent field testing to document performance on actual construction projects.
3. Component B shall be a blend of selected portland cements, specially graded aggregates, admixtures for controlling setting time, water reducers for workability, and an organic accelerator.
4. The materials shall be non-combustible, both before and after cure.
5. The materials shall be supplied in a factory-proportioned unit.
6. The polymer-modified, portland cement mortar must be placeable from 1/8" to 1-1/2" in depth per lift for vertical applications and 1/8" to 1" in depth for overhead applications.

2.03 PERFORMANCE CRITERIA SIKATOP 122 PLUS

A. Typical Properties of the mixed polymer-modified, portland cement mortar:

1. Working Time: Approximately 30 minutes
2. Finishing Time: 50-120 minutes
3. Color: concrete gray when mixed

B. Typical Properties of the cured polymer-modified, portland cement mortar:
1. Compressive Strength (ASTM C-109 Modified)
   a. 1 day: 3000 psi min. (20.7 MPa)
   b. 7 day: 5500 psi min. (37.9 MPa)
   c. 28 day: 7000 psi min. (48.3 MPa)
2. Flexural Strength (ASTM C-293) @ 28 days: 2000 psi (13.8 MPa)
3. Splitting Tensile Strength (ASTM C-496) @ 28 days 750 psi (5.2 MPa)
4. Bond Strength (ASTM C-882 Modified) @ 28 days: 2200 psi (15.2 MPa)
5. The portland cement mortar shall not produce a vapor barrier.
6. Density(wet mix): 136 lbs. / cu. ft. (2.18 kg/l)
7. Permeability (AASHTO T-277 @ 28 days Approximately 500 Coulombs)

2.04 PERFORMANCE CRITERIA SIKATOP 123 PLUS

A. Typical Properties of the mixed polymer-modified, portland cement mortar:
1. Working Time: Approximately 15 minutes
2. Finishing Time: 20 - 60 minutes
3. Color: concrete gray

B. Typical Properties of the cured polymer-modified, portland cement mortar:
1. Compressive Strength (ASTM C-109 Modified)
   a. 1 day: 3500 psi min. (24.1 MPa)
   b. 7 day: 6000 psi min. (44.8 MPa)
   c. 28 day: 7000 psi min. (48.3 MPa)
2. Flexural Strength (ASTM C-293) @ 28 days: 2000 psi (13.8 MPa)
3. Splitting Tensile Strength (ASTM C-496) @ 28 days: 900 psi (6.2 MPa)
4. Bond Strength (ASTM C-882 Modified) @ 28 days: 2200 psi (15.2 MPa)
5. The portland cement mortar shall not produce a vapor barrier.

6. Density (wet mix): 132 lbs. / cu. ft. (2.2 kg/l)
7. Permeability - AASHTO T-277 @ 28 days Approximately 500 Coulombs

PART 3 – EXECUTION

3.01 SURFACE PREPARATION SIKATOP 122 PLUS

A. Areas to be repaired must be clean, sound, and free of contaminants. All loose and deteriorated concrete shall be removed by mechanical means. Mechanically prepare the concrete substrate to obtain a surface profile of +/- 1/16" (CSP 5 or greater as per ICRI Guidelines) with a new exposed aggregate surface. Area to be patched shall not be less than 1/8" in depth.

B. Where reinforcing steel with active corrosion is encountered, sandblast the steel to a white metal finish to remove all contaminants and rust. Where corrosion has occurred due to the presence of chlorides, the steel shall be high pressure washed after mechanical cleaning. Prime steel with 2 coats of Sika Armatec 110 EpoCem as directed by manufacturer. (See Spec Component SC-201-0699)

3.02 SURFACE PREPARATION SIKATOP 123 PLUS

A. Areas to be repaired must be clean, sound, and free of contaminants. All loose and deteriorated concrete shall be removed by mechanical means. Mechanically prepare concrete substrate to obtain a surface profile of +/- 1/16" (CSP 5 or greater as per ICRI Guidelines) with a new exposed aggregate surface. Area to be patched shall not be less than 1/8" in depth.

B. Where reinforcing steel with active corrosion is encountered, sandblast the steel to a white metal finish to remove all contaminants and rust. Where corrosion has occurred due to the presence of chlorides, the steel shall be high pressure washed after mechanical cleaning. Prime steel with 2 coats of Sika Armatec 110 EpoCem as per the technical data sheet. (See Spec Component SC-201-0699)

3.03 MIXING AND APPLICATION SIKATOP 122 PLUS

A. Mechanically mix in appropriate sized mortar mixer or with a Sika jiffy paddle and low speed (400-600 rpm) drill. Pour approximately 4/5 gal Component A into the mixing container. Add Component B while continuing to mix. Mix to a uniform consistency for a maximum of three minutes. Add remaining Component A to mix if a more loose consistency is desired. Should smaller quantities be needed, be sure the components are measured in the correct ratio and that the Component B is uniformly blended before mixing the components together. Mix only that amount of material that can be placed in 30 minutes. Do not retemper material.

B. Mixing of the polymer-modified portland cement concrete: Pour all (1-gallon) of Component A into the mixing container. Add Component B while continuing to mix. Add correct amount of the pre-approved coarse aggregate, and continue mixing to a uniform consistency. Mixing time should be 3 minutes maximum.

C. Placement Procedure: At the time of application, the substrate should be saturated surface dry with no standing water. Mortar and/or concrete must be scrubbed into substrate filling all pores and voids. While the scrub coat is still plastic, force material against edge of repair,

working toward center. If repair area is too large to fill while scrub coat is still wet use Sika Armatec 110 EpoCem in lieu of scrub coat (See Spec Component SC-200). After filling, consolidate, then screed. Allow mortar or concrete to set to desired stiffness, then finish with trowel, manual or power, for smooth surface. Broom or burlap drag for rough surface. Areas where the depth of the repair is less than 1-inch shall be repaired with polymer-modified portland cement mortar. In areas where the depth of the repair is greater than 1 inch, the repair shall be made with polymer-modified portland cement concrete.

D. As per ACI recommendations for portland cement concrete, curing is required. Moist cure with wet burlap and polyethylene, a fine mist of water or a water-based compatible curing compound. Moist curing should commence immediately after finishing and continue for 48 hours. Protect newly applied material from rain, sun, and wind until compressive strength is 70% of the 28-day compressive strength. To prevent from freezing cover with insulating material. Setting time is dependent on temperature and humidity.

E. Adhere to all procedures, limitations and cautions for the polymer-modified portland cement mortar in the manufacturers current printed technical data sheet and literature.

3.04 MIXING AND APPLICATION SIKATOP 123 PLUS

A. Mechanically mix in an appropriate sized mortar mixer or with a Sika mud paddle and low speed (400-600 rpm) drill. Pour approximately 4/5 gal Component A into the mixing container. Add Component B while continuing to mix. Mix to a uniform consistency for a maximum of three minutes. Add remaining Component A to mix for desired consistency. Should smaller quantities be needed, be sure the components are measured in the correct ratio and that the Component B is uniformly blended before mixing the components together. Mix only that amount of material that can be placed in 10 - 15 minutes. Do not retemper material.

B. Placement Procedure: At the time of application, the substrate shall be saturated surface dry with no standing water. Mortar must be scrubbed into substrate filling all pores and voids. While the scrub coat is still plastic, force material against edge of repair, working toward center. If repair area is too large to fill while scrub coat is still wet use Sika Armatec 110 EpoCem in lieu of scrub coat. (See spec component SC-200-0699) After filling, consolidate then screed. Allow mortar to set to desired stiffness then finish with trowel for smooth surface. Wood float or sponge float for a rough surface. Areas where the depth of the repair area to sound concrete is greater than 1-1/2", the repair shall be made in lifts of 1-1/2" maximum thickness. The top surface of each lift shall be scored to produce a rough surface for the next lift. The preceding lift shall be allowed to reach final set before applying fresh material. The fresh mortar must be scrubbed into the preceding lift.

C. As per ACI recommendations for portland cement concrete, curing is required. Moist cure with wet burlap and polyethylene, a fine mist of water or a water-based* compatible curing compound. Moist curing should commence immediately after finishing and continue for 48 hours. Protect newly applied material from rain, sun, and wind until compressive strength is 70% of the 28-day compressive strength. To prevent from freezing cover with insulating material. Setting time is dependent on temperature and humidity.

D. Adhere to all procedures, limitations and cautions for the polymer-modified portland cement mortar in the manufacturers current printed technical data sheet and literature.

3.05 CLEANING

A. The uncured polymer-modified portland cement mortar can be cleaned from tools with water. The cured polymer -modified portland cement mortar can only be removed mechanically.

B. Leave finished work and work area in a neat, clean condition without evidence of spillovers onto adjacent areas.

END OF SECTION

SECTION 042200

UNIT MASONRY ASSEMBLIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes unit masonry assemblies consisting of the following:

1. Concrete masonry units.
2. Decorative concrete masonry units.
3. Mortar and grout.
4. Reinforcing steel.
5. Masonry joint reinforcement.
6. Ties and anchors.
7. Embedded flashing.
8. Miscellaneous masonry accessories.
9. Masonry-cell insulation.

B. Related Sections include the following:
1. Division 7 Section "Water Repellents" for water repellents applied to unit masonry assemblies.
2. Division 7 Section "Sheet Metal Flashing and Trim" for exposed sheet metal flashing.

C. Products installed, but not furnished, under this Section include the following:
1. Steel lintels for unit masonry, furnished under Division 5 Section "Metal Fabrications."
2. Hollow-metal frames in unit masonry openings, furnished under Division 8 Section “Steel Doors and Frames".”

1.3 DEFINITIONS

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

1.4 SUBMITTALS

A. Product Data: For each different masonry unit, accessory, and other manufactured product specified.

B. Shop Drawings: Show fabrication and installation details for the following:

1. Reinforcing Steel: Detail bending and placement of unit masonry reinforcing bars. Comply with ACI 315, "Details and Detailing of Concrete Reinforcement."
2. Fabricated Flashing: Detail corner units, end-dam units, and other special applications.

C. Samples for Initial Selection: For the following:

1. Unit masonry Samples in small-scale form showing the full range of colors and textures available for each different exposed masonry unit required.
2. Colored mortar Samples showing the full range of colors available.

D. Samples for Verification: For the following:

1. Full-size units for each different exposed masonry unit required, showing the full range of exposed colors, textures, and dimensions to be expected in the completed construction.
2. Colored mortar Samples for each color required, showing the full range of colors expected in the finished construction. Make samples using the same sand and mortar ingredients to be used on Project.
3. Weep holes/vents in color to match mortar color.
4. Accessories embedded in the masonry.

E. Material Certificates: Signed by manufacturers certifying that each of the following items complies with requirements:

1. Each type of masonry unit required.
   a. Include test data, measurements, and calculations establishing net-area compressive strength of masonry units.

2. Each cement product required for mortar and grout, including name of manufacturer, brand, type, and weight slips at time of delivery.
3. Each material and grade indicated for reinforcing bars.
4. Each type and size of joint reinforcement.
5. Each type and size of anchor, tie, and metal accessory.

1.5 QUALITY ASSURANCE

A. Testing Agency Qualifications: An independent testing agency, acceptable to authorities having jurisdiction, qualified according to ASTM C 1093 to conduct the testing indicated, as documented according to ASTM E 548.

B. 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, through one source from a single manufacturer for each product required.

C. Source Limitations for Mortar Materials: Obtain mortar ingredients of a uniform quality, including color for exposed masonry, from one manufacturer for each cementitious component and from one source or producer for each aggregate.

D. Sample Panels: Before installing unit masonry, build sample panels, using materials indicated for the completed Work, to verify selections made under sample Submittals and to demonstrate

aesthetic effects. Build sample panels for each type of exposed unit masonry assembly in sizes approximately 48 inches long by 48 inches high by full thickness.

1. Locate panels in the locations indicated or, if not indicated, as directed by Architect.
2. Clean exposed faces of panels with masonry cleaner indicated.
3. Where masonry is to match existing, erect panels adjacent and parallel to existing surface.
4. Protect approved sample panels from the elements with weather-resistant membrane.
5. Maintain sample panels during construction in an undisturbed condition as a standard for judging the completed Work.
6. Approval of sample panels is for color, texture, and blending of masonry units; relationship of mortar and sealant colors to masonry unit colors; tooling of joints; aesthetic qualities of workmanship; and other material and construction qualities specifically approved by Architect in writing.

    a. Approval of sample panels does not constitute approval of deviations from the Contract Documents contained in sample panels, unless such deviations are specifically approved by Architect in writing.

7. Demolish and remove sample panels when directed.

1.6 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 designed for lifting and emptying into dispensing silo. Store preblended, dry mortar mix in delivery containers on elevated platforms, under cover, and in a dry location or in a metal dispensing silo with weatherproof cover.

E. Store masonry accessories, including metal items, to prevent corrosion and accumulation of dirt and oil.

1.7 PROJECT 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 down both sides 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 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 3 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 coverings spread on ground and over wall surface.
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 ACI 530.1.

1. Cold-Weather Cleaning: Use liquid cleaning methods only when air temperature is 40 deg F and above and will remain so until masonry has dried, but not less than 7 days after completing cleaning.

E. Hot-Weather Requirements: Protect unit masonry work when temperature and humidity conditions produce excessive evaporation of water from mortar and grout. Provide artificial shade and wind breaks and use cooled materials as required.

1. When ambient temperature exceeds 100 deg F, or 90 deg F with a wind velocity greater than 8 mph, do not spread mortar beds more than 48 inches ahead of masonry. Set masonry units within one minute of spreading mortar.

PART 2 - PRODUCTS

2.1 CONCRETE MASONRY UNITS

A. General: Provide shapes indicated and as follows:

1. Provide special shapes for lintels, corners, jambs, sash, control joints, headers, bonding, and other special conditions.
2. Provide square-edged units for outside corners, unless indicated as bullnose.

B. Concrete Masonry Units: ASTM C90 and as follows:

1. Unit Compressive Strength: Provide units with minimum average net-area compressive strength of 1900 psi (13.1 MPa)
2. Weight Classification: Normal weight.
3. Provide Type I, moisture-controlled units.
4. Size (Width): Manufactured to the following dimensions as indicated on the plans:

    a. 4 inches nominal; 3-5/8 inches actual.
    b. 8 inches nominal; 7-5/8 inches actual.
    c. 12 inches nominal; 11-5/8 inches actual.

5. Exposed Faces: Manufacturer's standard color and texture, unless otherwise indicated.

C. Decorative Concrete Masonry Units: ASTM C90 and as follows:

1. Unit Compressive Strength: Provide units with minimum average net-area compressive strength of 1900 psi (13.1 MPa.
2. Weight Classification: Normal weight.
3. Provide Type I, moisture-controlled units.
4. Size: Manufactured to dimensions indicated for nondecorative units.
5. Finish: Exposed faces of the following general description matching color, pattern, and texture of Architect's samples.
    a. Normal-weight aggregate, split-face finish.

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

    a. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:
    b. Products: Subject to compliance with requirements, provide one of the following:

        1) Block Plus W-10; Addiment Inc.
        2) Dry-Block; W. R. Grace & Co., Construction Products Division.
        3) Rheopel; Master Builders.

2.2 MORTAR AND GROUT MATERIALS

A. Portland Cement-Lime Mix: Packaged blend of portland cement complying with ASTM C 150, Type I or Type III, and hydrated lime complying with ASTM C 207.

B. Aggregate for Mortar: ASTM C 144; except for joints less than 1/4 inch thick, use aggregate graded with 100 percent passing the No. 16 sieve.

1. White-Mortar Aggregates: Natural white sand or ground white stone.
2. Colored-Mortar Aggregates: Natural-colored sand or ground marble, granite, or other sound stone; of color necessary to produce required mortar color.

C. Aggregate for Grout: ASTM C 404.

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

E. Water-Repellent Admixture: Liquid water-repellent mortar admixture intended for use with concrete masonry units, containing integral water repellent by same manufacturer.

F. Water: Potable.

G. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:

1. Colored Portland Cement-Lime Mix:

a. Eaglebond; Blue Circle Cement.
b. Color Mortar Blend; Glen-Gery Corporation.
c. Rainbow Mortamix Custom Color Cement/Lime; Holnam, Inc.
d. Centurion Colorbond PL; Lafarge Corporation.
e. Lehigh Custom Color Portland/Lime; Lehigh Portland Cement Co.
f. Riverton Portland Cement Lime Custom Color; Riverton Corporation (The).

2. Cold-Weather Admixture:

a. Accelguard 80; Euclid Chemical Co.
b. Morseled; W. R. Grace & Co., Construction Products Division.
c. Trimix-NCA; Sonneborn, Div. of ChemRex, Inc.

3. Water-Repellent Admixture:

a. Mortar Tite; Addiment Inc.
b. Dry-Block Mortar Admixture; W. R. Grace & Co., Construction Products Division.
c. Rheopel; Master Builders.

2.3 REINFORCING STEEL

A. Uncoated Steel Reinforcing Bars: ASTM A 615/A 615M; Grade 60.

2.4 MASONRY JOINT REINFORCEMENT

A. General: ASTM A951 and as follows:
1. Hot-dip galvanized, carbon-steel wire for both interior and exterior walls.
2. Wire Size for Side Rods: W1.7 or 0.148 inch.
3. Wire Size for Cross Rods: W1.7 or 0.148 inch.
4. Provide in lengths of not less than 10 feet, with prefabricated corner and tee units where indicated.

B. For single-wythe masonry, provide either ladder or truss type with single pair of side rods and cross rods spaced not more than 16 inches o.c.

C. For multiwythe masonry, provide types as follows:

1. Ladder type with perpendicular cross rods spaced not more than 16 inches o.c. and 1 side rod for each face shell of hollow masonry units more than 4 inches in width, plus 1 side rod for each wythe of masonry 4 inches or less in width.
2. Tab type with single pair of side rods spaced for embedment within each face shell of backup wythe and rectangular box-type cross ties spaced not more than 16 inches o.c. Size ties to extend at least halfway through outer wythe but with at least 5/8-inch cover on outside face.

2.5 TIES AND ANCHORS, GENERAL

A. General: Provide ties and anchors, specified in subsequent articles, made from materials that comply with this Article, unless otherwise indicated.

B. Hot-Dip Galvanized Carbon-Steel Wire: ASTM A 82; with ASTM A 153, Class B-2 coating.

C. Steel Sheet, Galvanized after Fabrication: ASTM A 366/A 366M cold-rolled, carbon-steel sheet hot-dip galvanized after fabrication to comply with ASTM A 153.

D. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.

2.6 BENT WIRE TIES

A. General: Rectangular units with closed ends and not less than 4 inches wide. Z-shaped ties with ends bent 90 degrees to provide hooks not less than 2 inches long may be used for masonry constructed from solid units or hollow units laid with cells horizontal.

1. Where coursing between wythes does not align, use adjustable ties composed of 2 parts; 1 with pintles, the other with eyes; with maximum misalignment of 1-1/4 inches.

B. Wire: Fabricate from 3/16 inch diameter, hot-dip galvanized steel wire.

2.7 ADJUSTABLE ANCHORS FOR CONNECTING TO STEEL FRAME

A. General: Provide two-piece assemblies that allow vertical or horizontal adjustment but resist tension and compression forces perpendicular to plane of wall.

1. Anchor Section: Crimped 1/4-inch diameter, hot-dip galvanized steel wire anchor section for welding to steel.
2. Tie Section: Triangular-shaped wire tie, sized to extend within 1 inch of masonry face, made from 0.1875 inch diameter, hot-dip galvanized steel wire.

2.8 ADJUSTABLE MASONRY-VENEER ANCHORS

A. General: Provide two-piece assemblies that allow vertical or horizontal adjustment but resist tension and compression forces perpendicular to plane of wall, for attachment over sheathing to wood or metal studs, and as follows:

1. Structural Performance Characteristics: Capable of withstanding a 100-lbf load in both tension and compression without deforming or developing play in excess of 0.05 inch.

B. Screw-Attached, Masonry-Veneer Anchors: Units consisting of a wire tie section and a metal anchor section complying with the following requirements:

1. Anchor Section: Rib-stiffened, sheet metal plate with screw holes top and bottom, 2-3/4 inches wide by 3 inches high; with projecting tabs having slotted holes for inserting vertical legs of wire tie specially formed to fit anchor section.
2. Anchor Section: Sheet metal plate with screw holes top and bottom and with raised rib-stiffened strap stamped into center to provide a slot between strap and plate for connection of wire tie.

    a. Plate 1-1/4 inches wide by 6 inches long with strap 5/8 inch wide by 3-5/8 inches long; slot clearance formed between face of plate and back of strap shall not exceed diameter of wire tie by more than 1/32 inch.
3. Wire Tie Section: Triangular or Rectangular shaped wire tie sized to extend at least halfway through veneer but with at least 5/8-inch cover on outside face.
4. Fabricate sheet metal anchor sections and other sheet metal parts from 0.0966 inch**,** thick, steel sheet, galvanized after fabrication.
5. Fabricate wire tie sections from 0.1875 inch diameter, hot-dip galvanized steel wire.

C. Steel Drill Screws for Steel Studs: ASTM C 954 except manufactured with hex washer head and neoprene washer, No. 10 diameter by length required to penetrate steel stud flange by not less than 3 exposed threads, and with the following corrosion protective coating:

1. Organic polymer coating with salt-spray resistance to red rust of more than 800 hours per ASTM B 117.

D. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:

1. Screw-Attached, Masonry-Veneer Anchors:

    a. D/A 213; Dur-O-Wal, Inc.
    b. D/A 210 with D/A 700-708; Dur-O-Wal, Inc.
    c. 315-D with 316; Heckman Building Products, Inc.
    d. Pos-I-Tie; Heckman Building Products, Inc.
    e. DW-10; Hohmann & Barnard, Inc.
    f. DW-10HS; Hohmann & Barnard, Inc.
    g. DW-10-X; Hohmann & Barnard, Inc.
    h. 1004, Type III; Masonry Reinforcing Corporation of America.
    i. RJ-711; Masonry Reinforcing Corporation of America.

2. Organic-Polymer-Coated, Steel Drill Screws:

    a. Dril-Flex; Elco Industries, Inc.

b. Traxx; ITW-Buildex.

2.9 MISCELLANEOUS ANCHORS

A. Anchor Bolts: Steel bolts complying with ASTM A 307, Grade A; with ASTM A 563 hex nuts and, where indicated, flat washers; hot-dip galvanized to comply with ASTM A 153, Class C; of diameter and length indicated and in the following configurations:

1. Headed bolts.
2. Nonheaded bolts, bent in manner indicated.

B. Postinstalled Anchors: Anchors as described below, with capability to sustain, without failure, load imposed within factors of safety indicated, as determined by testing per ASTM E 488, conducted by a qualified independent testing agency.
1. Type: Expansion anchors.
2. Corrosion Protection: Carbon-steel components zinc plated to comply with ASTM B 633, Class Fe/Zn 5 (5 microns) for Class SC 1 service condition (mild).
3. For Postinstalled Anchors in Grouted Masonry Units: Capability to sustain, without failure, a load equal to six times the loads imposed.

2.10 EMBEDDED FLASHING MATERIALS

A. Metal Flashing: Fabricate from the following metal complying with requirements specified in Division 7 Section "Sheet Metal Flashing and Trim" and below:

B. Solder and Sealants for Sheet Metal Flashings: As specified in Division 7 Section "Sheet Metal Flashing and Trim."

2.11 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: Material as indicated below, designed to fit standard sash block and to maintain lateral stability in masonry wall; size and configuration as indicated.

1. Styrene-Butadiene-Rubber Compound: ASTM D 2000, Designation M2AA-805.

C. Bond-Breaker Strips: Asphalt-saturated, organic roofing felt complying with ASTM D 226, Type I (No. 15 asphalt felt).

D. Round Plastic Weep/Vent Tubing: Medium-density polyethylene, 3/8-inch OD by 4 inches long.

E. Wicking Material: Cotton or polyester rope, 1/4 to 3/8 inch in diameter, in length required to produce 2-inch exposure on exterior and 18 inches in cavity between wythes.

F. Plastic Weep Hole/Vent: One-piece, flexible extrusion made from UV-resistant polypropylene copolymer, designed to fill head joint with outside face held back 1/8 inch from exterior face of masonry, in color selected from manufacturer's standard.

G. Cavity Drainage Material: ¾ inch thick, free-draining mesh; made from polyethylene strands and shaped to avoid being clogged by mortar droppings.

H. Reinforcing Bar Positioners: Wire units designed to fit into mortar bed joints spanning masonry unit cells with loops for holding reinforcing bars in center of cells. Units are formed from 0.142 inch steel wire, hot-dip galvanized after fabrication.

1. Provide units with either two loops or four loops as needed for number of bars indicated.

I. Available Products: Subject to compliance with requirements, cavity drainage materials that may be incorporated into the Work include, but are not limited to, the following:

1. Plastic Weep Hole/Vent:

a. Cell Vent; Dur-O-Wal, Inc.

2. Cavity Drainage Material:

a. Mortar Break; Advanced Building Products, Inc.
b. CavClear Masonry Mat; CavClear.
c. Mortar Net; Mortar Net USA, Ltd.
d. Mortar Stop; Polytite Manufacturing Corp.

3. Reinforcing Bar Positioners:

a. D/A 811; Dur-O-Wal, Inc.
b. No. 376 Rebar Positioner; Heckman Building Products, Inc.
c. #RB Rebar Positioner; Hohmann & Barnard, Inc.
d. O-Ring Rebar Positioner; Masonry Reinforcing Corporation of America.

2.12 MASONRY-CELL INSULATION

A. Molded-Polystyrene Insulation Units: Rigid, cellular thermal insulation formed by the expansion of polystyrene-resin beads or granules in a closed mold to comply with ASTM C 578, Type I. Provide specially shaped units designed for installing in cores of masonry units. Provide cell insulation in units as located in the architectural plans or specifications.

2.13 MASONRY CLEANERS

A. Job-Mixed Detergent Solution: Solution of 1/2-cup dry measure tetrasodium polyphosphate and 1/2-cup dry measure laundry detergent dissolved in 1 gal. of water.

2.14 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. Add cold-weather admixture (if used) at the same rate for all mortar, regardless of weather conditions, to ensure that mortar color is consistent.

B. Preblended, Dry Mortar Mix: Furnish dry mortar ingredients in the 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 C270, Proportion Specification.
1. For masonry below grade, in contact with earth, and where indicated, use Type S.
2. For reinforced masonry and where indicated, 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 Table 5 of ACI 530.1/ASCE 6/TMS 602 for dimensions of grout spaces and pour height.
2. Provide grout with a slump of 8 to 11 inches as measured according to ASTM C 143.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance.

B. Before installation, examine rough-in and built-in construction to verify actual locations of piping connections.

3.2 INSTALLATION, GENERAL

A. Thickness: Build cavity and composite walls and other masonry construction to the full thickness shown. Build single-wythe walls to the actual widths of masonry units, using units of widths indicated.

B. Build chases and recesses to accommodate items specified in this Section and in other Sections of the Specifications.

C. Leave openings for equipment to be installed before completing masonry. After installing equipment, complete masonry to match the construction immediately adjacent to the opening.

D. Cut masonry units with motor-driven saws to provide clean, sharp, unchipped edges. Cut units as required to provide a continuous pattern and to fit adjoining construction. Where possible, use full-size units without cutting. Allow units cut with water-cooled saws to dry before

placing, 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.

1. Mix units from several pallets or cubes as they are placed.

F. Wetting of Brick: Wet brick before laying if the initial rate of absorption exceeds 30 g/30 sq. in. per minute when tested per ASTM C 67. Allow units to absorb water so they are damp but not wet at the time of laying.

3.3 CONSTRUCTION TOLERANCES

A. Comply with tolerances in ACI 530.1/ASCE 6/TMS 602 and the following:

B. For conspicuous vertical lines, such as external corners, door jambs, reveals, and expansion and control joints, do not vary from plumb by more than 1/4 inch in 20 feet , nor 1/2 inch maximum.

C. For vertical alignment of exposed head joints, do not vary from plumb by more than 1/4 inch in 10 feet, nor 1/2 inch maximum.

D. For conspicuous horizontal lines, such as exposed lintels, sills, parapets, and reveals, do not vary from level by more than 1/4 inch in 20 feet, nor 1/2 inch maximum.

E. For exposed bed joints, do not vary from thickness indicated by more than plus or minus 1/8 inch, with a maximum thickness limited to 1/2 inch. Do not vary from bed-joint thickness of adjacent courses by more than 1/8 inch.

F. For exposed head joints, do not vary from thickness indicated by more than plus or minus 1/8 inch. Do not vary from adjacent bed-joint and head-joint thicknesses by more than 1/8 inch.

3.4 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: Lay exposed masonry in the following bond pattern; do not use units with less than nominal 4-inch horizontal face dimensions at corners or jambs.

1. One-half running bond with vertical joint in each course centered on units in courses above and below.

C. Lay concealed masonry with all units in a wythe in running bond or bonded by lapping not less than 2 inches. Bond and interlock each course of each wythe at corners. Do not use units with less than nominal 4-inch horizontal face dimensions at corners or jambs.

D. Stopping and Resuming Work: In each course, rack back one-half-unit length for one-half running bond. Clean exposed surfaces of set masonry and remove loose masonry units and mortar before laying fresh masonry.

E. Built-in Work: As construction progresses, build in items specified under this and other Sections of the Specifications. Fill in solidly with masonry around built-in items.

F. Fill space between hollow-metal frames and masonry solidly with mortar, unless otherwise indicated.

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

H. Fill cores in hollow concrete masonry units with grout for full height of wall under bearing plates, beams, lintels, posts, and similar items, unless otherwise indicated.

I. Build non-load-bearing interior partitions full height of story to underside of solid floor or roof structure above, unless otherwise indicated.

1. Install compressible filler in joint between top of partition and underside of structure above.

3.5 MORTAR BEDDING AND JOINTING

A. Lay hollow masonry units as follows:

1. With full mortar coverage on horizontal and vertical face shells.
2. Bed webs in mortar in starting course on footings and in all courses of piers, columns, and pilasters, and where adjacent to cells or cavities to be filled with grout.
3. For starting course on footings where cells are not grouted, spread out full mortar bed, including areas under cells.

B. Lay solid brick-size masonry units with completely filled bed and head joints; butter ends with sufficient mortar to fill head joints and shove into place. Do not deeply furrow bed joints or slush head joints.

1. At cavity walls, bevel beds away from cavity, to minimize mortar protrusions into cavity. As work progresses, trowel mortar fins protruding into cavity flat against the cavity face of the brick.

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

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

3.6 BONDING OF MULTIWYTHE MASONRY

A. Use masonry joint reinforcement installed in horizontal mortar joints to bond wythes together.

B. Corners: Provide interlocking masonry unit bond in each wythe and course at corners, unless otherwise indicated.

1. Provide continuity with masonry joint reinforcement at corners by using prefabricated "L" units as well as masonry bonding.

C. Intersecting and Abutting Walls: Unless vertical expansion or control joints are shown at juncture, bond walls together as follows:
1. Provide continuity with masonry joint reinforcement by using prefabricated "T" units.

3.7 CAVITIES

A. Keep cavities clean of mortar droppings and other materials during construction. Strike joints facing cavities flush.

1. Use wood strips temporarily placed in cavity to collect mortar droppings. As work progresses, remove strips, clean off mortar droppings, and replace in cavity.

3.8 MASONRY-CELL INSULATION

A. Install molded-polystyrene insulation units into masonry unit cells before laying units.

3.9 MASONRY JOINT REINFORCEMENT

A. General: Provide continuous masonry joint reinforcement as indicated. Install entire length of longitudinal side rods in mortar with a minimum cover of 5/8 inch on exterior side of walls, 1/2 inch elsewhere. Lap reinforcement a minimum of 6 inches.

1. Space reinforcement not more than 16 inches o.c.

B. Cut or interrupt joint reinforcement at control and expansion joints, unless otherwise indicated.

C. Provide continuity at corners and wall intersections by using prefabricated "L" and "T" sections. Cut and bend reinforcing units as directed by manufacturer for continuity at returns, offsets, column fireproofing, pipe enclosures, and other special conditions.

3.10 ANCHORING MASONRY TO STRUCTURAL MEMBERS

A. Anchor masonry to structural members where masonry abuts or faces structural members to comply with the following:

1. Provide an open space not less than 1 inch in width between masonry and structural member, unless otherwise indicated. Keep open space free of mortar or other rigid materials.
2. Anchor masonry to structural members with flexible anchors embedded in masonry joints and attached to structure.
3. Space anchors as indicated, but not more than 16 inches o.c. vertically and 32 inches o.c. horizontally.

3.11 ANCHORING MASONRY VENEERS

A. Anchor masonry veneers to wall framing with masonry-veneer anchors to comply with the following requirements:

1. Fasten each anchor section through sheathing to wall framing with two metal fasteners of type indicated.
2. Embed tie sections in masonry joints. Provide not less than 2 inches of air space between back of masonry veneer and face of sheathing.
3. Locate anchor sections to allow maximum vertical differential movement of ties up and down.
4. Space anchors as indicated, but not more than 16 inches o.c. vertically and 32 inches o.c. horizontally with not less than 1 anchor for each 3.5 sq. ft. of wall area. Install additional anchors within 12 inches of openings and at intervals, not exceeding 36 inches, around perimeter.

3.12 CONTROL AND EXPANSION JOINTS

A. General: Install control and expansion joints in unit masonry as follows unless otherwise indicated on drawings. Build-in related items as masonry progresses. Do not form a continuous span through movement joints unless provisions are made to prevent in-plane restraint of wall or partition movement.
1. Vertical control joins shall be spaced at maximum 20’-0” o.c. in any continuous run of wall.

B. Form control joints in concrete masonry as follows:

1. Fit bond-breaker strips into hollow contour in ends of concrete masonry units on one side of control joint. Fill resultant core with grout and rake joints in exposed faces.
2. Install preformed control-joint gaskets designed to fit standard sash block.
3. Install interlocking units designed for control joints. Install bond-breaker strips at joint. Keep head joints free and clear of mortar or rake joint.
4. Install temporary foam-plastic filler in head joints and remove filler when unit masonry is complete.

3.13 LINTELS

A. Install steel lintels where indicated or as required to provide support above all openings as shown on the architectural, structural, mechanical, plumbing or electrical plans.

B. Provide masonry lintels where shown and where openings of more than 12 inches for brick-size units and 24 inches for block-size units are shown without structural steel or other supporting lintels.
1. Provide prefabricated or built-in-place masonry lintels if required in the architectural plans. Use specially formed bond beam units 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.

C. Provide minimum bearing of 8 inches at each jamb, unless otherwise indicated.

D. Fill cores in hollow concrete masonry units with grout for full height of wall under all lintels.

3.14 FLASHING, WEEP HOLES, AND 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. Prepare masonry surfaces so they are smooth and free from projections that could puncture flashing. Unless otherwise indicated, 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.

C. Install flashing as follows:
   1. At masonry-veneer walls, extend flashing from exterior face of veneer, through veneer, up face of sheathing at least 8 inches, and behind air-infiltration barrier or building paper.
   2. At lintels and shelf angles, extend flashing a minimum of 4 inches into masonry at each end. At heads and sills, extend flashing 4 inches at ends and turn flashing up not less than 2 inches to form a pan.

D. Install weep holes in the head joints in exterior wythes of the first course of masonry immediately above embedded flashing and as follows:

   1. Use round plastic tubing, wicking material or plastic weep hole/vents to form weep holes.
   2. Use wicking material to form weep holes above flashing in brick sills. Turn wicking down at lip of sill to be as inconspicuous as possible.
   3. Space weep holes formed from plastic tubing or wicking material 16 inches o.c.
   4. Place cavity drainage material immediately above flashing in cavities.

E. Trim wicking material used in weep holes flush with outside face of wall after mortar has set.

F. Install reglets and nailers for flashing and other related construction where they are shown to be built into masonry.

3.15 REINFORCED UNIT MASONRY INSTALLATION

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

   1. Construct formwork to conform to shape, line, and dimensions shown. Make it 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 other temporary loads that may be placed on them during construction.

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

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

1. Comply with requirements of ACI 530.1/ASCE 6/TMS 602 for cleanouts and for grout placement, including minimum grout space and maximum pour height.

3.16 PARGING

A. Parge predampened masonry walls, where indicated, with Type S or Type N mortar applied in 2 uniform coats to a total thickness of 3/4 inch. Scarify first parge coat to ensure full bond to subsequent coat.

B. Use a steel-trowel finish to produce a smooth, flat, dense surface with a maximum surface variation of 1/8 inch per foot. Form a wash at top of parging and a cove at bottom.

C. Damp-cure parging for at least 24 hours and protect the parging until cured.

3.17 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.

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.

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, polyethylene film, or waterproof masking tape.
4. Wet wall surfaces with water before applying cleaners; remove cleaners promptly by rinsing the surfaces thoroughly with clear water.
5. Clean brick by the bucket-and-brush hand-cleaning method described in BIA Technical Notes No. 20, using job-mixed detergent solution.

3.18 MASONRY WASTE DISPOSAL

A. Recycling: Unless otherwise indicated, excess masonry materials are Contractor's property. At completion of unit masonry work, remove from Project site.

END OF SECTION 042200

SECTION 055000 - METAL FABRICATIONS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Miscellaneous framing and supports.
2. Prefabricated building columns.
3. Shelf angles.
4. Metal ladders.
5. Alternating tread devices.
6. Metal ships' ladders and pipe crossovers.
7. Metal floor plate.
8. Elevator pit sump covers.
9. Structural-steel door frames.
10. Miscellaneous steel trim.
11. Metal bollards.
12. Vehicular barrier cable systems.
13. Pipe and downspout guards.
14. Abrasive metal nosings, treads, and thresholds.
15. Cast-iron wheel guards.
16. Metal downspout boots.
17. Loose bearing and leveling plates.

B. Products furnished, but not installed, under this Section include the following:

1. Loose steel lintels.
2. Steel weld plates and angles for casting into concrete for applications where they are not specified in other Sections.
3. Anchor bolts, steel pipe sleeves, slotted-channel inserts, and wedge-type inserts indicated to be cast into concrete or built into unit masonry.

C. Related Requirements:

1. Section 042000 "Unit Masonry" for installing loose lintels, anchor bolts, and other items built into unit masonry.
2. Section 051200 "Structural Steel Framing" for steel framing, supports, elevator machine beams, hoist beams, divider beams, door frames, and other steel items attached to the structural-steel framing.

1.2 COORDINATION

A. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' written instructions to ensure that shop primers and topcoats are compatible with one another.

B. Coordinate installation of metal fabrications that are anchored to or that receive other work. 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.

