

VOLUME 1 of 2

PROJECT MANUAL

**EXTERIOR WALL RECONSTRUCTION
AND RELATED WORK**

AT

CHERRY HILL HIGH SCHOOL EAST

1750 KRESSON ROAD
CHERRY HILL, NEW JERSEY 08034

FOR THE

CHERRY HILL BOARD OF EDUCATION

MALBERG ADMINISTRATION BUILDING
BOX 5015 45 RANOLDO TERRACE
CHERRY HILL, NEW JERSEY 08034



BECICA ASSOCIATES LLC
ARCHITECTURE/ENGINEERING
500 SOUTH KINGS HIGHWAY
CHERRY HILL, NEW JERSEY 08034

PROJ. NO.: 19CHS17078

ISSUED FOR BIDDING
JANUARY 9, 2020

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BID ADVERTISEMENT

Bid Number: 1920-36

**Cherry Hill Board of Education
Malberg Administrative Offices/Alternative High School
45 Ranoldo Terrace
P.O. Box 5015
Cherry Hill New Jersey 08034-2152
(856) 429-5600**

Notice is hereby given that sealed Bids will be received by the Cherry Hill Board of Education for the furnishing of all labor, material, equipment, and other facilities necessary for, or incidental to, the **Exterior Wall Reconstruction and Related Work**, at the Cherry Hill High School East, located at 1750 Kresson Road, Cherry Hill, New Jersey, 08003.

The Project will be awarded as a Single Overall Contract in accordance with NJSA 18A:18A-18(b).

Contract SOC-1 Single Overall Contract

Bidding Documents are on file and may be examined Monday through Friday from the hours of 9:00 A.M. to 4:00 P.M. at the office of the Purchasing Manager located in the Cherry Hill Board of Education Administrative Offices at the above address .

Electronic copies of the bid documents may be obtained by electronic delivery (e-mail) from the **Purchasing Manager**, via an e-mail request with **COMPLETE contact information** to ddenisar@chclc.org. Bidding Documents will be e-mailed to a prospective bidder upon receipt of the request, which must reference the Bid Number and include the bidder's company name, company address, company telephone and company facsimile numbers; the name of the bidder's contact and associated e-mail address. It is the responsibility of the bidder to print required forms included in the bid package.

A Pre-Bid Walk-through for the purpose of reviewing the project site by bidders is scheduled to take place at the project site on **Tuesday, January 14, 2020 at 3:00 P.M.**; it is recommended that bidders take this opportunity to familiarize themselves with the project site at the Pre-Bid Walk-through prior to submitting a bid. Failure of the bidder to visit the site is at the bidder's own risk.

Bids may be mailed to Deanna Denisar Purchasing Manager, at the Board of Education office address listed above; however, no bid will be considered, regardless of the postmark, unless it is in the hands of the Purchasing Manager, prior to the time set for the opening of the bids. Bids may also be delivered in person to the Purchasing Manager between the hours 8:30 a.m. and 4:00 p.m. on official business days. All bids must be duly time stamped, in the office of the Purchasing Manager, not later than the "Bid Opening - Date and Time" as stated below.

Bids will be received in the office of Deanna Denisar, Purchasing Manager, located at the above address, no later than **January 29, 2020 at 2:00 P.M.** (prevailing time) at which time they will be publicly opened and read aloud. **BIDDERS MUST SUBMIT ONE ORIGINAL THAT IS CLEARLY LABELED "ORIGINAL AND ONE COPY OF THEIR COMPLETE SUBMISSION, INCLUDING BONDS AND OTHER ATTACHMENTS plus one complete copy of their bid, including all supporting documentation in electronic format by means of a flash drive or a compact disc.**

Pursuant to N.J.S.A. 18A:18A-26, in order to submit a bid for the project, bidders and/or the bidder's sub-contractors shall be classified by the New Jersey Department of Treasury, Division of Property Management and Construction in the following disciplines: C008 General Construction or C009 General Construction –Alterations and Additions, C029 Structural Steel and Ornamental Iron, C030 Plumbing, C032 HVACR, and C047 Electrical.

Close of Bidder Questions	January 15, 2020
Issuance of Addendum, as necessary	January 17, 2020
Bid Opening:	January 29, 2020
Notice to Proceed issued (on or about):	February 12, 2020
Substantial Completion:	November 30, 2020

General Administrative Requirements of the bid/contract, including but not limited to the following:

- Conformance with Public School Contracts Law (NJSA 18A:18A-1 et.seq.)
- Conformance to New Jersey Prevailing Wage Rate Act (NJSA 34:11-56.27 et. seq.)
- Conformance to Affirmative Action (NJSA10:5-31 et.seq. and NJAC 17:27 et seq.)
- State of New Jersey Department of Treasury, Division of Property Management and Construction Contractor Classification (applicable to Contracts in excess of \$20,000.00) NJSA: 18A:18A-26 and NJSA: 18A:18A-27 et seq.
- State of New Jersey Public Disclosure Law, PL 1977, C-33 (Assembly Bill No. 22)
- Bid Security
- Consent of Surety
- Performance/Labor and Materials Bond
- Maintenance Bond
- State of New Jersey Department of Treasury, Business Registration Certificate
- State of New Jersey Public Works Contractor Registration Act Registration P.L. 1999 Chapter 238.
- Completed W-9 Form
- Signed Debarment Affidavit (included in bid package)
- C.271 Political Contribution Disclosure for Camden County
- Stockholder Disclosure Statement
- Affidavit of No Material Adverse Change of Circumstances
- Other documents as required in the Project Manual

The Cherry Hill Board of Education reserves the unqualified right to reject any and all bids or any part thereof, to waive any informalities in the bids, and to award the bid to a responsible and responsive bidder.

No bid may be withdrawn for period of (60) days from the date set for the opening of bids as set forth above.

By order of the Cherry Hill Board of Education
Camden County, New Jersey.
Lynn E. Shugars CPA, Asst. Superintendent
Business/Business Administrator/Board Secretary

Dated _____, 2020

END OF ADVERTISEMENT

INSTRUCTIONS TO BIDDERS

Project: **EXTERIOR WALL RECONSTRUCTION
AND RELATED WORK**

AT

**CHERRY HILL HIGH SCHOOL EAST
1750 KRESSON ROAD
CHERRY HILL, NEW JERSEY 08034**

Bidder

The bidder will be a single overall contract bidder. Where the word “Contractor” is used in these Instructions to Bidders, it refers to the successful bidder who performs work on this Project

Bid

The Base Contract Bid shall include furnishing all parts, materials, accessories and labor required for the renovations, per the specifications, at the Cherry Hill Board of Education’s Cherry Hill High School East site. All project work must be in accordance with the Specifications prepared on behalf of the Cherry Hill Board of Education.

Invitation to Bid

- A. In accordance with the Advertisement for Bids, proposals will be accepted by the Cherry Hill Board of Education (hereinafter referred to as the "Board") for the performance of the project designated in the Advertisement for Bids and further described in the Instructions to Bidders and Bid Specifications. The bids shall cover all cost of any nature, incident to and growing out of the work. In explanation but not in limitation thereof, these costs shall include the cost of all work, labor, materials, equipment, transportation and cost of anything else necessary to perform and complete the project in the manner and within the time required by the specifications, all incidental expenses in connection therewith, all costs on account of loss by damage or destruction of the project, and any additional expenses for unforeseen difficulties encountered, for settlement of damages and for replacement of defective work and materials.
- B. Before submitting a bid, all bidders shall become familiar with the Advertisement for Bids, Instructions to Bidders, Bid Specifications and other bidding documents. It shall also be the responsibility of every bidder to investigate the site of the project and make such examination thereof as may be necessary. All bidders shall determine that they can secure the necessary labor and equipment and that the materials they propose to use will comply with the requirements contained in the Specifications and can be obtained by them in the quantities and at the time required. Appointment for the inspection of the site can be arranged by contacting the Director of Operations, Don Bart, at 856-429-5600 ext. 4369.
- C. Each bidder shall provide a certification showing that he/she owns, leases or controls all the necessary equipment required by the Specifications. If the bidder is not the actual owner or lessee of any such equipment, he shall submit a certificate stating the source from which the equipment will be