1.3 ACTION SUBMITTALS

A. Product Data:

1. Nonslip aggregates and nonslip-aggregate surface finishes.
2. Fasteners.
3. Shop primers.
4. Shrinkage-resisting grout.
5. Prefabricated building columns.
6. Slotted channel framing.
7. Manufactured metal ladders.
8. Alternating tread devices.
9. Metal ships' ladders and pipe crossovers.
10. Metal bollards.
11. Vehicular barrier cable systems.
12. Pipe and downspout guards.
13. Abrasive metal nosings, treads, and thresholds.
14. Cast-iron wheel guards.
15. Metal downspout boots.

B. Shop Drawings: Show fabrication and installation details. Include plans, elevations, sections, and details of metal fabrications and their connections. Show anchorage and accessory items. Provide Shop Drawings for the following:

1. Miscellaneous framing and supports for applications where framing and supports are not specified in other Sections.
2. Elevator machine beams, hoist beams, and divider beams.
3. Steel shapes for supporting elevator door sills.
4. Steel girders for supporting wood frame construction.
5. Steel pipe columns for supporting wood frame construction.
6. Prefabricated building columns.
7. Shelf angles.
8. Metal ladders.
9. Alternating tread devices.
10. Metal ships' ladders and pipe crossovers.
11. Metal floor plate and supports.
12. Elevator pit sump covers.
13. Structural-steel door frames.
14. Miscellaneous steel trim including steel angle corner guards, steel edgings and loading-dock edge angles.
15. Metal bollards.
16. Loose steel lintels.
17. Vehicular barrier cable systems.

C. Delegated Design Submittals: For installed products indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.4 INFORMATIONAL SUBMITTALS

A. Mill Certificates: Signed by stainless steel manufacturers, certifying that products furnished comply with requirements.

B. Welding certificates.

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

D. Research Reports: For post-installed anchors.

E. Delegated design engineer qualifications.

1.5 QUALITY ASSURANCE

A. Welding Qualifications: Qualify procedures and personnel in accordance with the following welding codes:

1. AWS D1.1/D1.1M, "Structural Welding Code - Steel."
2. AWS D1.2/D1.2M, "Structural Welding Code - Aluminum."
3. AWS D1.6/D1.6M, "Structural Welding Code - Stainless Steel."

1.6 FIELD CONDITIONS

A. Field Measurements: Verify actual locations of walls, floor slabs, decks, and other construction contiguous with metal fabrications by field measurements before fabrication.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Structural Performance of Aluminum Ladders: Ladders, including landings, are to withstand the effects of loads and stresses within limits and under conditions specified in ANSI/ASC A14.3.

2.2 METALS

A. Metal Surfaces, General: Provide materials with smooth, flat surfaces unless otherwise indicated. For metal fabrications exposed to view in the completed Work, provide materials without seam marks, roller marks, rolled trade names, or blemishes.

B. Steel Plates, Shapes, and Bars: ASTM A36/A36M.

C. Stainless Steel Sheet, Strip, and Plate: ASTM A240/A240M or ASTM A666, Type 304.

D. Stainless Steel Bars and Shapes: ASTM A276/A276M, Type 304.

E. Rolled-Steel Floor Plate: ASTM A786/A786M, rolled from plate complying with ASTM A36/A36M or ASTM A283/A283M, Grade C or D.

F. Rolled-Stainless Steel Floor Plate: ASTM A793.

G. Abrasive-Surface Floor Plate: Steel plate with abrasive granules rolled into surface or with abrasive material metallically bonded to steel.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. IKG.
b. Ohio Gratings, Inc.
c. SlipNOT Metal Safety Flooring, division of Traction Technologies Holdings, LLC.
d. Approved Equivalent.

2. Source Limitations: Obtain floor plate from single source from single manufacturer.

H. Steel Tubing: ASTM A500/A500M, cold-formed steel tubing.

I. Steel Pipe: ASTM A53/A53M, Standard Weight (Schedule 40) unless otherwise indicated.

J. Zinc-Coated Steel Wire Rope: ASTM A741.

1. Wire Rope Fittings: Hot-dip galvanized-steel connectors with capability to sustain, without failure, a load equal to minimum breaking strength of wire rope with which they are used.

K. Stainless Steel Wire Rope: Wire rope manufactured from stainless steel wire complying with ASTM A492, Type 316.

1. Wire Rope Fittings: Stainless steel connectors, Type 316, with capability to sustain, without failure, a load equal to minimum breaking strength of wire rope with which they are used.

L. Slotted Channel Framing: Cold-formed metal box channels (struts) complying with MFMA-4.

1. Size of Channels: As indicated.
2. Galvanized Steel: ASTM A653/A653M, structural steel, Grade 33 (Grade 230), with G90 (Z275) coating; 0.064-inch (1.6-mm) nominal thickness.
3. Cold-Rolled Steel: ASTM A1008/A1008M, structural steel, Grade 33 (Grade 230); 0.0677-inch (1.7-mm) minimum thickness; hot-dip galvanized after fabrication.

M. Cast Iron: Either gray iron, ASTM A48/A48M, or malleable iron, ASTM A47/A47M, unless otherwise indicated.

N. Aluminum Plate and Sheet: ASTM B209 (ASTM B209M), Alloy 6061-T6.

O. Aluminum Extrusions: ASTM B221 (ASTM B221M), Alloy 6063-T6.

P. Aluminum-Alloy Rolled Tread Plate: ASTM B632/B632M, Alloy 6061-T6.

Q. Aluminum Castings: ASTM B26/B26M, Alloy 443.0-F.

R. Bronze Extrusions: ASTM B455, Alloy UNS No. C38500 (extruded architectural bronze).

S. Bronze Castings: ASTM B584, Alloy UNS No. C83600 (leaded red brass) or UNS No. C84400 (leaded semired brass).

T. Nickel Silver Extrusions: ASTM B151/B151M, Alloy UNS No. C74500.

U. Nickel Silver Castings: ASTM B584, Alloy UNS No. C97600 (20 percent leaded nickel bronze).

2.3 FASTENERS

A. General: Unless otherwise indicated, provide Type 304 stainless steel fasteners for exterior use and zinc-plated fasteners with coating complying with ASTM B633 or ASTM F1941/F1941M, Class Fe/Zn 5, at exterior walls. Select fasteners for type, grade, and class required.

1. Provide stainless steel fasteners for fastening aluminum, stainless steel or nickel silver.
2. Provide bronze fasteners for fastening bronze.

B. Steel Bolts and Nuts: Regular hexagon-head bolts, ASTM A307, Grade A (ISO 898-1, Property Class 4.6); with hex nuts, ASTM A563 (ASTM A563M); and, where indicated, flat washers.

C. High-Strength Bolts, Nuts, and Washers: ASTM F3125/F3125M, Grade A325 (Grade A325M), Type 3, heavy-hex steel structural bolts; ASTM A563, Grade DH3, (ASTM A563M, Class 10S3) heavy-hex carbon-steel nuts; and where indicated, flat washers.

D. Stainless Steel Bolts and Nuts: Regular hexagon-head annealed stainless steel bolts, ASTM F593 (ISO 3506-1); with hex nuts, ASTM F594 (ASTM F836M); and, where indicated, flat washers; Alloy Group 1 (A1).

E. Anchor Bolts: ASTM F1554, Grade 36, of dimensions indicated; with nuts, ASTM A563 (ASTM A563M); and, where indicated, flat washers.

1. Hot-dip galvanize or provide mechanically deposited, zinc coating where item being fastened is indicated to be galvanized.

F. Anchors, General: Capable of sustaining, without failure, a load equal to six times the load imposed when installed in unit masonry and four times the load imposed when installed in concrete, as determined by testing in accordance with ASTM E488/E488M, conducted by a qualified independent testing agency.

G. Cast-in-Place Anchors in Concrete: Either threaded or wedge type unless otherwise indicated; galvanized ferrous castings, either ASTM A47/A47M malleable iron or ASTM A27/A27M cast steel. Provide bolts, washers, and shims as needed, all hot-dip galvanized per ASTM F2329/F2329M.

H. Post-Installed Anchors: Torque-controlled expansion anchors or chemical anchors.

1. Material for Interior Locations: Carbon-steel components zinc plated to comply with ASTM B633 or ASTM F1941/F1941M, 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 F593 (ISO 3506-1), and nuts, ASTM F594 (ASTM F836M).

I. Slotted-Channel Inserts: Cold-formed, hot-dip galvanized-steel box channels (struts) complying with MFMA-4, 1-5/8 by 7/8 inches (41 by 22 mm) by length indicated with anchor straps or studs not less than 3 inches (75 mm) long at not more than 8 inches (200 mm) o.c. Provide with temporary filler and tee-head bolts, complete with washers and nuts, all zinc-plated to comply with ASTM B633, Class Fe/Zn 5, as needed for fastening to inserts.

2.4 MISCELLANEOUS MATERIALS

A. Universal Shop Primer: Fast-curing, lead- and chromate-free, universal modified-alkyd primer complying with MPI#79 and compatible with topcoat.

1. Use primer that contains pigments that make it easily distinguishable from zinc-rich primer.

B. Shop Primer for Galvanized Steel: Primer formulated for exterior use over zinc-coated metal and compatible with finish paint systems indicated.

C. Galvanizing Repair Paint: High-zinc-dust-content paint complying with SSPC-Paint 20 and compatible with paints specified to be used over it.

D. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D1187/D1187M.

E. Shrinkage-Resistant Grout: Factory-packaged, nonmetallic, nonstaining, noncorrosive, nongaseous grout complying with ASTM C1107/C1107M. Provide grout specifically recommended by manufacturer for interior and exterior applications.

F. Concrete: Comply with requirements in Section 033000 "Cast-in-Place Concrete" for normal-weight, air-entrained concrete with a minimum 28-day compressive strength of 4000 psi (27 MPa).

2.5 FABRICATION, GENERAL

A. Shop Assembly: Preassemble items in the shop to greatest extent possible. Disassemble units only as necessary for shipping and handling limitations. Use connections that maintain structural value of joined pieces. Clearly mark units for reassembly and coordinated installation.

B. 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.

C. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.

D. Form exposed work with accurate angles and surfaces and straight edges.

E. Weld corners and seams continuously 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. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface.

F. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners or welds where possible. Where exposed fasteners are required, use Phillips flat-head (countersunk) fasteners unless otherwise indicated. Locate joints where least conspicuous.

G. Fabricate seams and other connections that are exposed to weather in a manner to exclude water. Provide weep holes where water may accumulate.

H. Cut, reinforce, drill, and tap metal fabrications as indicated to receive finish hardware, screws, and similar items.

I. Provide for anchorage of type indicated; coordinate with supporting structure. Space anchoring devices to secure metal fabrications rigidly in place and to support indicated loads.

J. Where units are indicated to be cast into concrete or built into masonry, equip with integrally welded steel strap anchors, 1/8 by 1-1/2 inches (3.2 by 38 mm), with a minimum 6-inch (150-mm) embedment and 2-inch (50-mm) hook, not less than 8 inches (200 mm) from ends and corners of units and 24 inches (600 mm) o.c., unless otherwise indicated.

2.6 MISCELLANEOUS FRAMING AND SUPPORTS

A. General: Provide steel framing and supports not specified in other Sections as needed to complete the Work.

B. Fabricate units from steel shapes, plates, and bars of welded construction unless otherwise indicated. Fabricate to sizes, shapes, and profiles indicated and as necessary to receive adjacent construction.

1. Fabricate units from slotted channel framing where indicated.
2. Furnish inserts for units installed after concrete is placed.

C. Fabricate supports for operable partitions from continuous steel beams of sizes recommended by partition manufacturer with attached bearing plates, anchors, and braces as recommended by partition manufacturer. Drill or punch bottom flanges of beams to receive partition track hanger rods; locate holes where indicated on operable partition Shop Drawings.

D. Fabricate steel girders for wood frame construction from continuous steel shapes of sizes indicated.

1. Provide bearing plates welded to beams where indicated.
2. Drill or punch girders and plates for field-bolted connections where indicated.
3. Where wood nailers are attached to girders with bolts or lag screws, drill or punch holes at 24 inches (600 mm) o.c.

E. Fabricate steel pipe columns for supporting wood frame construction from steel pipe with steel baseplates and top plates as indicated. Drill or punch baseplates and top plates for anchor and connection bolts and weld to pipe with fillet welds all around. Make welds the same size as pipe wall thickness unless otherwise indicated.

1. Unless otherwise indicated, fabricate from Schedule 40 steel pipe.
2. Unless otherwise indicated, provide 1/2-inch (12.7-mm) baseplates with four 5/8-inch (16-mm) anchor bolts and 1/4-inch (6.4-mm) top plates.

F. Galvanize miscellaneous framing and supports where indicated.

2.7 PREFABRICATED BUILDING COLUMNS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Black Rock Fireproof Column, a division of United Steel.
2. Dean Lally LLC / FireTrol Columns.
3. Approved Equivalent.

B. Source Limitations: Obtain prefabricated building column from single source from single manufacturer.

C. General: Provide prefabricated building columns consisting of load-bearing structural-steel members protected by concrete fireproofing encased in an outer non-load-bearing steel shell. Fabricate connections to comply with details shown or as needed to suit type of structure indicated.

D. Fire-Resistance Ratings: Provide prefabricated building columns listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction for ratings indicated, based on testing in accordance with ASTM E119.

1. Fire-Resistance Rating: As indicated.

2.8 SHELF ANGLES

A. Fabricate shelf angles from steel angles of sizes indicated and for attachment to concrete framing. Provide horizontally slotted holes to receive 3/4-inch (19-mm) bolts, spaced not more than 6 inches (150 mm) from ends and 24 inches (600 mm) o.c., unless otherwise indicated.

1. Provide mitered and welded units at corners.
2. Provide open joints in shelf angles at expansion and control joints. Make open joint approximately 2 inches (50 mm) larger than expansion or control joint.

B. For cavity walls, provide vertical channel brackets to support angles from backup masonry and concrete.

C. Galvanize shelf angles located in exterior walls.

D. Furnish wedge-type concrete inserts, complete with fasteners, to attach shelf angles to cast-in-place concrete.

2.9 METAL LADDERS

A. General:

1. Comply with ANSI A14.3, except for elevator pit ladders.
2. For elevator pit ladders, comply with ASME A17.1/CSA B44.

B. Steel Ladders:

1. Space siderails 18 inches (457 mm) apart unless otherwise indicated.
2. Siderails: Continuous, 3/8-by-2-1/2-inch (9.5-by-64-mm) steel flat bars, with eased edges.
3. Rungs: 3/4-inch- (19-mm-) diameter or 3/4-inch- (19-mm-) square, steel bars.
4. Fit rungs in centerline of siderails; plug-weld and grind smooth on outer rail faces.
5. Provide nonslip surfaces on top of each rung, either by coating rung with aluminum-oxide granules set in epoxy-resin adhesive or by using a type of manufactured rung filled with aluminum-oxide grout.
6. Nonslip Surfaces for Steel Ladders: Provide nonslip surfaces on top of each rung by coating with abrasive material metallically bonded to rung.

    a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

        1) IKG.
        2) SlipNOT Metal Safety Flooring, division of Traction Technologies Holdings, LLC.
        3) Approved Equivalent.

7. Source Limitations: Obtain nonslip surfaces from single source from single manufacturer.
8. Provide platforms as indicated fabricated from welded or pressure-locked steel bar grating, supported by steel angles. Limit openings in gratings to no more than 3/4 inch (19 mm) in least dimension.
9. Support each ladder at top and bottom and not more than 60 inches (1500 mm) o.c. with welded or bolted steel brackets.
10. Galvanize exterior ladders, including brackets.

C. Aluminum Ladders:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

    a. Fixfast USA.

b. Halliday Products.
c. O'Keeffe's Inc.
d. Precision Ladders, LLC.
e. Royalite Manufacturing, Inc.
f. Thompson Fabricating, LLC.
g. UPNOVR, Inc.
h. Approved Equivalent.

2. Source Limitations: Obtain aluminum ladders from single source from single manufacturer.
3. Space siderails 18 inches (457 mm) apart unless otherwise indicated.
4. Siderails: Continuous extruded-aluminum channels or tubes, not less than 2-1/2 inches (64 mm) deep, 3/4 inch (19 mm) wide, and 1/8 inch (3.2 mm) thick.
5. Rungs: Extruded-aluminum tubes, not less than 3/4 inch (19 mm) deep and not less than 1/8 inch (3.2 mm) thick, with ribbed tread surfaces.
6. Fit rungs in centerline of siderails; fasten by welding or with stainless steel fasteners or brackets and aluminum rivets.
7. Provide platforms as indicated fabricated from pressure-locked aluminum bar grating or extruded-aluminum plank grating, supported by extruded-aluminum framing. Limit openings in gratings to no more than 3/4 inch (19 mm) in least dimension.
8. Support each ladder at top and bottom and not more than 60 inches (1500 mm) o.c.]with welded or bolted aluminum brackets.
9. Provide minimum 72-inch- (1830-mm-) high, hinged security door with padlock hasp at foot of ladder to prevent unauthorized ladder use.

2.10 METAL SHIPS' LADDERS AND PIPE CROSSOVERS

A. Provide metal ships' ladders and pipe crossovers where indicated. Fabricate of open-type construction with channel or plate stringers and pipe and tube railings unless otherwise indicated. Provide brackets and fittings for installation.

1. Treads are not to be less than 5 inches (127 mm) exclusive of nosing or less than 8-1/2 inches (216 mm) including the nosing, and riser height is not to be more than 9-1/2 inches (241 mm).
2. Fabricate ships' ladders and pipe crossovers, including railings from steel, stainless steel or aluminum, as indicated on the Contract Drawings.
3. Fabricate treads and platforms from welded or pressure-locked steel bar, pressure-locked stainless steel bar, pressure-locked aluminum bar or extruded-aluminum plank grating, as indicated on the Contract Drawings. Limit openings in gratings to no more than 3/4 inch (19 mm) in least dimension.
4. Fabricate treads and platforms from rolled-steel floor, rolled-stainless steel floor, rolled-aluminum-alloy tread or abrasive-surface floor plate, as indicated on the Contract Drawings.

B. Galvanize exterior steel ships' ladders and pipe crossovers, including treads, railings, brackets, and fasteners.

2.11 METAL FLOOR PLATE

A. Fabricate from rolled-steel floor, rolled-stainless steel floor, rolled-aluminum-alloy tread or abrasive-surface floor plate of thickness indicated below:

1. Thickness: As indicated.

B. Provide grating sections where indicated, fabricated from welded or pressure-locked steel bar, pressure-locked stainless steel bar, pressure-locked aluminum bar or extruded-aluminum plank grating. Limit openings in gratings to no more than 3/4 inch (19 mm) in least dimension.

C. Provide steel, stainless steel or aluminum angle supports as indicated.

D. Include steel, stainless steel or aluminum angle stiffeners, and fixed and removable sections as indicated.

E. Provide flush steel, stainless steel or aluminum bar drop handles for lifting removable sections, one at each end of each section.

2.12 ELEVATOR PIT SUMP COVERS

A. Fabricate from 3/16-inch (4.8-mm) rolled-steel floor plate with four 1-inch- (25-mm-) diameter holes for water drainage and for lifting.

B. Provide steel angle supports unless otherwise indicated.

2.13 STRUCTURAL-STEEL DOOR FRAMES

A. Fabricate structural-steel door frames from steel shapes, plates, and bars of size and to dimensions indicated, fully welded together, with 5/8-by-1-1/2-inch (16-by-38-mm) steel channel stops, unless otherwise indicated. Plug-weld built-up members and continuously weld exposed joints. Secure removable stops to frame with countersunk machine screws, uniformly spaced at not more than 10 inches (250 mm) o.c. Reinforce frames and drill and tap as necessary to accept finish hardware.

1. Provide with integrally welded steel strap anchors for securing door frames into adjoining concrete or masonry.

B. Extend bottom of frames to floor elevation indicated with steel angle clips welded to frames for anchoring frame to floor with expansion shields and bolts.

C. Galvanize exterior steel frames.

2.14 MISCELLANEOUS STEEL TRIM

A. Unless otherwise indicated, fabricate units from steel shapes, plates, and bars of profiles shown with continuously welded joints and smooth exposed edges. Miter corners and use concealed field splices where possible.

B. Provide cutouts, fittings, and anchorages as needed to coordinate assembly and installation with other work.

1. Provide with integrally welded steel strap anchors for embedding in concrete or masonry construction.

C. Galvanize exterior miscellaneous steel trim.

2.15 METAL BOLLARDS

A. Fabricate metal bollards from Schedule 80 steel pipe or steel shapes, as indicated.

1. Cap bollards with 1/4-inch-(6.4-mm-) thick, steel plate with flat top.
2. Where bollards are indicated to receive controls for door operators, provide cutouts for controls and holes for wire.
3. Where bollards are indicated to receive light fixtures, provide cutouts for fixtures and holes for wire.

B. Fabricate bollards with 3/8-inch-(9.5-mm-) thick, steel baseplates for bolting to concrete slab. Drill baseplates at all four corners for 3/4-inch (19-mm) anchor bolts.

1. Where bollards are to be anchored to sloping concrete slabs, angle baseplates for plumb alignment of bollards.

C. Fabricate sleeves for bollard anchorage from steel or stainless steel pipe or tubing with 1/4-inch-(6.4-mm-) thick, steel or stainless steel plate welded to bottom of sleeve. Make sleeves not less than 8 inches (200 mm) deep and 3/4 inch (19 mm) larger than OD of bollard.

D. Fabricate internal sleeves for removable bollards from Schedule 80 **steel** pipe or 1/4-inch (6.4-mm) wall-thickness steel tubing with an OD approximately 1/16 inch (1.5 mm) less than ID of bollards. Match drill sleeve and bollard for 3/4-inch (19-mm) steel] machine bolt.

E. Prime steel bollards with zinc-rich primer.

2.16 PIPE AND DOWNSPOUT GUARDS

A. Fabricate pipe and downspout guards from 3/8-inch- (9.5-mm-) thick by 12-inch- (300-mm-) wide, steel plate, bent to fit flat against the wall or column at both ends and to fit around pipe with 2-inch (50-mm) clearance between pipe and pipe guard. Drill each end for two 3/4-inch (19-mm) anchor bolts.

B. Galvanize steel pipe and downspout guards.

2.17 ABRASIVE METAL NOSINGS, TREADS, AND THRESHOLDS

A. Cast-Metal Units: Cast iron or aluminum, with an integral-abrasive, as-cast finish consisting of aluminum oxide, silicon carbide, or a combination of both. Fabricate units in lengths necessary to accurately fit openings or conditions.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

    a. American Safety Tread Co., Inc.
    b. Balco; a CSW Industrials Company.
    c. Barry Pattern & Foundry Co., Inc.
    d. Safe-T-Metal Company, Inc.
    e. Wooster Products Inc.
    f. Approved Equivalent.

2. Source Limitations: Obtain units from single source from single manufacturer.
3. Cross-hatched nosings, 4 inches (100 mm) wide, with 1/4-inch- (6-mm-) thick 1-inch (25-mm) lip, for casting into concrete.
4. Cross-hatched nosings, 1-1/2 inches (38-mm) wide, 3/8-inch- (9.5-mm-) thick 1-1/2 inch (38-mm) lip, for casting into concrete.
5. Cross-hatched Treads: Full depth of tread with 3/4-by-3/4-inch (19-by-19-mm) nosing, for application over bent plate treads or existing stairs.
6. Fluted-Saddle-Type Thresholds: 5 inches (125 mm) wide by 1/2 inch (12 mm) high, with tapered edges.
7. Fluted-Interlocking or -Hook-Strip Thresholds: 5 inches (125 mm) wide by 5/8 inch (16 mm) high, with tapered edge.
8. Thresholds: Plain-stepped- (stop-) type units, 5 inches (125 mm) wide by 1/2 inch (12 mm) high, with 1/2-inch (12-mm) step.

B. Extruded Units: Aluminum, with abrasive filler consisting of aluminum oxide, silicon carbide, or a combination of both, in an epoxy-resin binder. Fabricate units in lengths necessary to accurately fit openings or conditions.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

    a. American Safety Tread Co., Inc.
    b. Amstep Products.
    c. Armstrong Products, Inc.
    d. Balco; a CSW Industrials Company.
    e. Nystrom, Inc.
    f. Wooster Products Inc.
    g. Approved Equivalent.

2. Source Limitations: Obtain units from single source from single manufacturer.
3. Provide ribbed units, with abrasive filler strips projecting 1/16 inch (1.5 mm) above aluminum extrusion.
4. Nosings:

    a. Square-back units, 1-7/8 inches (48 mm) or 3 inches (75 mm) wide, for casting into concrete steps.
    b. Beveled-back units, 3 inches (75 mm) wide with 1-3/8-inch (35-mm) lip, for surface mounting on existing stairs.
    c. Two-piece units, 3 inches (75 mm) wide, with subchannel for casting into concrete steps.

5. Treads: Beveled-back units, full depth of tread with 1-3/8-inch (35-mm) lip, for application over existing stairs.

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.

E. Apply clear lacquer to concealed surfaces of extruded units.

2.18 CAST-IRON WHEEL GUARDS

A. Provide wheel guards made from cast-iron, 3/4-inch- (19-mm-) thick, hollow-core construction, of size and shape indicated. Provide holes for countersunk anchor bolts and grouting.

2.19 METAL DOWNSPOUT BOOTS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. J.R. Hoe & Sons Inc.
2. Neenah Foundry Company.
3. Approved Equivalent.

B. Source Limitations: Obtain downspout boots from single source from single manufacturer.

C. Provide downspout boots made from cast aluminum in heights indicated with inlets of size and shape to suit downspouts. Provide units with flanges and holes for countersunk anchor bolts.

1. Outlet: Vertical, to discharge into pipe or at 35 degrees from horizontal, to discharge onto splash block or pavement.

2.20 LOOSE BEARING AND LEVELING PLATES

A. Provide loose bearing and leveling plates for steel items bearing on masonry or concrete construction. Drill plates to receive anchor bolts and for grouting.

B. Galvanize bearing and leveling plates.

2.21 LOOSE STEEL LINTELS

A. Fabricate loose steel lintels from steel angles and shapes of size indicated for openings and recesses in masonry walls and partitions at locations indicated. Fabricate in single lengths for each opening unless otherwise indicated. Weld adjoining members together to form a single unit where indicated.

B. Size loose lintels to provide bearing length at each side of openings equal to one-twelfth of clear span, but not less than 8 inches (200 mm) unless otherwise indicated.

C. Galvanize loose steel lintels located in exterior walls.

2.22 STEEL WELD PLATES AND ANGLES

A. Provide steel weld plates and angles not specified in other Sections, for items supported from concrete construction as needed to complete the Work. Provide each unit with no fewer than two integrally welded steel strap anchors for embedding in concrete.

2.23 GENERAL FINISH REQUIREMENTS

A. Finish metal fabrications after assembly.

B. Finish exposed surfaces to remove tool and die marks and stretch lines, and to blend into surrounding surface.

2.24 STEEL AND IRON FINISHES

A. Galvanizing: Hot-dip galvanize items as indicated to comply with ASTM A153/A153M for steel and iron hardware and with ASTM A123/A123M for other steel and iron products.

1. Do not quench or apply post galvanizing treatments that might interfere with paint adhesion.

B. Preparation for Shop Priming Galvanized Items: After galvanizing, thoroughly clean galvanized surfaces of grease, dirt, oil, flux, and other foreign matter, and treat with metallic phosphate process.

C. Shop prime iron and steel items not indicated to be galvanized unless they are to be embedded in concrete, sprayed-on fireproofing, or masonry, or unless otherwise indicated.

D. Preparation for Shop Priming: Prepare surfaces to comply with requirements indicated below:

1. Exterior Items: SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."
2. Items Indicated to Receive Zinc-Rich Primer: SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."
3. Items Indicated to Receive Primers Specified in Section 099600 "High-Performance Coatings": SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."
4. Other Steel Items: SSPC-SP 3, "Power Tool Cleaning."
5. Galvanized-Steel Items: SSPC-SP 16, "Brush-off Blast Cleaning of Coated and Uncoated Galvanized Steel, Stainless Steels, and Non-Ferrous Metals."

E. Shop Priming: Apply shop primer to comply with SSPC-PA 1, "Paint Application Specification No. 1: Shop, Field, and Maintenance Painting of Steel," for shop painting.

1. Stripe paint corners, crevices, bolts, welds, and sharp edges.

2.25 ALUMINUM FINISHES

A. As-Fabricated Finish: AA-M12.

B. Clear Anodic Finish: AAMA 611, Class I, AA-M12C22A41.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing metal fabrications. Set metal fabrications accurately in location, alignment, and elevation; with edges and surfaces level, plumb, true, and free of rack; and measured from established lines and levels.

B. 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.

C. Field Welding: Comply with the following requirements:

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. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface.

D. Fastening to In-Place Construction: Provide anchorage devices and fasteners where metal fabrications are required to be fastened to in-place construction. Provide threaded fasteners for use with concrete and masonry inserts, toggle bolts, through bolts, lag screws, wood screws, and other connectors.

E. Provide temporary bracing or anchors in formwork for items that are to be built into concrete, masonry, or similar construction.

F. Corrosion Protection: Coat concealed surfaces of aluminum that come into contact with grout, concrete, masonry, wood, or dissimilar metals with the following:

1. Cast Aluminum: Heavy coat of bituminous paint.
2. Extruded Aluminum: Two coats of clear lacquer.

3.2 INSTALLATION OF MISCELLANEOUS FRAMING AND SUPPORTS

A. General: Install framing and supports to comply with requirements of items being supported, including manufacturers' written instructions and requirements indicated on Shop Drawings.

B. Anchor supports for ceiling-hung toilet partitions, operable partitions and overhead doors securely to, and rigidly brace from, building structure.

C. Anchor shelf angles securely to existing construction with expansion anchors or anchor bolts through bolts.

D. Support steel girders on solid grouted masonry, concrete, or steel pipe columns. Secure girders with anchor bolts embedded in grouted masonry or concrete or with bolts through top plates of pipe columns.

1. Where grout space under bearing plates is indicated for girders supported on concrete or masonry, install as specified in "Installing Bearing and Leveling Plates" Article.

E. Install pipe columns on concrete footings with grouted baseplates. Position and grout column baseplates as specified in "Installation of Bearing and Leveling Plates" Article.

1. Grout baseplates of columns supporting steel girders after girders are installed and leveled.

3.3 INSTALLATION OF PREFABRICATED BUILDING COLUMNS

A. Install prefabricated building columns to comply with ANSI/AISC 360, "Specifications for Structural Steel Buildings," and with requirements applicable to listing and labeling for fire-resistance rating indicated.

3.4 INSTALLATION OF SHELF ANGLES

A. Install shelf angles as required to keep masonry level, at correct elevation, and flush with vertical plane.

3.5 INSTALLATION OF METAL LADDERS

A. Secure ladders to adjacent construction with the clip angles attached to the stringer.

B. Install brackets as required for securing of ladders welded or bolted to structural steel or built into masonry or concrete.

3.6 INSTALLATION OF ALTERNATING TREAD DEVICES

A. Secure top and bottom of alternating tread devices to construction to comply with manufacturer's written instructions.

3.7 INSTALLATION OF METAL SHIPS' LADDERS AND PIPE CROSSOVERS

A. Secure top and bottom of ships' ladders to construction to comply with manufacturer's written instructions.

B. Secure pipe crossovers to construction to comply with manufacturer's written instructions.

3.8 INSTALLATION OF METAL FLOOR PLATE

A. Install metal floor plates flush with finished surface. Adjust as required to avoid lippage that could present a tripping hazard.

3.9 INSTALLATION OF ELEVATOR PIT SUMP COVERS

A. Install tops of elevator sump pit cover plates and frames flush with finished surface. Adjust as required to avoid lippage that could present a tripping hazard.

3.10 INSTALLATION OF STRUCTURAL-STEEL DOOR FRAMES

A. Fasten structural steel door frames to the floor slab by means of angle clips and expansion bolts. Anchor door jambs to adjacent construction in accordance with shop drawing details.

3.11 INSTALLATION OF MISCELLANEOUS STEEL TRIM

A. Anchor to concrete construction to comply with manufacturer's written instructions.

3.12 INSTALLATION OF METAL BOLLARDS

A. Fill metal-capped bollards solidly with concrete and allow concrete to cure seven days before installing.

1. Do not fill removable bollards with concrete.

B. Anchor bollards to existing construction with expansion anchors or anchor bolts. Provide four 3/4-inch (19-mm) bolts at each bollard unless otherwise indicated.

1. Embed anchor bolts at least 4 inches (100 mm) in concrete.

C. Anchor bollards in concrete with pipe sleeves preset and anchored into concrete. Fill annular space around bollard solidly with shrinkage-resistant grout; mixed and placed to comply with grout manufacturer's written instructions. Slope grout up approximately 1/8 inch (3 mm) toward bollard.

D. Anchor bollards in place with concrete footings. Center and align bollards in holes 3 inches (75 mm) above bottom of excavation. Place concrete and vibrate or tamp for consolidation. Support and brace bollards in position until concrete has cured.

E. Anchor internal sleeves for removable bollards in concrete by inserting in pipe sleeves preset into concrete. Fill annular space around internal sleeves solidly with shrinkage-resistant grout; mixed and placed to comply with grout manufacturer's written instructions. Slope grout up approximately 1/8 inch (3 mm) toward internal sleeve.

F. Anchor internal sleeves for removable bollards in place with concrete footings. Center and align sleeves in holes 3 inches (75 mm) above bottom of excavation. Place concrete and vibrate or tamp for consolidation. Support and brace sleeves in position until concrete has cured.

G. Place removable bollards over internal sleeves and secure with 3/4-inch (19-mm) machine bolts and nuts. After tightening nuts, drill holes in bolts for inserting padlocks. Owner furnishes padlocks.

H. Fill bollards solidly with concrete, mounding top surface to shed water.

1. Do not fill removable bollards with concrete.

3.13 INSTALLATION OF PIPE AND DOWNSPOUT GUARDS

A. Provide pipe guards at exposed vertical pipes in parking garages where not protected by curbs or other barriers. Install by bolting to wall or column with expansion anchors. Provide four 3/4-inch (19-mm) bolts at each pipe guard. Mount pipe guards with top edge 26 inches (660 mm) above driving surface.

3.14 INSTALLATION OF ABRASIVE METAL NOSINGS, TREADS, AND THRESHOLDS

A. Center nosings on tread widths unless otherwise indicated.

B. For nosings embedded in concrete steps or curbs, align nosings flush with riser faces and level with tread surfaces.

C. Seal thresholds exposed to exterior with elastomeric sealant complying with Section 079200 "Joint Sealants" to provide a watertight installation.

3.15 INSTALLATION OF CAST-IRON WHEEL GUARDS

A. Anchor wheel guards to concrete or masonry construction to comply with manufacturer's written instructions. Fill cores solidly with concrete.

3.16 INSTALLATION OF METAL DOWNSPOUT BOOTS

A. Anchor metal downspout boots to concrete or masonry construction to comply with manufacturer's written instructions.

B. Secure downspouts terminations to downspouts and substrate per manufacturer's instructions.

3.17 INSTALLATION OF LOOSE BEARING AND LEVELING PLATES

A. Clean concrete and masonry bearing surfaces of bond-reducing materials and roughen to improve bond to surfaces. Clean bottom surface of plates.

B. Set bearing and leveling plates on wedges, shims, or leveling nuts. After bearing members have been positioned and plumbed, tighten anchor bolts. Do not remove wedges or shims but, if protruding, cut off flush with edge of bearing plate before packing with shrinkage-resistant grout. Pack grout solidly between bearing surfaces and plates to ensure that no voids remain.

3.18 REPAIRS

A. Touchup Painting:

1. Immediately after erection, clean field welds, bolted connections, and abraded areas. Paint uncoated and abraded areas with same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.

a. Apply by brush or spray to provide a minimum 2.0-mil (0.05-mm) dry film thickness.

B. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A780/A780M.

PART 4 - MEASUREMENT, QUANITTY & PAYMENT

Cost for work specified in this section shall be paid for under the bid form line items for which they are a part. Costs shall include all furnishment and installation of miscellaneous metal fabrications as required per the contract documents. This includes but is not limited to all metal materials fasteners, miscellaneous framing/supports, prefabricated building columns, shelf angles, metal ladders, metal floor plates, elevator sump pit covers, structural steel door frames, metal trim, metal bollards, pipe/downspout guards, abrasive metal treads, metal downspout boots, loose steel lintels, and all metal finishes.

END OF SECTION 055000

SECTION 061000

ROUGH CARPENTRY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:

1. Framing with dimension lumber.
2. Framing with timbers.
3. Framing with engineered wood products.
4. Wood furring, grounds, nailers, and blocking.
5. Sheathing.
6. Subflooring.

1.3 DEFINITIONS

A. Rough Carpentry: Carpentry work not specified in other Sections and not exposed, unless otherwise specified.

B. Exposed Framing: Dimension lumber not concealed by other construction and indicated to receive a stained or natural finish.

1.4 SUBMITTALS

A. General: Submit each item in this Article according to the Conditions of the Contract and Division 1 Specification Sections.

B. Product Data for the following products:

1. Engineered wood products.
2. Underlayment.
3. Insulating sheathing.
4. Air-infiltration barriers.

C. Material certificates for dimension lumber specified to comply with minimum allowable unit stresses. Indicate species and grade selected for each use and design values approved by the American Lumber Standards Committee's (ALSC) Board of Review.

D. Wood treatment data as follows, including chemical treatment manufacturer's instructions for handling, storing, installing, and finishing treated materials:

1. For each type of preservative-treated wood product, include certification by treating plant stating type of preservative solution and pressure process used, net amount of preservative retained, and compliance with applicable standards.

1.5 QUALITY ASSURANCE

A. Testing Agency Qualifications: To qualify for approval, an independent testing agency must demonstrate to Architect's satisfaction, based on evaluation of agency-submitted criteria conforming to ASTM E 699, that it has the experience and capability to satisfactorily conduct the testing indicated without delaying the Work.

B. Single-Source Responsibility for Engineered Wood Products: Obtain each type of engineered wood product from one source and by a single manufacturer.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Keep materials under cover and dry. Protect from weather and contact with damp or wet surfaces. Stack lumber, plywood, and other panels. Provide for air circulation within and around stacks and under temporary coverings.

1. For lumber and plywood pressure treated with waterborne chemicals, place spacers between each bundle to provide air circulation.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Wood-Preservative-Treated Materials:
   a. Baxter: J. H. Baxter Co.
   b. Chemical Specialties, Inc.
   c. Continental Wood Preservers, Inc.
   d. Osmose Wood Preserving, Inc.

2. Laminated-Veneer Lumber:
   a. Alpine Structures.
   b. Georgia-Pacific Corp.
   c. Trus Joist MacMillan.

3. Prefabricated Wood I-Joists:
   a. Trus Joist MacMillan.
   b. Alpine Structures.
   c. Georgia-Pacific Corp.

4. Gypsum Sheathing Board:
    a. Georgia-Pacific Corp.
    b. National Gypsum Co.; Gold Bond Building Products Division.
    c. United States Gypsum Co.

5. Air-Infiltration Barriers:
    a. Celotex Corporation (The); Building Products Division.
    b. DuPont Company; Fibers Department.

2.2 LUMBER, GENERAL

A. Lumber Standards: Comply with DOC PS 20, "American Softwood Lumber Standard," and with applicable grading rules of inspection agencies certified by ALSC's Board of Review.

B. Inspection Agencies: Inspection agencies, and the abbreviations used to reference them, include the following:

1. NELMA - Northeastern Lumber Manufacturers Association.
2. NLGA - National Lumber Grades Authority (Canadian).
3. RIS - Redwood Inspection Service.
4. SPIB - Southern Pine Inspection Bureau.
5. WCLIB - West Coast Lumber Inspection Bureau.
6. WWPA - Western Wood Products Association.

C. Grade Stamps: Provide lumber with each piece factory marked with grade stamp of inspection agency evidencing compliance with grading rule requirements and identifying grading agency, grade, species, moisture content at time of surfacing, and mill.

D. Where nominal sizes are indicated, provide actual sizes required by DOC PS 20 for moisture content specified. Where actual sizes are indicated, they are minimum dressed sizes for dry lumber.

1. Provide dressed lumber, S4S, unless otherwise indicated.
2. Provide dry lumber with 19 percent maximum moisture content at time of dressing for 2-inch nominal (38-mm actual) thickness or less, unless otherwise indicated.

2.3 WOOD-PRESERVATIVE-TREATED MATERIALS

A. General: Where lumber or plywood is indicated as preservative treated or is specified to be treated, comply with applicable requirements of AWPA C2 (lumber) and AWPA C9 (plywood). Mark each treated item with the Quality Mark Requirements of an inspection agency approved by ALSC's Board of Review.

B. Pressure treat wood members in contact with ground or freshwater with waterborne preservatives to a minimum retention of 0.40 lb/cu. ft. (6.4 kg/cu. m).

2.4 DIMENSION LUMBER

A. General: Provide dimension lumber of grades indicated according to the ALSC National Grading Rule (NGR) provisions of the inspection agency indicated.

B. Non-Load-Bearing Interior Partitions: Provide framing of the following grade and species:

1. Grade: No. 2.
2. Species: Eastern softwoods; NELMA.
3. Species: Northern species; NLGA.
4. Species: Mixed southern pine; SPIB.
5. Species: Western woods; WCLIB or WWPA.
6. Species: Any species above.

C. Exterior and Load-Bearing Walls: Provide framing of the following grade and species:

1. Grade: No. 2.
2. Species: Hem-fir (north); NLGA..
3. Species: Southern pine; SPIB.
4. Species: Douglas fir-larch; WCLIB or WWPA.
5. Species: Mixed southern pine; SPIB.
6. Species: Spruce-pine-fir; NLGA.
7. Species: Douglas fir-south; WWPA.
8. Species: Hem-fir; WCLIB or WWPA.
9. Species: Douglas fir-larch (north); NLGA.
10. Species: Spruce-pine-fir (south); NeLMA, WCLIB, or WWPA.
11. Species: Any species above.

D. Framing Other than Non-Load-Bearing Partitions: Provide framing of the following grade and species:

1. Grade: No. 2.
2. Species: Spruce-pine-fir south; NELMA.
3. Species: Hem-fir north; NLGA.
4. Species: Spruce-pine-fir north; NLGA.
5. Species: Mixed southern pine; SPIB.
6. Species: Hem-fir; WCLIB or WWPA.
7. Species: Any species above.

2.5 BOARDS

A. Exposed Boards: Where boards will be exposed in the finished work, provide the following:

1. Moisture Content: 19 percent maximum.
2. Species and Grade: Spruce-pine-fir, C & Btr per WCLIB rules or C Select per NLGA or WWPA rules.
3. As noted on plans by Architect.

B. Concealed Boards: Where boards will be concealed by other work, provide lumber with 19 percent maximum moisture content and of following species and grade:

1. Species and Grade: Eastern softwoods, No. 3 Common per NELMA rules.

2. Species and Grade: Mixed southern pine, No. 2 per SPIB rules.
3. Species and Grade: Spruce-pine-fir, Standard per WCLIB rules or No. 3 Common per WWPA rules.
4. Species and Grade: Western woods, Standard per WCLIB rules or No. 3 Common per WWPA rules.
5. Species and Grade: Any species above.

2.6 MISCELLANEOUS LUMBER

A. General: Provide lumber for support or attachment of other construction, including rooftop equipment curbs and support bases, cant strips, bucks, nailers, blocking, furring, grounds, stripping, and similar members.

B. Fabricate miscellaneous lumber from dimension lumber of sizes indicated and into shapes shown.

C. Moisture Content: 19 percent maximum for lumber items not specified to receive wood preservative treatment.

D. Grade: For dimension lumber sizes, provide No. 3 or Standard grade lumber per ALSC's NGRs of any species. For board-size lumber, provide No. 3 Common grade per NELMA, NLGA, or WWPA; No. 2 grade per SPIB; or Standard grade per NLGA, WCLIB or WWPA of any species.

2.7 ENGINEERED WOOD PRODUCTS

A. General: Provide engineered wood products acceptable to authorities having jurisdiction and for which current model code research or evaluation reports exist that evidence compliance with building code in effect for Project.

1. Allowable Design Stresses: Provide engineered wood products with allowable design stresses, as published by manufacturer, that meet or exceed those indicated. Manufacturer's published values shall be determined from empirical data or by rational engineering analysis, and demonstrated by comprehensive testing performed by a qualified independent testing agency.

B. Laminated-Veneer Lumber: Lumber manufactured by laminating wood veneers in a continuous press using an exterior-type adhesive complying with ASTM D 2559 to produce members with grain of veneers parallel to their lengths and complying with the following requirements:

1. Extreme Fiber Stress in Bending: 2500 psi (17 MPa) for 12-inch nominal- (286-mm actual-) depth members.
2. Modulus of Elasticity: 2,000,000 psi (13 800 MPa).
3. Tension Parallel to Grain: 1850 psi (13 MPa).
4. Compression Parallel to Grain: 2800 psi (19 MPa).
5. Compression Perpendicular to Grain: 400 psi (3 MPa) perpendicular to and 500 psi (3.5 MPa) and parallel to glue line.
6. Horizontal Shear: 285 psi (2 MPa) perpendicular to and 190 psi (1.3 MPa) parallel to glue line.

C. Prefabricated Wood I-Joists: Units manufactured by bonding stress-graded lumber flanges to wood-based structural-use panel webs with exterior-type adhesives complying with ASTM D 2559, to produce I-shaped joists complying with the following requirements:

1. Flange Material: Laminated-veneer lumber.
2. Web Material: Oriented-strand board (OSB) complying with DOC PS 2.
3. Web Material: Plywood complying with DOC PS 2.
4. Web Material: Either material indicated above, as standard with joist manufacturer.
5. Structural Capacities: Establish and monitor structural capacities according to ASTM D 5055.
6. Sizes: Depths and widths as indicated, with flanges not less than 1-1/2 inches (38 mm) in actual width.
7. I-Joists shall be installed with all required anchors, stiffeners and bracing in accordance with manufacturer requirements.

D. Parallel-Strand Lumber: Structural composite lumber made from wood strand elements with grain primarily parallel to member lengths, evaluated and monitored according to ASTM D 5456 and manufactured with an exterior-type adhesive complying with ASTM D 2559.
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
   a. Louisiana-Pacific Corporation.
   b. Weyerhaeuser Company.
   c. Or equal.
2. Extreme Fiber Stress in Bending, Edgewise: 2900 psi (20 MPa) for 12-inch nominal-(286-mm actual-) depth members.
3. Modulus of Elasticity, Edgewise: 2,200,000 psi (15 100 MPa).

2.8 CONCEALED, PERFORMANCE-RATED STRUCTURAL-USE PANELS

A. General: Where structural-use panels are indicated for the following concealed types of applications, provide APA-performance-rated panels complying with requirements designated under each application for grade, span rating, exposure durability classification, and edge detail (where applicable).

1. Thickness: Provide panels meeting requirements specified but not less than thickness indicated.
2. Span Ratings: Provide panels with span ratings required to meet "Code Plus" provisions of APA Form No. E30, "APA Design/Construction Guide: Residential & Commercial."

B. Subflooring: APA-rated sheathing.
1. Exposure Durability Classification: Exposure 1.
2. Span Rating: 48/24.
3. Minimum thickness: ¾ inch.
4. Floor sheathing shall be tongue and groove and installed with both construction adhesive and required nailing.

C. Wall Sheathing: APA-rated sheathing.
1. Exposure Durability Classification: Exposure 1.

2. Span Rating: As required to suit stud spacing indicated.
3. Minimum thickness indicated on plan.

D. Roof Sheathing: APA-rated sheathing.
1. Exposure Durability Classification: Exposure 1.
2. Minimum Span Rating: 32/16.
3. Minimum thickness: 5/8 inch.
4. Roof sheathing shall be installed with panel clips.

2.9 STRUCTURAL-USE PANELS FOR BACKING

A. Plywood Backing Panels: For mounting electrical or telephone equipment, provide fire-retardant-treated plywood panels with grade, C-D Plugged Exposure 1, in thickness indicated or, if not otherwise indicated, not less than 15/32 inch (11.9 mm) thick.

2.10 AIR-INFILTRATION BARRIER

A. Air retarder complying with ASTM E 1677; made from polyolefins; either cross-laminated films, woven strands, or spunbonded fibers; coated or uncoated; with or without perforations to transmit water vapor but not liquid water; and as follows:

1. Minimum Thickness: 3 mils (0.08 mm).
2. Minimum Water-Vapor Transmission: 10 perms (575 ng/Pa x s x sq. m) when tested according to ASTM E 96, Procedure A.
3. Maximum Flame Spread: 25 per ASTM E 84.
4. Minimum Allowable Exposure Time: 3 months.

2.11 FASTENERS

A. General: Provide fasteners of size and type indicated that comply with requirements specified in this Article for material and manufacture.

1. Where rough carpentry is exposed to weather, in ground contact, or in area of high relative humidity, provide fasteners with a hot-dip zinc coating per ASTM A 153 or of Type 304 stainless steel.

B. Nails, Wire, Brads, and Staples: FS FF-N-105.

C. Power-Driven Fasteners: CABO NER-272.

D. Wood Screws: ASME B18.6.1.

E. Lag Bolts: ASME B18.2.1. (ASME B18.2.3.8M)

F. Bolts: Steel bolts complying with ASTM A 307, Grade A (ASTM F 568, Property Class 4.6); with ASTM A 563 (ASTM A 563M) hex nuts and, where indicated, flat washers.

2.12 METAL FRAMING ANCHORS

A. General: Provide galvanized steel framing anchors of structural capacity, type, and size indicated and as follows:

1. Research or Evaluation Reports: Provide products for which model code research or evaluation reports exist that are acceptable to authorities having jurisdiction and that evidence compliance of metal framing anchors for application indicated with building code in effect for Project.
2. Allowable Design Loads: Provide products with allowable design loads, as published by manufacturer, that meet or exceed those indicated. Manufacturer's published values shall be determined from empirical data or by rational engineering analysis, and demonstrated by comprehensive testing performed by a qualified independent testing agency.

B. Galvanized Steel Sheet: Hot-dip, zinc-coated steel sheet complying with ASTM A 653, G60 (ASTM A 653M, Z180) coating designation; structural, commercial, or lock-forming quality, as standard with manufacturer for type of anchor indicated.

C. Joist Hangers: U-shaped joist hangers with 2-inch- (50-mm-) long seat and 1-1/4-inch- (32-mm-) wide nailing flanges at least 85 percent of joist depth.
1. Thickness: 0.064 inch (1.6 mm).

D. Top Flange Hangers: U-shaped joist hangers, full depth of joist, formed from metal strap with tabs bent to extend over and be fastened to supporting member.
1. Strap Width: 2 inches (50 mm).
2. Thickness: 0.064 inch (1.6 mm).

E. Bridging: Rigid, V-section, nail less type, 0.064 inch (1.6 mm) thick, length to suit joist size and spacing.

F. Rafter Tie-Downs (Hurricane Ties): Bent strap tie for fastening rafters or roof trusses to wall studs below, 1-5/8 inches (41 mm) wide by 0.052 inch (1.3 mm) thick minimum. Tie-Downs must be selected to meet uplift forces as calculated in the wood truss design.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Discard units of material with defects that impair quality of rough carpentry and that are too small to use with minimum number of joints or optimum joint arrangement.

B. Set rough carpentry to required levels and lines, with members plumb, true to line, cut, and fitted.

C. Fit rough carpentry to other construction; scribe and cope as required for accurate fit. Correlate location of furring, nailers, blocking, grounds, and similar supports to allow attachment of other construction.

D. Apply field treatment complying with AWPA M4 to cut surfaces of preservative-treated lumber and plywood.

E. Securely attach rough carpentry work to substrate by anchoring and fastening as indicated, complying with the following:

1. CABO NER-272 for power-driven staples, P-nails, and allied fasteners.
2. Published requirements of metal framing anchor manufacturer.
3. "Recommended Nailing Schedule" of referenced framing standard and with AFPA's "National Design Specifications for Wood Construction."
4. "Table 2305.2--Fastening Schedule" of the BOCA National Building Code.

F. Use common wire nails, unless otherwise indicated. Use finishing nails for finish work. Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting wood; predrill as required.

G. Use hot-dip galvanized or stainless-steel nails where rough carpentry is exposed to weather, in ground contact, or in area of high relative humidity.

H. Countersink nail heads on exposed carpentry work and fill holes with wood filler.

3.2 WOOD FRAMING, GENERAL

A. Framing Standard: Comply with AFPA's "Manual for Wood Frame Construction," unless otherwise indicated.

B. Framing with Engineered Wood Products: Install engineered wood products to comply with manufacturer's written instructions.

C. Install framing members of size and at spacing indicated.

D. Do not splice structural members between supports.

E. Firestop concealed spaces of wood-framed walls and partitions at each floor level and at ceiling line of top story. Where firestopping is not inherent in framing system used, provide closely fitted wood blocks of 2-inch nominal- (38-mm actual-) thickness lumber of same width as framing members.

3.3 AIR-INFILTRATION BARRIER

A. Cover sheathing with air-infiltration barrier as follows:
1. Apply air retarder to comply with manufacturer's written instructions.
2. Apply air-infiltration barrier to cover upstanding flashing with 4-inch (100-mm) overlap.

END OF SECTION 06100

SECTION 075130

COLD-APPLIED BUILT-UP ASPHALT ROOFING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:

1. Cold-applied built-up asphalt roofing system on concrete deck, lightweight concrete deck and wood deck.
2. Roof insulation.
3. Flashings.
4. Roof surfacing consisting of white spar aggregate.

B. Related Sections include the following:

1. Division 6 Section "Rough Carpentry" for wood nailers, cants, curbs, and blocking.

2. Division 7 Section "Sheet Metal Flashing and Trim" for metal roof penetration flashings, flashings, and counterflashings provided and warranted as part of the Work of this Section.

1.3 DEFINITIONS

A. Roofing Terminology: Refer to ASTM D 1079 and glossary of NRCA's "The NRCA Roofing and Waterproofing Manual" for definition of terms related to roofing work in this Section.

1.4 PERFORMANCE REQUIREMENTS

A. General: Provide installed roofing membrane and base flashings that remain watertight; do not permit the passage of water; and resist specified uplift pressures, thermally induced movement, and exposure to weather without failure.

B. Material Compatibility: Provide roofing materials that are compatible with one another under conditions of service and application required, as demonstrated by roofing manufacturer based on testing and field experience.

C. FMG Listing: Provide roofing membrane, base flashings, and component materials that comply with requirements in FMG 4450 and FMG 4470 as part of a roofing system and that are listed in

FMG's "Approval Guide" for Class 1 or noncombustible construction, as applicable. Identify materials with FMG markings.

1. Fire/Windstorm Classification: Class 1A- 90.
2. Hail Resistance: SH.

D. Flashings: Comply with requirements of Division 7 Section “Sheet Metal Flashing and Trim.” Provide base flashings, perimeter flashings, detail flashings and component materials that comply with requirements and recommendations of the following:

1. FMG 1-49 Loss Prevention Data Sheet for Perimeter Flashings.
2. FMG 1-29 Loss Prevention Data Sheet for Above Deck Roof Components.
3. NRCA Roofing and Waterproofing Manual (Sixth Edition) for construction details and recommendations.
4. SMACNA Architectural Sheet Metal Manual (Sixth Edition) for construction details.

1.5 SUBMITTALS

A. Product Certificate: Submit notarized certificate, indicating complete list of products intended for use under Work of this Section, including product names and numbers and manufacturers’ names, with statement indicating that products to be provided meet the requirements of the Contract Documents.

B. Product Data: For each type of product indicated.

C. Shop Drawings: For roofing system. Include plans, elevations, sections, details, and attachments to other Work.

1. Base, perimeter, and detail flashings, cants, and membrane terminations.
2. Tapered insulation, including slopes.
3. Crickets, saddles, and tapered edge strips, including slopes.
4. Insulation fastening patterns.

D. Samples for Verification: For the following products:

1. 8-by-10-inch square of base sheet, ply sheet, and flashing sheet.
2. 8-by-10-inch square of roof insulation and cover board.
3. 3 lb of aggregate surfacing material.
4. Six insulation and base sheet fasteners of each type, length, and finish.

E. Installer Certificates: Signed by roofing system manufacturer certifying that Installer is approved, authorized, or licensed by manufacturer to install roofing system.

F. Manufacturer Certificates: Signed by roofing manufacturer certifying that roofing system complies with requirements specified in "Performance Requirements" Article.

1. Submit evidence of meeting performance requirements, including FMG listing.

G. Qualification Data: For Installer, manufacturer, and manufacturer’s technical representative.

H. Qualification Data: For testing agency and testing agency personnel.

I. Product Test Reports: Based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified testing agency, for roofing system and system components.

1. Include report-indicating compliance with roof system load-strain properties requirements.

J. Manufacturer Certificates: Indicating compliance of proposed products with requirements, including:
   1. Product Compatibility: Indicate manufacturer has verified compatibility of roofing system components, including but not limited to: Roofing base and ply sheets, membrane backer and flashing sheets, reinforcement fabric felts and mats, adhesives, mastics, coatings, and sealants.
   2. Adhesive Flammability: Indicate manufacturer has verified cold process adhesives and coatings are non-flammable.

K. Manufacturer Approval of Testing Agency: Manufacturer's letter indicating acceptance of qualifications and approval of testing agency to perform inspections specified under Part 3 Article "Field Quality Control."
   1. Indicate manufacturer's approval of testing agency's authority to perform final roofing inspection and manufacturer's warranty certification.

L. Research/Evaluation Reports: For components of roofing system, published by one or more of the following:
   1. Building Officials and Code Administrators International Evaluation Service (BOCA-ES) Evaluation Reports.
   2. International Code Council (ICC).
   3. International Council of Building Officials, Inc. Evaluation Service (ICBO-ES) Evaluation Reports.
   4. National Evaluation Service, Inc. (NES).

M. Maintenance Data and Training Materials: For roofing system to include in maintenance manuals and Owner's training library.

N. Warranties: Special warranties specified in this Section.

O. Inspection Reports: Copy of daily and final technical inspection reports of roofing installation.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: A qualified firm that is approved, authorized, or licensed by roofing system manufacturer to install manufacturer's product and that is eligible to receive manufacturer's warranty.

B. Manufacturer Qualifications: A qualified manufacturer that has UL listing and FMG approval for roofing system identical to that used for this Project.

C. Manufacturer's Technical Representative Qualifications: An authorized full-time employee representative of manufacturer experienced in the installation and maintenance of the specified roofing system and qualified to determine Installer's compliance with the requirements of this Project.
   1. If Manufacturer does not employ full-time Technical Representatives, inspection personnel shall be certified as a Registered Roof Observer by the Roof Consultants Institute, and shall be experienced in the installation and maintenance of the specified

roofing system and qualified to determine Installer’s compliance with the requirements of this Project.

D. Source Limitations: Obtain components for roofing system from or approved in writing by roofing system manufacturer.

E. Fire-Test-Response Characteristics: Provide roofing materials with the fire-test-response characteristics indicated as determined by testing identical products per test method below by UL, FMG, or another testing and inspecting agency acceptable to authorities having jurisdiction. Materials shall be identified with appropriate markings of applicable testing and inspecting agency.
   1. Exterior Fire Test Exposure: Class A; ASTM E 108, for application and roof slopes indicated.
   2. Fire-Resistance Ratings: ASTM E 119, for fire-resistance-rated roof assemblies of which roofing system is a part.

F. Preinstallation Conference: Conduct conference at Project site. Comply with requirements in Division 1 Section "Project Management and Coordination." Review methods and procedures related to roofing system including, but not limited to, the following:
   1. Meet with Owner, Architect, Owner's insurer if applicable, testing and inspecting agency representative, roofing Installer, roofing system manufacturer's representative, and installers whose work interfaces with or affects roofing including installers of roof accessories and roof-mounted equipment.
   2. Review methods and procedures related to roofing installation, including manufacturer's written instructions.
   3. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
   4. Examine deck substrate conditions and finishes for compliance with requirements, including flatness and fastening.
   5. Review structural loading limitations of roof deck during and after roofing.
   6. Review flashings, special roofing details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that will affect roofing system.
   7. Review governing regulations and requirements for insurance and certificates if applicable.
   8. Review temporary protection requirements for roofing system during and after installation.
   9. Review roof observation and repair procedures after roofing installation.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver roofing materials to Project site in original containers with seals unbroken and labeled with manufacturer's name, product brand name and type, date of manufacture, and directions for storage.
   1. Where roofing system is indicated as requiring FMG classification or UL listing, containers shall bear label-indicating manufacture in compliance with FMG classification or UL listing quality assurance requirements.

B. Do not store materials in open or in contact with ground or roof surface.

C. Store materials in their original undamaged containers in a clean, dry, protected location and within the temperature range required by roofing system manufacturer. Store roll goods on ends only.

D. Protect stored liquid material from direct sunlight.
   1. Discard and legally dispose of liquid material that cannot be applied within its stated shelf life.

E. Protect roof insulation materials from physical damage and from deterioration by sunlight, moisture, soiling, and other sources. Store in a dry location. Comply with insulation manufacturers written instructions for handling, storing, and protecting during installation.

F. Handle and store roofing materials and place equipment in a manner to avoid temporary overloading or permanent deflection of deck.

1.8 PROJECT CONDITIONS

A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit roofing system to be installed according to manufacturer's written instructions and warranty requirements.

1.9 WARRANTY

A. Warranty, General: Warranties specified shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.

B. Special Manufacturer’s Warranty: Submit roofing system Manufacturer's Warranty, in which manufacturer agrees to repair or replace components of roofing system that fail in materials or workmanship within specified warranty period. Failure includes roof leaks.
   1. Special warranty includes roofing membrane, base flashings, roofing membrane accessories roof insulation fasteners cover boards sheet metal flashings and trim, copings, roof edge flashings, roof edge drainage systems, counterflashings and reglets, and roof expansion assemblies specified in other Division 7 Sections and other components of roofing system.
   2. Warranty Period: Twenty (20) years from date of Substantial Completion.
   3. New Roof Component Coverage: A single manufacturer shall provide specified warranty. The manufacturer's warranty must include labor and material coverage against leakage on all components including those manufactured by others. Included in the warranty coverage are the following:
      a. Insulation materials, fasteners, and adhesives.
      b. New and temporary roof membrane components and adhesives.
      c. Metal edge components including cleat strips.
      d. Tapered edge and cant strips.
      e. Surface mastics, coatings, stripping, plies, including elastomeric coatings.
      f. All drain and scupper flashings.
      g. Any roof leaks or other problems caused by substrate movement (e.g. insulation movement) of any component other than the deck shall not be excluded.

h. Any movement associated with metal edge joints or flanges causing leaks.
i. Damages caused by wind speed up to specified wind speed for Project.
j. Permanent tie-ins and/or joints separating new and old roofing.
k. Materials not manufactured by the roofing system manufacturer must be clearly stated on the warranty that they are covered by the conditions of the warranty.

4. Allowable Exclusions: The following exclusions are the only exclusions permitted on the warranty.
   a. Natural or accidental disasters including, but not limited to, damage caused by lightning, hailstorms, floods, hurricane force winds (74 mph or greater), tornadoes, earthquakes, fire, animals, penetration of the membrane, or chemical attack by outside agents.
   b. Any intentional or negligent act on the part of the Owner or any third party including, but not limited to, misuse, traffic, storage of or discharge of materials or effluent on the roof. Any repair of these items will be at the owner's expense.
   c. Distortion, expansion or contraction of the roofing system caused by faulty original construction or design of building components including parapet walls, copings, chimneys, skylights, vents or roof deck, or lack of positive, proper, or adequate drainage resulting in ponding water on the roof.
5. The Roofing Contractor shall certify compliance with the above warranty requirements by submitting a copy of the warranty as a submittal item upon request of the Owner. A letter from an officer of the manufacturer must be submitted, which states that the submitted warranty shall be issued at Substantial Completion. The Owner reserves the right to reject roofing systems that do not meet warranty requirements.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Basis-of-Design Manufacturer/Product: The roof system specified in this section is based upon Tremco, Inc with products named in other Part 2 articles. Subject to compliance with requirements, provide the named product or an approved comparable product.
   1. Tremco Inc.
   2. Or approved equal

2.2 BASE-SHEET MATERIALS

A. Base Sheet: ASTM D 4601, Type II, nonperforated, asphalt-impregnated and -coated, glass-fiber sheet, dusted with fine mineral surfacing on both sides.

2.3 ROOFING MEMBRANE PLIES

A. Ply Sheet: BURmastic Composite Ply HT: Nonperforated, asphalt-coated, polyester/fiberglass/polyester reinforced sheet dusted with fine mineral surfacing on both sides which meets the requirements of ASTM D 4601, Type II, suitable for application method specified, and as follows:
   1. Breaking Strength, minimum, ASTM D 146: machine direction, 145 lbf/in; cross machine direction, 135 lbf/in.

2. Tear Strength, minimum, ASTM D 4073: machine direction, 220 lbf; cross machine direction, 190 lbf.
3. Pliability, 1/2-inch radius bend, ASTM D 146: No failures.
4. Thickness, minimum, ASTM D 146: 0.050 inch.
5. Weight, minimum, ASTM D 228: 30 lb/100 sq. ft.
6. Mass of desaturated polyester/glass/polyester mat, ASTM D 228: 2.2 lb/100 sq. ft.Asphalt, minimum, ASTM D 228: 10 lb/100 sq. ft.

2.4 ROOFING MEMBRANE CAP SHEET

A. Roofing Membrane Cap Sheet: POWERply Premium FR: ASTM D 6162, Grade G, Type III, composite polyester and glass fiber reinforced, SBS/SIS/SEBS-modified asphalt sheet; granular surfaced; suitable for application method specified and as follows:
1. Exterior Fire-Test Exposure, ASTM E 108: Class A.
2. Tensile Strength at 73 deg. F, minimum, ASTM D 5147: machine direction 480 lbf/in; cross machine direction 500 lbf/in.
3. Tear Strength at 73 deg. F, minimum, ASTM D 5147: machine direction, 780 lbf; cross machine direction 760 lbf.
4. Elongation at 73 deg. F, minimum, ASTM D 5147: machine direction, 6.0 percent; cross machine direction, 6.0 percent.
5. Low Temperature Flex, maximum, ASTM D 5147: -35 deg. F.
6. Thickness, minimum, ASTM D 5147: 0.160 inch

2.5 FLASHING SHEET

A. Flashing Sheet: Thermoplastic Tri-Polymer Alloy (TPA) Sheet: ASTM D 4434, Type IV, internally fabric reinforced, uniform, flexible TPA sheet, CRRC listed and California Title 24 Energy Code compliant.
1. Tensile Strength at 0 deg. F, minimum, ASTM D 6509: 300 lbf/in.
2. Tear Strength at 77 deg. F, minimum, ASTM D 6509: 100 lbf.
3. Elongation at 0 deg. F, minimum at fabric break, ASTM D 6509: machine direction, 25 percent; cross machine direction, 25 percent.
4. Thickness: 45 mils, nominal.
5. Exposed Face Color: White.
6. Reflectance, ASTM C 1549: 86 percent.
7. Thermal Emittance, ASTM C 1371: .86.
8. Solar Reflectance Index (SRI), ASTM E 1980: 108

2.6 ASPHALT MATERIALS

A. Low-VOC Asphalt Primer: TREMprime LV: ASTM D 41, low-VOC, solvent-based asphalt primer with the following physical properties:
1. Asbestos Content, EPA 600 R-93/116: None.
2. Non-Volatile Content, minimum, ASTM D 1644: 60 percent.
3. Volatile Organic Compounds, maximum, ASTM D 3960: 350 g/L.
4. Flash Point, minimum, ASTM D 3278: 100 deg. F.
5. Density at 77 deg. F, minimum, ASTM D 1475: 7.8 lb/gal.

2.7 COLD-APPLIED ADHESIVE MATERIALS

A. Ply Sheet, Cap Sheet & Top Pour Adhesive: Powerply Standard Cold Adhesive: One-part, asbestos-free, cold-applied adhesive specially formulated for compatibility and use with specified roofing membranes and flashings, with the following physical properties:
   1. Asbestos Content, EPA 600 R-93/116: None.
   2. Volatile Organic Compounds (VOC), maximum, ASTM D 6511: 320 g/L.
   3. Nonvolatile Content, minimum, ASTM D 6511: 72 percent.
   4. Flash Point, minimum, ASTM D 93: 100 deg. F.
   5. Density at 77 deg. F, minimum, ASTM D 6511: 8.5 lb/gal.
   6. Uniformity and Consistency, ASTM D 6511: Pass.
   7. Asphalt Content, minimum, ASTM D 6511: 50 percent.
   8. Viscosity at 77 deg. F, ASTM D 2196: 25,000 to 75,000 cP.

B. Flashing Sheet Adhesive: Sheeting Bond White: One-part, asbestos-free, cold-applied, SEBS/SIS-based, elastomeric trowel-grade adhesive specially formulated for compatibility and use with specified roofing membranes and flashings, with the following properties:
   1. Adhesion in Peel, minimum, ASTM D 1876: 3 lbf/in.
   2. Lap Shear Adhesion, minimum, ASTM D 816: 18 psi.
   3. Asbestos Content: ASTM D 276: None.
   4. Volatile Organic Compounds (VOC), maximum, ASTM D 3960: 250 g/L.

2.8 AUXILIARY ROOFING MEMBRANE MATERIALS

A. General: Auxiliary materials recommended by roofing system manufacturer for intended use and compatible with built-up roofing.

B. Base Flashing Stripping Adhesive: Rock-It Adhesive: One-part, white, highly reflective polymeric surfacing adhesive, CRRC listed and California Title 24 Energy Code compliant when combined with approved white gravel, with following physical properties:
   1. Asbestos Content, EPA 600 R-93/116: None.
   2. Volatile Organic Compounds (VOC), maximum, ASTM D 6511: 250 g/L.
   3. Nonvolatile Matter, minimum ASTM D 6511: 50 percent.
   4. Flash Point, minimum, ASTM D 93: 120 deg. F.
   5. Reflectance (adhesive plus aggregate), ASTM C 1549: 71 percent.
   6. Thermal emittance (adhesive plus aggregate), ASTM C 1371: 0.85.
   7. Solar Reflectance Index (SRI), adhesive plus gravel, ASTM E 1980: 86.

C. Asphalt Roofing Cement: ASTM D 4586, asbestos free, of consistency required by roofing system manufacturer for application.

D. Mastic Sealant: Polyisobutylene, plain or modified bitumen, nonhardening, nonmigrating, nonskinning, and nondrying.

E. Fasteners: Factory-coated steel fasteners and metal or plastic plates meeting corrosion-resistance provisions in FM 4470; designed for fastening roofing membrane components to substrate; tested by manufacturer for required pullout strength; and acceptable to roofing system manufacturer.

F. Metal Flashing Sheet: Metal flashing sheet is specified in Division 7 Section "Sheet Metal Flashing and Trim."

G. Aggregate Surfacing: ASTM D 1863, No. 6 or No. 67, clean, dry, opaque, water-worn gravel or crushed stone, free of sharp edges.

H. Miscellaneous Accessories: Provide miscellaneous accessories recommended by roofing system manufacturer.

2.9 ROOF INSULATION

A. General: Provide preformed roof insulation boards that comply with requirements and referenced standards, selected from manufacturer's standard sizes and of thicknesses indicated.

B. Polyisocyanurate Board Insulation: ASTM C 1289, Type II, Class 1, Grade 2, HCFC-free, with felt or glass-fiber mat facer on both major surfaces.
   1. Board Thickness: 3.1” (MIN)
   2. Thermal Resistance (LTTR value): R-19

C. Tapered Insulation: Provide factory-tapered insulation boards fabricated to slope of 1/4 inch per 12 inches, unless otherwise indicated.

D. Provide preformed saddles, crickets, tapered edge strips, and other insulation shapes where indicated for sloping to drain. Fabricate to slopes indicated.

2.10 INSULATION ACCESSORIES

A. General: Roof insulation accessories recommended by insulation manufacturer for intended use and compatible with membrane roofing.

B. Fasteners: Factory-coated steel fasteners and metal or plastic plates meeting corrosion-resistance provisions in FMG 4470, designed for fastening roof insulation to substrate, and acceptable to roofing system manufacturer.

C. Insulation Adhesive: Fas-n-Free Adhesive: Solvent-free, cold fluid-applied, bituminous-urethane adhesive formulated to adhere roof insulation to substrate, with the following physical properties:
   1. Asbestos Content, EPA 600/R13/116: None.
   2. Volatile Organic Compounds (VOC), maximum, ASTM D 3960: 20 g/L.
   3. Non-Volatile Content, minimum, ASTM D 1644: 98 percent.
   4. Density at 77 deg. F, minimum: ASTM D 1875: 8.5 lb/gal.
   5. Elongation at 77 deg. F, minimum, ASTM D 412: 1200 percent.
   6. T-Peel Strength at 77 deg. F, minimum: ASTM D 1876: 15 lbf.
   7. Adhesion Strength in Shear at 77 deg. F, minimum, ASTM D 816: 80 psi.
   8. Low-Temperature Flexibility, maximum, ASTM D 816: -60 deg. F.

D. Insulation Cant Strips: ASTM C 208, Type II, Grade 1, cellulosic-fiber insulation board.

E. Tapered Edge Strips: ASTM C 208, Type II, Grade 1, cellulosic-fiber insulation board.

F. Cover Board: SecureRock ASTM C 1177/C 1177M, water-resistant gypsum substrate, 1/4 inch

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with the following requirements and other conditions affecting performance of roofing system:

1. Verify that roof openings and penetrations are in place and set and braced and that roof drains are securely clamped in place.
2. Verify that wood cants, blocking, curbs, and nailers are securely anchored to roof deck at penetrations and terminations and that nailers match thicknesses of insulation.
3. Verify that surface plane flatness and fastening of steel roof deck comply with requirements in Division 5 Section "Steel Deck."
4. Verify that concrete substrate is visibly dry and free of moisture. Test for capillary moisture by plastic sheet method according to ASTM D 4263.
5. Verify that wood deck is securely fastened with no projecting fasteners and with no adjacent units in excess of 1/16 inch out of plane relative to adjoining deck.
6. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Clean substrate of dust, debris, moisture, and other substances detrimental to roofing installation according to roofing system manufacturer's written instructions. Remove sharp projections.

B. Prevent materials from entering and clogging roof drains and conductors and from spilling or migrating onto surfaces of other construction. Remove roof-drain plugs when no work is taking place or when rain is forecast.

C. Prime surface of concrete deck with asphalt primer at a rate of 3/4 gal. / 100 sq. ft. and allow primer to dry.

3.3 INSTALLATION, GENERAL

A. Install roofing system in accordance with manufacturer’s recommendations.

B. Install roofing membrane, base flashings, and component materials in compliance with requirements in FMG 4450 and FMG 4470 as part of a membrane roofing system as as listed in FMG’s “Approval Guide” for fire/windstorm classification indicated. Comply with recommendations in FMG Loss Prevention Data Sheet 1-49.

C. Install roofing system in accordance with the following NRCA Manual Plates and NRCA recommendations; modify as required to comply with requirements of FMG references above:
1. Base Flashing at Parapet Wall: Plates BUR-1 and BUR-1S.
2. Base Flashing and Counterflashing at Parapet Wall: Plates BUR-4 and BUR-4S.
3. Base Flashing and Counterflashing at Parapet Wall, Movement Joint: Plates BUR-6 and BUR-6S.

4. Base and Surface-mounted Counterflashing: Plates BUR-4 and BUR-4S.
5. Perimeter Edge, Raised: Plates BUR- and BUR-2S.
6. Perimeter Edge, Gravel-stop: Plates BUR-3 and BUR-3S.
7. Scupper, Raised: Plates BUR-21 and BUR-21S.
8. Gutter at Draining Edge: Plates BUR-22 and BUR-22S.
9. Expansion Joint, with metal cover: Plates BUR-7 and BUR-7S and Division 7 Section "Sheet Metal Flashing and Trim."
10. Expansion Joint, with premanufacturerd cover: Plates BUR-7A and BUR-7AS and Division 7 Section "Roof Expansion Assemblies."
11. Curb Detail at Rooftop HVAC Units, Premanufactured: Plates BUR-12 and BUR-12S.
12. Curb Detail at Rooftop HVAC Units, Job-Built, Wood: Plates BUR-13 and BUR-13S.
13. Curb Detail at Skylight, Roof Hatch, and Smoke Vents: Plates 14 and 14S
14. Penetration, Structural Member: Plates BUR-14 and BUR-14S.
15. Penetration, Sheet Metal Enclosure: Plates 15 and 15S
16. Penetration, Stack Flashing: Plates BUR-17 and BUR-17S.
17. Penetration, Pocket: Plates BUR-19 and BUR-19S.
18. Roof Drain: Plates BUR-20 and BUR-22S.