- obtained and shall obtain a certificate from the owner and person in control of equipment, granting to the bidder the control of the equipment required during such time as may be necessary for the completion of that portion of the contract for which it is necessary (see bid form #20).
- D. Pursuant to N.J.S.A. 18A:18A-20, only manufactured and farm products of the United States, wherever available, shall be used in the performance of the work required to complete the project.
- E. Any questions which a bidder may have shall be brought to the attention of the Architect and/or Engineer. Requests for specific information or clarifications must be received by the Architect in writing ten (10) days, Saturdays, Sundays and holidays excepted, prior to bid date to allow appropriate review and response time, or by the date specified in the Bid Specifications and advertisement, whichever is earlier.
- F. Any prospective bidder who wishes to challenge a bid specification shall file such challenge with the School Business Administrator no less than three (3) business days prior to the bid opening. Challenges filed after that time shall be void and shall have no impact whatsoever on the Board of Education or the award of a contract.
- G. Notice of revisions or addenda to the advertisement or bid specifications will be sent in writing, via certified mail, certified facsimile transmission or delivery service to all persons who have picked up a copy of the bidding documents. Notice shall be provided no later than seven (7) days, Saturday, Sundays or holidays excepted, prior to the date for acceptance of bids to any person who has received a bid package. It shall be the responsibility of the bidder to ascertain that he has received all amendments, revisions and clarifications prior to submitting his bid. Failure to receive notice of any amendment, revision or clarification when good faith notice is sent or delivered shall not be considered failure by the Board to provide notice and shall not relieve a bidder from any obligation under his bid. All amendments, revisions and clarifications shall become part of the contract documents.

Preparation of Bids

- A. Bidders shall comply with the requirements contained in the Advertisement for Bids, Instructions to Bidders, Bid Specifications, and other bidding documents. Bid prices must be included on the Bid Form by typewriter or in ink in both words and figures. In the case of discrepancy between the words and figures, the words shall govern. Any alteration, correction or erasure on any bidding form must be initialed by the signer of the Bid Form.
- B. All bidders must use and complete the entire Bid package, including each document listed in the Bidder's Checklist and provide the other documentation listed in the Checklist.
- C. Bids must be submitted on the form of proposal furnished by the Board. Where the bidder is a corporation or a partnership, the person submitting the bid must certify that he is duly authorized to submit a bid on behalf of the corporation or partnership. The corporate seal should be affixed to the bid.
- D. Alternative bids will not be accepted unless otherwise authorized in the bidding documents. Where alternates are specified, the bidder shall indicate the amount of the alternate(s) to be added or deducted from the base bid. The Board reserves the right to award a Contract based upon the possible inclusion of one or more alternate bids. The amounts of the alternate bids shall include any

- and all modifications to related, adjacent or surrounding work made necessary by use of such alternate bids.
- E. The Bidder shall clearly designate, for each Alternate Bid, Allowance or Unit Price whether the change in price is an addition or subtraction by annotating each addition with either “+” or “add” and annotating each subtraction with either “-“ or “deduct”. In the event that there is no change to the price, then, “NC” or “no change” shall be entered in the appropriate space. THE FAILURE TO BID AN ALTERNATE, ALLOWANCE OR UNIT PRICE BY LEAVING AN ALTERNATE, ALLOWANCE OR UNIT PRICE BLANK OR STATING “NO BID” SHALL BE CONSIDERED A MATERIAL DEFECT, RESULTING IN REJECTION OF THE BID.
- F. Bids shall be submitted in a sealed envelope with the name and address of the bidder and the name of the project marked on the front of the envelope. **Telegraph, telecopy, or facsimile of bids will not be considered. BIDDERS MUST SUBMIT ONE ORIGINAL THAT IS CLEARLY LABELED “ORIGINAL AND THREE (3) COPIES OF THEIR COMPLETE SUBMISSION, INCLUDING BONDS AND OTHER ATTACHMENTS, plus one complete copy of their bid, including all supporting documentation, in electronic format by means of a flash drive or a compact disc.** Sealed bids submitted by mail should be enclosed in an outside envelope marked “SEALED BID ENCLOSED”.
- G. The bidder shall respond to all blanks in the proposed form; the failure of any bidder to clearly and completely respond to all bids, Alternate Bids, Allowances and Unit Prices shall be deemed a material defect that cannot be waived, which will render the bid non-responsive or non-responsible. In such a case, the bid will not be considered and no award will be made based on such bid.
- H. Conditional bids or bids submitted with clarifications or modifications included in the bid form will be considered non-responsive and/or non-responsible and will be rejected by the Owner.
- I. Any bid not received by the date and time set forth in the Advertisement for Bids will not be considered by the Board.
- J. A bidder may withdraw his bid at any time prior to the scheduled time for opening bids. No bid, however, may be withdrawn for a period of sixty (60) days from the opening of the bids.

Obligation of the Bidder

At the time of the opening of the bids, each bidder will be presumed to have inspected the site and to have read and become thoroughly familiar with the Advertisement for Bids, Instructions to Bidders, Bid Specifications and other bidding documents. The failure or omission of any bidder to receive or examine any form, instrument or document or to visit the site and acquaint himself with the conditions there existing, shall not relieve the bidder from his obligation to furnish all the necessary labor and materials to complete the project at the bid price. A claim of mistake or omission will likewise not excuse a bidder from any obligation under his bid. The submission of a bid will be considered conclusive evidence that the bidder has made such an examination.

Quality of Products/Goods Used

All products and goods used in the project shall be new and covered by the applicable manufacturer's warranty. Where a brand name is specified in the specifications, the bidder may use an equivalent brand,

provided the procedures set forth in the specifications are followed. In case of conflict between elements of the proposed contract documents, the contractor shall base his bid on the more expensive or greater quality work.

Brand Name or Equivalent and Substitutions

The materials, products and equipment described in the bidding documents establish a standard of required function, dimension, appearance and quality to be met by any proposed substitution. Pursuant to N.J.A.C. 5:34-9.2 (c), "when a specification uses "brand name or equivalent", the listed brand name shall serve as a reference or point of comparison for the functional or operational characteristic desired for the good or service being requested. Where a bidder submits an "equivalent", it shall be the responsibility of the bidder to document the equivalence claim. The Bid shall not be based on inclusion of any materials and equipment not equal in quality to the specified materials or equipment. The burden of proof is on the Contractor. Failure to submit documentation demonstrating equivalence shall be grounds for rejection of the claim of equivalence". The Architect's decision of approval or disapproval of a proposed substitution shall be final.

Assignment/Subcontract

The Contractor may not assign the contract for this Project to any person, partnership or corporation nor may it subcontract any part of the work required to be performed under the contract without obtaining the prior written approval of the Board.

Prequalification of Bidders

- A. Pursuant to N.J.S.A. 18A:18A-26 *et seq.*, all bidders and those subcontractors for the four (4) major branches of work (plumbing and gas fitting work, heating and ventilating systems and equipment, electrical work and structural steel and ornamental iron work) on any contract for public work in which the entire cost of the project exceeds \$20,000.00 must be prequalified by the Department of Treasury, Division of Property Management and Construction as to character and amount of public work on which they may submit bids (see Subcontractor Identification Statement – form #11). No person shall be qualified to bid on any public work contract with the Board if he has not submitted a statement to the Department of Treasury, Division of Property Management and Construction which fully develops the financial ability, adequacy of plant and equipment, organization and prior experience of the prospective bidder, and such other pertinent and material facts, within a period of one year preceding the date of opening of the bids for such contract. Bidders on this project, and their subcontractors, if applicable, shall be prequalified by the DPMC in the classifications set forth in the Bid Advertisement for this Project.
- B. Pursuant to N.J.S.A. 18A:18A-32, every prequalified bidder must submit with his/her proposal, an affidavit stating that there has been no material adverse change in his qualification information. Any bid not including this affidavit shall be rejected as being non-responsive to the bid requirements (see form #8).
- C. All bidders shall furnish satisfactory evidence that it has sufficient means and experience in the type of work to complete the project in accordance with the bid specifications. A subcontractor listing form, Statement of Qualifications form and Performance Record form are included as part of the bidding documents and must be submitted therewith (see forms #2 and #3). No part of this project may be subcontracted without the express written approval of the Board.
- D. The bidder and all subcontractors named in the bid must submit DPMC Form 701 setting forth the

total amount of uncompleted contracts. Form 701 is included as part of the bidding documents (form #10).