3.4 INSULATION INSTALLATION

A. Coordinate installing roofing system components so insulation is not exposed to precipitation or left exposed at the end of the workday.

B. Comply with roofing system manufacturer's written instructions for installing roof insulation.

C. On nailable decks (LIGHTWEIGHT CONCRETE AND WOOD), install one lapped course of base sheet and mechanically fasten to substrate according to roofing system manufacturer's written instructions.

D. Insulation stops for backnailing:
   1. Mechanically attach wood blocking. Install fasteners in two rows stagger nailed, with spacing of fasteners not exceeding 24 inches (600 mm). Blocking thickness: Equal to final insulation thickness. For roof slopes between 2:12 and 3:12 (16:6% to 25%), install insulation stops 20 feet (6 m) on center perpendicular to the slope. Apply the membrane parallel to the slope and backnail to the nailers.
   2. For roof slopes of 3:12 (25%) and greater, install insulation stops 4 feet (1220 mm) on center perpendicular to the slope. Apply the membrane parallel to the slope and backnail to the nailers.

E. Insulation Cant Strips: Install and secure preformed 45-degree insulation cant strips at junctures of built-up roofing membrane system with vertical surfaces or angle changes greater than 45 degrees.

F. Install tapered insulation under area of roofing to conform to slopes indicated.

G. Install insulation with long joints of insulation in a continuous straight line with end joints staggered between rows, abutting edges and ends between boards. Fill gaps exceeding 1/4 inch with insulation.
   1. Cut and fit insulation within 1/4 inch of nailers, projections, and penetrations.

H. Install insulation at minimum thickness of 2 inches.

I. Install insulation at average overall thickness of minimum 2 inches

J. Install one or more layers of insulation under area of roofing to achieve thickness indicated. Where overall insulation thickness is 2 inches or greater, install 2 or more layers with joints of each succeeding layer staggered from joints of previous layer a minimum of 6 inches in each direction.

K. Trim surface of insulation where necessary at roof drains so completed surface is flush and does not restrict flow of water.

L. Install tapered edge strips at perimeter edges of roof that do not terminate at vertical surfaces.

M. Adhered Insulation (CONCRETE AND LIGHWEIGHT CONCRETE DECKS): Install each layer of insulation and adhere to substrate as follows:
   1. Set each layer of insulation in a cold fluid-applied insulation adhesive.

N. Mechanically Fastened and Adhered Insulation (STEEL AND WOOD DECKS): Install each layer of insulation and secure first layer of insulation to deck using mechanical fasteners specifically designed and sized for fastening specified board-type roof insulation to deck type.
   1. Fasten first layer of insulation according to requirements in FMG's "Approval Guide" for specified Windstorm Resistance Classification.
   2. Fasten first layer of insulation to resist uplift pressure at corners, perimeter, and field of roof.
   3. Install subsequent layers of insulation in a cold fluid-applied adhesive.

O. Install cover boards over insulation with long joints in continuous straight lines with end joints staggered between rows. Stagger joints from joints in insulation below a minimum of 6 inches in each direction. Loosely butt cover boards together and fasten to roof deck. Tape joints if required by roofing system manufacturer.
   1. Apply cold, fluid-applied adhesive to underside and immediately bond cover board to substrate.

3.5 ROOFING MEMBRANE INSTALLATION, GENERAL

A. Install built-up roofing membrane system according to roofing system manufacturer's written instructions and applicable recommendations of ARMA/NRCA's "Quality Control Guidelines for the Application of Built-up Roofing."

B. Start installation of built-up roofing membrane in presence of roofing system manufacturer's technical personnel.

C. Cooperate with testing and inspecting agencies engaged or required to perform services for installing built-up roofing system.

D. Coordinate installing roofing system components so insulation and roofing membrane sheets are not exposed to precipitation or left exposed at the end of the workday or when rain is forecast.

1. Provide tie-offs at end of each day's work to cover exposed roofing membrane sheets and insulation with a course of coated felt set in roofing cement or hot roofing asphalt with joints and edges sealed.
2. Complete terminations and base flashings and provide temporary seals to prevent water from entering completed sections of roofing system.
3. Remove and discard temporary seals before beginning work on adjoining roofing.

E. Cold Process Asphalt Heating
1. An in-line heat exchange unit may be used to facilitate application
   a. Do not exceed maximum adhesive temperature of 100° F.
2. Heat exchange unit: Use heat transfer oil approved by heating equipment manufacturer.
3. Follow operation procedures recommended by heating equipment manufacturer.

F. Substrate-Joint Penetrations: Prevent roofing asphalt from penetrating substrate joints, entering building, or damaging roofing system components or adjacent building construction.

3.6 ROOFING MEMBRANE INSTALLATION ON ROOF SLOPES LESS THAN 2:12

A. Install four ply sheets starting at low point of roofing system. Align ply sheets without stretching. Shingle side laps of ply sheets uniformly to achieve required number of plies throughout thickness of roofing membrane. Shingle in direction to shed water. Extend ply sheets over and terminate beyond cants.
1. Embed each ply sheet in a solid mopping of cold, fluid-applied adhesive, applied at rate required by roofing system manufacturer, to form a uniform membrane without ply sheets touching.
2. Broom in ply sheets to ensure of proper adhesion.

B. Aggregate Surfacing: Promptly after installing and testing roofing membrane, base flashing, and stripping, flood-coat roof surface with 5 gallons/100 sq. ft. of cold fluid-applied adhesive. While flood coat is fluid, cast the following average weight of aggregate in a uniform course:
1. Aggregate Weight: 400 lb/100 sq. ft.

3.7 ROOFING MEMBRANE INSTALLATION ON ROOF SLOPES LESS THAN 2:12ROOFING MEMBRANE INSTALLATION ON ROOF SLOPES LESS THAN 2:12ROOFING MEMBRANE INSTALLATION ON ROOF SLOPES GREATER THAN 2:12

A. Install two (2) ply sheets and cap sheet starting at low point of roofing system. Align ply sheets without stretching. Shingle side laps of ply sheets uniformly to achieve required number of plies throughout thickness of roofing membrane. Shingle in direction to shed water. Extend ply sheets over and terminate beyond cants.
1. Embed each ply sheet in a solid mopping of cold, fluid-applied adhesive, applied at rate required by roofing system manufacturer, to form a uniform membrane without ply sheets touching.
2. Broom in ply sheets to ensure of proper adhesion.

3.8 FLASHING AND STRIPPING INSTALLATION

A. Install base flashing over cant strips and other sloping and vertical surfaces, at roof edges, and at penetrations through roof, and secure to substrates according to roofing system manufacturer's written instructions and as follows:
   1. Prime substrates with asphalt primer if required by roofing system manufacturer.
   2. Flashing Sheet Application: Adhere flashing sheet to substrate in cold adhesive applied at rate required by roofing system manufacturer.

B. Extend base flashing up walls or parapets a minimum of 8 inches above roofing membrane and 6 inches onto field of roofing membrane.

C. Mechanically fasten top of base flashing securely at terminations and perimeter of roofing.
   1. Seal top termination of base flashing with a termination bar.

D. Install stripping, according to roofing system manufacturer's written instructions, where metal flanges and edgings are set on built-up roofing.
   1. Flashing-Sheet Stripping at Vertical Laps and Corners: Heat weld vertical laps and corners. Install TPA Universal Corners by heat welding into all inside and outside flashing corners.
   2. Flashing-Sheet Stripping at Leading Edge: Where the flashing membrane meets the roof, install flashing sheet stripping in a continuous coating of base flashing stripping adhesive.
   3. Apply Unreinforced TPA as a stripping ply over all overlap edges.

E. Roof Drains: Set 30-by-30-inch metal flashing in bed of asphalt roofing cement on completed roofing membrane. Cover metal flashing with stripping and extend a minimum of 4 inches beyond edge of metal flashing onto field of roofing membrane. Clamp roofing membrane, metal flashing, and stripping into roof-drain clamping ring.

3.9 FIELD QUALITY CONTROL

A. Manufacturer’s Technical Representative: Contractor will engage a qualified manufacturer’s technical representative acceptable to Owner for a minimum of three (3) full-time days on site to perform roof tests and inspections and to prepare test reports.

B. Test Cuts: Before flood coating and surfacing built-up roofing membrane, test specimens will be removed to evaluate problems observed during quality-assurance inspections of roofing membrane as follows:
   1. Approximate quantities of components within roofing membrane will be determined according to ASTM D 3617.
   2. Test specimens will be examined for interply voids according to ASTM D 3617 and to comply with criteria established in Appendix 3 of ARMA/NRCA's "Quality Control Guidelines for the Application of Built-up Roofing."

C. Final Roof Inspection: Arrange for roofing system manufacturer's technical personnel to inspect roofing installation on completion and submit report to Architect.
   1. Notify Architect and Owner 48 hours in advance of date and time of inspection.

D. Repair or remove and replace components of roofing system where test results or inspections indicate that they do not comply with specified requirements.

E. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

3.10 PROTECTING AND CLEANING

A. Protect roofing system from damage and wear during remainder of construction period. When remaining construction will not affect or endanger roofing, inspect roofing for deterioration and damage, describing its nature and extent in a written report, with copies to Architect and Owner.

B. Correct deficiencies in or remove roofing system that does not comply with requirements, repair substrates, and repair or reinstall roofing system to a condition free of damage and deterioration at time of Substantial Completion and according to warranty requirements.

C. Clean overspray and spillage from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

END OF SECTION 075130

SECTION 076000

SHEET METAL FLASHING AND TRIM

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Manufactured reglets and counterflashing.
2. Formed roof drainage sheet metal fabrications.
3. Formed low-slope roof sheet metal fabrications.

1.2 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Shop Drawings: Show installation layouts of sheet metal flashing and trim, including plans, elevations, expansion-joint locations, and keyed details. Distinguish between shop- and field-assembled work.

C. Samples: For each exposed product and for each finish specified.

D. Maintenance data.

E. Warranty: Sample of special warranty.

1.3 QUALITY ASSURANCE

A. Sheet Metal Flashing and Trim Standard: Comply with SMACNA's "Architectural Sheet Metal Manual" unless more stringent requirements are specified or shown on Drawings.

1.4 WARRANTY

A. Special Warranty on Finishes: Manufacturer's standard form in which manufacturer agrees to repair finish or replace sheet metal flashing and trim that shows evidence of deterioration of factory-applied finishes within 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 SHEET METALS

A. General: Protect mechanical and other finishes on exposed surfaces from damage by applying a strippable, temporary protective film before shipping.

B. Aluminum Sheet: ASTM B 209 alloy as standard with manufacturer for finish required, with temper as required to suit forming operations and performance required.

1. As-Milled Finish: One-side bright mill finish.
2. Alclad Finish: Metallurgically bonded surfacing to both sides, forming a composite aluminum sheet with reflective luster.
3. Factory Prime Coating: Where painting after installation is indicated, pretreat with white or light-colored, factory-applied, baked-on epoxy primer coat; minimum dry film thickness of 0.2 mil.
4. Clear Anodic Finish, Coil Coated: AAMA 611, AA-M12C22A41, Class I, 0.018 mm or thicker.
5. Color Anodic Finish, Coil Coated: AAMA 611, AA-M12C22A42/A44, Class I, 0.018 mm or thicker.
6. Exposed Coil-Coated Finishes:

    a. Two-Coat Fluoropolymer: AAMA 620. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in color coat.
    b. Three-Coat Fluoropolymer: AAMA 620. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in both color coat and clear topcoat.
    c. Siliconized Polyester: Epoxy primer and silicone-modified, polyester-enamel topcoat.

7. Color: Match Existing

C. Stainless-Steel Sheet: ASTM A 240/A 240M or ASTM A 666, Type 304, dead soft, fully annealed; finish.

2.2 UNDERLAYMENT MATERIALS

A. Polyethylene Sheet: 6-mil-thick polyethylene sheet complying with ASTM D 4397.

B. Felt: ASTM D 226, Type II (No. 30), asphalt-saturated organic felt, nonperforated.

C. Self-Adhering, High-Temperature Sheet: Minimum 30 to 40 mils thick, consisting of slip-resisting polyethylene-film top surface laminated to layer of butyl or SBS-modified asphalt adhesive, with release-paper backing; cold applied. Provide primer when recommended by underlayment manufacturer.

1. Thermal Stability: ASTM D 1970; stable after testing at 240 deg F
2. Low-Temperature Flexibility: ASTM D 1970; passes after testing at minus 20 deg F.

D. Slip Sheet: Building paper, 3-lb/100 sq. ft. minimum, rosin sized.

2.3 MISCELLANEOUS MATERIALS

A. General: Provide materials and types of fasteners, solder, welding rods, protective coatings, separators, sealants, and other miscellaneous items as required for complete sheet metal flashing and trim installation and recommended by manufacturer of primary sheet metal unless otherwise indicated.

B. Fasteners: Wood screws, annular threaded nails, self-tapping screws, self-locking rivets and bolts, and other suitable fasteners designed to withstand design loads and recommended by manufacturer of primary sheet metal.

1. General: Blind fasteners or self-drilling screws, gasketed, with hex-washer head.

    a. Exposed Fasteners: Heads matching color of sheet metal using plastic caps or factory-applied coating.
    b. Blind Fasteners: High-strength aluminum or stainless-steel rivets suitable for metal being fastened.
    c. Spikes and Ferrules: Same material as gutter; with spike with ferrule matching internal gutter width.
2. Fasteners for Aluminum Sheet: Aluminum or Series 300 stainless steel.
3. Fasteners for Stainless-Steel Sheet: Series 300 stainless steel.

C. Solder:
1. For Stainless Steel: ASTM B 32, Grade Sn60, with an acid flux of type recommended by stainless-steel sheet manufacturer.

D. Sealant Tape: Pressure-sensitive, 100 percent solids, gray polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape 1/2 inch wide and 1/8 inch thick.

E. Elastomeric Sealant: ASTM C 920, elastomeric polymer sealant; low modulus; of type, grade, class, and use classifications required to seal joints in sheet metal flashing and trim and remain watertight.

F. Butyl Sealant: ASTM C 1311, single-component, solvent-release butyl rubber sealant; polyisobutylene plasticized; heavy bodied for hooked-type expansion joints with limited movement.

G. Epoxy Seam Sealer: Two-part, noncorrosive, aluminum seam-cementing compound, recommended by aluminum manufacturer for exterior nonmoving joints, including riveted joints.

H. Bituminous Coating: Cold-applied asphalt emulsion complying with ASTM D 1187.

2.4 REGLETS

A. Reglets: Units of type, material, and profile indicated, formed to provide secure interlocking of separate reglet and counterflashing pieces, and compatible with flashing indicated [with factory-mitered and -welded corners and junctions.

2.5 FABRICATION, GENERAL

A. General: Custom fabricate sheet metal flashing and trim to comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, geometry, metal thickness, and other characteristics of item indicated. Fabricate items at the shop to greatest extent possible.

1. Obtain field measurements for accurate fit before shop fabrication.
2. Form sheet metal flashing and trim without excessive oil canning, buckling, and tool marks and true to line and levels indicated, with exposed edges folded back to form hems.
3. Conceal fasteners and expansion provisions where possible. Exposed fasteners are not allowed on faces exposed to view.

B. Sealed Joints: Form nonexpansion but movable joints in metal to accommodate elastomeric sealant.

C. Expansion Provisions: Where lapped expansion provisions cannot be used, form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with butyl sealant concealed within joints.

D. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal.

E. Seams: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with elastomeric sealant unless otherwise recommended by sealant manufacturer for intended use.

F. Seams for Aluminum: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with epoxy seam sealer.

2.6 ROOF DRAINAGE SHEET METAL FABRICATIONS

A. Conductor Heads: Fabricate conductor heads with flanged back and stiffened top edge and of dimensions and shape indicated complete with outlet tubes, exterior flange trim and built-in overflows. Fabricate from the following materials:
1. Aluminum: 0.032 inch thick.
2. Stainless Steel: 0.016 inch thick.
3. Galvanized Steel: 0.028 inch > thick.

2.7 LOW-SLOPE ROOF SHEET METAL FABRICATIONS

A. Roof-Edge Flashing (Gravel Stop) and Fascia Cap: Fabricate in minimum 96-inch-long, but not exceeding 10-foot-long, sections. Furnish with 6-inch-wide, joint cover plates. Fabricate from the following materials:
1. Aluminum: 0.050 inch thick.
2. Stainless Steel: 0.019 inch thick.

B. Copings: Fabricate in minimum 96-inch-long, but not exceeding 10-foot-long, sections. Fabricate joint plates of same thickness as copings. Furnish with continuous cleats to support

edge of external leg and drill elongated holes for fasteners on] interior leg. Miter corners, seal, and solder or weld watertight. Fabricate from the following materials:
1. Aluminum: 0.050 inch thick.
2. Stainless Steel: 0.025 inch thick.

C. Base Flashing: Fabricate from the following materials:
1. Aluminum: 0.040 inch thick.
2. Stainless Steel: 0.019 inch thick.

D. Counterflashing and Flashing Receivers: Fabricate from the following materials:
1. Aluminum: [0.032 inch thick.
2. Stainless Steel: 0.019 inch > thick.

E. Roof-Penetration Flashing: Fabricate from the following materials:
1. Stainless Steel: 0.019 inch thick.

F. Roof-Drain Flashing: Fabricate from the following materials:
1. Stainless Steel: 0.016 thick.

PART 3 - EXECUTION

3.1 UNDERLAYMENT INSTALLATION

A. Polyethylene Sheet: Install polyethylene sheet with adhesive for anchorage. Apply in shingle fashion to shed water, with lapped and taped joints of not less than 2 inches.

B. Felt Underlayment: Install felt underlayment with adhesive for temporary anchorage. Apply in shingle fashion to shed water, with lapped joints of not less than 2 inches.

C. Self-Adhering Sheet Underlayment: Install self-adhering sheet underlayment, wrinkle free. Comply with temperature restrictions of underlayment manufacturer for installation; use primer rather than nails for installing underlayment at low temperatures. Apply in shingle fashion to shed water, with end laps of not less than 6 inches staggered 24 inches between courses. Overlap side edges not less than 3-1/2 inches). Roll laps with roller. Cover underlayment within 14 days.

3.2 INSTALLATION, GENERAL

A. General: Anchor sheet metal flashing and trim and other components of the Work securely in place, with provisions for thermal and structural movement so that completed sheet metal flashing and trim shall not rattle, leak, or loosen, and shall remain watertight. Use fasteners, solder, welding rods, protective coatings, separators, sealants, and other miscellaneous items as required to complete sheet metal flashing and trim system.

1. Install sheet metal flashing and trim true to line and levels indicated. Provide uniform, neat seams with minimum exposure of solder, welds, and sealant.

2. Install sheet metal flashing and trim to fit substrates and to result in watertight performance. Verify shapes and dimensions of surfaces to be covered before fabricating sheet metal.
3. Space cleats not more than 12 inches apart. Anchor each cleat with two fasteners. Bend tabs over fasteners.
4. Install exposed sheet metal flashing and trim without excessive oil canning, buckling, and tool marks.
5. Install sealant tape where indicated.
6. Torch cutting of sheet metal flashing and trim is not permitted.

B. Metal Protection: Where dissimilar metals will contact each other or corrosive substrates, protect against galvanic action by painting contact surfaces with bituminous coating or by other permanent separation as recommended by SMACNA.

1. Coat back side of uncoated aluminum and stainless-steel sheet metal flashing and trim with bituminous coating where flashing and trim will contact wood, ferrous metal, or cementitious construction.
2. Underlayment: Where installing metal flashing directly on cementitious or wood substrates, install a course of felt underlayment and cover with a slip sheet or install a course of polyethylene sheet.

C. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at a maximum of 10 feet with no joints allowed within 24 inches of corner or intersection. Where lapped expansion provisions cannot be used or would not be sufficiently watertight, form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with sealant concealed within joints.

D. Fastener Sizes: Use fasteners of sizes that will penetrate metal decking not less than recommended by fastener manufacturer to achieve maximum pull-out resistance.

E. Seal joints as shown and as required for watertight construction.

F. Soldered Joints: Clean surfaces to be soldered, removing oils and foreign matter. Pre-tin edges of sheets to be soldered to a width of 1-1/2 inches except reduce pre-tinning where pre-tinned surface would show in completed Work.

1. Do not solder aluminum sheet.
2. Do not use torches for soldering. Heat surfaces to receive solder and flow solder into joint. Fill joint completely. Completely remove flux and spatter from exposed surfaces.
3. Stainless-Steel Soldering: Tin edges of uncoated sheets using solder recommended for stainless steel and acid flux. Promptly remove acid flux residue from metal after tinning and soldering. Comply with solder manufacturer's recommended methods for cleaning and neutralization.

G. Rivets: Rivet joints in uncoated aluminum where indicated and where necessary for strength.

3.3 ROOF DRAINAGE SYSTEM INSTALLATION

A. General: Install sheet metal roof drainage items to produce complete roof drainage system according to SMACNA recommendations and as indicated. Coordinate installation of roof perimeter flashing with installation of roof drainage system.

B. Conductor Heads: Anchor securely to wall with elevation of conductor head rim 1 inch below discharge.

C. Expansion-Joint Covers: Install expansion-joint covers at locations and of configuration indicated. Lap joints a minimum of 4 inches in direction of water flow.

3.4 ROOF FLASHING INSTALLATION

A. General: Install sheet metal flashing and trim to comply with performance requirements and SMACNA's "Architectural Sheet Metal Manual." Provide concealed fasteners where possible, set units true to line, and level as indicated. Install work with laps, joints, and seams that will be permanently watertight and weather resistant.

B. Roof Edge Flashing: Anchor to resist uplift and outward forces according to recommendations in SMACNA's "Architectural Sheet Metal Manual" and as indicated. Interlock bottom edge of roof edge flashing with continuous cleat anchored to substrate at staggered 3-inch centers.

C. Copings: Anchor to resist uplift and outward forces according to recommendations in SMACNA's "Architectural Sheet Metal Manual" and as indicated.

1. Interlock exterior bottom edge of coping with continuous cleat anchored to substrate at 24-inch centers.
2. Anchor interior leg of coping with washers and screw fasteners through slotted holes at 24-inch centers.

D. Pipe or Post Counterflashing: Install counterflashing umbrella with close-fitting collar with top edge flared for elastomeric sealant, extending a minimum of 4 inches over base flashing. Install stainless-steel draw band and tighten.

E. Counterflashing: Coordinate installation of counterflashing with installation of base flashing. Insert counterflashing in reglets or receivers and fit tightly to base flashing. Extend counterflashing 4 inches over base flashing. Lap counterflashing joints a minimum of 4 inches and bed with sealant.

F. Roof-Penetration Flashing: Coordinate installation of roof-penetration flashing with installation of roofing and other items penetrating roof. Seal with elastomeric sealant and clamp flashing to pipes that penetrate roof.

3.5 WALL FLASHING INSTALLATION

A. General: Install sheet metal wall flashing to intercept and exclude penetrating moisture according to SMACNA recommendations and as indicated. Coordinate installation of wall flashing with installation of wall-opening components such as windows, doors, and louvers.

B. Opening Flashings in Frame Construction: Install continuous head, sill, jamb, and similar flashings to extend 4 inches beyond wall openings.

3.6 CLEANING AND PROTECTION

A. Clean exposed metal surfaces of substances that interfere with uniform oxidation and weathering.

B. Clean and neutralize flux materials. Clean off excess solder and sealants.

C. Remove temporary protective coverings and strippable films as sheet metal flashing and trim are installed unless otherwise indicated in manufacturer's written installation instructions.

END OF SECTION

SECTION 077100

GUTTERS AND DOWNSPOUTS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Gutters and Downspouts.

B. Related Accessories.

1.2 REFERENCES

A. ASTM B 209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.

B. SMACNA - Architectural Sheet Metal Manual.

1.3 DESIGN / PERFORMANCE REQUIREMENTS

A. Conform to applicable code for size and method of rain water discharge.

B. American Architectural Manufacturers Association (AAMA) Specification 1405.1 "Specification for Aluminum Raincarrying Systems".

1.4 SUBMITTALS

A. Product Data: Manufacturer's catalog data, detail sheets, and specifications.

B. Shop Drawings: Prepared specifically for this project; showing dimensions of metal gutters and accessories, fastening details and connections and interface with other products.

C. Selection Samples: For each finish product specified, two complete sets of color chips representing manufacturer's full range of available colors and patterns.

D. Verification Samples: For each finish product specified, two samples, minimum size 6 inches (150 mm) square, representing actual product, color, and patterns.

E. Manufacturer's Certificates: Certify products meet or exceed specified requirements.

F. Manufacturers warranties.

1.5 QUALITY ASSURANCE

A. Manufacturer Qualifications:

B. Installer Qualifications: Certified and approved installer of the sheet metal roofing manufacturer.

C. Perform Work in accordance with SMACNA Manual

1.6 DELIVERY, STORAGE, AND HANDLING

A. Store products in manufacturer's unopened packaging until ready for installation.

B. Store products to prevent twisting, bending, and abrasion, and to provide ventilation. Slope stored materials to drain.

C. During storage prevent contact with materials capable of causing discoloration, staining, or other damage.

1.7 PROJECT CONDITIONS

A. Coordinate installation with installation of adjacent roofing, siding and related materials.

1.8 WARRANTY

A. Provide the Manufacturer's Limited 20-Year, pro-rated and non-transferable Warranty covering labor materials.

1.9 COORDINATION

A. Coordinate Work with other operations and installation of floor finish materials to avoid damage to installed underlayment and membrane materials.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Basis of Design: Mazmet Metal Products, which is located at: 1050 Bristol Road; Mountainside, NJ 07092; Phone: 908.654.7686; Fax: Fax: 908.654.7898;

B. Substitutions: Approved equal.

2.2 COMPONENTS

A. Gutters: Aluminum sheet, ASTM B 209, Alloy 3105-H24. Minimum tensile strength 26,000 psi, minimum yield strength 25,000 psi or equivalent. Continuous and seamless sheet aluminum, roll formed.
   1. Thickness:
      a. 0.063 inch

B. Downspouts: Aluminum sheet, ASTM B 209, Alloy 3105-H24. Minimum tensile strength 26,000 psi, minimum yield strength 25,000 psi or equivalent.
   1. Thickness:
      a. 0.063 inch
   2. Size:
      a. Match Existing : 4 inches by 4 inches (min.).

C. Endcaps: Aluminum sheet, ASTM B 209, Alloy 3105-H24, thickness 0.063 inch

D. Inside and Outside Mitres: Aluminum sheet, ASTM B 209, Alloy 3105-H24, thickness 0.063inch

E. Gutter Hangers and Anchors: Aluminum sheet, ASTM B 209, Alloy 3105-H24, thickness 0.063 inch. Provide types required to suit project requirements.

F. Downspout Anchors: Aluminum. Provide types required to suit project requirements.

G. Elbows: Aluminum sheet, ASTM B 209, Alloy 3105-H24. Minimum tensile strength 26,000

psi, minimum yield strength 25,000 psi or equivalent.

1. Thickness:
    a. 0.063 inch
2. Size: To match downspouts.

H. Aluminum Finish: Kynar 500 system factory applied in a continuous process in a single operation.

1. Color:
    a. Approved by Owner from Manufacturer’s Standard Colors.

I. Sealant: As recommended by manufacturer.

J. Fasteners: Same material and finish as gutters and downspouts.

2.3 FABRICATION

A. Continuously form seamless gutters to the profiles and sizes specified.

B. Form downspouts of profiles and sizes specified.

C. Hem exposed edges of metal.

PART 3 EXECUTION

3.1 EXAMINATION

A. Do not begin installation until substrates have been properly prepared.

B. Verify governing dimensions at building.

C. Verify surfaces are ready to receive gutters and downspouts.

3.2 PREPARATION

A. Clean surfaces thoroughly prior to installation.

B. Clean and repair if necessary any adjoining work on which this work is in any way dependent for its proper installation.

C. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.3 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Install gutters using appropriate hangers to allow normal expansion and contraction.

C. Install gutter hangers using two 1-1/4 inch (32 mm) screw shank nails and fastened into solid lumber.

D. All gutters shall be in continuous length for each elevation (run). No end laps are allowed.

E. Exercise care in placing aluminum in contact with other dissimilar metals or materials that are not compatible with aluminum.

F. Providing adequate insulation/separation where ever necessary, such as by painting or otherwise protecting when they are in contact with aluminum or when drainage from them passes over aluminum surfaces.

G. Install sealants where indicated to clean dry surfaces only without skips or voids.

3.4 PROTECTION

A. Protect installed products until completion of project.

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

END OF SECTION

SECTION 077233

ROOF HATCHES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Work included: Furnishing and installing factory fabricated roof hatches.

1.2 SUBMITTALS

A. Product Data: Provide manufacturer's product data for all materials in this specification.

B. Shop Drawings: Show profiles, accessories, location, and dimensions.

C. Samples: Manufacturer to provide upon request; sized to represent material adequately.

D. Contract Closeout: Roof hatch manufacturer shall provide the manufacturer's Warranty prior to the contract closeout.

1.3 WARRANTY

A. Manufacturer's standard warranty: Materials shall be free of defects in material and workmanship for a period of five years from the date of purchase. Should a part fail to function in normal use within this period, manufacturer shall furnish a new part at no charge.

1.4 PRODUCT HANDLING

A. All materials shall be delivered in manufacturer's original packaging.

B. Store materials in a dry, protected, well-vented area. The contractor shall thoroughly inspect product upon receipt and report damaged material immediately to delivering carrier and note such damage on the carrier's freight bill of lading.

C. Remove protective wrapping after installation.

1.5 JOB CONDITIONS

A. Verify that other trades with related work are complete before installing roof hatch(s).Felt: ASTM D 226, Type II (No. 30), asphalt-saturated organic felt, nonperforated.

B. Mounting surfaces shall be straight and secure; substrates shall be of proper width.

C. Refer to the construction documents, shop drawings, and manufacturer's installation instructions.

D. Coordinate installation with roof membrane and roof insulation manufacturer's instructions before starting.

E. Observe all appropriate OSHA safety guidelines for this work.

PART 2 - PRODUCTS

2.1 MANUFACTURER

A. Basis of Design: The Bilco Company

B. Or approved equal

2.2 Roof Hatch

A. Furnish and install where indicated on plans metal roof hatch:

1. Type: S

2. Size: Field Verify.

3. The roof hatch shall be single leaf.

4. The roof hatch shall be pre-assembled from the manufacturer.

B. Performance characteristics:

1. Cover shall be reinforced to support a minimum live load of 40 psf (195kg/m2) with a maximum deflection of 1/150th of the span or 20 psf wind uplift.

2. Operation of the cover shall be smooth and easy with controlled operation throughout the entire arc of opening and closing.

3. Operation of the cover shall not be affected by temperature.

4. Entire hatch shall be weathertight with fully welded corner joints on cover and curb.

C. Cover: Shall be 14 gauge type 304 stainless steel with a 3" (76mm) beaded flange with formed reinforcing members. Cover shall have a heavy extruded EPDM rubber gasket that is bonded to the cover interior to assure a continuous seal when compressed to the top surface of the curb.

D. Cover insulation: Shall be fiberglass of 1" (25.4mm) thickness, fully covered and protected by a metal liner of 18 gauge type 304 stainless steel.

E. Curb: Shall be 12" (305mm) in height and 14 gauge stainless steel. The curb shall be formed with a 3-1/2" (89mm) flange with 7/16" (11.1mm) holes provided for securing to the roof deck.

The curb shall be equipped with an integral metal capflashing of the same gauge and material as the curb, fully welded at the corners, that features the Bil-Clip® flashing system, including stamped tabs, 6” (153mm) on center, to be bent inward to hold single ply roofing membrane securely in place.

F. Curb insulation: Shall be rigid, high-density fiberboard of 1” (25.4mm) thickness on outside of curb.

G. Lifting mechanisms: Manufacturer shall provide compression spring operators enclosed in telescopic tubes to provide, smooth, easy, and controlled cover operation throughout the entire arc of opening and closing. The upper tube shall be the outer tube to prevent accumulation of moisture, grit, and debris inside the lower tube assembly. The lower tube shall interlock with a flanged support shoe welded to the curb assembly.

H. Hardware

1. All hardware shall be type 316 stainless steel

2. Heavy pintle hinges shall be provided

3. Cover shall be equipped with a spring latch with interior and exterior turn handles

4. Roof hatch shall be equipped with interior and exterior padlock hasps.

5. The latch strike shall be a stamped component bolted to the curb assembly.

6. Cover shall automatically lock in the open position with a rigid hold open arm equipped with a 1” diameter red vinyl grip handle to permit easy release for closing.

7. Compression spring tubes shall be an anti-corrosive composite material and all other hardware shall be zinc plated and chromate sealed. Springs shall have an electrocoated acrylic finish for corrosion resistance.

8. Cover hardware shall be bolted into heavy gauge channel reinforcing welded to the underside of the cover and concealed within the insulation space.

I. Finish: Bead blast finished stainless steel.

PART 3 - EXECUTION

3.1 INSPECTION

A. Verify that roof hatch installation will not disrupt other trades. Verify that the substrate is dry, clean, and free of foreign matter. Report and correct defects prior to any installation.

3.2 INSTALLATION

A. Submit product design drawings for review and approval to the architect or specifier before fabrication.

B. The installer shall check as-built conditions and verify the manufacturer’s roof hatch details for accuracy to fit the application prior to fabrication. The installer shall comply with the roof hatch Manufacturer's installation instructions.

C. The installer shall furnish mechanical fasteners consistent with the roof requirements.

END OF SECTION

SECTION 082000

FIBERGLASS REINFORCED PLASTIC DOORS AND FRAMES

PART 1 - GENERAL

1.01 DESCRIPTION

The Contractor shall provide fiberglass reinforced plastic (FRP) doors and fiberglass resin transfer molded door frames; complete in place wherever a door location is shown on the Drawings.

1.02 QUALITY ASSURANCE

A. Qualifications of Manufacturer: Products used in the work of this section shall be produced by manufacturers regularly engaged in manufacture of similar items and with a history of successful production acceptable to the Engineer.

B. Installer Qualifications: An experienced installer who has completed fiberglass door and frame installations similar in material, design, and extent to those indicated and whose work has resulted in construction with a record of successful in-service performance

B. Basis of Acceptance: The manufacturer's recommended installation procedures, when approved by the Engineer, will become the basis for inspecting and accepting or rejecting actual installation procedures used on this work.

C. Source limitations: Obtain fiberglass reinforced plastic doors and resin transfer molded fiberglass frames through one source fabricated from a single manufacturer, including fire rated fiberglass frames. This ensures complete uniformity of physical properties and consistency in the resin chemistry tailored for this application. Glass for windows in doors shall also be furnished and installed by door and frame manufacturer

1.03 REFERENCE STANDARDS

Test certification by an independent and accredited laboratory is required for the properties listed in this section. Reports shall be made available upon request for each of the standards and certifications described below.

A. Door Properties:

1) Standard test method for steady state thermal transmission properties by means of the heat flow meter apparatus.
2) Successfully completed 1,000,000 cycles test in accordance with: AAMA 920-03 – Specification for Operating Cycle Performance of Side-Hinged Exterior Door Systems. ANSI A250.4-2001 – Test Procedure and Acceptance Criteria for Physical Endurance for Steel Doors, Frames, Frame Anchors and Hardware Reinforcings. NWWDA TM-7 Test Method to Determine the Physical Endurance of Wood Doors and Associated Hardware Under Accelerated Operating Conditions.

B. Laminate Properties:

Door face plate is a minimum of 0.125 inch thick fiberglass reinforced plastic molded into one continuous sheet starting with a 25 mil resin-rich gelcoat layer resin integrally molded with multiple layers of 1.5 oz. sq ft fiberglass mat and one layer of 18 oz per square yard fiberglass woven roving saturated with special resin. Door plate weight shall not be less than 0.97 lbs per square foot at a ratio of 30/70 glass resin.
Laminated plate by itself evaluated in accordance with Florida Building Code TAS 201 Large Missile Impact Test as per ASTM-1996-05b, Standard Specification for Performance of Exterior Windows, Curtain Wall, Doors and Storm Shutters Impacted by Windborne Debris in Hurricanes.

1) ASTM D 638 Tensile Strength Properties of Plastic
2) ASTM D 790 Flexural Strength Properties of Plastic
3) ASTM D 2583 Indention Hardness of Plastics
4) ASTM D 256 Izod Pendulum Impact Resistance
5) ASTM D 792 Density/Specific Gravity Of Plastics
6) ASTM D 1761 Mechanical Properties of Fasteners
7) ASTM E 84 Surface Burning Characteristics of Materials
8) ASTM G 155 Xenon Light Exposure of Non Metallic Materials
9) ASTM D 635 Method For Rate of Burning
10) ASTM D 2843 Smoke Density
11) ASTM D 1929 Self Ignition Temperature Properties
12) SFBC PA 201 Impact Procedures for Large Missile Impact

C. Core Properties:

1) ASTM C 177 Thermal Properties of Materials
2) ASTM D 1622 Density and Specific Gravity
3) ASTM E 84 Surface Burning Characteristics of Materials
4) WDMA TM-10 and TM-5 Firestop ASTM E 152 U.L 10(b)
5) ASTM E90-04- Sound Transmission Loss
6) ASTM E413-04- Classification for Rating Sound Insulation
7) ASTM E1332-90- Standard Classification for Determination of Outdoor-Indoor Transmission Class
8) ASTM E2235-04- Standard Test for Determination of Decay Rates for Use in Sound Insulation Methods

1.04 SUBMITTALS

A. Product Data: Manufacturer's descriptive literature and installation instructions.

B. Shop Drawings: Illustrations and schedule of door and frame sizes, types, materials, construction, finishing, anchoring, accessories, and preparation for installing hardware.

D. Certificates: Manufacturer's certificates that materials meet specification requirements.

1.05 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Shipment: Each door and frame shall be delivered individually crated for protection from damage

in cardboard containers, clearly marked with project information, door location, specific reference number as shown on drawings, and shipping information. Each crate shall contain all fasteners necessary for installation as well as complete installation instructions.

B. Deliver material in manufacturer's original packaging on edge, out of inclement weather for protection against the elements with all tags and labels intact and legible.

C. Store and handle material in such manner as to avoid damage; store at site under cover on wood blocking or on suitable floors.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. Fiberglass doors and frames shall be products of the following manufacturers or equivalent, subject to compliance with specification requirements:

1. Chem-Pruf Door Co.
2. Approved Equivalent.

B. All work of this section shall be the products of a single manufacturer.

2.02 FABRICATION

Surfaces shall be smooth and free from warp or buckles. Arrises shall be straight, sharp and out of wind. Assemble joints so that the intersection will be imperceptible when finished.