- E. For every contract for public work which exceeds \$20,000.00, the Board shall, upon completion thereof, report to the Department of Treasury, Division of Property Management and Construction as to the Contractor's performance and shall also furnish such report from time to time during performance if the Contractor is then in default.
- F. All bidders shall provide information on its performance including a list of completed contracts that were of similar size and scope to this project (see bid form #3).

Ownership Disclosure Statement

- A. Pursuant to P.L. 1977, Chapter 33 (N.J.S.A. 52:25-24.2), all corporations and partnerships (including limited partnerships, limited liability corporations, limited liability partnerships and subchapter S corporations) shall submit a statement with its bid which sets forth the names and addresses of all stockholders in the corporation or partnership who own 10% or more of its stock or of all individual partners in the partnership who own a 10% or greater interest therein. If one or more such stockholder or partner is itself a corporation or partnership, the stockholders holding 10% or more of that corporation's stock or the individual partners owning 10% or greater interest in that partnership shall also be listed. The disclosure shall be continued until names and addresses of every non-corporate stockholder and individual partner exceeding the 10% ownership criteria has been listed.
- B. Any bidder whose stockholders or partners own less than ten percent (10%) of the stock shall certify such fact to the Board.
- C. A form certification is included as part of the bidding documents (form #1).

Non-Collusion

No official or employee of the Board who is authorized in his or her official capacity to negotiate, make, accept or approve or to take part in such decision regarding a contract in connection with a school facilities project shall have any financial or other personal interest in any such contract. The Board and its officers and employees shall comply with the School Ethics Law, N.J.S.A. 18A:12-21 et seq. and N.J.A.C. 6A:28.

No bidder shall directly or indirectly enter into any agreement, participate in any collusion or otherwise take any action in restraint of free, competitive bidding in connection with this project.

A form affidavit of non-collusion is included as part of the bidding documents and must be completed by the bidder (form #4).

Bid Guarantees

- A. Every bid must be accompanied by a bid guarantee in the form of an unconditional certified check, cashier's check or bid bond furnished by a surety company authorized to do business in the State of New Jersey in an amount of ten percent (10%) of the bidder's base bid, but not in excess of \$20,000.00.
- B. All bid guarantees must be issued by a surety licensed to issue such guarantees in the State and must be acceptable to the Board. Certified or cashier's checks shall be drawn on a State or national bank

rated "A" by at least two nationally recognized rating agencies, A.M. Best & Co. of Oldwick, New Jersey being one such agency. Checks shall be made payable to the Board.

- C. The ten percent (10%) security shall be forfeited if the bidder fails to execute a contract with the Board and furnish the Board with a performance/labor and materials bond and the required certificates of insurance within ten (10) days after the contract is awarded. In the event the bidder defaults by failing to execute the contract or to provide all guarantees, insurance and other items required, the funds represented by such bidder's bid guarantee shall be released to the Board and become and remain the property of the Board. Delivery of the bid guarantee constitutes agreement of the bidder and the surety and any other entity that issued the bid, that such amount shall be released to the Board in the event of such default. In the event of default and subsequent award of the contract to another bidder, the bidder shall be liable for the difference between the amount of his bid and the amount for which the Board is obligated to pay on an award to another bidder, less the ten percent (10%) security.
- D. No interest will be paid on the bid guarantee while in the Owner's possession.

Contract Bonds

- A. The bidder to whom the contract is awarded shall furnish and deliver a performance/labor and materials bond or bonds, together with power of attorney, in the amount of the bid to the Board within ten (10) days from the date of the award as security for the faithful performance of the contract and the payment of all persons furnishing labor and materials for the project. The performance/labor and materials bond or bonds shall be maintained in full force and effect until the Board is satisfied that all unpaid claims against the bidder have been resolved.
- B. The performance/labor and materials bond(s) shall not be acceptable unless in compliance with the requirements set forth in N.J.S.A. 2A:44-143 et seq. Said bond(s) shall have attached thereto a Surety Disclosure Statement and Certification to which each surety executing the bond has subscribed. The bond and statement and certification shall be complete in all respects and duly acknowledged according to law.
- C. Prior to the start of the guarantee period and before final payment is made, the bidder shall provide the Board with a one-year maintenance bond, together with power of attorney, in the amount of the contract price to insure the replacement or repair of defective materials or workmanship during the guarantee period.
- D. Arrangements have to be made with a surety company licensed to do business in the State of New Jersey to furnish the bidder with a performance/labor and materials bond and maintenance bond if the contract is awarded to the bidder. The surety company issuing the performance/labor and materials bond shall be assigned a current rating of not less than A- (excellent) by A.M. Best Company, Oldwick, New Jersey.
- E. A Consent of surety, together with a power of attorney, must be submitted with the bid (see form #13).
- F. The costs of the performance/labor and materials bond(s) and maintenance bond shall be paid by the bidder.

Attorney-in Fact

If an attorney-in fact signs a bid bond, performance bond, payment bond, maintenance bond or certificate of surety, a certified and effectively dated copy of the power-of-attorney shall accompany each bond or consent.

Release of Liens

Neither the final payment nor any part of the retained percentage shall become due until the Contractor shall deliver to the Board a complete Release of all Liens arising out of the Contract and an affidavit that so far as he has knowledge or information, the releases include all labor and material for which a lien could be filed, but the Contractor may, if any subcontractor refuses to furnish a release in full, furnish a bond satisfactory to the Board, to indemnify him against any liens. If any lien remains unsatisfied after all payments are made, the Contractor shall refund to the Board all monies that the latter may be compelled to pay in discharging such a lien, including all costs and reasonable attorney's fees.

Award of Contract

- A. The award of Contracts will be made in accordance with the provisions of N.J.S.A. 18A:18A:36, et seq., Article 8, "Awarding Contracts," and shall be executed by both the Owner and the Contractor within twenty-one (21) days, Sundays and holidays excepted, unless otherwise agreed to by both parties.
- B. The Board reserves the right to reject any or all bids and waive any informality in the bidding process if it is in the best interest of the Board of Education. The Board reserves the right to reject the bid of any bidder with whom the Board has had a prior negative experience. In the event that a bidder unsuccessfully challenges a bid submission by filing an action in a court of law, the Bidder agrees to be responsible for the payment of and all reasonable costs and fees incurred on the part of the Owner resulting from the protest.
- C. If the bid specifications seek bids for a single overall contract or for portions of the work, then the Board reserves the right to award the contract to the lowest responsible bidder to the entire project or, if the total amount bid by each bidder for each portion of the project is less than the amount bid by the lowest responsible bidder for the overall contract, the Board shall award bids to each of the lowest responsible bidders for each portion of the work. Evidence of performance security shall be provided by the bidder on behalf of himself and any or all subcontractors or by each respective subcontractor or any combination thereof which results in evidence of performance security, equaling but not exceeding the total amount of the bid.
- D. A decision on whether the contract will be awarded and to whom it will be awarded shall be made within sixty (60) days from the date the bids are opened. The contract, if awarded, shall be awarded to the lowest responsible bidder. Whenever two or more bids are equal, the Board has the absolute discretion to award the contract to either bidder. The Board shall articulate in its resolution, its rationale in awarding the bid.
- E. All bid guarantees will be returned, upon request, within ten (10) business days after the bids have been opened, except that the bid guarantees of the three lowest bidders shall be retained until either: (1) three (3) days after the contract is awarded and signed and the bidder's performance/labor and materials bond and insurance certificates are approved by the Board, or (2) all bids are rejected by the Board. Should the bid not be accepted and the Contract awarded within sixty (60) days following the Bid Opening, or any length of time thereafter, the Bid Security will be returned to the Bidder, if requested, unless agreed upon by the Owner and the Bidder.