2.03 FRP DOORS

A. Doors shall be made of fiberglass reinforced plastic (FRP) using Class 1 premium resin with no fillers that is specifically tailored to resist chemicals and contaminants typically found in environment for which these specifications are written. Doors shall be 1 ¾ inch thick and of flush construction, having no seams or cracks. For consistency in the resin chemistry tailored for this application and to maintain the same physical properties throughout the structure, all fiberglass components including face plates, stiles and rails and frames must be fabricated by the same manufacturer. Components obtained through various outside sources for plant assembly will not be accepted.

B. Door Plates shall be 0.125 inch thick minimum, molded in one continuous piece, starting with 25 mil gelcoat of the color specified, integrally molded with multiple layers of 1.5 ounces per square foot fiberglass mat and one layer of 18 ounce per square yard fiberglass woven roving. Each layer shall be individually laminated with resin as mentioned above. Door plate weight shall not be less than 0.97 lbs per square foot at a ratio of 30/70 glass to resin. Plate alone to withstand Large Missile Impact per FBC TAS 201. Face plates manufactured using the pultrusion process does not allow for a smooth molded gelcoat finish, the use of woven roving for adequate plate thickness, strength and weight, or the appropriate glass to resin ratio and will not meet the quality standards of this project.

C. Stiles and Rails shall be constructed starting from the outside toward the inside, with a matrix of at least three layers of 1.5 ounce per square foot of fiberglass mat. The stile and rail shall be molded in one continuous piece to a U-shaped configuration and to the exact dimensions of the door. In this manner there will be no miter joints and disparate materials used to form the one-piece stile and rail.

D. Core material shall be Polypropylene plastic honeycomb core with a non woven polyester veil for unparalleled plate bonding, 180 PSI typical compression range unless otherwise requested.

E. Internal Reinforcement shall be #2 SPF of sufficient amount to adequately support required hardware and function of same.

F. Finish of door frame shall be identical with 25 mil resin-rich gelcoat of the specified color integrally molded in at time of manufacture resulting in a smooth gloss surface that is dense and non-porous. To achieve optimum surface characteristics, the gelcoat shall be cured within a temperature range of 120F to 170F creating an impermeable outer surface, uniform color throughout, and a permanent homogeneous bond with the resin/fiberglass substrate beneath. Only the highest quality gelcoat will be used to ensure enduring color and physical properties. Paint and/or post application of gelcoat results in poor mechanical fusion and will be deemed unacceptable for this application. The finish of the door and frame must be field repairable without compromising the integrity of the original uniform composite structure, function or physical strength.

G. Window openings shall be provided for at time of manufacture and shall be completely sealed so that the interior of the door is not exposed to the environment. Fiberglass retainers, which hold the glazing in place, shall be resin transfer molded with a profile that drains away from glazing. The window retainer must match the color and finish of the door plates with 25 mil of resin-rich gelcoat integrally molded in at time of manufacture. Mechanical fasteners shall not be used to attach retainers. Glass, as specified herein, shall be furnished and installed by door and frame manufacturer. In order to maintain uniform appearance, product longevity and the corrosion resistance this application requires, window retainers fabricated from Metal, PVC or Vinyl will not be accepted.

H. Louver openings shall be completely sealed so that the interior of the door is not exposed to the environment. Louvers are to be solid fiberglass “V” Vanes and shall match the color and finish of the door plates.

I. Transoms shall be identical to the doors in finish, construction, materials, thickness and reinforcement.

2.04 FRP FRAMES

A. Frames (rated and non-rated) shall be fiberglass and manufactured using the resin transfer method creating one solid piece (no voids) with complete uniformity in color and size. Beginning with a minimum 25 mil gelcoat layer molded in and a minimum of two layers of continuous strand fiberglass mat saturated with resin, the frame will be of one-piece construction with molded stop. All frame profiles shall have a core material of 2 psf polyurethane foam. Metal frames or pultruded fiberglass frames will not be accepted.

B. Finish of frame shall be identical to the door with 25 mil resin-rich gelcoat of the specified color integrally molded in at time of manufacture. To achieve optimum surface characteristics, the gelcoat shall be cured within a temperature range of 120F to 170F creating an impermeable outer surface, uniform color throughout, and a permanent homogeneous bond with the resin/fiberglass substrate beneath. Only the highest quality gelcoat will be used to ensure enduring color and physical properties. Paint and/or post application of gelcoat result in poor mechanical fusion and will be deemed unacceptable for this application. The finish of the door and frame must be field repairable without compromising the integrity of the original uniform composite structure, function or physical strength.

C. Jamb/Header connection shall be mitered for tight fit.

D. Internal Reinforcement shall be continuous within the structure to allow for mounting of specified hardware. Reinforcing material shall be a dense matrix of cloth glass fibers and premium resin with a minimum hinge screw holding value of 1000 lbs per screw. All reinforcing materials shall be completely encapsulated. Documented strength of frame screw holding value after third insert must be submitted. Dissimilar materials, such as steel, will be deemed unacceptable as reinforcement for hardware attachment.

E. Mortises for hardware shall be accurately machined by CNC to hold dimensions to +/- 0.010 inch in all three axis.

F. Hinge pockets shall be accurately machined by CNC to facilitate heavy duty hinges at all hinge locations, using shims when standard weight hinges are used.

2.05 HARDWARE REINFORCING

A. Minimum Hardware Reinforcing Gauges listed below. All gauges to be U. S. Standard:

1. Hinges - 1-3/4" - Frame 7 gauge - Door 7 gauge
2. Mortise Locksets and Deadlocks - Door 14 gauge frame 14 gauge
3. Bored or Cylindrical Locks - Door 14 gauge - Frame 14 gauge
4. Flush Bolts and Chain and Foot Bolts - Door 14 gauge - Frame 14 gauge
5. Surface Applied Closers - Door 12 gauge - Frame 12 gauge
6. Hold-Open Arms - Door 12 gauge - Frame 12 gauge
7. Push and Pull Plates & Bars - Door 16 gauge except when thru bolts are used
8. Surface Panic Devices - Door 14 gauge - Frame 14 gauge
9. Floor Checking Hinges - Door 7 gauge - Frame 7 gauge

2.06 HARDWARE SCHEDULE

A. The special nature of this material requires that all related hardware as specified must be furnished and installed by the door frame manufacturer to maintain product quality and function as well as to ensure sufficient support/reinforcement, precision tooling and proper sealing methods are provided. The following is the minimum hardware required per door:

1. 4 1/2” X 4 1/2” Stainless Steel Butt Hinges with non- removable pins and ball bearings (3 hinges per door)

2. Heavy Duty Cylindrical Type Schlage “D” Series Lockset or equal. Provide a minimum of three keys per lock - final key shall be same as existing GCUA keys. Contractor must use a construction lock set during construction.

3. Kickplates - brushed aluminum inside and out.

4. Door stops - brush aluminum.

5. Door closer with hold open arm.

6. Panic devices on all exit doors from building.

7. Wall bumpers

8. Thresholds caulked with approved mastic.

PART 3 – EXECUTION

3.01 INSTALLATION

A. Contractor shall verify openings are correctly prepared to receive doors and frames.

B. Field alteration of doors or frames to accommodate field conditions is strictly prohibited.

3.01 WARRANTY

Provide lifetime guarantee on all fiberglass doors and frames against failure due to corrosion. Additionally, fiberglass doors and fiberglass frames shall also be guaranteed for ten years against failure due to materials and workmanship, including warp, separation or delamination, and expansion of the core.

PART 4 – QUANTITY AND PAYMENT

4.01 PAYMENT

No separate payment will be made for work related to fiberglass doors, frames and related appurtenances as outlined above. Include all such costs in with the related items as shown in the Proposal for which it is a part.

END OF SECTION 082000

SECTION 099000

PAINTING

PART 1 - GENERAL

1.01 SUMMARY

A. Description of Work in this section:

1. Proposed Facilities:

a. Painting and finishing of exposed exterior items and surfaces.
b. Painting and finishing of exposed interior items and surfaces.
c. Field painting of exposed electrical items.
d. Field painting of exposed mechanical items.
e. Painting and finishing buried items designated herein.
f. Provide painting system in water plant building, pump house and chemical room areas.
g. Paint insulation where designated.

B. All surfaces in contact with water shall be tasteless, odorless, safe for contact with potable water, and shall be in accordance with NSF 61. The paints in these areas shall be lead and chromate free.

C. Piping Identification: All Utility piping shall be provided with color coded paint coatings and markers as specified herein.

1.02 REFERENCES

Steel Structures Painting Manual Volume 2, "Systems and Specifications", Steel Structures Painting Council (SSPC); Current Ed.

1.03 DEFINITIONS

DFM (dry film mils): Thickness, measured in mils, of a coat of paint in the cured state.

1.04 SUBMITTALS

A. Product Data: Submit copies of manufacturer's technical data sheets for each coating.

B. Color and Texture Samples:

1. Provide for each coating system, color, and texture and applied to representative substrate samples.

a. Prepare samples to show bare, prepared surface and each successive coat.
b. Label each sample with coating name and color.

2. Miscellaneous substrates: 12 x 12 inch hardboard.

3. Wood: 8 inch square samples for surfaces; 8-inch long samples for trim.
4. Metal: 5 x 7 inch samples.

1.05 QUALITY ASSURANCE

A. Materials:

1. All coating materials required by this section shall be provided by a single manufacturer, unless otherwise required or approved.

B. Applicator: Firm with not less than 5 years of successful experience in painting work similar in scope of work of this project.

1. Maintain throughout duration of the work of a crew of painters who are fully qualified to satisfy requirements of the specifications.

C. Mock-up: Before proceeding with work of this section, finish one complete space or item of each color scheme required, showing selected colors, finish texture, materials, and workmanship.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Delivery: Deliver materials in manufacturer's original containers bearing coating name and color, material composition data, date of manufacture, legal notices if applicable, and mixing, thinning, and application instructions.

1.07 PROJECT CONDITIONS

A. Surface Preparation of Concrete:

1. Verify concrete has cured for a minimum of 28 days before surface preparation begins.
2. Visually inspect for excess shrinkage and cracking. Also check for defects such as honeycombs, fins and irregularities such as surface voids, excess porosity and holes that can affect coating application. Make repairs if necessary.
3. Remove any surface contaminants such as hardeners, curing compounds, grease and dirt, etc. and irregularities in the surface by abrasive blasting to provide a sound surface with adequate profile (similar to 60-grit sandpaper minimum). Remove all dust and debris prior to coating application by vacuum or desired method.

B. Apply coatings only under the following environmental conditions:

1. Provide continuous ventilation and heating to prevent accumulation of hazardous fumes and to maintain surface and ambient temperatures above 50 degrees F for 24 hours before, during and for 48 hours after application of finishes, or longer if required to obtain fuel cure as indicated by manufacturer's instructions.

C. Do not apply exterior paint in damp, rainy weather or until surface has thoroughly dried from effects of such weather. Avoid painting surfaces while exposed to hot sun.

D. Do not apply paint when surface temperature is below due point; or when relative humidity is above 85 percent; unless approved by Engineer.

1.08 COORDINATION

A. Coordination: Where special coatings will be applied over shop coatings specified in other sections, coordinate work of such other sections to ensure that only approved, compatible primers are applied.

1.09 MAINTENANCE STOCK

A. At time of completing application, deliver stock of maintenance material to the Owner. Furnish not less than one properly labeled and sealed 1 gallon can of each type of finish coat of each color, taken from lots furnished for the work.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Paint: Manufactured by MAB Paints, Sherwin Williams or approved equal, suitable for purpose specified as recommended and certified by paint manufacturer. Use manufacturer's standard colors as selected by Owner and approved by Engineer.

B. Products of the following manufacturer, provided they comply with requirements of the contract documents, will be among those considered in accordance with standard substitution procedures:

1. PPG Industries, Inc./Pittsburgh Paints.
2. Pratt & Lambert, Inc.
3. Finnaren & Haley, Inc.
4. Benjamin Moore & Company

C. Sealer for exterior woodwork: Shellac

D. Paint Schedule:

1. Interior and Exterior Blockwork

1 coat MAB, Block Kote # 2000 or 1 coat Sherwin Williams B42 Series Heavy Duty Block Filler (10 mils dft/coat)
Finish:
2 coats MAB, Ply-mastic, 044 or 2 coats Sherwin Williams B62 Series Epolon II MulitMil (4-6 mils dft/coat)

2. Masonry Below Grade

2 coats MAB, ply-tile epoxy tar coating, 796 line or 2 coats Sherwin Williams Tar Guard CoalTak Epoxy (8 mils dft/coat)

3. Interior Wood Trim and Doors
Prime:
1 coat MAB, Rich lux latex sealer/undercover, 037-154 (1.4-1.8 mils dft/coat)

Finish:
2 coats MAB, Rich lux semi-glass latex enamel, 023, (1.2-1.5 mils dft/coat)

4. Exterior Wood Trim and Doors
   Prime:
   1 coat MAB, Rich lux latex sealer/undercover, 037-154 (1.4-1.8 mils dft/coat)

   Finish:
   2 coats MAB, Rich lux Exterior semi-glass latex enamel, 023, (1.2-1.5 mils dft/coat)

5. Gypsum Wallboard
   Prime:
   1 coat MAB, Prime Fast, 037-138 Line or 1 coat Sherwin Williams B28 Series Prep Rite 200 Latex Primer 1.2-1.6 miles DFT

   Finish:
   2 coats MAB, Rich lux low lustre .028 line or 2 coats Sherwin Williams Series Promar 200 Latex Finish 1.2 – 1.6 mils DFT/coat

6. Metal - Exterior (unless specified otherwise)
   Including Structural Steel, Piping, Doors and Frames, Equipment and Miscellaneous Metals:
   Prime:
   1 coats MAB, Hydro-prime II, 073-189 or Sherwin Williams DTM Acrylic Primer 1.5-2.0 DFT/coat

   Finish:
   2 coats MAB, Rust-o-lastic glass acrylic, 043 line or 2 coats Sherwin Williams B66 Series DTM Acrylic (2-3 mils dft/coats)

7. Interior Structural Steel, Interior Ferrous Piping & Equipment (non-submerged)
   Including Structural Steel, Piping, Doors and Door Frames, Equipment and Miscellaneous Metals:
   Prime:
   1 coat MAB, Rust-o-lastic shop primer, 073 line or 1 coat Sherwin Williams Kromik Primer 1.8-2.2 miles DFT

   Finish:
   2 coats MAB, Rust-o-lastic finish, 074 line or 2 coats Sherwin Williams Industrial Enamel B54 Series 1.8-2.2 mils DFT/coat

8. Steel (including all Tanks) and Piping – All Interior and Exterior Surfaces (including submerged, potable water operation)

   Primer: MAB Ponamid, 65 Series, at 4-6.0 mils DFT
   Intermediate: MAB, Ponamid, 65 Series at 4-6.0 mils DFT
   Finish: MAB, Ponamid, 65 Series at 4-6.0 mils DFT
   Surface Preparation: Near White Blast per SSPC-SP-10

9. Concrete Floors

   Primer: MAB, Plymastic 044 line, at 5-7.0 mils DFT

Finish: MAB, Ply-Mastic 044, at 5-7.0 mils DFT
Additive: H&C™ SharkGrip Slip Resistant Additive, 3.2 oz. per one gallon of paint
Surface Preparation: Brush off blast to remove curing compounds, laitance and dirt. Give the concrete a roughness similar to sandpaper

10. Steel – High Heat to 750 Deg. F (Blower Discharge Piping)

Primer: MAB Hi Temp Gray Primer, at 1.5-2.0 mils DFT
Finish: MAB, Hi Temp Aluminum Top Coat at 1.0-1.5 mils DFT
Surface Preparation: Near White Blast per SSPC-SP-10

NOTE: The designation steel includes all ferrous piping (i.e. ductile iron).

SPECIAL NOTE:

After the interior of the tanks have been properly painted and cured, but prior to placing the tank into service, the water must be tested for volatile organic compounds (VOCs) as established in the NJ Safe Drinking Water Regulations NJAC 7:10-5. The tested VOCs and their corresponding MCLs shall be as established in the Federal Regulations as well as the below listed state regulated VOCs:

State-regulated VOC contaminant	MCL (ug/l or ppb)
Benzene	1
Carbon Tetrachloride	2
Chlorobenzene	50
1,3-Dichlorobenzene	600
1,2-Dichloroethane	2
1,1-Dichloroethylene	2
Methylene chloride	3
Tetrachloroethylene	1
Trichlorobenzene(s)	9
1,1,1-Trichloroethane	30
Trichloroethylene	1
Xylene(s)	1000
1,1- Dichloroethane	50
1,1,2- Trichloroethane	3
1,1,2,2-Tetrachloroethane	1
Napthalene	300
Methyl tertiary butyl ether (MTBE)	70

Should the VOC water quality test fail, the Contractor is responsible for taking whatever measures are necessary to re-cure the tank (if required) and abate the VOC levels accordingly. If the tank continues to fail the VOC test and has to be taken out of service due to the elevated VOC levels from the paint, the Contractor will be held liable for liquidated damages established in the Contract until the tank is permitted to operate.

E. Paint schedule for water plant building, pump house, chemical room containment area. Includes, but not limited to, all concrete, interior of all block walls and all stairs in chemical room.

1. Application – Concrete Areas – Horizontal/Vertical

   a. Primer Coat: Apply a primer coat of NSP 100 Epoxy Concrete Sealer at a spread rate of approximately 300 sq/ft/gal by phenollic core roller and allow paint to cure for a minimum of six hours at 77 deg F. Avoid any contamination between coats.
   b. Intermediate Coat: Apply one coat of NSP 120 High Performance Epoxy Coating by desired method (1/4" nap, phenolic core roller or Airless Spray) to a DFPT of no less than 15 mils. Allow intermediate coat to cure for minimum of 6 hours at 77 deg. F. before proceeding to finish. Refer to Tech Data Sheet for temperature requirements and min/max recoat times prior to curing. On all stair horizontal surfaces broadcast to excess silica sand to provide a non-slip surface. After curing remove excess by vacuum.
   c. Finish Coat: Apply one coat of NSP 120 High Performance Epoxy Coating by desired method to a DFT of 15 mils. Allow curing for a minimum of 12 hours at 77 deg. F. before returning to service.

2. Application – Concrete Areas – Block Walls

   a. Primer Coat: Apply a primer coat of NSP 100 Epoxy Concrete Sealer at a spread rate of approximately 300 sq/ft/gal by phenolic core roller and allow paint to cure for a minimum of six hours at 77 deg F. Avoid any contamination between coats.
   b. For concrete block masonry, apply coat of NSP 700 Concrete/Block Filler with soft rubber trowel to a DFT of 25-30 mils. Allow to cure for a minimum of 6-12 hours before proceeding to finish coat.
   c. Finish Coat: Apply one coat of NSP 120 High Performance Epoxy Coating by desired method to a DFT of 15 mils. Allow curing for a minimum of 12 hours at 77 deg. F. before returning to service.
   d. Follow all established good painting practices and information contained in the Technical Data Sheet for each NSP product.

2.02 PRODUCTS

A. Colors:

1. For multicoat systems, apply each coat using a successively darker tint or shade, unless approved otherwise.
2. Exception: Where permitted by applicable regulations.

2.03 PIPING MARKERS

A. Manufacturer: Provide products produced by one of the following:

1. W.H. Brady Company.
2. Seton Name Plate Corporation.
3. Or equal.

B. General:

1. Piping markers shall be formed from laminated plastic. All printing shall be sealed with a formed butyrate plastic film. Markers for piping up to six (6)-inch diameter shall be preformed to completely wrap around the pipe requiring no adhesive. Markers for pipes over six(6)-inch diameter shall be preformed to the contour of the pipe and attached with stainless steel spring fasteners.
2. For pipes under ¾-inch outside diameter: Provided brass tags, 1 ½-inch diameter, with depressed ¼-inch high black filled letters above ½-inch high black filled numbers.
3. Each marker shall consist of at least 1 legend descriptive of the function of the pipe, and a directional arrow.
4. The size of the lettering and marker shall conform to ANSI A13.1.
5. Location of Markers:
   a. Adjacent to each valve and "T" connection.
   b. At each branch and riser takeoff.
   c. At each pipe passage through a wall, floor and ceiling.
   d. On all horizontal and vertical pipe runs at 25-foot intervals.
6. Lettering stenciled directly to the pipe will not be acceptable.

PART 3 - EXECUTION

3.01 INSPECTION

A. Verify that surfaces and conditions are ready for work in accordance with coating manufacturer's recommendations.

3.02 SURFACE PREPARATION

A. Apply coatings to surfaces that are clean properly prepared in accordance with manufacturer's instructions. Remove dirt, dust, grease, oils, and foreign matter. Prepare surface for proper texture necessary to optimum coating adhesion and intended finished appearance. Plan cleaning, preparation, and coating operations to avoid contamination of freshly coated surfaces.

1. Do not apply coatings to labels that identify equipment, fire-resistance ratings, etc.
2. Remove hardware, cover plates, and similar items before applying coatings.
3. Provide protection for non-removable of coatings, install removed items. Use only skilled workmen for removal and replacement of such items.
4. Protect surfaces not scheduled for coating. Clean, repair, or replace to the satisfaction of the Architect/Engineer any surfaces inadvertently spattered or coated.
5. Acid etching: Prepare surface profile by uniformly etching surface to a texture, to touch, of 100 grit sandpaper; do not over-etch surface. After etching, surface shall be free from surface glaze, laitance, salts, loosely adhering material, etching solutions, and foreign material of any kind.

   a. After detergent cleaning and while floor is in a saturated but surface dry condition, apply acid solution (1 part 20 degree Baume muriatic acid to 2 to 4 parts potable water) using low pressure pray equipment.
   b. When bubbling action begins to subside, remove salt formations, loose material, and spent solution by scrubbing with stiff bristle broom and flushing with water

under moderate pressure. Repeat rinsing operation until pH test papers yield a pH of 7 or higher on the surface.

6. Brush-off blast cleaning: Prepare surface profile and remove laitance and solid contaminants from surface by abrasive blast cleaning. After blast cleaning, surface shall be free from curing compounds, surface glaze, laitance, salts, loosely adhering material, and foreign material of any kind.

    a. Perform blasting operation so as to open any surface voids, bugholes, etc. and to remove cuing compounds, surface glaze, laitance, salts, loosely adhering material, and foreign material of any kind, but without exposing underlying.
    b. Use only dry, oil-free air and clean media, unless other blast cleaning methods are approved.
    c. After blast cleaning, completely remove dust and loose particles by vacuuming; brushing or blowing will not be permitted.
    d. Patch surface voids, bugholes, etc., in an approved manner, and allow to cure before applying coatings.

7. Allow substrate to dry thoroughly. Test for moisture in accordance with coating manufacturer's recommendations before applying coatings.
8. Intricate fabricated shapes may be pickled in lieu of hand or power tool cleaning.
9. Before hand or power tool cleaning, remove visible oil, grease, soluble welding residue, and salts by solvent cleaning. After hand or power tool cleaning, reclean surfaces if necessary.
10. Before touching up coatings damaged by handling or welding, reprepare damaged surfaces.

3.03 MIXING AND THINNING

A. Remove and discard any skin formed on surface of coatings in containers. Discard any containers where skin comprises 2 percent or more of the remaining material. Do not add thinner except as specifically recommended (not merely permitted) by the coating manufacturer for proper coating application under the circumstances prevailing at the project site when application equipment recommended by the coating manufacturer is employed. Use only the quantities and the types of thinner recommended.

3.04 APPLICATION

A. General:

1. Apply coatings in accordance with coating manufacturer's instructions and using application method best suited for obtaining full, uniform coverage of surfaces to be coated.
2. Apply each coat to achieve the dry film thickness per coat recommended by the coating manufacturer. Application rates in excess of those recommended and fewer numbers of coats than specified will not be accepted.
3. Completed coatings shall be free of defects such as runs, sags, variations in color, lap or brush marks, holidays, and skips.
4. Apply coatings according to the schedule at the end of this section and as otherwise indicated. Coat all similar surfaces not specifically mentioned unless specifically exempted.

5. Coat front and back of miscellaneous items such as covers, access panels, and grilles. Apply fully finish coats behind movable items of furniture and equipment before installation. Apply prime coat only behind non-movable items of furniture and equipment before installation.
6. Sand gloss coats before applying subsequent coatings.

B. Apply coatings to match approved mock-ups.

C. Remove coatings not in compliance with this specification, re-clean and re-prepare surfaces as specified, and apply coatings to comply with the contract documents.

D. Scheduling:

1. Applying first coat of material to properly prepared surfaces without delay.

a. Apply successive coats within the time limits recommended by the manufacturer.

E. Mechanical and Electrical Items:

1. Paint electrical items exposed in view in exterior, finished spaces and in equipment rooms.
2. Paint mechanical items exposed in view in exterior, finished spaces and in equipment rooms.
3. Color-code items in accordance with color schedules.

4. Paint the following electrical items:

a. Conduit and fittings.
b. Others as indicated on drawings.

3.05 PRIME COATS

A. General:

1. Field apply bottom coats scheduled except where the contract documents require shop coating of ferrous metals.
2. Ferrous metals that have not been shop primed shall be field primed promptly after arrival at the site or shall be stored away from the effects of weather.
3. Repair and retouch damaged prime coats using approved, compatible primer.

B. Primers for Wood and Wood Products:

1. Apply first coat to wood upon receipt at the site and before wood is exposed to sun or rain.
2. Backprime concealed surfaces and cut edges of exterior wood trim prior to installation.
3. Backprime concealed surfaces and cut edges of exterior wood door frames prior to installation.

3.06 FINISH COATS

A. Number of Coats and Minimum Coating Thickness:

1. Apply not less than the number of coats indicated.
2. Apply each coat to achieve not less than the dry film thicknesses indicated per coat.
3. Apply additional coats at no additional cost to the Owner when necessary to achieve complete hiding, uniform texture, or uniform sheen and appearance.

3.07 CLEANING AND PROTECTION

A. Cleaning:

1. Clean work area on a daily basis; dispose of spent materials and empty containers. If requested, turn over the Architect/Engineer all empty coatings containers used during the course of each day.
2. Remove all trace of coatings from adjacent surfaces not scheduled to be coated. Remove by appropriate methods that do not damage surfaces.

B. Protection:

1. Protect work against damage until fully cured. Provide signs identifying wet surfaces until surfaces are adequately cured.
2. Shortly before final completion of the project, examine surfaces for damage to coatings and restore coatings to new, undamaged condition.
3. Touch-up of minor damage will be acceptable where result is not visibly different from surrounding surfaces. Where result is different either in color, sheen, or texture, recoat entire surface.

3.08 COLOR SELECTION

A. The following color selections shall be used for the designated utilities:

Utility	Color Selection
Water Lines:	
Raw Water Line	Dark Blue with red bands
Sludge Recirculation Suction Line	Tan with yellow bands
Waste Sludge Line	Brown with Orange bands
Finish Water, Filter Effluent, Potable	Light Blue
Non Potable water	Blue with Black Bands
Wastewater Line	Gray
Air Lines:	Green
Chemicals	
Polymer	Orange with Green Band
Chlorine, Other Chemicals	Colors and bands as directed
Natural Gas:	Black

B. All other colors to be selected by the Owner

3.09 CORRECTION OF DEFICIENCIES AND DEFECTIVE WORK

A. Correct deficiencies in film thickness by application of additional coat(s) of paint.

B. Correct defective work or work not meeting specifications by removal and recoating as directed by Engineer.

C. All corrections shall be made at no additional cost to Owner.

END OF SECTION

USE THESE DOCUMENTS WHEN SUBMITTING YOUR ORIGINAL BID

PLEASE PRINT (LEGIBLY) OR TYPE

Accompanying this proposal is a certified check in the amount of $_____, a cashier's check in the amount of $_____, or a bid bond in the amount of $_____, payable to the City of Vineland which is to be forfeited as liquidated damages, if in the event that this proposal is accepted, the undersigned shall fail to execute the contract or to furnish satisfactory bond as require.

COMPANY_____

ADDRESS_____

_____

TELEPHONE_____

WITNESS_____

BY_____
(Signature)

The bidder shall state on the line below, if a corporation, the name of the state in which incorporated.

_____
(Name-please print or type)

_____

_____
(Title)

DATE_____

_____
(Contact Person Who Prepared Proposal)

_____
(Telephone Number)

Have you attached the required items listed on the Check List? Failure to do so may result in automatic rejection of this bid.

_____
(Federal I.D. Number)

_____
(Fax Number)

_____
(Email address)

PROPOSAL
COV BID 2025-22 DUE: 8-12-25

To the City of Vineland Purchasing Agent

Pursuant to and in compliance with your Advertisement for Bids and the Information for Bidders relating thereto, the undersigned hereby offers to furnish all plant, labor, materials, supplies, equipment and other facilities and things necessary for, or proper for, or incidental to the VINELAND CLEARWELL IMPROVEMENTS, as required by, and in strict accordance with the applicable provisions of plans and specifications and all addenda issued by the CITY OF VINELAND or its Engineer prior to the date of opening the bids, whether received by the undersigned or not, for the amount bid based on the following unit d/ l i

NOTE: Extension of Unit Prices must be exact.

BASE BID

Item	Quantity	Units	Description	Unit Price	Amount
1	1	LS	GENERAL CONDITIONS, MOBILIZATION, AND DEMOBILIZATION	$	$
2	1	LS	DRAIN RESIDUAL WATER IN CLEARWELL	$	$
3	1	LS	DEMOLITION OF INTERIOR GATE VALVES	$	$
4	1	LS	DEMOLITION OF EXISTING SLAT TRAY AERATOR	$	$
5	1	LS	REMOVE AND REINSTALL LEVEL TRANSDUCER AND WATER LEVEL FLOATS	$	$
6	4750	SF	DEMOLITION OF EXISTING ROOFING SYSTEM, INCLUDING FLASHING MATERIALS	$	$
7	650	SF	REPAIR INTERIOR CONCRETE SPALLS (IF & WHERE DIRECTED)	$	$
8	250	SF	REPAIR EXTERIOR CONCRETE SPALLS (IF & WHERE DIRECTED)	$	$
9	30	LF	REPAIR EXTERIOR CONCRETE CRACKS (IF & WHERE DIRECTED)	$	$

Item	Quantity	Units	Description	Unit Price	Amount
10	4750	SF	FURNISH AND INSTALL HOLLOWCORE ROOF	$	$
11	4750	SF	FURNISH AND INSTALL BUILT-UP ROOFING SYSTEM INCLUDING FLASHING AND TAPERED INSULATION	$	$
12	3	EA	FURNISH AND INSTALL ROOF HATCHES	$	$
13	1	LS	FURNISH AND INSTALL FLASHING FOR ALL ROOF PENETRATIONS	$	$
14	500	LF	INSTALL NEW METAL DRIP EDGE	$	$
15	1	LS	INSTALL NEW GUTTER AND DOWNSPOUTS	$	$
16	1	EA	FURNISH AND INSTALL FIBERGLASS DOOR	$	$
17	1	EA	FURNISH AND INSTALL STAINLESS STEEL LADDER	$	$
18	13	EA	REMOVE AND INFILL LOUVERS	$	$
19	12500	SF	COAT INTERIOR SURFACES	$	$
20	1	LS	DISINFECT ALL INTERIOR SURFACES AND LABORATORY TESTING	$	$
21	1	LS	ALLOWANCE	$ 50,000.00	$ 50,000.00

TOTAL CONSTRUCTION COST, BASE BID Items #1 - #21, Inclusive

Item	Quantity	Units	Description	Unit Price ($)	Amount

TOTAL AMOUNT BID WRITTEN OUT

SIGNATURE **NAME & TITLE**

BID DATE **COMPANY NAME**

ALTERNATE BID NO. 1

Item	Quantity	Units	Description	Unit Price	Amount
A1.1	1500	SF	REPAIR INTERIOR CONCRETE SPALLS (IF & WHERE DIRECTED)	$	$
A1.2	100	LF	REPAIR INTERIOR CONCRETE CRACKS (IF & WHERE DIRECTED)	$	$
A1.3	2000	SF	PAINT EXTERIOR CONCRETE	$	$

TOTAL CONSTRUCTION COST, ALTERNATE BID NO. 1 , Items #A1.1 - A1.2, Inclusive

$

BID CHECKLIST

Failure by the bidder to submit with their bid all of the MANDATORY Items that are check below shall be cause for rejection of bid.

VMWU CLEARWELL'S 2&3 IMPROVMEMENTS
COV BID # 2025-22

DATE (8-12-25)

	REQUIRED WITH BID	INITIAL & SUBMIT
1. Bid Guarantee **(IN DUPLICATE** (a bid bond is not a consent of surety)	X	
2. Certificate or Consent of Surety Form **(IN DUPLICATE)**	X	
3. Statement of Ownership Disclosure **(IN DUPLICATE)**	X	
4. EEO/Affirmative Action Compliance Notice **(IN DUPLICATE)**	X	
5. Check List **(IN DUPLICATE)**	X	
6. Proposal **(IN DUPLICATE)**	X	
7. Acknowledgement of Receipt of Addenda **(IN DUPLICATE)**	X	
8. List of Subcontractors per NJSA 40A:11-16, if any, If none, state so. **(IN DUPLICATE)**	X	

The items that are checked below shall be submitted no later than the time period indicated.

Required as Conditioned	Item	Read, Initialed Shall Submit
X	**Performance Bond (Due with the executed contract)**	
X	**Labor and Material Payment Bond (Due with the executed contract)**	

(continued on next page)

___X___	**Maintenance Bond** **(Due with the executed contract)**	_____
___X___	**Public Works Contractor Registration Certificate(s) for the General or Prime Contractor and any Subcontractor submitted in the bid proposal with a date effective at the time the proposal is submitted** **(Due prior to contract award)**	_____
___X___	**New Jersey Business Registration Certificate** **(Due prior to contract award)**	_____
___X___	**Disclosure of Investment Activities in Iran** **(Due prior to contract award)**	_____
___X___	**Certificate(s) of Insurance as specified In the Bid Document** **(Due with executed contract)**	_____
___X___	**Certification of Non-Debarment for Federal Contracts.** **(Due prior to contract award)**	_____
___X___	**Certification of Regarding Debarment Suspension.** **(Due prior to contract award)**	----------

The items that are checked below are to be reviewed by the bidders.

Review Required	Item	Read & Initialed
___X___	**Americans with Disabilities Act Language**	_____
___X___	**General Instructions**	_____
___X___	**Technical Specifications**	_____

THE ITEMS AND/OR FORMS INDICATED ABOVE SHALL BE REVIEWED AND/OR SUBMITTED WITH YOUR BID. THIS CHECKLIST IS PROVIDED FOR INFORMATIONAL PURPOSES ONLY. ALL REQUIRED DOCUMENTATION MAY NOT BE LISTED ABOVE AND IT SHALL BE THE RESPONSIBILITY OF THE BIDDER TO CAREFULLY REVIEW THE COMPLETE BID PACKAGE, FAMILIARIZE THEMSELVES WITH THE REQUIREMENTS OF THIS BID AND TO SUBMIT WITH THEIR BID ALL REQUIRED DOCUMENTATION.

SIGNATURE

The undersigned hereby acknowledges that they have submitted and/or reviewed the above listed requirements:

_____ _____

(COMPANY) **(NAME – PLEASE PRINT OR TYPE)**

_____ _____

(SIGNATURE) **(DATE)**

STATEMENT OF OWNERSHIP DISCLOSURE

N.J.S.A. 52:25-24.2 (P.L. 1977, c.33, as amended by P.L. 2016, c.43)

This statement shall be completed, certified to, and included with all bid and proposal submissions. Failure to submit the required information is cause for automatic rejection of the bid or proposal.

Name of Organization: _____

Organization Address: _____

Part I:

Check the box that represents the type of business organization:

- ☐ Sole Proprietorship (skip Parts II and III, execute certification in Part IV)
- ☐ Non-Profit Corporation (skip Parts II and III, execute certification in Part IV)
- ☐ For-Profit Corporation (any type)
- ☐ Limited Liability Company (LLC)
- ☐ Limited Partnership
- ☐ Limited Liability Partnership (LLP)
- ☐ Other (be specific):

Part II:

The list below contains the names and addresses of all stockholders in the corporation who own 10 percent or more of its stock, of any class, or of all individual partners in the partnership who own a 10 percent or greater interest therein, or of all members in the limited liability company who own a 10 percent or greater interest therein, as the case may be. **(COMPLETE THE LIST BELOW IN THIS SECTION)**

OR

No one stockholder in the corporation owns 10 percent or more of its stock, of any class, or no individual partner in the partnership owns a 10 percent or greater interest therein, or no member in the limited liability company owns a 10 percent or greater interest therein, as the case may be. **(SKIP TO PART IV)**

(Please attach additional sheets if more space is needed):

Name of Individual or Business Entity	Address

Part III DISCLOSURE OF 10% OR GREATER OWNERSHIP IN THE STOCKHOLDERS, PARTNERS OR LLC MEMBERS LISTED IN PART II

If a bidder has a direct or indirect parent entity which is publicly traded, and any person holds a 10 percent or greater beneficial interest in the publicly traded parent entity as of the last annual federal Security and Exchange Commission (SEC) or foreign equivalent filing, ownership disclosure can be met by providing links to the website(s) containing the last annual filing(s) with the federal Securities and Exchange Commission (or foreign equivalent) that contain the name and address of each person holding a 10% or greater beneficial interest in the publicly traded parent entity, along with the relevant page numbers of the filing(s) that contain the information on each such person. **Attach additional sheets if more space is needed.**

Website (URL) containing the last annual SEC (or foreign equivalent) filing	Page #'s

Please list the names and addresses of each stockholder, partner or member owning a 10 percent or greater interest in any corresponding corporation, partnership and/or limited liability company (LLC) listed in Part II **other than for any publicly traded parent entities referenced above.** The disclosure shall be continued until names and addresses of every non-corporate stockholder, and individual partner, and member exceeding the 10 percent ownership criteria established pursuant to N.J.S.A. 52:25-24.2 has been listed. **Attach additional sheets if more space is needed.**

Stockholder/Partner/Member and Corresponding Entity Listed in Part II	Address

Part IV Certification

I, being duly sworn upon my oath, hereby represent that the foregoing information and any attachments thereto to the best of my knowledge are true and complete. I acknowledge: that I am authorized to execute this certification on behalf of the bidder/proposer; that the **<name of contracting unit>** is relying on the information contained herein and that I am under a continuing obligation from the date of this certification through the completion of any contracts with **<type of contracting unit>** to notify the **<type of contracting unit>** in writing of any changes to the information contained herein; that I am aware that it is a criminal offense to make a false statement or misrepresentation in this certification, and if I do so, I am subject to criminal prosecution under the law and that it will constitute a material breach of my agreement(s) with the, permitting the **<type of contracting unit>** to declare any contract(s) resulting from this certification void and unenforceable.

Full Name (Print) :		Title :	
Signature :		Date :	

AFFIRMATIVE ACTION COMPLIANCE NOTICE

N.J.S.A. 10:5-31 and N.J.A.C. 17:27

GOODS AND SERVICES CONTRACTS

(INCLUDING PROFESSIONAL SERVICES)

This form is a summary of the successful bidder's requirement to comply with the requirements of N.J.S.A. 10:5-31 and N.J.A.C. 17:27-1 et seq.

The successful bidder shall submit to the public agency, after notification of award but prior to execution of this contract, one of the following three documents as forms of evidence:

(a) A photocopy of a valid letter that the contractor is operating under an existing Federally approved or sanctioned affirmative action program (good for one year from the date of the letter);

OR

(b) A photocopy of a Certificate of Employee Information Report approval, issued in accordance with N.J.A.C. 17:27-4;

OR

(c) A photocopy of an Employee Information Report (Form AA302) provided by the Division and distributed to the public agency to be completed by the contractor in accordance with N.J.A.C. 17:27-4.

The successful vendor may obtain the Affirmative Action Employee Information Report (AA302) from the contracting unit during normal business hours.

The successful vendor(s) must submit the copies of the AA302 Report to the Division of Contract Compliance and Equal Employment Opportunity in Public Contracts (Division). The Public Agency copy is submitted to the public agency, and the vendor copy is retained by the vendor.

The undersigned vendor certifies that he/she is aware of the commitment to comply with the requirements of N.J.S.A. 10:5-31 and N.J.A.C. 17:27.1 et seq. and agrees to furnish the required forms of evidence.

The undersigned vendor further understands that his/her bid shall be rejected as non-responsive if said contractor fails to comply with the requirements of N.J.S.A. 10:5-31 and N.J.A.C. 17:27-1 et seq.

COMPANY: _____ SIGNATURE: _____

PRINT NAME: _____ TITLE: _____

DATE: _____

FAILURE BY THE BIDDER TO COMPLETE AND RETURN THIS NOTICE WITH THEIR BID SUBMISSION SHALL BE CAUSE FOR THEIR BID TO BE REJECTED AS NON-RESPONSIVE

CITY OF VINELAND
ACKNOWLEDGMENT OF RECEIPT OF ADDENDA

Pursuant to N.J.S.A. 40A:11-23.1a, the undersigned bidder hereby acknowledges receipt of the following notices, revisions, or addenda to the bid advertisement, specifications or bid documents. By indicating date of receipt, bidder acknowledges the submitted bid takes into account the provisions of the notice, revision or addendum. Note that the local unit's record of notice to bidders shall take precedence and that failure to include provisions of changes in a bid proposal may be subject for rejection of the bid.

Addendum Number	Dated	Acknowledge Receipt (Initial)
_____	_____	_____
_____	_____	_____
_____	_____	_____

_____No addenda received.

Acknowledged for: _____
(Name of Bidder)

By: _____
(Signature of Authorized Representative)

Name: _____
(Please type or Print)

Title: _____

Date: _____

City of Vineland - Division of Purchasing
DISCLOSURE OF INVESTMENT ACTIVITIES IN IRAN FORM

STATE OF NEW JERSEY
DEPARTMENT OF THE TREASURY - DIVISION OF PURCHASE AND PROPERTY 33 WEST STATE STREET, P.O. BOX 230 TRENTON, NEW JERSEY 08625-0230

BID SOLICITATION # AND TITLE: _____

VENDOR NAME: _____

Pursuant to N.J.S.A. 52:32-57, et seq. (P.L. 2012, c.25 and P.L. 2021, c.4) any person or entity that submits a bid or proposal or otherwise proposes to enter into or renew a contract must certify that neither the person nor entity, nor any of its parents, subsidiaries, or affiliates, is identified on the New Jersey Department of the Treasury's Chapter 25 List as a person or entity engaged in investment activities in Iran. The Chapter 25 list is found on the Division's website at: https://www.state.nj.us/treasury/purchase/pdf/Chapter25List.pdf.

Vendors/Bidders must review this list prior to completing the below certification. If the Director of the Division of Purchase and Property finds a person or entity to be in violation of the law, s/he shall take action as may be appropriate and provided by law, rule or contract, including but not limited to, imposing sanctions, seeking compliance, recovering damages, declaring the party in default and seeking debarment or suspension of the party.

CHECK THE APPROPRIATE BOX

☐ I certify, pursuant to N.J.S.A. 52:32-57, et seq. (P.L. 2012, c.25 and P.L. 2021, c.4), that neither the Vendor/Bidder listed above nor any of its parents, subsidiaries, or affiliates is listed on the New Jersey Department of the Treasury's Chapter 25 List of entities determined to be engaged in prohibited activities in Iran.

OR

☐ I am unable to certify as above because the Vendor/Bidder and/or one or more of its parents, subsidiaries, or affiliates is listed on the New Jersey Department of the Treasury's Chapter 25 List. I will provide a detailed, accurate and precise description of the activities of the Vendor/Bidder, or one of its parents, subsidiaries or affiliates, has engaged in regarding investment activities in Iran by completing the information requested below.

Entity Engaged in Investment Activities _____

Relationship to Vendor/ Bidder _____

Description of Activities _____

_____

_____

Duration of Engagement _____

Anticipated Cessation Date _____

**Attach Additional Sheets If Necessary.*

CERTIFICATION

I, the undersigned, certify that I am authorized to execute this certification on behalf of the Vendor, that the foregoing information and any attachments hereto, to the best of my knowledge are true and complete. I acknowledge that the City of Vineland is relying on the information contained herein, and that the Vendor is under a continuing obligation from the date of this certification through the completion of any contract(s) with the City to notify the City in writing of any changes to the information contained herein; that I am aware that it is a criminal offense to make a false statement or misrepresentation in this certification. If I do so, I may be subject to criminal prosecution under the law, and it will constitute a material breach of my contract(s) with the City, permitting the City to declare any contract(s) resulting from this certification void and unenforceable.

_____ _____

Signature Date

_____

Full Name (Print) and Title

CERTIFICATION REGARDING THE DEBARMENT SUSPENSION, INELIGIBILITY AND VOLUNTARY EXCLUSION

I am _____ of the firm of _____,
(Your Title) (Name of your Organization)

_____,
(Address of your Organization)

CHOOSE ONE OF THE FOLLOWING

( ) A. I hereby certify on behalf of _____
(Name of your Organization)

that neither it nor its principals are included on the State Treasurer's and Economic Development Authority's or the Federal Government's List of Debarred, Suspended, or Disqualified Bidders as a result of action taken by any State or Federal Agency.

( ) B. I am unable to certify to any of the statements set forth in this certification. I have attached an explanation to this form.

Subscribed and sworn to
Before me this day of
_____ 20___.

_____
(Signature)

_____
(Signature of Notary Public)

_____
(Typed or Printed Name and Title)

My Commission expires_____
(Month, Day, Year)

CERTIFICATION OF NON-DEBARMENT
FOR FEDERAL GOVERNMENT CONTRACTS
N.J.S.A. 52:32-44.1 (P.L. 2019, c.406)

This certification shall be completed, certified to, and submitted to the contracting unit prior to contract award, except for emergency contracts where submission is required prior to payment.

PART I: VENDOR INFORMATION	
Individual or Organization Name	
Physical Address of Individual or Organization	
Unique Entity ID (if applicable)	
CAGE/NCAGE Code (if applicable)	

Check the box that represents the type of business organization:

☐Sole Proprietorship (skip Parts III and IV) ☐Non-Profit Corporation (skip Parts III and IV)

☐For-Profit Corporation (any type) ☐Limited Liability Company (LLC) ☐Partnership

☐Limited Partnership ☐Limited Liability Partnership (LLP)

☐Other (be specific): _____

PART II – CERTIFICATION OF NON-DEBARMENT: Individual or Organization

I hereby certify that the individual or organization listed above in Part I is not debarred by the federal government from contracting with a federal agency. I further acknowledge: that I am authorized to execute this certification on behalf of the above-named organization; that the ***City of Vineland*** is relying on the information contained herein and that I am under a continuing obligation from the date of this certification through the date of contract award by ***City of Vineland of Vineland*** to notify the ***City of Vineland*** in writing of any changes to the information contained herein; that I am aware that it is a criminal offense to make a false statement or misrepresentation in this certification, and if I do so, I am subject to criminal prosecution under the law and that it will constitute a material breach of my agreement(s) with the City of Vineland, permitting the ***City of Vineland*** to declare any contract(s) resulting from this certification void and unenforceable.

Full Name (Print):		Title:	
Signature:		Date:	

PART III – CERTIFICATION OF NON-DEBARMENT: Individual or Entity Owning Greater than 50 Percent of Organization	
Section A (Check the Box that applies)	
☐	Below is the name and address of the stockholder in the corporation who owns more than 50 percent of its voting stock, or of the partner in the partnership who owns more than 50 percent interest therein, or of the member of the limited liability company owning more than 50 percent interest therein, as the case may be.
Name of Individual or Organization	
Physical Address	
OR	
☐	No one stockholder in the corporation owns more than 50 percent of its voting stock, or no partner in the partnership owns more than 50 percent interest therein, or no member in the limited liability company owns more than 50 percent interest therein, as the case may be.
Section B (Skip if no Business entity is listed in Section A above)	
☐	Below is the name and address of the stockholder in the corporation who owns more than 50 percent of the voting stock of the organization's parent entity, or of the partner in the partnership who owns more than 50 percent interest in the organization's parent entity, or of the member of the limited liability company owning more than 50 percent interest in organization's parent entity, as the case may be.
Stockholder/Partner/Member Owning Greater Than 50 Percent of Parent Entity	
Physical Address	
OR	
☐	No one stockholder in the parent entity corporation owns more than 50 percent of its voting stock, no partner in the parent entity partnership owns more than 50 percent interest therein, or no member in the parent entity limited liability company owns more than 50 percent interest therein, as the case may be.

Section C – Part III Certification			
I hereby certify that no individual or organization that is debarred by the federal government from contracting with a federal agency owns greater than 50 percent of the **Organization listed above in Part I** or, if applicable, owns greater than 50 percent of a parent entity of < >. I further acknowledge: that I am authorized to execute this certification on behalf of the above-named organization; that the ***City of Vineland*** is relying on the information contained herein and that I am under a continuing obligation from the date of this certification through the date of contract award ***City of Vineland*** to notify the ***City of Vineland*** in writing of any changes to the information contained herein; that I am aware that it is a criminal offense to make a false statement or misrepresentation in this certification, and if I do so, I am subject to criminal prosecution under the law and that it will constitute a material breach of my agreement(s) with the **City of Vineland**, permitting the ***City of Vineland*** to declare any contract(s) resulting from this certification void and unenforceable.			
Full Name (Print):		**Title:**	
Signature:		**Date:**	

Part IV – CERTIFICATION OF NON-DEBARMENT: Contractor – Controlled Entities	
Section A	
☐	Below is the name and address of the corporation(s) in which the **Organization listed in Part I** owns more than 50 percent of voting stock, or of the partnership(s) in which the **Organization listed in Part I** owns more than 50 percent interest therein, or of the limited liability company or companies in which the **Organization listed above in Part I** owns more than 50 percent interest therein, as the case may be.

Name of Business Entity	Physical Address

Add additional sheets if necessary

OR	
☐	The **Organization listed above in Part I** does not own greater than 50 percent of the voting stock in any corporation and does not own greater than 50 percent interest in any partnership or any limited liability company.

Section B (skip if no business entities are listed in Section A of Part IV)	
☐	Below are the names and addresses of any entities in which an entity listed in Part III A owns greater than 50 percent of the voting stock (corporation) or owns greater than 50 percent interest (partnership or limited liability company).

Name of Business Entity Controlled by Entity Listed in Section A of Part IV	Physical Address

Add additional Sheets if necessary

OR	
☐	No entity listed in Part III A owns greater than 50 percent of the voting stock in any corporation or owns greater than 50 percent interest in any partnership or limited liability company.

Section C – Part IV Certification

I hereby certify that the **Organization listed above in Part I** does not own greater than 50 percent of any entity that that is debarred by the federal government from contracting with a federal agency and, if applicable, does not own greater than 50 percent of any entity that in turns owns greater than 50 percent of any entity debarred by the federal government from contracting with a federal agency. I further acknowledge: that I am authorized to execute this certification on behalf of the above-named organization; that the ***City of Vineland*** is relying on the information contained herein and that I am under a continuing obligation from the date of this certification through the date of contract award by ***City of Vineland*** to notify the ***City of Vineland*** in writing of any changes to the information contained herein; that I am aware that it is a criminal offense to make a false statement or misrepresentation in this certification, and if I do so, I am subject to criminal prosecution under the law and that it will constitute a material breach of my agreement(s) with the **City of Vineland**, permitting the ***City of Vineland*** to declare any contract(s) resulting from this certification void and unenforceable.

Full Name (Print):		Title:	
Signature:		Date:	

CITY OF VINELAND

LIST OF SUBCONTRACTORS

(as required by NJSA40A:11-16)

COV BID # 2025-22

August 12, 2025

The following subcontractors are to be used on this project in the four (4) specialty trade categories noted below: These subcontractors must be registered with the Department of Labor's Division of Wage and Hour Compliance (Public Works Contractor Registration) at the time proposals are received.

NOTE: If the project's scope of work does not involve any of the specialty trade categories below, please write the word **"NONE"** in each appropriate space(s).

If the project's scope of work does involve any of the specialty trade categories below, but will be done "in-house" by the General Contractor or a qualified, licensed employee(s), where required, or by such other employee(s) on the contractor's payroll, write the word **"IN-HOUSE"** and provide the names(s) and license number(s), where required, or the name(s) of those employees(s) in each of the appropriate spaces below:

DO NOT LEAVE ANY SPACE BLANK

1. PLUMBING AND GAS FITTING AND ALL KINDRED WORK:

Name: _____

Address: _____

License Number: _____

2. **STEAM AND HOT WATER HEATING AND VENTILATING APPARATUS AND ALL KINDRED WORK:**

Name: _____

Address: _____

3. **ELECTRICAL WORK:**

Name: _____

Address: _____

4. **STRUCTURAL STEEL AND ORNAMENTAL IRON WORK:**

Name: _____

Address: _____

BY: _____
(SIGNATURE OF AUTHORIZED REPRESENTATIVE)

NAME: _____
(PLEASE PRINT)

DATE: _____

THE ABOVE NAMED SUBCONTRACTORS MUST BE REGISTERED WITH THE DEPARTMENT OF LABOR'S DIVISION OF WAGE AND HOUR COMPLIANCE (PUBLIC WORKS CONTRACTORS REGISTRATION) AT THE TIME PROPOSALS ARE RECEIVED.

BUSINESS REGISTRATION CERTIFICATES MUST BE SUBMITTED, FOR ANY OF THE COMPANIES/INDIVIDUALS LISTED ABOVE AS ONE OF THE FOUR PRIME SUB-CONTRACTORS.

SAMPLE FORM OF BID BOND

A. We, the undersigned

_____ as Principal and

_____ as Surety, are hereby held and firmly bound unto

_____ in the penal sum of _____ Dollars

($_____), lawful money of the United States for the payment of which well and truly to be made, we hereby jointly and severally bind ourselves, our heirs, executors, administrators, successors and assigns. Signed this

_____ day of _____, 20 _____.

B. THE CONDITION of the above obligation is such that whereas the Principal has submitted to the_____,

a certain bid attached hereto and hereby made a part of hereto and hereby made a part of hereof, to enter into a contract in writing for the (insert type of work)

_____.

C. NOW THEREFORE:

If said bid shall be rejected, or in the alternate, if said bid shall be accepted and the Principal shall execute and deliver a contract in the form of Agreement required by the Bid Documents and for the payment of all persons performing labor or furnishing materials in connection therewith, and shall in all respects perform the agreement created by the acceptance of said bid. Then this obligation shall be void, otherwise the same shall remain in force and effect, it being expressly understood and agreed that the liability of the surety for any and all claims hereunder shall, in no event, exceed the penal amount of this obligation as herein stated.

D. THE SURETY for value received, hereby stipulates and agrees that the obligations of said Surety and its bond shall in no way be impaired or affected by an extensions of the time within the "OBLIGEE" may accept such bid. And said Surety does hereby waive notice of any such extension.

E. IN WITNESS WHEREOF, the Principal and the Surety have hereunto set their hands and seals, and such of them as corporations have caused their corporate seals to be hereto fixed and these presents to be signed by their proper officers, the day and year set forth above.

_____(L.S.)
PRINCIPAL

_____
SURETY

(SEAL)

_____
BY

NOTE: Bid Bond must be signed by an authorized agent or representative of a surety company and not by the individual or company submitting the bid.

SURETY FORM

The City of Vineland has provided this certificate of surety for submission to a bidder's insurance/bonding company. Language such as this will be accepted; however, language that limits the timeframe in which the City can process claims against a performance bond or language that states the surety is conditional depending on contract terms, will not be accepted. (Contract terms will be as outlined in the bid specifications)

To:

Purchasing Board
City of Vineland
640 E. Wood Street
Vineland, NJ 08360

_____
NAME OF INSURANCE/BONDING COMPANY

being duly qualified to transact business in the State of New Jersey, hereby certifies and agrees that if:

_____
CONTRACTOR NAME

Is the successful bidder for _____

_____ **it as surety, will provide**

the bidder with the bond or bonds as are called for in the bid specifications.

Signed and Sealed _____, 20 ___.

_____
NAME OF INSURANCE/BONDING COMPANY

_____ _____
Printed name of Attorney-in-Fact *Signature of Attorney-in-Fact*

POWER OF ATTORNEY FOR THE ATTORNEY-IN-FACT MUST BE ATTACHED TO CONSENT OF SURETY AND CORPORATE SEAL OF THE SURETY COMPANY MUST BE AFFIXED TO SURETY FORM

CERTIFICATE OF SURETY MUST BE SIGNED BY AN AUTHORIZED AGENT OR REPRESENTATIVE OF A SURETY COMPANY AND NOT BY THE INDIVIDUAL OR COMPANY SUBMITTING THE BID

INSURANCE/BONDING COMPANY TO PROVIDE THE FOLLOWING:

NAME_____ **TITLE**_____

ADDRESS_____

TELEPHONE NO. _____

USE THESE DOCUMENTS WHEN SUBMITTING YOUR DUPLICATE BID

PLEASE PRINT (LEGIBLY) OR TYPE

Accompanying this proposal is a certified check in the amount of $_____, a cashier's check in the amount of $_____, or a bid bond in the amount of $_____, payable to the City of Vineland which is to be forfeited as liquidated damages, if in the event that this proposal is accepted, the undersigned shall fail to execute the contract or to furnish satisfactory bond as require.

COMPANY_____

ADDRESS_____

_____

TELEPHONE_____

WITNESS_____

BY_____
(Signature)

The bidder shall state on the line below, if a corporation, the name of the state in which incorporated.

_____

_____
(Name-please print or type)

_____
(Title)

DATE_____

_____
(Contact Person Who Prepared Proposal)

_____
(Telephone Number)

Have you attached the required items listed on the Check List? Failure to do so may result in automatic rejection of this bid.

_____
(Federal I.D. Number)

_____
(Fax Number)

_____
(Email address)

PROPOSAL
COV BID 2025-22 DUE: 8-12-25

To the City of Vineland Purchasing Agent

Pursuant to and in compliance with your Advertisement for Bids and the Information for Bidders relating thereto, the undersigned hereby offers to furnish all plant, labor, materials, supplies, equipment and other facilities and things necessary for, or proper for, or incidental to the VINELAND CLEARWELL IMPROVEMENTS, as required by, and in strict accordance with the applicable provisions of plans and specifications and all addenda issued by the CITY OF VINELAND or its Engineer prior to the date of opening the bids, whether received by the undersigned or not, for the amount bid based on the following unit d/ l i

NOTE: Extension of Unit Prices must be exact.

BASE BID

Item	Quantity	Units	Description	Unit Price	Amount
1	1	LS	GENERAL CONDITIONS, MOBILIZATION, AND DEMOBILIZATION	$	$
2	1	LS	DRAIN RESIDUAL WATER IN CLEARWELL	$	$
3	1	LS	DEMOLITION OF INTERIOR GATE VALVES	$	$
4	1	LS	DEMOLITION OF EXISTING SLAT TRAY AERATOR	$	$
5	1	LS	REMOVE AND REINSTALL LEVEL TRANSDUCER AND WATER LEVEL FLOATS	$	$
6	4750	SF	DEMOLITION OF EXISTING ROOFING SYSTEM, INCLUDING FLASHING MATERIALS	$	$
7	650	SF	REPAIR INTERIOR CONCRETE SPALLS (IF & WHERE DIRECTED)	$	$
8	250	SF	REPAIR EXTERIOR CONCRETE SPALLS (IF & WHERE DIRECTED)	$	$
9	30	LF	REPAIR EXTERIOR CONCRETE CRACKS (IF & WHERE DIRECTED)	$	$

Item	Quantity	Units	Description	Unit Price	Amount
10	4750	SF	FURNISH AND INSTALL HOLLOWCORE ROOF	$	$
11	4750	SF	FURNISH AND INSTALL BUILT-UP ROOFING SYSTEM INCLUDING FLASHING AND TAPERED INSULATION	$	$
12	3	EA	FURNISH AND INSTALL ROOF HATCHES	$	$
13	1	LS	FURNISH AND INSTALL FLASHING FOR ALL ROOF PENETRATIONS	$	$
14	500	LF	INSTALL NEW METAL DRIP EDGE	$	$
15	1	LS	INSTALL NEW GUTTER AND DOWNSPOUTS	$	$
16	1	EA	FURNISH AND INSTALL FIBERGLASS DOOR	$	$
17	1	EA	FURNISH AND INSTALL STAINLESS STEEL LADDER	$	$
18	13	EA	REMOVE AND INFILL LOUVERS	$	$
19	12500	SF	COAT INTERIOR SURFACES	$	$
20	1	LS	DISINFECT ALL INTERIOR SURFACES AND LABORATORY TESTING	$	$
21	1	LS	ALLOWANCE	$ 50,000.00	$ 50,000.00

TOTAL CONSTRUCTION COST, BASE BID Items #1 - #21, Inclusive

Item	Quantity	Units	Description	$ Unit Price	Amount

TOTAL AMOUNT BID WRITTEN OUT

SIGNATURE **NAME & TITLE**

BID DATE **COMPANY NAME**

ALTERNATE BID NO. 1

Item	Quantity	Units	Description	Unit Price	Amount
A1.1	1500	SF	REPAIR INTERIOR CONCRETE SPALLS (IF & WHERE DIRECTED)	$	$
A1.2	100	LF	REPAIR INTERIOR CONCRETE CRACKS (IF & WHERE DIRECTED)	$	$
A1.3	2000	SF	PAINT EXTERIOR CONCRETE	$	$

TOTAL CONSTRUCTION COST, ALTERNATE BID NO. 1 , Items #A1.1 - A1.2, Inclusive

$

BID CHECKLIST

Failure by the bidder to submit with their bid all of the MANDATORY Items that are check below shall be cause for rejection of bid.

VMWU CLEARWELL'S 2&3 IMPROVMEMENTS
COV BID # 2025-22

DATE (8-12-25)

	REQUIRED WITH BID	INITIAL & SUBMIT
1. Bid Guarantee **(IN DUPLICATE** (a bid bond is not a consent of surety)	X	
2. Certificate or Consent of Surety Form **(IN DUPLICATE)**	X	
3. Statement of Ownership Disclosure **(IN DUPLICATE)**	X	
4. EEO/Affirmative Action Compliance Notice **(IN DUPLICATE)**	X	
5. Check List **(IN DUPLICATE)**	X	
6. Proposal **(IN DUPLICATE)**	X	
7. Acknowledgement of Receipt of Addenda **(IN DUPLICATE)**	X	
8. List of Subcontractors per NJSA 40A:11-16, if any, If none, state so. **(IN DUPLICATE)**	X	

The items that are checked below shall be submitted no later than the time period indicated.

Required as Conditioned	Item	Read, Initialed Shall Submit
X	**Performance Bond (Due with the executed contract)**	
X	**Labor and Material Payment Bond (Due with the executed contract)**	

(continued on next page)

___X___	**Maintenance Bond** **(Due with the executed contract)**	_____
___X___	**Public Works Contractor Registration Certificate(s) for the General or Prime Contractor and any Subcontractor submitted in the bid proposal with a date effective at the time the proposal is submitted** **(Due prior to contract award)**	_____
___X___	**New Jersey Business Registration Certificate** **(Due prior to contract award)**	_____
___X___	**Disclosure of Investment Activities in Iran** **(Due prior to contract award)**	_____
___X___	**Certificate(s) of Insurance as specified In the Bid Document** **(Due with executed contract)**	_____
___X___	**Certification of Non-Debarment for Federal Contracts.** **(Due prior to contract award)**	_____
___X___	**Certification of Regarding Debarment Suspension.** **(Due prior to contract award)**	----------

The items that are checked below are to be reviewed by the bidders.

Review Required	Item	Read & Initialed
___X___	**Americans with Disabilities Act Language**	_____
___X___	**General Instructions**	_____
___X___	**Technical Specifications**	_____

THE ITEMS AND/OR FORMS INDICATED ABOVE SHALL BE REVIEWED AND/OR SUBMITTED WITH YOUR BID. THIS CHECKLIST IS PROVIDED FOR INFORMATIONAL PURPOSES ONLY. ALL REQUIRED DOCUMENTATION MAY NOT BE LISTED ABOVE AND IT SHALL BE THE RESPONSIBILITY OF THE BIDDER TO CAREFULLY REVIEW THE COMPLETE BID PACKAGE, FAMILIARIZE THEMSELVES WITH THE REQUIREMENTS OF THIS BID AND TO SUBMIT WITH THEIR BID ALL REQUIRED DOCUMENTATION.

SIGNATURE

The undersigned hereby acknowledges that they have submitted and/or reviewed the above listed requirements:

_____ _____

(COMPANY) **(NAME – PLEASE PRINT OR TYPE)**

_____ _____

(SIGNATURE) **(DATE)**

STATEMENT OF OWNERSHIP DISCLOSURE

N.J.S.A. 52:25-24.2 (P.L. 1977, c.33, as amended by P.L. 2016, c.43)

This statement shall be completed, certified to, and included with all bid and proposal submissions. Failure to submit the required information is cause for automatic rejection of the bid or proposal.

Name of Organization: _____

Organization Address: _____

Part I:

Check the box that represents the type of business organization:

- ☐ Sole Proprietorship (skip Parts II and III, execute certification in Part IV)
- ☐ Non-Profit Corporation (skip Parts II and III, execute certification in Part IV)
- ☐ For-Profit Corporation (any type)
- ☐ Limited Liability Company (LLC)
- ☐ Limited Partnership
- ☐ Limited Liability Partnership (LLP)
- ☐ Other (be specific):

Part II:

The list below contains the names and addresses of all stockholders in the corporation who own 10 percent or more of its stock, of any class, or of all individual partners in the partnership who own a 10 percent or greater interest therein, or of all members in the limited liability company who own a 10 percent or greater interest therein, as the case may be. **(COMPLETE THE LIST BELOW IN THIS SECTION)**

OR

No one stockholder in the corporation owns 10 percent or more of its stock, of any class, or no individual partner in the partnership owns a 10 percent or greater interest therein, or no member in the limited liability company owns a 10 percent or greater interest therein, as the case may be. **(SKIP TO PART IV)**

(Please attach additional sheets if more space is needed):

Name of Individual or Business Entity	Address

Part III DISCLOSURE OF 10% OR GREATER OWNERSHIP IN THE STOCKHOLDERS, PARTNERS OR LLC MEMBERS LISTED IN PART II

If a bidder has a direct or indirect parent entity which is publicly traded, and any person holds a 10 percent or greater beneficial interest in the publicly traded parent entity as of the last annual federal Security and Exchange Commission (SEC) or foreign equivalent filing, ownership disclosure can be met by providing links to the website(s) containing the last annual filing(s) with the federal Securities and Exchange Commission (or foreign equivalent) that contain the name and address of each person holding a 10% or greater beneficial interest in the publicly traded parent entity, along with the relevant page numbers of the filing(s) that contain the information on each such person. **Attach additional sheets if more space is needed.**

Website (URL) containing the last annual SEC (or foreign equivalent) filing	Page #'s

Please list the names and addresses of each stockholder, partner or member owning a 10 percent or greater interest in any corresponding corporation, partnership and/or limited liability company (LLC) listed in Part II **other than for any publicly traded parent entities referenced above.** The disclosure shall be continued until names and addresses of every non-corporate stockholder, and individual partner, and member exceeding the 10 percent ownership criteria established pursuant to N.J.S.A. 52:25-24.2 has been listed. **Attach additional sheets if more space is needed.**

Stockholder/Partner/Member and Corresponding Entity Listed in Part II	Address

Part IV Certification

I, being duly sworn upon my oath, hereby represent that the foregoing information and any attachments thereto to the best of my knowledge are true and complete. I acknowledge: that I am authorized to execute this certification on behalf of the bidder/proposer; that the **<name of contracting unit>** is relying on the information contained herein and that I am under a continuing obligation from the date of this certification through the completion of any contracts with **<type of contracting unit>** to notify the **<type of contracting unit>** in writing of any changes to the information contained herein; that I am aware that it is a criminal offense to make a false statement or misrepresentation in this certification, and if I do so, I am subject to criminal prosecution under the law and that it will constitute a material breach of my agreement(s) with the, permitting the **<type of contracting unit>** to declare any contract(s) resulting from this certification void and unenforceable.

Full Name (Print) :		Title :	
Signature :		Date :	

AFFIRMATIVE ACTION COMPLIANCE NOTICE

N.J.S.A. 10:5-31 and N.J.A.C. 17:27

GOODS AND SERVICES CONTRACTS

(INCLUDING PROFESSIONAL SERVICES)

This form is a summary of the successful bidder's requirement to comply with the requirements of N.J.S.A. 10:5-31 and N.J.A.C. 17:27-1 et seq.

The successful bidder shall submit to the public agency, after notification of award but prior to execution of this contract, one of the following three documents as forms of evidence:

(a) A photocopy of a valid letter that the contractor is operating under an existing Federally approved or sanctioned affirmative action program (good for one year from the date of the letter);

OR

(b) A photocopy of a Certificate of Employee Information Report approval, issued in accordance with N.J.A.C. 17:27-4;

OR

(c) A photocopy of an Employee Information Report (Form AA302) provided by the Division and distributed to the public agency to be completed by the contractor in accordance with N.J.A.C. 17:27-4.

The successful vendor may obtain the Affirmative Action Employee Information Report (AA302) from the contracting unit during normal business hours.

The successful vendor(s) must submit the copies of the AA302 Report to the Division of Contract Compliance and Equal Employment Opportunity in Public Contracts (Division). The Public Agency copy is submitted to the public agency, and the vendor copy is retained by the vendor.

The undersigned vendor certifies that he/she is aware of the commitment to comply with the requirements of N.J.S.A. 10:5-31 and N.J.A.C. 17:27.1 et seq. and agrees to furnish the required forms of evidence.

The undersigned vendor further understands that his/her bid shall be rejected as non-responsive if said contractor fails to comply with the requirements of N.J.S.A. 10:5-31 and N.J.A.C. 17:27-1 et seq.

COMPANY: _____ SIGNATURE: _____

PRINT NAME: _____ TITLE: _____

DATE: _____

FAILURE BY THE BIDDER TO COMPLETE AND RETURN THIS NOTICE WITH THEIR BID SUBMISSION SHALL BE CAUSE FOR THEIR BID TO BE REJECTED AS NON-RESPONSIVE

CITY OF VINELAND
ACKNOWLEDGMENT OF RECEIPT OF ADDENDA

Pursuant to N.J.S.A. 40A:11-23.1a, the undersigned bidder hereby acknowledges receipt of the following notices, revisions, or addenda to the bid advertisement, specifications or bid documents. By indicating date of receipt, bidder acknowledges the submitted bid takes into account the provisions of the notice, revision or addendum. Note that the local unit's record of notice to bidders shall take precedence and that failure to include provisions of changes in a bid proposal may be subject for rejection of the bid.

Addendum Number	Dated	Acknowledge Receipt (Initial)
_____	_____	_____
_____	_____	_____
_____	_____	_____

_____No addenda received.

Acknowledged for: _____
(Name of Bidder)

By: _____
(Signature of Authorized Representative)

Name: _____
(Please type or Print)

Title: _____

Date: _____

City of Vineland - Division of Purchasing
DISCLOSURE OF INVESTMENT ACTIVITIES IN IRAN FORM

STATE OF NEW JERSEY
DEPARTMENT OF THE TREASURY - DIVISION OF PURCHASE AND PROPERTY 33 WEST STATE STREET, P.O. BOX 230 TRENTON, NEW JERSEY 08625-0230

BID SOLICITATION # AND TITLE: _____

VENDOR NAME: _____

Pursuant to N.J.S.A. 52:32-57, et seq. (P.L. 2012, c.25 and P.L. 2021, c.4) any person or entity that submits a bid or proposal or otherwise proposes to enter into or renew a contract must certify that neither the person nor entity, nor any of its parents, subsidiaries, or affiliates, is identified on the New Jersey Department of the Treasury's Chapter 25 List as a person or entity engaged in investment activities in Iran. The Chapter 25 list is found on the Division's website at: https://www.state.nj.us/treasury/purchase/pdf/Chapter25List.pdf.

Vendors/Bidders must review this list prior to comp'eting the below certification. If the Director of the Division of Purchase and Property finds a person or entity to be in violation of the law, s/he shall take action as may be appropriate and provided by law, rule or contract, including but not limited to, imposing sanctions, seeking compliance, recovering damages, declaring the party in default and seeking debarment or suspension of the party.

CHECK THE APPROPRIATE BOX

☐ I certify, pursuant to N.J.S.A. 52:32-57, et seq. (P.L. 2012, c.25 and P.L. 2021, c.4), that neither the Vendor/Bidder listed above nor any of its parents, subsidiaries, or affiliates is listed on the New Jersey Department of the Treasury's Chapter 25 List of entities determined to be engaged in prohibited activities in Iran.

OR

☐ I am unable to certify as above because the Vendor/Bidder and/or one or more of its parents, subsidiaries, or affiliates is listed on the New Jersey Department of the Treasury's Chapter 25 List. I will provide a detailed, accurate and precise description of the activities of the Vendor/Bidder, or one of its parents, subsidiaries or affiliates, has engaged in regarding investment activities in Iran by completing the information requested below.

Entity Engaged in Investment Activities _____

Relationship to Vendor/ Bidder _____

Description of Activities _____

_____

_____

Duration of Engagement _____

Anticipated Cessation Date _____

**Attach Additional Sheets If Necessary.*

CERTIFICATION

I, the undersigned, certify that I am authorized to execute this certification on behalf of the Vendor, that the foregoing information and any attachments hereto, to the best of my knowledge are true and complete. I acknowledge that the City of Vineland is relying on the information contained herein, and that the Vendor is under a continuing obligation from the date of this certification through the completion of any contract(s) with the City to notify the City in writing of any changes to the information contained herein; that I am aware that it is a criminal offense to make a false statement or misrepresentation in this certification. If I do so, I may be subject to criminal prosecution under the law, and it will constitute a material breach of my contract(s) with the City, permitting the City to declare any contract(s) resulting from this certification void and unenforceable.

_____ _____

Signature Date

_____

Full Name (Print) and Title

CERTIFICATION REGARDING THE DEBARMENT SUSPENSION, INELIGIBILITY AND VOLUNTARY EXCLUSION

I am _____ of the firm of _____,
(Your Title) (Name of your Organization)

_____,
(Address of your Organization)

CHOOSE ONE OF THE FOLLOWING

( ) A. I hereby certify on behalf of _____
(Name of your Organization)

that neither it nor its principals are included on the State Treasurer's and Economic Development Authority's or the Federal Government's List of Debarred, Suspended, or Disqualified Bidders as a result of action taken by any State or Federal Agency.

( ) B. I am unable to certify to any of the statements set forth in this certification. I have attached an explanation to this form.

Subscribed and sworn to
Before me this day of
_____ 20____.

_____
(Signature)

_____
(Signature of Notary Public)

_____
(Typed or Printed Name and Title)

My Commission expires_____
(Month, Day, Year)

CERTIFICATION OF NON-DEBARMENT
FOR FEDERAL GOVERNMENT CONTRACTS
N.J.S.A. 52:32-44.1 (P.L. 2019, c.406)

This certification shall be completed, certified to, and submitted to the contracting unit prior to contract award, except for emergency contracts where submission is required prior to payment.

PART I: VENDOR INFORMATION	
Individual or Organization Name	
Physical Address of Individual or Organization	
Unique Entity ID (if applicable)	
CAGE/NCAGE Code (if applicable)	
Check the box that represents the type of business organization:	

☐Sole Proprietorship (skip Parts III and IV) ☐Non-Profit Corporation (skip Parts III and IV)

☐For-Profit Corporation (any type) ☐Limited Liability Company (LLC) ☐Partnership

☐Limited Partnership ☐Limited Liability Partnership (LLP)

☐Other (be specific): _____

PART II – CERTIFICATION OF NON-DEBARMENT: Individual or Organization			
I hereby certify that the **individual or organization listed above in Part I** is not debarred by the federal government from contracting with a federal agency. I further acknowledge: that I am authorized to execute this certification on behalf of the above-named organization; that the ***City of Vineland*** is relying on the information contained herein and that I am under a continuing obligation from the date of this certification through the date of contract award by ***City of Vineland of Vineland*** to notify the ***City of Vineland*** in writing of any changes to the information contained herein; that I am aware that it is a criminal offense to make a false statement or misrepresentation in this certification, and if I do so, I am subject to criminal prosecution under the law and that it will constitute a material breach of my agreement(s) with the **City of Vineland**, permitting the ***City of Vineland*** to declare any contract(s) resulting from this certification void and unenforceable.			
Full Name (Print):		Title:	
Signature:		Date:	

PART III – CERTIFICATION OF NON-DEBARMENT: Individual or Entity Owning Greater than 50 Percent of Organization	
Section A (Check the Box that applies)	
☐	Below is the name and address of the stockholder in the corporation who owns more than 50 percent of its voting stock, or of the partner in the partnership who owns more than 50 percent interest therein, or of the member of the limited liability company owning more than 50 percent interest therein, as the case may be.
Name of Individual or Organization	
Physical Address	
OR	
☐	No one stockholder in the corporation owns more than 50 percent of its voting stock, or no partner in the partnership owns more than 50 percent interest therein, or no member in the limited liability company owns more than 50 percent interest therein, as the case may be.
Section B (Skip if no Business entity is listed in Section A above)	
☐	Below is the name and address of the stockholder in the corporation who owns more than 50 percent of the voting stock of the organization's parent entity, or of the partner in the partnership who owns more than 50 percent interest in the organization's parent entity, or of the member of the limited liability company owning more than 50 percent interest in organization's parent entity, as the case may be.
Stockholder/Partner/Member Owning Greater Than 50 Percent of Parent Entity	
Physical Address	
OR	
☐	No one stockholder in the parent entity corporation owns more than 50 percent of its voting stock, no partner in the parent entity partnership owns more than 50 percent interest therein, or no member in the parent entity limited liability company owns more than 50 percent interest therein, as the case may be.