- F. If the lowest responsible bidder is not a resident of the State of New Jersey, then the bidders shall designate a proper agent in the State upon whom process may be served as a condition precedent for the awarding of the contract. If the lowest responsible bidder is not a corporation of the State of New Jersey, then the awarding of the contract and payment of consideration thereunder is conditioned upon the bidder filing a certificate of doing business in the State of New Jersey and complying with the provisions of N.J.S.A. 14A:13-1 et seq.
- G. After notification of award, but prior to signing a construction contract, the Contractor shall submit to the Division of Public Contracts EEO Compliance an initial Project Workforce Report (Form AA 201) 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 also agrees to submit a copy of the Monthly Project Workforce Report once a month thereafter for the duration of this contract to said Division 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-the-job programs for outreach and training of minorities and women.

The Contractor and its subcontractors shall furnish such reports or other documents to the Division of Public Contracts EEO Compliance as may be requested by the Division 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 Division of Public Contracts EEO Compliance for conducting a compliance investigation pursuant to **Subchapter 10 of the Administrative Code (N.J.A.C. 17:27)**.

Form of Agreement

The contract shall be comprised of the Advertisement for Bids, Instructions to Bidders, Bid Specifications, any amendments and clarifications, diagrams, the bidding documents, Standard Form of Agreement between Owner and Contractor, AIA Document A101, as revised by the Owner, General Conditions of the Contract for Construction, AIA Document A201, as revised by the Owner, all supplementary and additional conditions of the Contract and any addenda thereto. The Owner reserves the right to substitute the CM/a editions of AIA Documents as revised by the Owner in the event the Owner decides to retain the services of a Construction Manager. The bidder to whom the contract is awarded shall, within five (5) days from receipt of the Agreement between Owner and Contractor from the Board, sign and return the contract to the Board.

Payment Schedule

Unless specifically stated otherwise in the Contract Documents, upon the presentation of a duly executed voucher, the contract amount shall be paid within thirty (30) days of completion of the project, including the training sessions, and the production of the maintenance bond, manufacturer's warranty and release of lien. In the event the total cost of project exceeds \$100,000, partial payments shall be made in accordance with the contract documents. If the Contractor has a performance bond, 2% of the amount due on each partial payment shall be withheld when the outstanding balance exceeds \$500,000 and 5% of the amount due when the outstanding balance is \$500,000 or less.

Warranty

See sections 3.5.1, 3.5.2 and 3.5.3 of the General Conditions of the Contract for Construction (modified AIA Document A201-2017).

Liability

- A. The Contractor shall assume full responsibility and liability for any and all injuries to any person and any and all damages to any property resulting from or in connection with the project which are caused by any error, omission or negligent act of the Contractor, his agents and employees, and any subcontractor which he may employ.
- B. The Contractor shall be liable for any and all damages caused by a breach of the terms of this contract.

Indemnification:

The contract for this project will provide that the Contractor shall indemnify and hold the Board harmless from any and all claims against the Board (see Project Manual, Article 3.18 of modified AIA document A201-2017 for full indemnification provision).

Prevailing Wage Rate

- A. The Board shall not award any contract to a Contractor or subcontractor who is listed or who is on record with the New Jersey Department of Labor and Workforce Development/Office of the Labor Commissioner, as having failed to pay prevailing wages in accordance with the Prevailing Wage Act, each Contractor and subcontractor is required:
 - 1. To comply with the New Jersey Prevailing Wage Act, N.J.S.A. 34:11-56.25 et seq., and pay all workmen and/or subcontractors performing services in connection with the project not less than the prevailing rate of wages as determined by the New Jersey Department of Labor and Workforce Development, whereby said prevailing rate of wages are enumerated in the list of prevailing wage rates included as part of the Project Specifications and Contract Documents, are on file in the Board's office and/or design professional's office and are made a part hereof and incorporated herein by reference;
 - 2. To contact the New Jersey Department of Labor and Workforce Development to verify the prevailing wage rates applicable to the Project;
 - 3. To furnish the Board with an affidavit stating that all workmen have been paid in accordance with the New Jersey Prevailing Wage Act, N.J.S.A. 34:11-56 et seq;
 - 4. Upon request, file verified written statements with the board certifying the amounts then due and owing to any and all workmen for wages due on account of the work and the names of the persons whose wages are unpaid and the amount due to each;
 - 5. To submit weekly payroll forms in full compliance with the Prevailing Wage Act;
 - 6. To keep an accurate record showing the name, craft or trade and actual hourly rate of wages paid to each workman employed by him in connection with the project. Records shall be preserved for two (2) years from the date of payment; and
 - 7. To post the prevailing wage rates for each craft and classification involved in the work, including the effective date of any changes thereof, in prominent and easily accessible places

at the site of the project and at such place or places as are used to pay workmen their wages.

- B. In the event that it is found that anyone employed by the Contractor or any Subcontractor has been paid a rate of wages less than the prevailing wage required to be paid by such contract, the Board may terminate the Contractor's right to proceed with the work or such part of the work as to which there has been a failure to pay required wages and to prosecute the work to completion or otherwise. The Contractor and his Sureties shall be liable to the Owner for any excess costs occasioned thereby.

Contractor Debarment

The Contractor, its sub-consultants or subcontractors, may be debarred, suspended or disqualified from contracting and working on a school project if found to have committed any of the acts listed in N.J.A.C. 17:19-4.1 et seq. and N.J.A.C. 19:38A-4.1 et seq. (see attached form #5 - Affidavit Regarding List of Debarred, Suspended or Disqualified Bidders)

Business Registration Certificate

- A. Pursuant to N.J.S.A. 52:32-44, the bidder must provide a copy of a current Business Registration Certificate issued by the New Jersey Department of Treasury, Division of Revenue before award of the contract. The bidder shall provide copies of a current Business Registration Certificate for itself and each subcontractor. The requirement of proof of business registration extends down through all levels (tiers) of the Project. Thus, 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.
- B. The Contractor shall maintain and submit a current, updated list of subcontractors and their current Business Registration Certificate as a continuing obligation under the contract for this Project. Before final payment on the contract is made by the Board, the Contractor shall submit an accurate list and the proof of business registration of each subcontractor or supplier used in the fulfillment of the contract, or shall attest that no subcontractors were used.
- C. A bidder/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 copy not properly provided or maintained under a contract with a contracting agency.

Taxes:

For the term of the contract for the Project, the successful bidder and each of its affiliates and each subcontractor, and each of its affiliates so designated pursuant to N.J.S.A. 52:32-44(g)(3), shall collect and remit to the Director, New Jersey Division of Taxation, the use tax due pursuant to the Sales and Use Act, N.J.S.A. 54:32B-1 et seq., on all sales of tangible personal property delivered into this State, regardless of whether the tangible personal property is intended for a contract with a contracting agency. For purposes herein, "affiliate" shall mean any entity that: (a) directly, indirectly or constructively controls another entity; (b) is directly, indirectly or constructively controlled by another entity; or, (c) is subject to the control of a common entity. For purposes of the immediately preceding sentence, an entity controls another entity if it owns, directly or indirectly, more than fifty percent (50%) of the ownership interest of that entity.

Public Works Contractor Registration Act

All contractors and subcontractors as defined in N.J.S.A. 34:11-56.48 et seq. submitting a bid and/or performing work for this project shall be registered with the New Jersey Department of Labor and Workforce Development in accordance with N.J.S.A. 34:11-56.48 et seq. The bidder shall be registered at the time the bid is submitted. The Public Works Contractor Registration Certificate must be submitted prior to contract award.

Laws

The Contractor shall comply with all applicable laws, statutes, regulations, and ordinances and any order issued by any governmental entity. This contract shall be governed by the laws of the State of New Jersey.

Anti-Bullying Bill of Rights – Reporting of Harassment, Intimidation and Bullying-Contracted Service

The contracted service provider shall comply with all applicable provision of the New Jersey Anti-Bullying Bill of Rights Act – N.J.S.A. 18A:37-13.1 et seq., all applicable code regulations, and the Anti-Bullying Policy of the Board of Education. The district shall provide to the contracted service provider a copy of the board's Anti-Bullying Policy.