Section C – Part III Certification			
I hereby certify that no individual or organization that is debarred by the federal government from contracting with a federal agency owns greater than 50 percent of the **Organization listed above in Part I** or, if applicable, owns greater than 50 percent of a parent entity of < >. I further acknowledge: that I am authorized to execute this certification on behalf of the above-named organization; that the ***City of Vineland*** is relying on the information contained herein and that I am under a continuing obligation from the date of this certification through the date of contract award ***City of Vineland*** to notify the ***City of Vineland*** in writing of any changes to the information contained herein; that I am aware that it is a criminal offense to make a false statement or misrepresentation in this certification, and if I do so, I am subject to criminal prosecution under the law and that it will constitute a material breach of my agreement(s) with the **City of Vineland**, permitting the ***City of Vineland*** to declare any contract(s) resulting from this certification void and unenforceable.			
Full Name (Print):		**Title:**	
Signature:		**Date:**	

Part IV – CERTIFICATION OF NON-DEBARMENT: Contractor – Controlled Entities	
Section A	
☐	Below is the name and address of the corporation(s) in which the **Organization listed in Part I** owns more than 50 percent of voting stock, or of the partnership(s) in which the **Organization listed in Part I** owns more than 50 percent interest therein, or of the limited liability company or companies in which the **Organization listed above in Part I** owns more than 50 percent interest therein, as the case may be.

Name of Business Entity	Physical Address
Add additional sheets if necessary	
OR	
☐	The **Organization listed above in Part I** does not own greater than 50 percent of the voting stock in any corporation and does not own greater than 50 percent interest in any partnership or any limited liability company.

Section B (skip if no business entities are listed in Section A of Part IV)	
☐	Below are the names and addresses of any entities in which an entity listed in Part III A owns greater than 50 percent of the voting stock (corporation) or owns greater than 50 percent interest (partnership or limited liability company).

Name of Business Entity Controlled by Entity Listed in Section A of Part IV	Physical Address
Add additional Sheets if necessary	

OR	
☐	No entity listed in Part III A owns greater than 50 percent of the voting stock in any corporation or owns greater than 50 percent interest in any partnership or limited liability company.

Section C – Part IV Certification

I hereby certify that the **Organization listed above in Part I** does not own greater than 50 percent of any entity that that is debarred by the federal government from contracting with a federal agency and, if applicable, does not own greater than 50 percent of any entity that in turns owns greater than 50 percent of any entity debarred by the federal government from contracting with a federal agency. I further acknowledge: that I am authorized to execute this certification on behalf of the above-named organization; that the ***City of Vineland*** is relying on the information contained herein and that I am under a continuing obligation from the date of this certification through the date of contract award by ***City of Vineland*** to notify the ***City of Vineland*** in writing of any changes to the information contained herein; that I am aware that it is a criminal offense to make a false statement or misrepresentation in this certification, and if I do so, I am subject to criminal prosecution under the law and that it will constitute a material breach of my agreement(s) with the City of Vineland, permitting the ***City of Vineland*** to declare any contract(s) resulting from this certification void and unenforceable.

Full Name (Print):		Title:	
Signature:		Date:	

CITY OF VINELAND

LIST OF SUBCONTRACTORS

(as required by NJSA40A:11-16)

COV BID # 2025-22

August 12, 2025

The following subcontractors are to be used on this project in the four (4) specialty trade categories noted below: These subcontractors must be registered with the Department of Labor's Division of Wage and Hour Compliance (Public Works Contractor Registration) at the time proposals are received.

NOTE: If the project's scope of work does not involve any of the specialty trade categories below, please write the word **"NONE"** in each appropriate space(s).

If the project's scope of work does involve any of the specialty trade categories below, but will be done "in-house" by the General Contractor or a qualified, licensed employee(s), where required, or by such other employee(s) on the contractor's payroll, write the word **"IN-HOUSE"** and provide the names(s) and license number(s), where required, or the name(s) of those employees(s) in each of the appropriate spaces below:

DO NOT LEAVE ANY SPACE BLANK

1. PLUMBING AND GAS FITTING AND ALL KINDRED WORK:

Name: _____

Address: _____

License Number: _____

2. STEAM AND HOT WATER HEATING AND VENTILATING APPARATUS AND ALL KINDRED WORK:

Name: _____

Address: _____

3. ELECTRICAL WORK:

Name: _____

Address: _____

4. STRUCTURAL STEEL AND ORNAMENTAL IRON WORK:

Name: _____

Address: _____

BY: _____
(SIGNATURE OF AUTHORIZED REPRESENTATIVE)

NAME: _____
(PLEASE PRINT)

DATE: _____

THE ABOVE NAMED SUBCONTRACTORS MUST BE REGISTERED WITH THE DEPARTMENT OF LABOR'S DIVISION OF WAGE AND HOUR COMPLIANCE (PUBLIC WORKS CONTRACTORS REGISTRATION) AT THE TIME PROPOSALS ARE RECEIVED.

BUSINESS REGISTRATION CERTIFICATES MUST BE SUBMITTED, FOR ANY OF THE COMPANIES/INDIVIDUALS LISTED ABOVE AS ONE OF THE FOUR PRIME SUB-CONTRACTORS.

SAMPLE FORM OF BID BOND

A. We, the undersigned

_____ as Principal and

_____ as Surety, are hereby held and firmly bound unto

_____ in the penal sum of _____Dollars

($_____), lawful money of the United States for the payment of which well and truly to be made, we hereby jointly and severally bind ourselves, our heirs, executors, administrators, successors and assigns. Signed this _____ day of _____, 20 _____.

B. THE CONDITION of the above obligation is such that whereas the Principal has submitted to the_____,

a certain bid attached hereto and hereby made a part of hereto and hereby made a part of hereof, to enter into a contract in writing for the (insert type of work)

_____.

C. NOW THEREFORE:

If said bid shall be rejected, or in the alternate, if said bid shall be accepted and the Principal shall execute and deliver a contract in the form of Agreement required by the Bid Documents and for the payment of all persons performing labor or furnishing materials in connection therewith, and shall in all respects perform the agreement created by the acceptance of said bid. Then this obligation shall be void, otherwise the same shall remain in force and effect, it being expressly understood and agreed that the liability of the surety for any and all claims hereunder shall, in no event, exceed the penal amount of this obligation as herein stated.

D. THE SURETY for value received, hereby stipulates and agrees that the obligations of said Surety and its bond shall in no way be impaired or affected by an extensions of the time within the "OBLIGEE" may accept such bid. And said Surety does hereby waive notice of any such extension.

E. IN WITNESS WHEREOF, the Principal and the Surety have hereunto set their hands and seals, and such of them as corporations have caused their corporate seals to be hereto fixed and these presents to be signed by their proper officers, the day and year set forth above.

_____(L.S.)
PRINCIPAL

_____
SURETY

(SEAL)

_____
BY

NOTE: Bid Bond must be signed by an authorized agent or representative of a surety company and not by the individual or company submitting the bid.

SURETY FORM

The City of Vineland has provided this certificate of surety for submission to a bidder's insurance/bonding company. Language such as this will be accepted; however, language that limits the timeframe in which the City can process claims against a performance bond or language that states the surety is conditional depending on contract terms, will not be accepted. (Contract terms will be as outlined in the bid specifications)

To:

Purchasing Board
City of Vineland
640 E. Wood Street
Vineland, NJ 08360

_____

NAME OF INSURANCE/BONDING COMPANY

being duly qualified to transact business in the State of New Jersey, hereby certifies and agrees that if:

_____

CONTRACTOR NAME

Is the successful bidder for _____

_____ it as surety, will provide

the bidder with the bond or bonds as are called for in the bid specifications.

Signed and Sealed _____, 20 ___.

_____

NAME OF INSURANCE/BONDING COMPANY

_____ _____

Printed name of Attorney-in-Fact *Signature of Attorney-in-Fact*

POWER OF ATTORNEY FOR THE ATTORNEY-IN-FACT MUST BE ATTACHED TO CONSENT OF SURETY AND CORPORATE SEAL OF THE SURETY COMPANY MUST BE AFFIXED TO SURETY FORM

CERTIFICATE OF SURETY MUST BE SIGNED BY AN AUTHORIZED AGENT OR REPRESENTATIVE OF A SURETY COMPANY AND NOT BY THE INDIVIDUAL OR COMPANY SUBMITTING THE BID

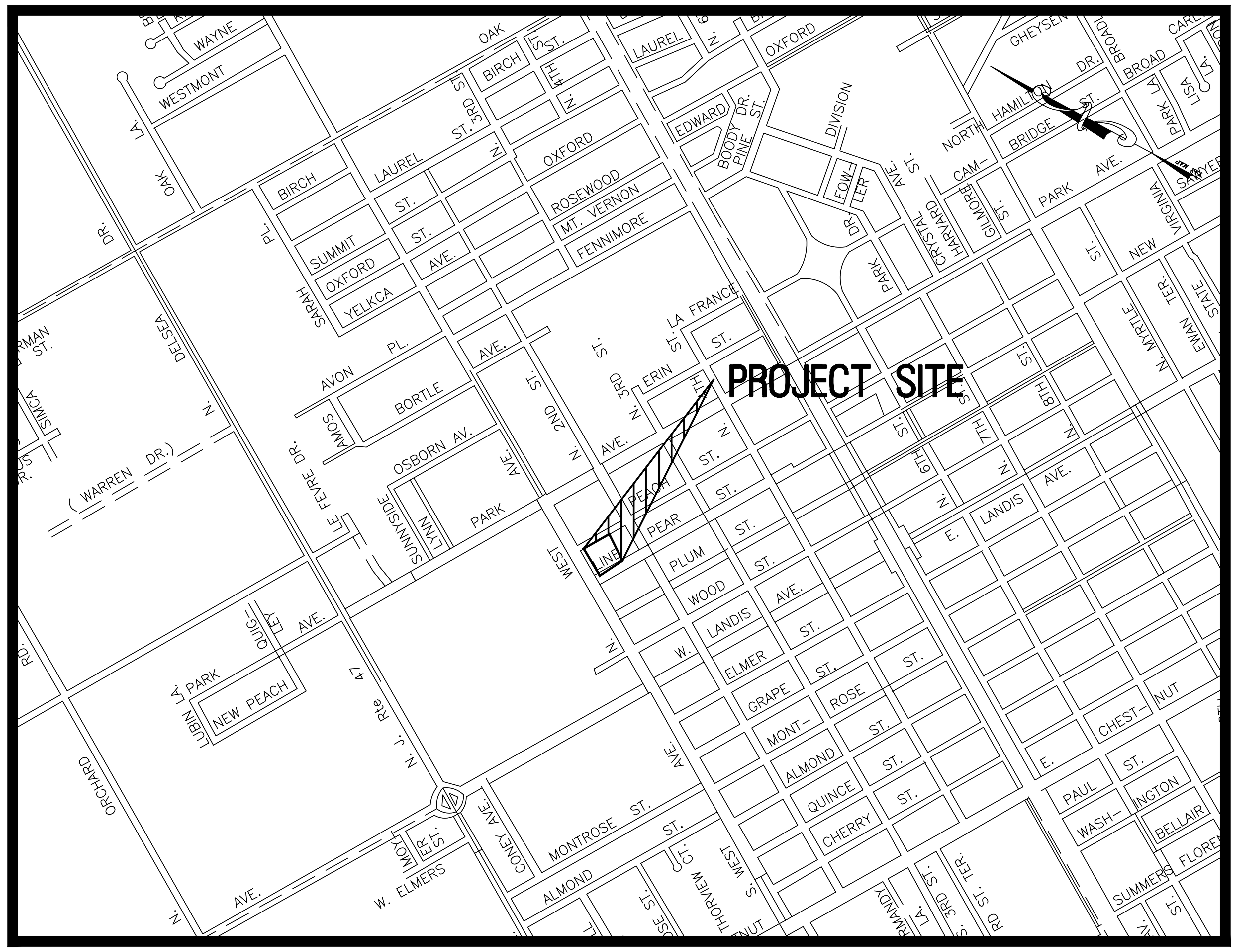
INSURANCE/BONDING COMPANY TO PROVIDE THE FOLLOWING:

NAME_____ TITLE_____

ADDRESS_____

TELEPHONE NO. _____

CITY OF VINELAND MUNICIPAL WATER UTILITY
CLEARWELL IMPROVEMENTS



PROJECT LOCATION MAP

SHEET INDEX	
SHEETS	DESCRIPTION
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DATE: 06-12-2025
JACQUELINE D. TROVATO
NJ PROFESSIONAL ENGINEER LIC. No. 51944

PLANS WHICH DO NOT BEAR AN EMBOSSED SEAL ARE NOT VALID.

No.	REVISION	DATE	BY	CHK

TITLE SHEET

CITY OF VINELAND MUNICIPAL WATER UTILITY
CLEARWELL IMPROVEMENTS
CITY OF VINELAND CUMBERLAND COUNTY NEW JERSEY

DRAWN BY :	DESIGN BY :	CHECKED BY :	SCALE :
JG	AJK	CK	AS NOTED
DATE : 2.2025		SHEET No. : T-1	
JOB No. : 0614T045			

New Jersey One Call
CALL BEFORE YOU DIG
811 or 1-800-272-1000
ITS THE LAW
IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO CONTACT NJ ONE CALL PRIOR TO THE START OF CONSTRUCTION. CALL FOR MARKOUTS THREE (3) FULL BUSINESS DAYS IN ADVANCE AND BEGIN EXCAVATION WITHIN 10 DAYS. ALL CONTRACTORS ON-SITE MUST HAVE THEIR OWN MARKOUT.

CITY OF VINELAND
CUMBERLAND COUNTY, NEW JERSEY

JUNE, 2025

P:\CADD Projects\NJ\Cumberland Co\Vineland Cty\0614T045-Vineland Clea

GENERAL NOTES

DESIGN CRITERIA

CODE:

ALL CONSTRUCTION SHALL COMPLY WITH 2021 INTERNATIONAL BUILDING CODE, NEW JERSEY EDITION.

1. LIVE LOAD:

   A. ROOF LIVE LOAD 20 PSF

2. DEAD LOAD:

   A. STRUCTURAL AND BUILDING COMPONENTS SELF WEIGHT

3. WIND LOADING PER IBC 2021 – NEW JERSEY EDITION:

   A. BASIC WIND VELOCITY (V): 128 MPH
   B. EXPOSURE CATEGORY: C
   C. RISK CATEGORY: III
   D. INTERNAL PRESSURE COEFFICIENT: GC_pi=±0.18

4. SEISMIC LOADING PER IBC 2021 – NEW JERSEY EDITION:

   A. RESPONSE ACCELERATOR:
      S_S = 0.145 S_{DS} = 0.155
      S_1 = 0.043 S_{D1} = 0.068
   B. SEISMIC DESIGN CATEGORY: B
   C. SEISMIC SITE CLASSIFICATION: D
   D. IMPORTANCE FACTOR I_E: 1.25
   E. BASIC SEISMIC FORCE RESISTING SYSTEM. ORDINARY PLAIN CONCRETE SHEAR WALLS
   F. SEISMIC BASE SHEAR = 170 KIPS
   G. SEISMIC RESPONSE COEFFICIENTS, C_S = 0.13
   H. RESPONSE MODIFICATION COEFFICIENTS, R: 1.5
   I. ANALYSIS PROCEDURE USED: ELF

5. SNOW LOADING PER IBC 2021 – NEW JERSEY EDITION:

   A. GROUND SNOW LOAD: 20 PSF
   B. IMPORTANCE FACTOR: 1.1
   C. ROOF SNOW LOAD, P_M: 22 PSF
   D. SNOW EXPOSURE FACTOR, C_E: 1.0
   E. THERMAL FACTOR, C_T: 1.2
   F. SLOPE FACTOR, C_S: 1.0

FOUNDATION CONCRETE

1. ALL CONCRETE SHALL BE NORMAL WEIGHT STRUCTURAL CONCRETE HAVING A DESIGN COMPRESSIVE STRENGTH AT 28 DAYS AS FOLLOWS:

   A. FOOTINGS 4,000 PSI
   B. WALLS AND PIERS 4,000 PSI
   C. SLAB-ON-GRADE 4,000 PSI

2. NO CONCRETE SHALL BE PLACED UNTIL CONCRETE DESIGN MIXES HAVE BEEN SUBMITTED FOR EACH CLASS OF CONCRETE NOTED ABOVE AND HAVE BEEN APPROVED BY THE ENGINEER.
3. REINFORCING STEEL SHALL BE DEFORMED BARS OF INTERMEDIATE GRADE NEW BILLET STEEL CONFORMING TO CURRENT REQUIREMENTS OF ASTM A 615, GRADE 60. LAP BARS 40 DIAMETER UNLESS OTHERWISE SHOWN. ALL HOOKS SHALL BE STANDARD HOOKS, UNLESS OTHERWISE NOTED.
4. WELDED WIRE FABRIC SHALL CONFORM TO ASTM A 185.
5. ALL MESH SHALL BE SPLICED SO THAT THE OVERLAP OF THE OUTERMOST CROSS WIRES OF EACH ADJOINING SHEET IS NOT LESS THAN THE SPACING OF THE CROSS WIRES PLUS 2 INCHES, UNLESS NOTED OTHERWISE.
6. FOR ALL SLABS ON GRADE WHERE NOT OTHERWISE SPECIFIED, USE 6x6–W2.9xW2.9 W.W.F.
7. MINIMUM STEEL PROTECTION, UNLESS OTHERWISE SHOWN, SHALL BE 1–INCH FOR INTERIOR FACE OF WALLS, 2 INCHES FOR EXTERIOR FACE OF WALLS, 3 INCHES FOR FOOTINGS AND OTHER STRUCTURAL CONCRETE DEPOSITED AGAINST GROUND, 2 INCHES FOR CONCRETE PERMANENTLY EXPOSED TO EARTH OR WEATHER.
8. ALL STRUCTURAL MEMBERS SHALL BE POURED FOR THEIR FULL DEPTHS IN ONE OPERATION. CONSTRUCTION JOINTS, SUCH AS DAY'S POUR JOINTS, SHALL BE LOCATED IN THE MIDDLE THIRD OF THE SPAN, MAIN REINFORCING TO RUN THROUGH THE JOINT, KEY AND ROUGHEN JOINTS TO EXPOSE AGGREGATE. CONTRACTOR SHALL SUBMIT DRAWING INDICATING CONSTRUCTION JOINT LOCATIONS FOR APPROVAL.
9. NO CONCRETE SHALL BE PLACED IN WATER.
10. ALL SLABS ON GRADE SHALL HAVE THICKENINGS, DEPRESSIONS, OPENINGS, ETC. AS SHOWN ON OR AS REQUIRED BY VARIOUS TRADES.
11. REFER TO ARCHITECTURAL DRAWINGS AND/OR SPECIFICATIONS FOR CONCRETE FINISHES.
12. FOR ADDITIONAL CONCRETE WORK NOT SHOWN ON STRUCTURAL DRAWINGS, SEE ARCHITECTURAL DRAWINGS.

SUPERSTRUCTURE CONCRETE

1. ALL CONCRETE SHALL BE NORMAL WEIGHT STRUCTURAL CONCRETE HAVING A DESIGN COMPRESSIVE STRENGTH AS FOLLOWS:

   A. COLUMNS 4,000 PSI
   B. SLABS, BEAM 4,000 PSI
   C. WALLS 4,000 PSI

2. NO CONCRETE SHALL BE PLACED UNTIL CONCRETE DESIGN MIXES HAVE BEEN SUBMITTED FOR EACH CLASS OF CONCRETE NOTED ABOVE AND HAVE BEEN APPROVED BY THE ENGINEER.
3. REINFORCING STEEL SHALL BE DEFORMED BARS OF INTERMEDIATE GRADE NEW BILLET STEEL CONFORMING TO CURRENT REQUIREMENTS OF ASTM A 615, GRADE 60. LAP BARS 40 DIAMETER UNLESS OTHERWISE SHOWN. ALL HOOKS SHALL BE STANDARD HOOKS, UNLESS OTHERWISE NOTED.
4. MINIMUM STEEL PROTECTION, UNLESS OTHERWISE SHOWN, SHALL BE 3/4–INCH FOR SLABS, 1–INCH FOR INTERIOR FACE OF WALLS, 2–INCH FOR EXTERIOR FACE OF WALLS, 1 1/2–INCH FOR BEAM STIRRUPS AND COLUMN TIES, 2–INCH FOR VERTICAL COLUMN REINFORCING.
5. ALL STRUCTURAL MEMBERS SHALL BE POURED FOR THEIR FULL DEPTHS IN ONE OPERATION. CONSTRUCTION JOINTS, SUCH AS DAY'S POUR JOINTS, SHALL BE LOCATED IN THE MIDDLE THIRD OF THE SPAN, MAIN REINFORCING TO RUN THROUGH THE JOINT, KEY AND ROUGHEN JOINTS TO EXPOSE AGGREGATE. CONTRACTOR SHALL SUBMIT DRAWING INDICATING CONSTRUCTION JOINT LOCATIONS FOR APPROVAL.
6. NO OPENINGS SHALL BE MADE IN ANY STRUCTURAL MEMBER, UNLESS SPECIFICALLY SHOWN ON THE STRUCTURAL DRAWINGS, WITHOUT APPROVAL FROM THE ENGINEER. NO SLEEVES SHALL BE PLACED HORIZONTALLY OR VERTICALLY IN BEAMS OR JOISTS, UNLESS SPECIFICALLY SHOWN ON THE STRUCTURAL DRAWINGS, WITHOUT APPROVAL FROM THE ENGINEER.
7. CONTRACTOR SHALL SUBMIT A COORDINATED DRAWING SHOWING ALL SLEEVES, OPENINGS, BLOCKOUTS, ETC., AS REQUIRED BY ALL TRADES, FOR APPROVAL, PRIOR TO PLACING CONCRETE IN THAT AREA.
8. ALL SLABS SHALL HAVE THICKENINGS, DEPRESSIONS, OPENINGS, ETC. AS SHOWN HEREIN OR ON ARCHITECTURAL, MECHANICAL, ELECTRICAL, AND PLUMBING DRAWINGS.
9. WELDED WIRE FABRIC SHALL CONFORM TO ASTM A 185.
10. ALL MESH SHALL BE SPLICED SO THAT THE OVERLAP BETWEEN OUTERMOST CROSS WIRES OF EACH SHEET IS NOT LESS THAN THE SPACING OF THE CROSS WIRES PLUS 2 INCHES, UNLESS OTHERWISE SHOWN ON DRAWINGS.
11. FOR ALL SLABS WHERE NOT OTHERWISE SPECIFIED USE STYLE 6x6–W2.9xW2.9 W.W.F.
12. FOR ADDITIONAL CONCRETE WORK NOT SHOWN ON STRUCTURAL DRAWINGS, SEE ARCHITECTURAL DRAWINGS.
13. REFER TO ARCHITECTURAL DRAWINGS AND/OR SPECIFICATIONS FOR CONCRETE FINISHES.

MASONRY

1. HOLLOW CONCRETE MASONRY UNITS ASTM C90, GRADE N, TYPE 1 NORMAL WEIGHT 1900 PSI NET AREA COMPRESSIVE.
2. MORTAR SHALL BE ASTM C270, TYPE S FOR ALL REINFORCED MASONRY, EXTERIOR WALLS AND WALLS BELOW GRADE.
3. GROUT SHALL BE ASTM C476, 28 DAY COMPRESSIVE STRENGTH OF 3,000 PSI.
4. REINFORCING STEEL GRADE 60 REINFORCING BARS.
5. HORIZONTAL JOINT REINFORCEMENT ASTM A951.
6. STRENGTH OF MASONRY ASSEMBLY f'm = 1,500 PSI.
7. CONSTRUCTION SHALL CONFORM TO SPECIFICATIONS FOR MASONRY STRUCTURES, ACI 530.1
8. REINFORCING METAL TIES AND ANCHORS SHALL BE PROTECTED FROM CONTACT WITH SOIL AND BEFORE BEING PLACED SHALL BE FREE FROM LOOSE RUST AND OTHER COATINGS THAT WILL DESTROY OR REDUCE THE BOND. MINIMUM LAP SHALL BE 48 BAR DIAMETERS FOR REBAR AND 6" FOR JOINT REINFORCEMENT.
9. SHOP DRAWINGS SHOWING ALL BAR REINFORCING IN ELEVATION (1/8" TO 1'–0" MINIMUM SCALE) SHALL BE SUBMITTED AND REVIEWED PRIOR TO CONSTRUCTION.
10. ALL MASONRY WALLS TO HAVE 9 GAGE TRUSS TYPE HORIZONTAL REINFORCEMENT AT 16 INCHES ON CENTER.
11. MASONRY UNITS SHALL BE STEAM CURED, A MINIMUM OF 28 DAYS AT THE TIME OF DELIVERY AND CONTINUOUSLY PROTECTED FROM EXPOSURE TO RAIN OR OTHER SOURCES OF WATER FROM TIME OF CASTING TO FINAL PLACEMENT IN WALL. MASONRY UNITS SHALL BE DRY, FREE FROM SOIL, ICE AND FROST WHEN LAID IN WALL. SEE ACI 530.1 FOR COLD AND HOT WEATHER CONSTRUCTION AND WALL PROTECTION REQUIREMENTS.

PRECAST HOLLOW CORE SLABS

1. THE DESIGN, FABRICATION & ERECTION OF PRECAST CONCRETE SLABS SHALL CONFORM TO THE REQUIREMENTS OF ACI 328 & THE LATEST PCI CODE. PRECAST MANUFACTURER SHALL BE PCI APPROVED. PRECAST MANUFACTURER SHALL SUBMIT SHOP DRAWINGS & CALCULATIONS, BOTH WHICH MUST BE SIGNED AND SEALED BY A LICENSED PROFESSIONAL ENGINEER IN THE STATE OF NEW JERSEY.
2. PRECAST CONCRETE PLANK SHALL BE DESIGNED TO SUPPORT ALL SUPERIMPOSED LOADS INCLUDING PARTITION LOADS. FOR LOCATION OF PARTITIONS, SEE ARCHITECTURAL DRAWINGS.
3. IF SHIMS ARE REQUIRED AT PRECAST PLANK BEARING, THEY MUST BE CONTINUOUS FOR THE FULL WIDTH OF THE PLANK. POINT SHIMMING IS NOT ACCEPTABLE. USE OF KORALATH SHIMS OR APPROVED EQUAL.
4. PRECAST CONCRETE MEMBERS SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 5,000 PSI.
5. PRECAST MANUFACTURER SHALL COORDINATE WITH OTHER TRADES & ALL CONTRACT DRAWINGS FOR SIZE & LOCATION OF ALL OPENINGS. PRECAST MANUFACTURER SHALL DESIGN, PROVIDE, & INSTALL ALL HANGERS, INSERTS, ATTACHMENTS & APPURTENANCES AS REQUIRED.
6. ALL OPENINGS IN PRECAST CONCRETE MUST BE PROVIDED BY OR APPROVED IN WRITING BY THE PRECAST MANUFACTURER. NO REINFORCING IN PRECAST CONCRETE IS TO BE CUT WITHOUT PRIOR APPROVAL OF PRECAST MANUFACTURER.
7. PRECAST MANUFACTURER IS TO OBTAIN ALL PRECAST CONCRETE DIMENSIONS FROM ARCHITECTURAL DOCUMENTS.
8. PRECAST MANUFACTURER TO COORDINATE QUANTITIES & LOCATIONS OF ALL CONNECTIONS (GRAVITY & LATERAL) FOR PRECAST CONCRETE WITH MANUFACTURER OF SUPPORT MATERIAL (STEEL, CONCRETE, ETC.), BASED ON GENERAL GUIDELINES AS SHOWN ON STRUCTURAL DOCUMENTS.
9. WELD PLATES AND OTHER EMBEDDED ITEMS AS SHOWN ON STRUCTURAL DRAWINGS ARE FOR DESIGN INTENT ONLY. PRECAST MANUFACTURER IS RESPONSIBILITY FOR QUANTITY & LOCATION OF THEIR ITEMS.

STRUCTURAL STEEL

1. STRUCTURAL STEEL SHALL CONFORM TO THE FOLLOWING ASTM DESIGNATIONS, LATEST EDITION:

   A. STRUCTURAL STEEL SHAPES ASTM A992 HAVING A MINIMUM YIELD STRENGTH OF 50 KSI.
   B. MISC SHAPES, BARS, AND PLATES – A 36 HAVING A MINIMUM YIELD STRENGTH OF 36 KS.
   C. ROUND PIPE – A 53, GRADE B HAVING A MINIMUM YIELD STRENGTH OF 35 KS.
   D. SQUARE AND RECTANGULAR TUBING – A 500, GRADE B HAVING A MINIMUM YIELD STRENGTH OF 46 KSI.

2. BOLTS SHALL CONFORM TO THE FOLLOWING ASTM DESIGNATIONS: HIGH STRENGTH BOLTS–A 325 OR A 490; ANCHOR BOLTS–F1554; STANDARD FASTENERS–A 307.
3. ALL WELDING ELECTRODES SHALL CONFORM TO THE E–70 SERIES OF THE SPECIFICATION FOR MILD STEEL ARC WELDING ELECTRODES ASTM A 233.
4. ALL BOLTS SHALL BE 3/4–INCH DIAMETER, OPEN HOLES 13/16–INCH DIAMETER, UNLESS OTHERWISE SHOWN OR NOTED.
5. ALL SHOP CONNECTIONS MAY BE HIGH STRENGTH BOLTED OR WELDED.
6. ALL FIELD CONNECTIONS MAY BE HIGH STRENGTH BOLTED EXCEPT WHERE DETAILS INDICATE WELDING.
7. ALL HIGH STRENGTH BOLTED CONNECTIONS SHALL BE INSTALLED IN ACCORDANCE WITH SPECIFICATION FOR STRUCTURAL JOINTS USING ASTM A 325 OR A 490 BOLTS.
8. ALL HIGH STRENGTH BOLTED CONNECTIONS SHALL BE FULLY PRE–TENSIONED UNLESS NOTED OTHERWISE.
9. ALL HIGH STRENGTH BOLTS IN OVERSIZED HOLES SHALL BE SLIP CRITICAL.
10. ALL HIGH STRENGTH BOLTED CONNECTIONS USED FOR KICKERS AND BRACING MEMBERS WHICH ARE FABRICATED WITH SLOTTED HOLES SHALL USE SLIP–CRITICAL BOLTS. IF STANDARD HOLES ARE USED, BOLTS SHALL BE FULLY PRE–TENSIONED.
11. NO PENETRATIONS ARE PERMITTED THROUGH STRUCTURAL STEEL MEMBERS UNLESS INDICATED ON STRUCTURAL DRAWINGS OR APPROVED BY ENGINEER.
12. APPROVAL OF THE ENGINEER SHALL BE MANDATORY FOR THE USE OF CUTTING TORCH IN THE FIELD.
13. DURING ERECTION, STRUCTURAL STEEL FRAME SHALL BE ADEQUATELY BRACED IN ALL LINES, TWO WAYS.
14. CONNECTIONS SHALL BE DESIGNED PER AISC TO CARRY FULL CAPACITY OF UNIFORMLY LOADED MEMBER, UNLESS NOTED OTHERWISE. REACTIONS GREATER THAN FULL MEMBER CAPACITY ARE INDICATED THUS (60K) ON PLAN.
15. ALL GROUT UNDER STEEL PLATES SHALL BE NON–SHRINK "PRE–MIX" TYPE AND SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 5,000 PSI.
16. FOR ALL MISCELLANEOUS STEEL CONSTRUCTION NOT SHOWN ON STRUCTURAL DRAWINGS, SEE ARCHITECTURAL DRAWINGS.
17. EXPANSION BOLTS SHALL BE 3/4–INCH DIAMETER KWIK BOLT ANCHORS AS MANUFACTURED BY HILTI OR APPROVED EQUIVALENT AS APPROVED BY THE ENGINEER, AND INSTALLED IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
18. ALL STEEL COLUMN BASE PLATES SHALL INCLUDE LEVELING PLATES AS REQUIRED FOR CONSTRUCTION.
19. ALL EXPOSED / EXTERIOR STEEL SHALL BE HOT DIPPED GALVANIZED OR STAINLESS STEEL, UNLESS OTHERWISE SHOWN ON THE DRAWINGS.

DEMOLITION NOTES

1. REMOVE EXISTING CONSTRUCTION AS SHOWN ON PLANS. SEE SECTIONS AND DETAILS FOR EXTENT OF STRUCTURE TO BE REMOVED.
2. EXISTING STRUCTURAL STEEL FRAMING SHALL REMAIN UNLESS SPECIFICALLY NOTED ON PLAN TO BE REMOVED.
3. CONCRETE ENCASEMENT AROUND REMAINING STEEL WILL REMAIN, UNLESS NOTED OTHERWISE.
4. IF FIELD CONDITIONS DIFFER FROM THOSE SHOWN ON DRAWINGS, NOTIFY ENGINEER BEFORE PROCEEDING WITH DEMOLITION.

EXISTING CONSTRUCTION

1. ALL DIMENSIONS AND ELEVATIONS OF EXISTING STRUCTURES SHOWN ON THE DRAWINGS ARE OBTAINED FROM AVAILABLE SOURCES AND ARE NOT GUARANTEED TO BE TRUE AND EXACT. THE CONTRACTOR SHALL VERIFY THESE DIMENSIONS AND ELEVATIONS BY ACTUAL FIELD MEASUREMENTS PRIOR TO FABRICATION OF ANY MATERIALS AND START OF WORK AND IMMEDIATELY REPORT ANY DISCREPANCIES TO THE ENGINEER.

MISCELLANEOUS

1. CONTRACTOR SHALL VERIFY CONDITIONS IN THE FIELD AND IMMEDIATELY NOTIFY ENGINEER OF ANY CONDITIONS NOT AS ASSUMED; HE SHALL TAKE FIELD MEASUREMENTS AS REQUIRED AND BE RESPONSIBLE FOR SAME.
2. CONTRACTOR SHALL COORDINATE WITH ALL RELATED TRADES FOR DETAILING, FABRICATION, AND ERECTION PRIOR TO SUBMITTING SHOP DRAWINGS FOR APPROVAL.
3. ALL STRUCTURAL WORK SHALL BE COORDINATED WITH ARCHITECTURAL, MECHANICAL, ELECTRICAL, PLUMBING, ETC. REQUIREMENTS. DISCREPANCIES AND/OR INTERFERENCE SHALL BE REPORTED TO THE ENGINEER IMMEDIATELY.
4. GENERAL CONTRACTOR TO PROVIDE APPROPRIATE NUMBER OF COPIES OF ONE COMPLETE COORDINATED DRAWING SHOWING ALL SLEEVES, CONDUIT BOXOUT, DUCT OPENINGS, ETC. AS REQUIRED FOR ALL TRADES FOR ENGINEER'S APPROVAL. THIS SHALL BE DONE A MINIMUM OF TWO WEEKS PRIOR TO POURING AFFECTED SLABS, COLUMNS, OR FOOTINGS.
5. NO OPENINGS SHALL BE MADE IN ANY STRUCTURAL MEMBER UNLESS SPECIFICALLY SHOWN ON THE STRUCTURAL DRAWINGS OR OTHER APPROVAL FROM THE ENGINEER.
6. SUPPORT DETAILS FOR ARCHITECTURAL, MECHANICAL, ELECTRICAL, AND PLUMBING EQUIPMENT IS BASED UPON AVAILABLE INFORMATION OF MANUFACTURER. CONTRACTOR SHALL COORDINATE REQUIREMENTS OF ACTUAL EQUIPMENT AND SHALL PROVIDE ANY ADDITIONAL REQUIRED FRAMING.