Law Against Discrimination

The Contractor shall comply with the anti-discrimination provisions of N.J.S.A. 10:2-1 et seq., the New Jersey Law Against Discrimination, N.J.S.A. 10:5-1 et seq., and all provisions regarding equal employment opportunity, N.J.S.A. 10:5-31 et seq., N.J.A.C. 17:27-1.1 et seq. and N.J.A.C. 6A:7-1.8. The Board and Contractor guaranty to afford equal opportunity in performance of the contracts in accordance with an affirmative action program approved by the State Treasurer. The New Jersey Department of Treasury's mandatory equal employment contract language, which is included as part of the bidding documents, shall be a part of the contract for this Project. Failure of the Contractor to execute a contract containing the mandatory language within the time prescribed by these Instructions, shall result in rejection of the bid as being non-responsive, in which event the Contractor shall forfeiture his/her bid deposit (see form #6 for mandatory equal employment opportunity language and Americans with Disabilities Act language and form #7 for Affirmative Action Questionnaire).

Political Contributions

- A. The Contractor is advised of the responsibility to file an annual disclosure statement on political contributions with the New Jersey Election Law Enforcement Commission (ELEC) pursuant to N.J.S.A. 19:44A-20.27 if the Contractor receives contracts in excess of \$50,000 from public entities in a calendar year. It is the Contractor's responsibility to determine if filing is necessary. Additional information on this requirement is available from ELEC at (888) 313-3532 or at www.elec.state.nj.us.
- B. In addition, pursuant to N.J.A.C. 6A:23A-6.3, no business entity which has made a reportable contribution (as defined in N.J.S.A. 19:44A-1 et seq.) to a member of the Board of Education during the preceding one (1) year shall be awarded a contract in excess of \$17,500.
- C. Any business entity doing business with the Board is precluded from making any reportable contributions to any member of the Board during the term of the contract.

- D. When a business entity is a natural person, a contribution by that person's spouse or child that resides therewith shall be deemed to be a contribution by the business entity. Where a business entity is other than a natural person, a contribution by the person or other business entity having an interest therein shall be deemed to be a contribution by the business entity.
- E. A political contribution disclosure (hereinafter referred to as "PCD") form is required to be submitted for all contracts greater than \$17,500. No contract award shall be made unless the completed PCD is submitted to the Board's office prior to the award of the contract failure to submit the PCD shall result in the rejection of the bid. A sample form is included as part of the bidding documents and must be completed by the bidder (form # 18).

Disclosure of Investment Activities in Iran

Pursuant to N.J.S.A. 52:32-55 et seq. and N.J.S.A. 18A:18A-49.4, a person or entity listed on the Department of the Treasury's List of Persons or Entities Engaging in Prohibited Investment Activities in Iran shall be ineligible to bid on, submit a proposal for, enter into or renew a contract for goods and services with a State agency and other public entities, such as a board of education.

Additionally, any person or entity that submits a bid or proposal or otherwise proposes to enter into or renew a contract shall certify at the time the bid is submitted that the person or entity is not identified on the above mentioned list as a person or entity engaging in investment activities in Iran. A form is included as part of the bidding documents (form #19).

Insurance

The Contractor shall provide insurance coverage in accordance with the amounts set forth in Article 11 of AIA Document A201, as modified by the Board, General Conditions of the Contract for Construction (see Project Manual). The required certificates of insurance shall be provided to the District within ten (10) days of its award of the contract. The Board will have the right to request copies of the Contractor's insurance policies or any part thereof for the duration of the contract period.

Liquidated Damages

TIME IS OF THE ESSENCE for this Project. The Contractor is advised that the contract will require the payment of liquidated damages if it fails to meet certain milestones set forth in the Contract Documents (see Article 3 of modified AIA document A101-2017 in the Project Manual). In the event the Project is not completed on the date established in the contract, the Contractor shall pay the Board five hundred dollars (\$500.00) Dollars as liquidated damages, not as a penalty, for each calendar day the project is delayed beyond each milestone date until said milestone is achieved.

Document Maintenance

Pursuant to N.J.A.C. 17:44-2.2, the Contractor 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.

Name of Firm: _____

(Printed/Typed)

BID FORMS

BIDDER'S CHECKLIST

THE FOLLOWING CHECKLIST MUST BE PROPERLY COMPLETED AND SUBMITTED WITH THE BID PACKAGE TO THE CHERRY HILL PUBLIC SCHOOLS BOARD OF EDUCATION AS PART OF THE BID DOCUMENTS.

ITEM

Reviewed the Bidding Documents (including: The permits obtained by the owner, work, site, location, conditions, and all local conditions, ordinances, laws and regulations that in any manner may affect cost, progress, performance or furnishing of the Work).

Reviewed Bid, Labor and Material, and Maintenance Bond requirements

Reviewed Agreement

Reviewed Affirmative Action Agreement, Procurement, Professional and Service Contracts

NOTE: ONE ORIGINAL AND ONE COPY PLUS A COMPLETE ELECTRONIC COPY BY MEANS OF FLASH DRIVE OR COMPACT DISC OF THE ENTIRE BID PACKAGE MUST BE SUBMITTED

Bidder's Proposal (form attached)

Ownership Disclosure Certificate (bid form #1 attached)

Statement of Bidder's Qualifications (bid form #2 attached)

Performance Record/References (form #3 attached)

Non-Collusion Affidavit (bid form #4 attached)

Affidavit Regarding List of Debarred, Suspended or Disqualified Bidders (bid form #5 Attached)

Mandatory Equal Employment Opportunity and Americans with Disabilities Act Language (form #6 attached)

Affirmative Action Questionnaire (bid form #7 attached)

- Affidavit of No Material Adverse Change of Circumstances (bid form #8 attached)
- Current Notice of Classification Issued by DPMC (attach to bid form #9)
- Total Amount of Uncompleted Contracts (attach DPMC Form 701 to bid form #10)
- Subcontractor Identification Statement (bid form #11 attached)
- Certificate of Insurance Statement (bid form #12 attached)
- Consent of Surety (bid form #13 attached)
- Bid Bond, Certified Check, Cashier's Check or any combination thereof in an amount no less than ten (10) percent of the total amount of the bid, not to exceed \$20,000 (no form attached)
- Registration with the New Jersey Department of Labor and Workforce Development at the time of bid opening is required) (see form #14)
- Current Business Registration Certificate (New Jersey Department of Treasury) (attach to bid form #15-if the Business Registration Certificate is not attached, it must be submitted prior to award of contract)
- Attach current required Trade License(s) , if applicable (attach to bid form #16)
- U.S. Department of Treasury Form W-9 (bid form # 17 attached)
- C.271 Political Contribution Disclosure (bid form#18 attached)
- Disclosure of Investment Activities in Iran (bid form #19 attached)
- Equipment Certification (bid form #20 attached)

Required Forms for listed Subcontractors (N.J.S.A. 18A:18A-18)

- Registration with the New Jersey Department of Labor and Workforce Development at the time of bid opening is required) (see form #14)
- Current Business Registration Certificate (New Jersey Department of Treasury) (attach to bid form #15-if the Business Registration Certificate is not attached, it must be submitted prior to award of contract)

- Current Notice of Classification Issued by DPMC
- Total Amount of Uncompleted Contracts (Form DPMC 701 enclosed)
- Current required Trade License(s)
- Bid Bond (Subcontractors if not furnished by the prime bidder)

FAILURE TO COMPLETE AND SUBMIT ALL OF THE ABOVE DOCUMENTS ON THE FORMS PROVIDED WITHIN MAY RESULT IN REJECTION OF YOUR BID.

By placing a checkmark in the boxes provided I acknowledge having read and fully understand all the requirements of each of the documents referenced herein.

Bidder's Authorized Representative:

Name: _____ Title: _____
(Printed/Typed) (Printed/Typed)

Signature: _____ Date: _____

**CHERRY HILL PUBLIC SCHOOLS BOARD OF EDUCATION
CONSTRUCTION PROJECTS**

BIDDER'S PROPOSAL

TO: **Cherry Hill Public Schools Board of Education**

PROJECT: **Exterior Wall Reconstruction
and Related Work**

At

**Cherry Hill High School East
1750 Kresson Rd
Cherry Hill, Nj 08003**

NAME OF BIDDER: _____

ADDRESS OF BIDDER: _____

TELEPHONE NUMBER: _____

TELEFAX NUMBER: _____

E-MAIL ADDRESS: _____

CONTRACT FOR: _____

PURSUANT TO AND IN COMPLIANCE with your Invitation to Submit a Proposal for the above referenced project and in accordance with the Information for Bidders relating thereto, the undersigned hereby agrees to furnish all plant, labor, materials, supplies, equipment and other facilities and things necessary or proper for, or incidental to, or required by the Plans and Specifications as prepared by BECICA ASSOCIATES LLC, 500 S. Kings Highway, Cherry Hill, New Jersey (856) 795-1180, along with all other addenda issued and mailed to the undersigned prior to the date of opening of Proposals.

IN SUBMITTING THIS PROPOSAL, I HAVE RECEIVED AND INCLUDED THE FOLLOWING ADDENDA:

<u>Addendum No.</u>	<u>Date</u>
_____	_____
_____	_____
_____	_____

CONTRACT SOC-1:

Base Bid the lump sum of _____ Dollars (\$ _____)

ALLOWANCES (to be included in the Exterior Wall Reconstruction and Related Work Base Bid):

Allowance No. 1: Include \$250,000.00 in the Base Bid for correction of existing unforeseen conditions as directed by the project architect. Please see section 012100 for Allowance details

Alternates shall be awarded in the following order:

Alternate Bid SOC-1A (Add): Installation of Solar Shades as indicated on construction documents.

Add to the SOC-1 Base Bid the sum of _____ Dollars (\$ _____)

Alternate Bid SOC-1B (Add): Scope of work for reconstruction of Wall 5 as indicated on construction documents.

Add to the SOC-1 Base Bid the sum of _____ Dollars (\$ _____)

Alternate Bid SOC-1C (Add): Scope of work for reconstruction of Wall 6 as indicated on construction documents.

Add to the SOC-1 Base Bid the sum of _____ Dollars (\$ _____)

Bidder's Authorized Representative:

Name: _____
(Printed/Typed)

Title: _____
(Printed/Typed)

Signature: _____

Date: _____

(Seal)

BID FORM ATTACHMENT #1

OWNERSHIP DISCLOSURE STATEMENT

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: _____

City, State, ZIP: _____

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)
- Partnership Limited Partnership Limited Liability Partnership (LLP)
- Other (be specific): _____

Part II Check the appropriate box

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	Home Address (for Individuals) or Business 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	Home Address (for Individuals) or Business 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 **Cherry Hill Board of Education** 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 the **Board of Education** to notify the **Board of Education** 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 **Board of Education** to declare any contract(s) resulting from this certification void and unenforceable.

Full Name (Print):		Title:	
Signature:		Date:	

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.

BID FORM ATTACHMENT #2

STATEMENT OF BIDDER'S QUALIFICATIONS

All questions must be answered and the data given must be clear and comprehensive. This statement must be notarized. Questions may be answered on separate attached sheets. The Bidder may submit any additional information he desires.

1. _____
Name of Bidder (printed/typed)
2. _____
Address of permanent Main Office (printed/typed)
3. _____
Date Organized (printed/typed)
4. Number of years engaged in construction or contracting business under present firm or trade name? _____
5. Contract on hand: (Show gross amount of each Contract and the appropriate dates of Completion) _____
(An itemized list shall be appended to this form and titled: Statement of Bidder's Qualification item #5)
6. General character of work performed by you _____
(An Itemized list shall be appended to this form and titled: Statement of Bidder's Qualification Item #6)
7. Have you ever failed to complete any work awarded to you? _____
If so, where and why? _____ *(An Itemized list shall be appended to this form and titled: Statement of Bidder's Qualification Item #7)*
8. Have you ever defaulted on a Contract? _____
If so, where and why? _____ *(An Itemized list shall be appended to this form and titled: Statement of Bidder's Qualification Item #8)*
9. List the more important Contracts recently completed by you, stating approximate gross cost for each and the month and year completed. _____
(An Itemized list shall be appended to this form and titled: Statement of Bidder's Qualification Item #9)
10. Have you had any material adverse changes from the trades as listed in N.J. Notice of Classification within last five (5) years _____.

If so, list prior classification and related adverse changes. _____ (An Itemized list shall be appended to this form and titled: Statement of Bidder's Qualification Item #10)

11. Background and experience of the principal member of your organization, including the officers

(An Itemized list shall be appended to this form and titled: Statement of Bidder's Qualification Item #11)

12. Bank Reference:

Financial Institution: _____

Account Manager's Name: _____

Account Manager's Telephone Number: _____

13. Will you, upon request, fill out a detailed financial statement and furnish any other information that may be required by the proper agency? _____

The undersigned, hereby authorized and requests any person, firm or corporation to furnish any information requested by the proper agency in verification of the recitals comprising this Statement of Bidder's Qualifications.

Dated at _____ this _____ day of _____, 20__.

Subscribed and sworn to before me
This _____ day of _____, 20__

The above information is true and correct
to the best of my knowledge.

(Seal) Notary Public of New Jersey/
Specify Other State (_____)

My commission expires _____, 20__.

Bidder's Authorized Representative:

Name: _____
(Printed/Typed)

Title: _____
(Printed/Typed)

Representing: _____
Company/Agency (Printed/Typed)

Signature:

BID FORM ATTACHMENT #3

PERFORMANCE RECORD

Name of Firm: _____
 (Printed/Typed)

Address: _____
 (Printed/Typed)

1. How many years has your organization been in business as a Contractor under your present business name? _____
2. How many years experience in construction work has your organization had (a) As a prime contractor? _____ (b) As a subcontractor? _____
3. What is the construction experience of the principal individuals of your organization?

Individual's Name	Present Position or Office	Yrs. of Construction Experience	Magnitude & Type of Work	In What Capacity

(An Itemized list may be appended to this form and titled: Performance Record Item #3)

4. Have you ever failed to complete any work contracted to you? _____
 If so, where and why? _____ (attach an itemized list to this form titled Performance Record item #4)
5. Has any officer or partner of your organization ever failed to complete a construction contract handled in his own name? _____

If so, state name of individual, name of owner, location and type of project, and reason for the failure to complete. _____ (An Itemized list shall be appended to this form and titled Performance Record item #5)

Provide a list of all contracts completed by you which were similar in size and scope to this project for calendar years 2011 to the present.

Supplemental project information sheets indicating the following information for each contract shall be appended to this form:

- Firm identification: _____
- Project Owner: _____
 - Address: _____
 - Contact Person: _____
 - Telephone Number: _____
- Project Name: _____
- Project Address: _____
- Type of project: _____
- Project Architect/Engineer: _____
 - Address: _____
 - Contact Person: _____
 - Telephone Number: _____
- Contract price: _____
- Date Completed: _____
- Was time extension required? Yes/No
If Yes, provide explanation: _____

- Were penalties imposed by Owner? Yes/No
If Yes, provide explanation: _____

- Were liens, claims or stop notices filed? Yes/No
If Yes, provide explanation: _____

PERFORMANCE RECORD *(continued)*

I certify that the forgoing statements are understood and the information provided is true and I am aware that if any such statements are willfully false, I may be subject to punishment.

Subscribed and sworn to before me
This _____ day of _____, 20__.

(Seal) Notary Public of New Jersey/
Specify Other State (_____)

My commission expires _____, 20__.

The above information is true and correct
to the best of my knowledge.