ABBREVIATIONS

E.F.	EACH FACE
WF1	WALL FOOTING
CMU	CONCRETE MASONRY UNIT
V.I.F.	VERIFY IN THE FIELD
O.C.	ON CENTER
E.W.	EACH WAY
T&B	TOP & BOTTOM
AL	ALUMINUM
CS	CARBON STEEL
SS	STAINLESS STEEL
CL	CENTER LINE
GALV.	GALVANIZED
T.O.M.	TOP OF MASONRY

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Jacqueline D Trovato
DATE: 06-12-2025
JACQUELINE D. TROVATO
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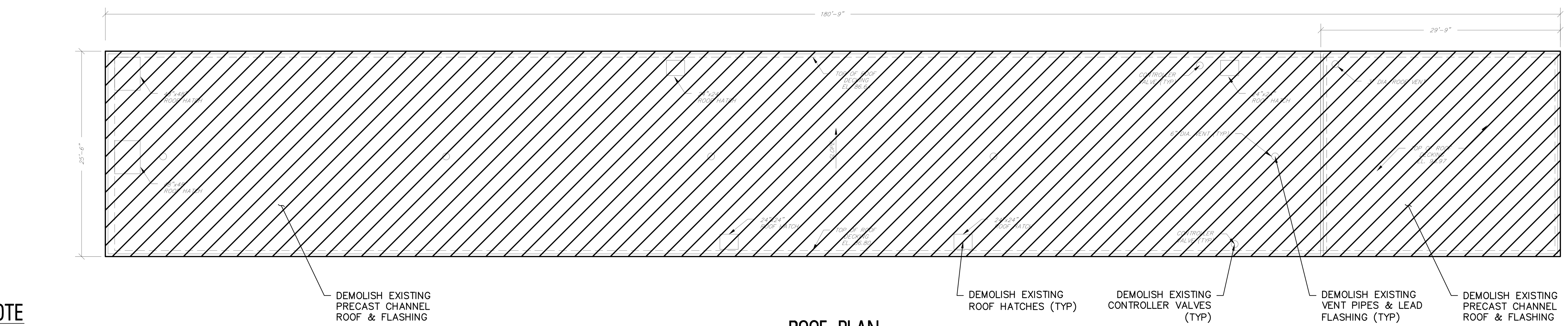
STRUCTURAL COVER SHEET

CITY OF VINELAND MUNICIPAL WATER UTILITY
CLEARWELL IMPROVEMENTS
CITY OF VINELAND CUMBERLAND COUNTY NEW JERSEY

DRAWN BY:	DESIGN BY:	CHECKED BY:	SCALE:
JG	AJK	CK	AS NOTED
DATE: 2.2025		SHEET No.: S-1	
JOB No.: 0614T045			

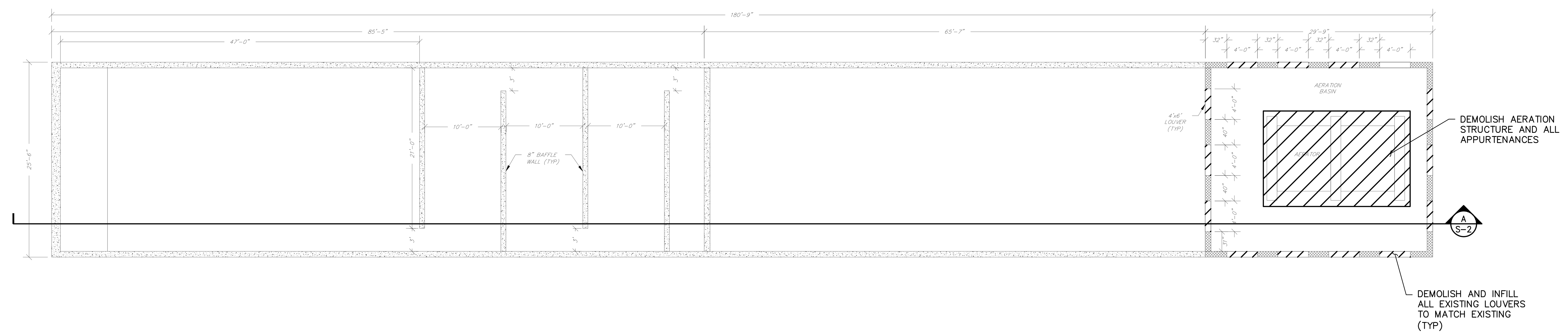


NOTE

DEMOLISHED MATERIALS MUST NOT BE ALLOWED TO DAMAGE CLEARWELL INTERIOR. DAMAGE INCURRED DURING DEMOLITION TO CLEARWELL INTERIOR MUST BE REPAIRED AT NO ADDITIONAL COST TO THE OWNER. NO MATERIALS ARE TO BE STORED INSIDE CLEARWELL.

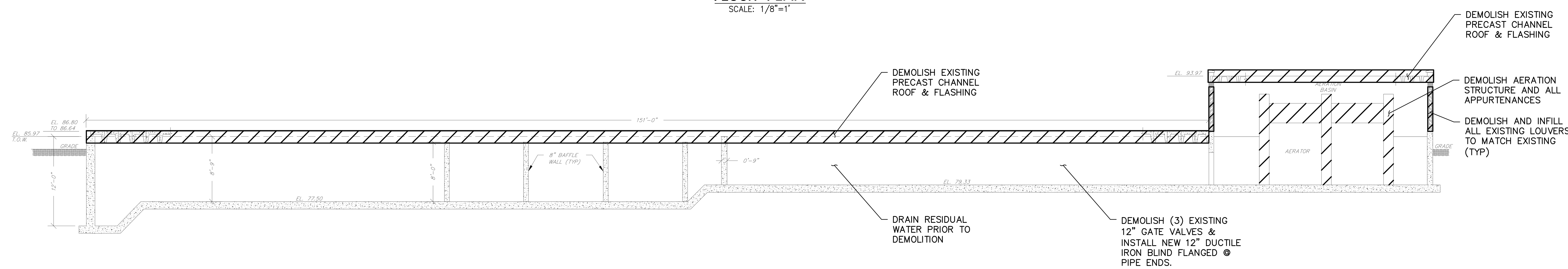
ROOF PLAN

SCALE: 1/8"=1'



FLOOR PLAN

SCALE: 1/8"=1'



A / S-2 SECTION

SCALE: 1/8"=1'

NOTE

CONTRACTOR SHALL EVALUATE ALL ELECTRICAL GROUNDS FOR CODE COMPLIANCE AND EFFICACY. ANY DEFICIENCIES ARE TO BE REPORTED TO OWNER.

0' 4' 8' 16'
1/8" = 1'-0"

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CLEARWELL EXISTING / DEMOLITION FLOOR PLANS AND SECTIONS

CITY OF VINELAND MUNICIPAL WATER UTILITY
CLEARWELL IMPROVEMENTS
CITY OF VINELAND CUMBERLAND COUNTY NEW JERSEY

DRAWN BY:	DESIGN BY:	CHECKED BY:	SCALE:
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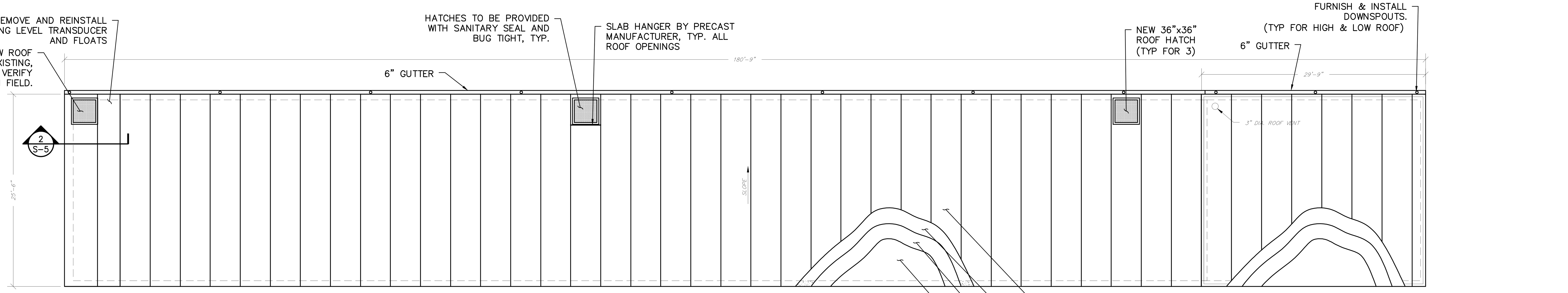
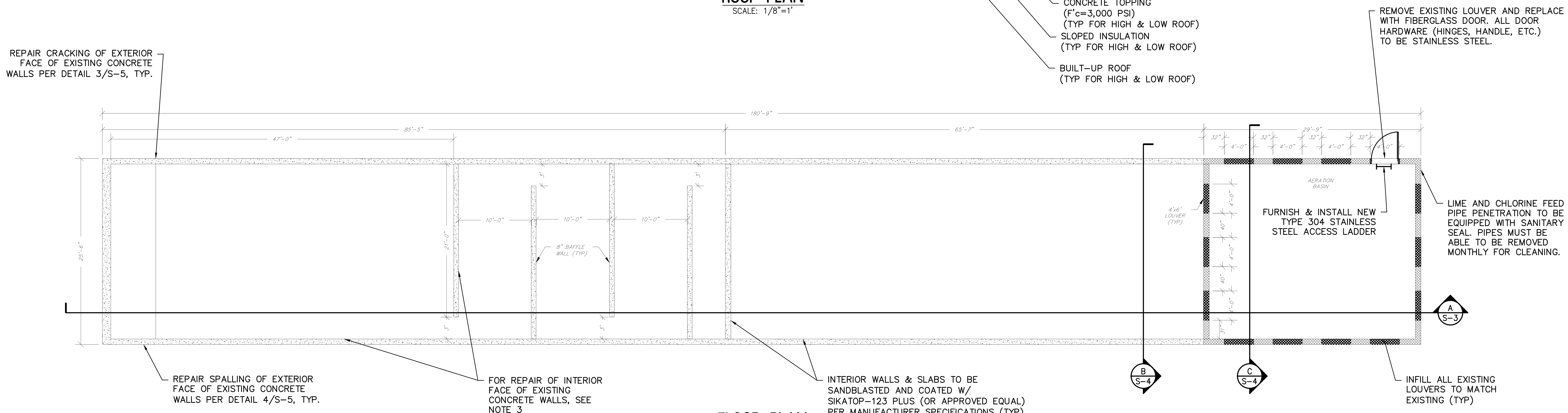
DATE: 2.2025
JOB No.: 0614T045
SHEET No.: S-2



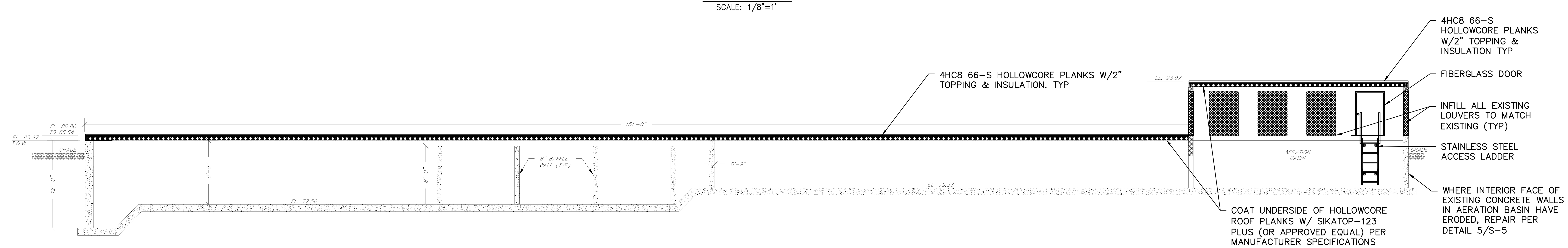
ROOF PLAN

SCALE: 1/8"=1'



FLOOR PLAN

SCALE: 1/8"=1'



(A / S-3) SECTION

SCALE: 1/8"=1'

NOTES:

1. ALL PENETRATIONS (PIPES, DOOR OPENINGS, HATCHES) SHALL BE EQUIPPED WITH SANITARY SEALS.
2. CONTRACTOR SHALL EVALUATE ALL ELECTRICAL GROUNDS FOR CODE COMPLIANCE AND EFFICACY. ANY DEFICIENCIES ARE TO BE REPORTED TO OWNER.
3. CONTRACTOR SHALL EVALUATE CONDITION OF EXISTING CONCRETE WALLS IN CLEARWELL INTERIOR FOR DEFICIENCIES SUCH AS CRACKING, SURFACE EROSION, AND SPALLING. WHERE REQUIRED, REPAIR PER DETAILS 3, 4, AND 5/S-5

0' 4' 8' 16'
1/8" = 1'-0"

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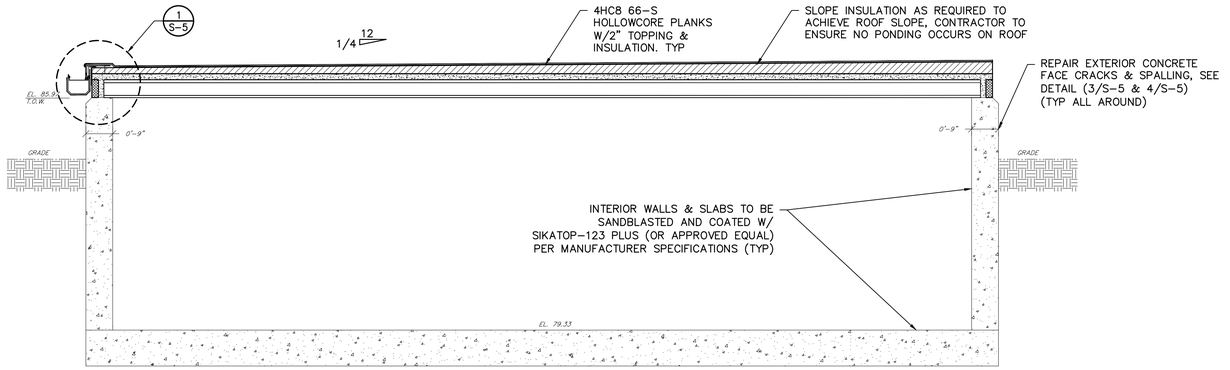
CLEARWELL PROPOSED FLOOR PLANS AND SECTIONS

CITY OF VINELAND MUNICIPAL WATER UTILITY
CLEARWELL IMPROVEMENTS

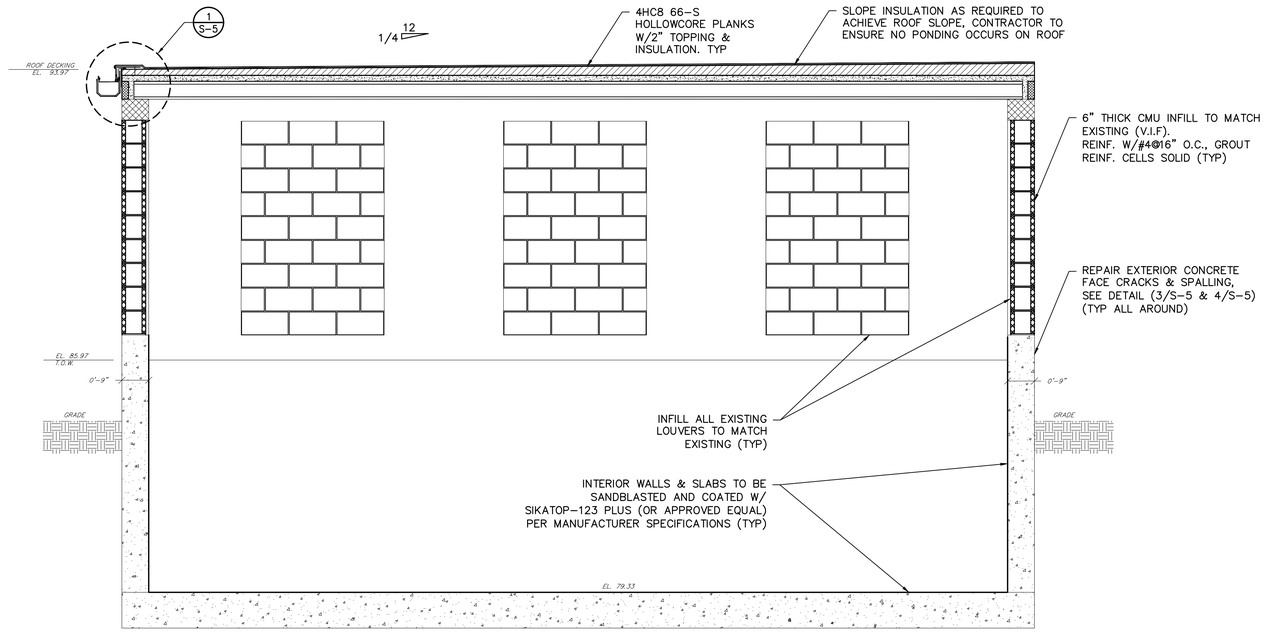
CITY OF VINELAND | CUMBERLAND COUNTY | NEW JERSEY

DRAWN BY:	DESIGN BY:	CHECKED BY:	SCALE:
JG	AJK	CK	AS NOTED

DATE: 2.2025
JOB No.: 0614T045
SHEET No.: S-3



B S-4 **SECTION**
SCALE: 1/2"=1'



C S-4 **SECTION**
SCALE: 1/2"=1'

0' 1' 2' 4'
1/2" = 1'-0"

REMINGTON & VERNICK **ENGINEERS**
2059 SPRINGDALE ROAD
CHERRY HILL, NJ 08003
(856) 795-9595, FAX (856) 795-1882
WEB ADDRESS : RVE.COM
Certification of Authorization: 24 GA 28003300
Excellence • Innovation • Service

Jacqueline D'Trovato
DATE: 06-12-2025
JACQUELINE D. TROVATO
NJ PROFESSIONAL ENGINEER LIC. No. 51944

PLANS WHICH DO NOT BEAR AN EMBOSSED SEAL ARE NOT VALID.

No.	REVISION	DATE	BY CHK

STRUCTURAL SECTIONS

CITY OF VINELAND MUNICPAL WATER UTILITY
CLEARWELL IMPROVEMENTS
CITY OF VINELAND — CUMBERLAND COUNTY — NEW JERSEY

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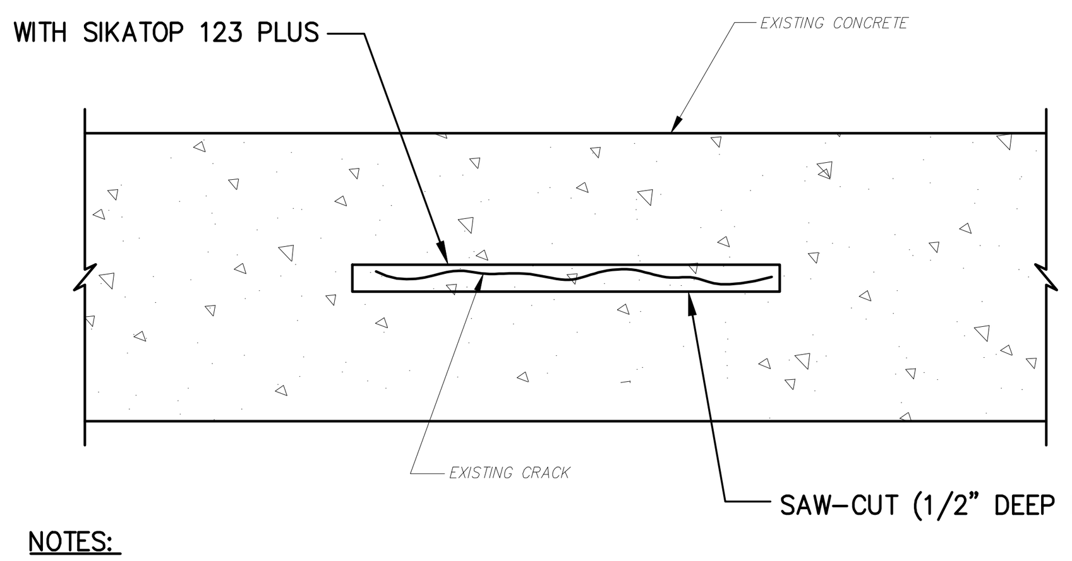
DATE : 2.2025		SHEET No. : S-4	
JOB No. : 0614T045			

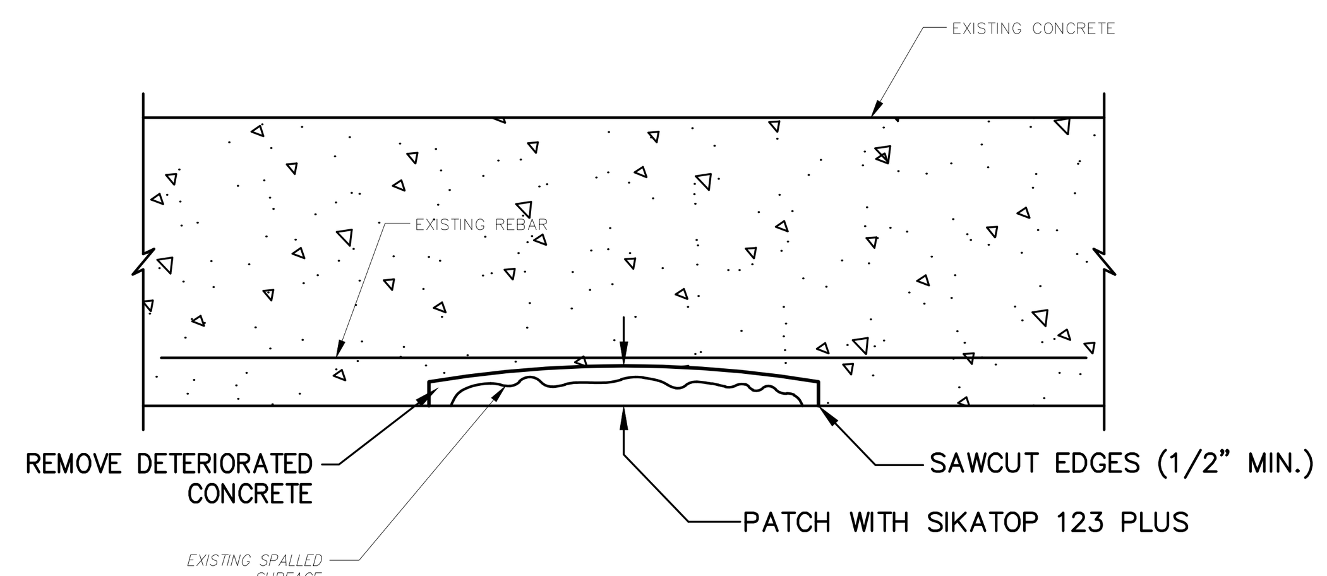
P:\CAD Projects\NJ Counties\Cumberland Co\Vineland City\0614T045\Vineland Improvements\0614T045-Struct Revs.dwg, 6/11/2025 3:48:56 PM



NOTES:

1. SAW-CUT ALONG THE CRACK A MINIMUM ¼" WIDE X ½" DEEP.
2. REMOVE ALL DUST, DIRT, LOOSE AND DETERIORATED CONCRETE TO SOUND CONCRETE.
3. IF HALF OF THE DIAMETER OF THE REBAR IS EXPOSED, CHIP OUT 1" MINIMUM BEHIND THE BAR.
4. WHERE REBAR WITH ACTIVE CORROSION IS ENCOUNTERED, SANDBLAST TO REMOVE ALL CONTAMINANTS AND RUST. SPLICE THE REBAR WHERE SECTION LOSS IS GREATER THAN 25%.
5. CLEAN AND COAT ALL REBAR WITH SIKA ARMATEC 110 OR EQUAL.
6. CLEAN AND COAT CONCRETE REPAIR SURFACES WITH SIKA ARMATEC 110 OR EQUAL.
7. PATCH WITH SIKATOP 123 PLUS OR EQUAL.
8. CONTRACTOR SHALL STRICTLY FOLLOW MANUFACTURERS GUIDELINES FOR SURFACE PREPARATION, MIXING, APPLICATION, FINISHING AND CURING.

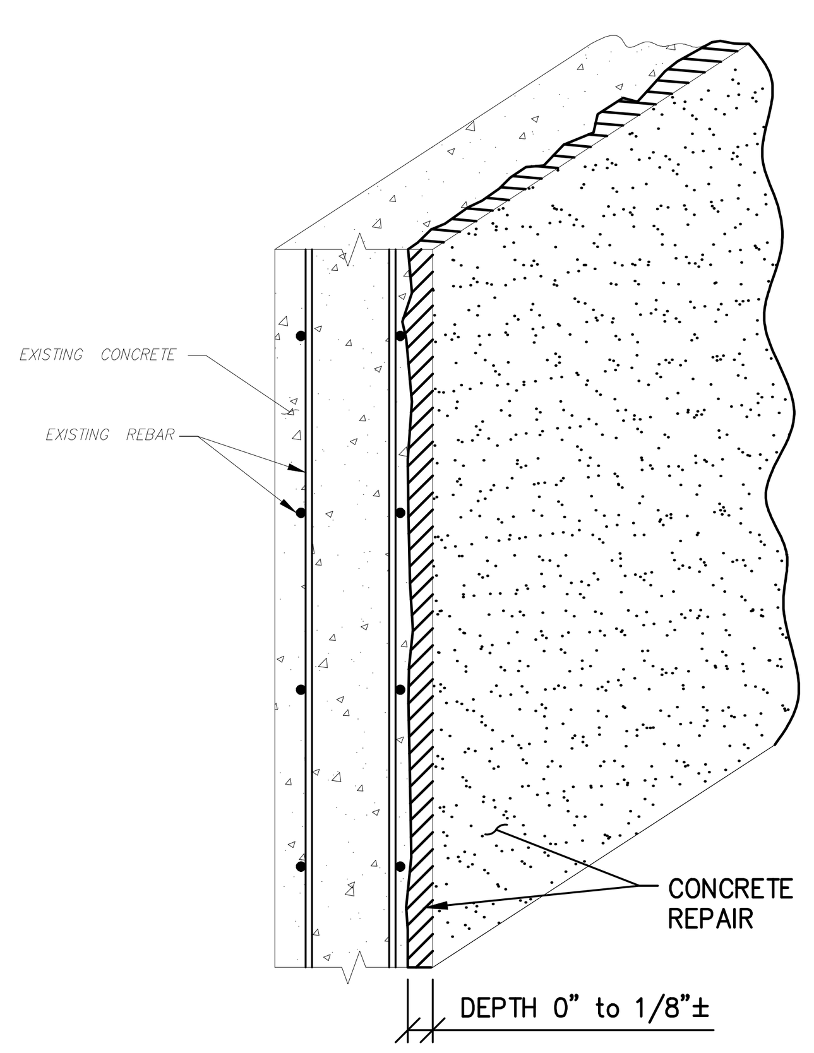
3/S-5 CONCRETE CRACK REPAIR DETAIL
N.T.S.



NOTES:

1. SCOPE INCLUDES SMALL SPALLS WITH REBAR NOT EXPOSED AND/OR REBAR WITH LESS THAN HALF THE DIAMETER EXPOSED. DEPTH OF REPAIR BETWEEN 0" TO 2".
2. SAW-CUT AROUND THE SPALL PERIMETER A MINIMUM ½" DEEP.
3. REMOVE ALL DUST, DIRT, LOOSE AND DETERIORATED CONCRETE TO SOUND CONCRETE.
4. CLEAN AND COAT ALL REBAR WITH SIKA ARMATEC 110 OR EQUAL.
5. CLEAN AND COAT CONCRETE REPAIR SURFACES WITH SIKA ARMATEC 110 OR EQUAL.
6. PATCH WITH SIKATOP 123 PLUS OR EQUAL.
7. CONTRACTOR SHALL STRICTLY FOLLOW MANUFACTURERS GUIDELINES FOR SURFACE PREPARATION, MIXING, APPLICATION, FINISHING AND CURING.

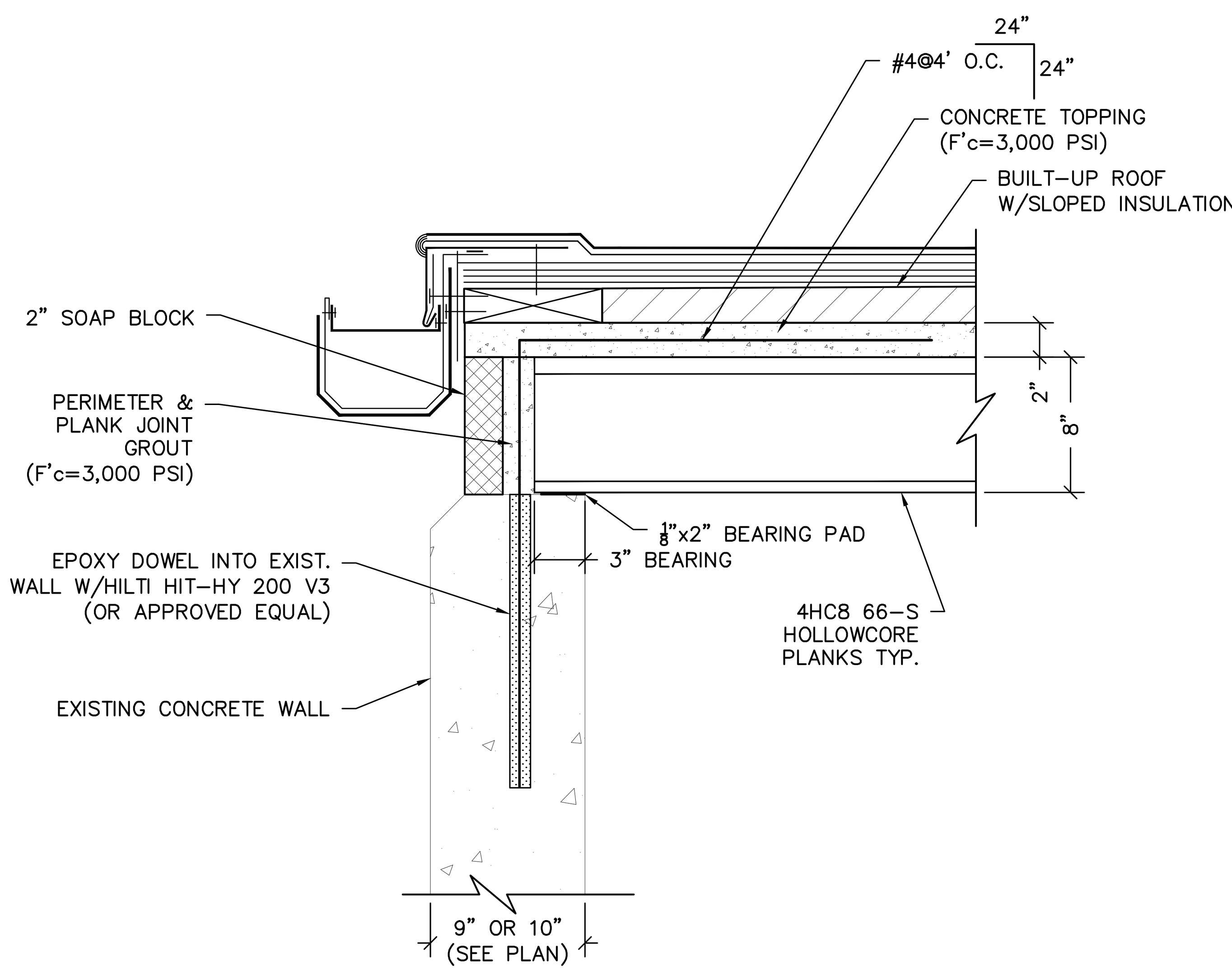
4/S-5 CONCRETE SPALL REPAIR DETAIL
N.T.S.



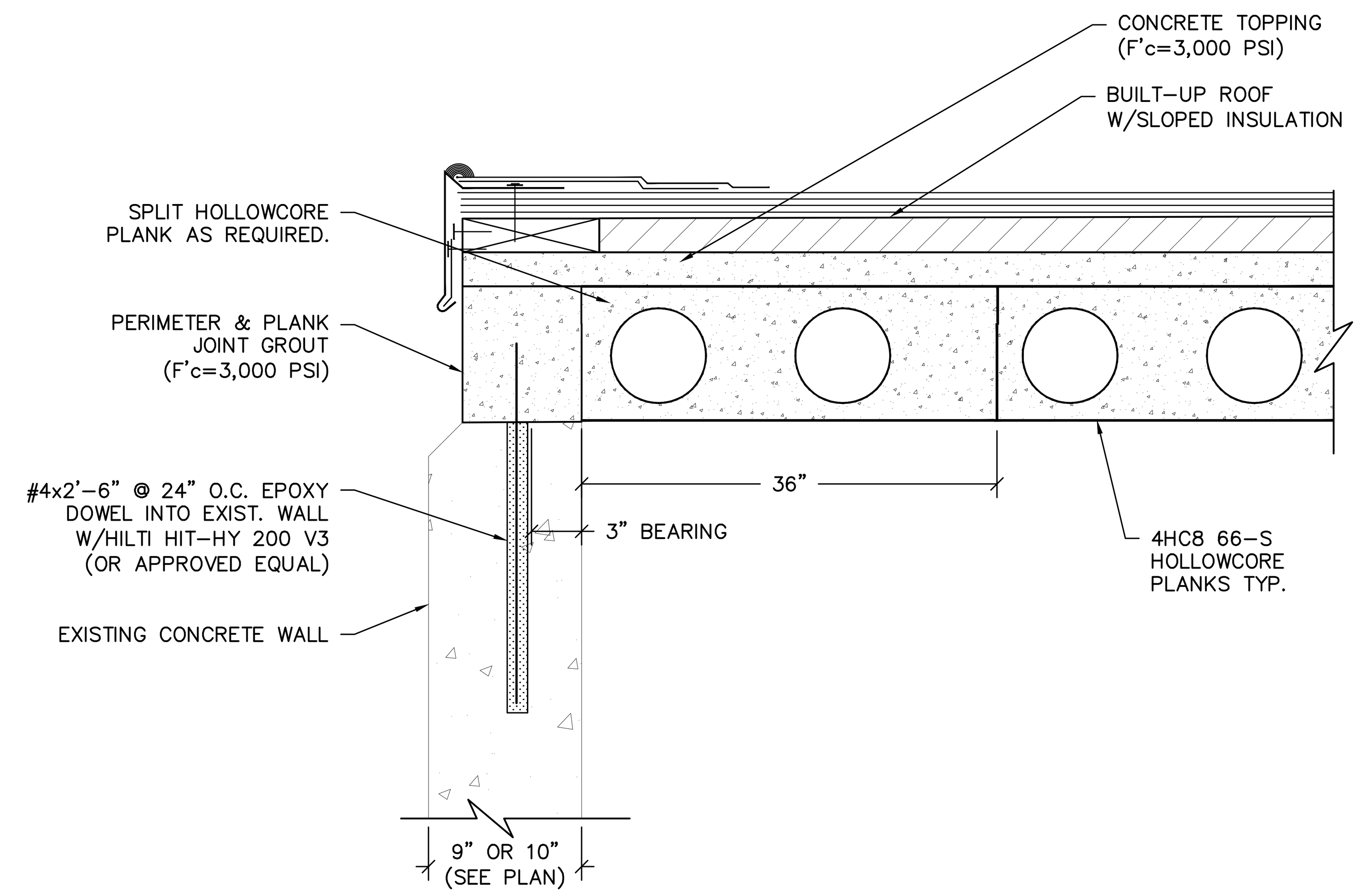
NOTES:

1. SCOPE INCLUDES SURFACE REPAIR FOR DEPTHS BETWEEN 0" TO 1/8".
2. REMOVE ALL DUST, DIRT, LOOSE AND DETERIORATED CONCRETE TO SOUND CONCRETE.
3. CLEAN ALL CONCRETE SURFACES WITH HIGH PRESSURE SAND OR WATER BLASTING.
4. RESTORE SURFACE WITH TWO (2) COATS OF SIKATOP SEAL 107 OR EQUAL.
5. COAT SURFACE WITH TWO (2) COATS OF SIKAGUARD 62 OR EQUAL.
6. CONTRACTOR SHALL STRICTLY FOLLOW MANUFACTURERS GUIDELINES FOR SURFACE PREPARATION, MIXING, APPLICATION, FINISHING AND CURING.

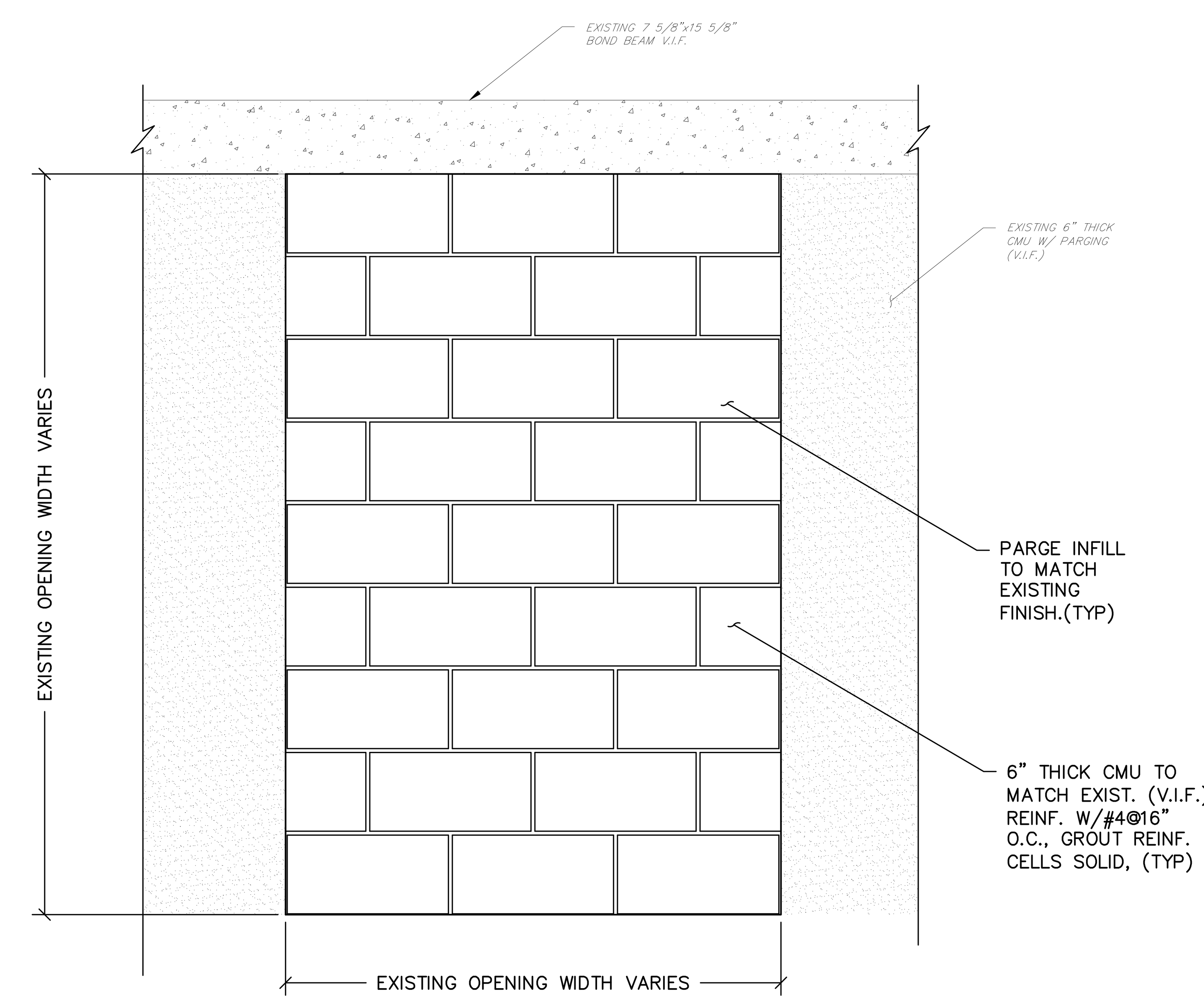
5/S-5 CONCRETE SURFACE REPAIR DETAIL
N.T.S.



1/S-5 HOLLOWCORE PLANK WALL BEARING DETAIL
N.T.S.



2/S-5 HOLLOWCORE PLANK WALL BEARING DETAIL
N.T.S.



6/S-5 MASONRY WALL INFILL DETAIL
N.T.S.

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STRUCTURAL DETAILS

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CLEARWELL IMPROVEMENTS
CITY OF VINELAND — CUMBERLAND COUNTY — NEW JERSEY

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