Bidder's Authorized Representative:

Name: _____
(Printed/Typed)

Title: _____
(Printed/Typed)

Representing: _____
Company/Agency (Printed/Typed)

Signature: _____

BID FORM ATTACHMENT #4

NON-COLLUSION AFFIDAVIT

STATE OF NEW JERSEY/ _____

Specify, of other

COUNTY OF _____

I, _____, of the (City, Town, Borough) of _____ State of _____, of full age, being duly sworn according to law on my oath depose and say that:

I am _____ of the firm of _____, the Bidder making the Proposal for the above named projects, and that I executed the said Proposal with full authority to do so; that said Bidder has not, directly or indirectly, entered into any agreement, participated in any collusion, or otherwise taken any action in restraint of free, competitive bidding in connection with the above named project; and that all statements contained in said Proposal and in this affidavit are true and correct, and made with full knowledge, and the State of New Jersey relies upon the truth of the statements contained in this affidavit in awarding the contract for the said project.

I further warrant that no person or selling agency has been employed or retained to solicit or secure such contract upon an agreement or understanding for a commission, percentage, brokerage or contingent fee, except bona fide employees or bona fide established commercial or selling agencies maintained by _____.

(N.J.S.A. 52:34-15)

Subscribed and sworn to before me
This _____ day of _____, 20__.

The above information is true and correct
to the best of my knowledge.

(Seal) Notary Public of New Jersey/
Specify Other State (_____)

Bidder's Authorized Representative:

Name: _____
(Printed/Typed)

My commission expires _____, 20__.

Title: _____
(Printed/Typed)

Signature: _____

BID FORM ATTACHMENT #5

**AFFIDAVIT REGARDING LIST OF DEBARRED,
SUSPENDED OR DISQUALIFIED BIDDERS**

I, _____ of the organization/firm of
_____ in the (City, Town, Borough) of
_____ State of _____ and being of full age,
being duly sworn according to law on my oath depose and say that:

I am the Bidder making the proposal for the products/services relative to this request for proposal, and that I executed the said proposal with full authority to do so; that said bidder is not at the time of the making this bid included on the New Jersey State Treasurer's, the New Jersey Economic Development Authority's, the New Jersey Schools 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.

Bidder's Authorized Representative:

Name: _____
(Printed/Typed)

Title: _____
(Printed/Typed)

Representing: _____
Company/Agency (Printed/Typed)

Subscribed and sworn to before
me this _____ day of 20__

By: _____
(signature)

(Seal) Notary Public New Jersey

Date: _____

Specify Other State (_____)

My commission expires _____, 20__.

BID FORM ATTACHMENT #6

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

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, up-grading, 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 Division 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 Division is satisfied that the contractor or subcontractor is employing workers provided by a union which provides evidence, in accordance with standards prescribed by the Division, 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 Division, 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 contractor 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 Division. 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 Division, 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 Division.

(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 Division and submitted promptly to the Division 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 Division an initial project workforce report (Form AA 201) electronically provided to the public agency by the Division, 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 Division 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 the job programs for outreach and training of minorities and women.

(D) The contractor and its subcontractors shall furnish such reports or other documents to the Division of Public Contracts Equal Employment Opportunity Compliance as may be requested by the Division 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 Division of Public Contracts Equal Employment Opportunity Compliance for conducting a compliance investigation pursuant to **Subchapter 10 of the Administrative Code (NJAC 17:27)**.

(E) The Contractor and its subcontractors shall furnish such reports or other documents to the Affirmative Action Office as may be requested by the office 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 Affirmative Action Office for conducting a compliance investigation pursuant to **Subchapter 10 of the Administrative Code (N.J.A.C. 17:27)**.

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

The CONTRACTOR and the OWNER do hereby agree that the provisions of Title II of the Americans With Disabilities Act of 1990 (the "Act") (42 U.S.C. §12101 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 thereto, are made a part of this contract. In providing any aid, benefit, or service on behalf of the OWNER 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 OWNER in any action or administrative proceeding commenced pursuant to this Act. The CONTRACTOR shall indemnify, protect, and save harmless the OWNER, its agents, servants, and employees from and against any and all suits, claims, losses demands, or damages, or 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 and 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 OWNER grievance procedure, the CONTRACTOR agrees to abide by any decision of the OWNER which is rendered pursuant to said grievance procedure. If any action or administrative proceeding results in an award of damages against the OWNER or if the OWNER 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 OWNER shall, as soon as practicable after a claim has 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 OWNER or any of its agents, servants, and employees, the OWNER shall expeditiously forward or have forwarded to the CONTRACTOR every demand, complaint, notice, summons, pleading, or other process received by the OWNER or its representatives.

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

It is further agreed and understood that the OWNER assumes no obligation to indemnify or save harmless the CONTRACTOR, its agents, servants, employees and subcontractors for any claim which may arise out to 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 CONTRACTOR'S obligations assumed in this agreement, nor shall they be construed to relieve the CONTRACTOR from any liability, nor preclude the OWNER from taking any other actions available to it under any other provisions of the Agreement or otherwise at law.

Name of Company

Signature of Authorized Representative

Name and Title

Subscribed and sworn to before
me this _____ day of _____ 20__

(Seal) Notary Public New Jersey

Specify Other State (_____)

My commission expires _____, 20__.

BID FORM ATTACHMENT #7

AFFIRMATIVE ACTION QUESTIONNAIRE

Bidders are required to comply with the requirements of N.J.S.A. 10:5-31, et seq., (P.L. 1975, c. 127) and N.J.A.C. 17:27.

I hereby certify compliance with the requirements of the State of New Jersey, Department of Treasury, Affirmative Action Regulation N.J.S.A. 10:5-31, et seq., (P.L. 1975, c. 127) and N.J.A.C. 17:27.

I also certify, if awarded the contract, within seven (7) days after signing the contract, form AA201-A (Building Construction) and/or AA201-B (Heavy Construction) shall be completed and submitted to the Owner and the Affirmative Action Office, if it is determined by the Architect that such forms are required and necessary for the completion of the project.

I certify that the forgoing statements are understood and the information provided is true, and I am aware that if any such statements are willfully false, I may be subject to punishment.

Bidder's Authorized Representative:

Name: _____
(Printed/Typed)

Title: _____
(Printed/Typed)

Representing: _____
Company/Agency Name (Printed/Typed)

Company/Agency Address (Printed/Typed):

Signature: _____

Date: _____

BID FORM ATTACHMENT #8

AFFIDAVIT OF NO MATERIAL ADVERSE CHANGE OF CIRCUMSTANCES

This Affidavit must be submitted with the bid for Public School work pursuant to N.J.S.A.
18A:18A-32.

State of _____)

: SS:

County of _____)

_____ being duly sworn, according to law, deposes and
says that he/she is _____ of _____
and that the answers to the following statements are true and correct and that there has been no
material adverse change in the qualification information subsequent to the latest statement
submitted as required under Chapter 105, Laws of 1962 (N.J.S.A. 18A:18A:27 et seq.) as
amended, except as set forth herewith:

_____ is classified by the State of New Jersey under
Chapter 105, Laws of 1962, as amended. This classification became effective
_____, and will expire _____.

Type of Contract/Trade classified:

Approved Amount \$ _____

A copy of my valid and active Prequalification/Classification Certificate from the Department of
Treasury, Division of Property Management and Construction is attached.

The total amount of uncompleted work on contracts is \$ _____.

I hereby certify, under penalty as provided by law, that there is not now pending any litigation or
other action that may jeopardize my rating, status or contract limits from their current levels and
that at the time of the bid submission, the value of all outstanding incomplete contracts does not
exceed this firm's existing aggregate rating limit.

**REMAINDER OF PAGE INTENTIONALLY LEFT BLANK
SIGNATURE ON FOLLOWING PAGE**

AFFIDAVIT OF NO MATERIAL ADVERSE CHANGE OF CIRCUMSTANCES

(continued)

I certify that the foregoing statements made by me are true. I am aware that if any of the statements made by me are willfully false, I may be subject to punishment

Bidder's Authorized Representative:

Name: _____
(Printed/Typed)

Title: _____
(Printed/Typed)

Representing: _____
Company/Agency Name (Printed/Typed)

Signature: _____

Sworn to before me this _____
Day of _____, 20__

Notary Public of _____
My commission expires __/__/__.

BID FORM ATTACHMENT #9

NJDPMC NOTICE OF CLASSIFICATION FORM

Sample NJDPMC Notice of Classification form is shown; Bidder and listed subcontractors shall submit copies of original, unaltered or amended forms with the bid submission

State of New Jersey



DEPARTMENT OF THE TREASURY
DIVISION OF PROPERTY MANAGEMENT AND
CONSTRUCTION
20 WEST STATE STREET - P.O. BOX 042
TRENTON, NEW JERSEY 08625-0042



NOTICE OF CLASSIFICATION

In accordance with N.J.S.A. 18A:18A-27 et seq (Department of Education) and N.J.S.A. 52:35-1 (Department of the Treasury) and any rules and regulations issued pursuant hereto, you are hereby notified of your classification to do State work for the Department (s) as previously noted.

Aggregate Amount	Trade(s) & License(s)	Effective Date	Expiration Date

- Licenses associated with certain trades are on file with the Division of Property Management & Construction (DPMC).
- Current license information must be verified prior to bid award.
- A copy of the DPMC 701 Form (Total Amount of Uncompleted Projects) may be accessed from the DPMC website at <http://www.state.nj.us/treasury/dpmc>.

ANY ATTEMPT BY A CONTRACTOR TO ALTER OR MISREPRESENT ANY INFORMATION CONTAINED IN THIS FORM MAY RESULT IN PROSECUTION AND/OR DEBARMENT, SUSPENSION OR DISQUALIFICATION. INFORMATION ON AGGREGATE AMOUNTS CAN BE VERIFIED ON THE DPMC WEB SITE.

BID FORM ATTACHMENT #10

NJDPMC TOTAL OF UNCOMPLETED CONTRACTS FORM

TO BE COMPLETED BY GENERAL CONTRACTOR AND LISTED SUBCONTRACTORS



State of New Jersey

DEPARTMENT OF THE TREASURY
DIVISION OF PROPERTY MANAGEMENT AND CONSTRUCTION
33 W. STATE STREET
PO BOX 034
TRENTON, NEW JERSEY 08625-0042

REPLY TO:
TEL: (609) 943-3400
FAX: (609) 984-8495

**TOTAL AMOUNT OF
UNCOMPLETED CONTRACTS**

(This form is to be used with the NOTICE OF CLASSIFICATION when submitting bids to the Department of Education.)

I Certify that the amount of uncompleted work on contracts is \$ _____.

The amount claimed includes uncompleted portions of all currently held contracts from all sources (public and private) in accordance with N.J.A.C. 17:19-2.13.

I further certify that the amount of this bid proposal, including all outstanding incomplete contracts does not exceed my prequalification dollar limit.



Affix
corporate
seal
here

Respectfully submitted,

By _____

Name of Firm

Signature

Title

Business Address

Phone

Sworn to and
subscribed before me
This day of
20

Notary Public

DPMC 701 (3/05)

BID FORM ATTACHMENT #11

SUBCONTRACTOR IDENTIFICATION STATEMENT

In accordance with N.J.S.A. 18A:18A-18 **FOR A SINGLE OVERALL BID ONLY**, the following information **MUST** be provided for all subcontractors to whom you will subcontract the furnishing of 1) plumbing and gas fitting and all kindred work, 2) heating and ventilating systems and equipment, 3) electrical work, and 4) structural steel and ornamental iron work.

TRADE	Contractor's Name/Address	NJ License No. Where applicable

PURSUANT TO N.J.S.A. 18A:18A-18(b), EACH SUBCONTRACTOR MUST BE QUALIFIED IN ACCORDANCE WITH ARTICLE 6 TITLE 18A (N.J.S.A. 18A:18A-27) . PROOF OF SAID QUALIFICATION MUST BE SUBMITTED AT THE TIME THE BID IS SUBMITTED FOR EACH OF THE ABOVE LISTED SUBCONTRACTORS WITH APPLICABLE TRADE LICENSES. *(Required documents for each listed subcontractor shall be appended to this form)*

If work of the types designated by the above referenced law will be performed by the Bidder, the Bidder shall state below and shall enclose copies of licenses covering each trade.

TRADE	N.J. License No. Where applicable

(Copies of applicable trade licenses for each trade to be performed by the Bidder shall be appended to this form)

**REMAINDER OF PAGE INTENTIONALLY LEFT BLANK
 SIGNATURE ON FOLLOWING PAGE**

SUBCONTRACTOR IDENTIFICATION STATEMENT *(continued)*

Bidder's Authorized Representative:

Name: _____
(Printed/Typed)

Title: _____
(Printed/Typed)

Representing: _____
Company/Agency Name (Printed/Typed)

Signature: _____

Date: _____

BID FORM ATTACHMENT #12

CERTIFICATE OF INSURANCE STATEMENT

Name of Firm: _____
(Printed/Typed)

Address: _____
(Printed/Typed)

The Bidder fully understands the Cherry Hill Public Schools Board of Education insurance requirements as stated in the General Conditions and agrees to provide all insurance required by these documents prior to execution of contract.

Bidder's Authorized Representative:

Name: _____
(Printed/Typed)

Title: _____
(Printed/Typed)

Representing: _____
Company/Agency Name (Printed/Typed)

Signature: _____

Date: _____

BID FORM ATTACHMENT #13

CONSENT OF SURETY

KNOW ALL MEN BY THESE PRESENTS, That for valuable consideration, the receipt whereof is hereby acknowledged,

_____ (Name of Surety)

a corporation of the State of _____ and authorized to do business in the State of New Jersey, with offices at _____ (address of Surety), certifies that application has been made to the Surety by:

_____ (Name and Address of Bidder)

and satisfactory arrangements have been completed by which the undersigned Surety has agreed, that if the Bidder is awarded the Overall Contract Work for the

CHERRY HILL BOARD OF EDUCATION

The undersigned Surety will execute and furnish to the **CHERRY HILL BOARD OF EDUCATION:** the Performance-Payment Bond upon the terms and conditions stated in the Project Manual, equal to 100% of the Contract Sum, which bond shall be conditioned for the faithful performance on the part of the Bidder and its subcontractors of the terms and conditions of the Contract according to the drawings and specifications on which the bid is made and the payment of all persons furnishing labor and materials for the project.

Attach the usual proof of authority of Officers of surety company to execute this consent

_____ SURETY COMPANY

By: _____
Authorized Agent
Print or type name and title below signature

NOTE: TO ALL BONDING COMPANIES
ANY STANDARD BONDING COMPANY FORMS WILL BE ACCEPTABLE

BID FORM ATTACHMENT # 14

CURRENT PUBLIC WORKS CONTRACTOR REGISTRATION ACT CERTIFICATE

*BIDDER MUST BE REGISTERED WITH THE DEPARTMENT OF LABOR AND WORKFORCE
DEVELOPMENT AT THE TIME OF THE BID OPENING*

*BIDDER SHOULD ATTACH ITS CURRENT PUBLIC WORKS CONTRACTOR REGISTRATION ACT
CERTIFICATE AND ATTACH THE CERTIFICATE OF EACH SUBCONTRACTOR LISTED ON BID FORM #11.
IF NOT ATTACHED TO BID, THE CERTIFICATES MUST BE SUBMITTED PRIOR TO AWARD OF CONTRACT*

BID FORM ATTACHMENT # 15

BUSINESS REGISTRATION CERTIFICATE

BIDDER SHOULD ATTACH ITS CURRENT BUSINESS REGISTRATION CERTIFICATE AND ATTACH THE BUSINESS REGISTRATION CERTIFICATE OF EACH SUBCONTRACTOR LISTED ON BID FORM #11. IF NOT AVAILABLE AT THE TIME OF BID, PURSUANT TO N.J.S.A. 52:32-44, THE BIDDER MUST SUBMIT THE BUSINESS REGISTRATION CERTIFICATES PRIOR TO THE TIME THE CONTRACT IS AWARDED

BID FORM ATTACHMENT # 16

TRADE LICENSES

BIDDER SHOULD ATTACH APPLICABLE TRADE LICENSES FOR ITSELF AND LISTED SUBCONTRACTORS

BID FORM ATTACHMENT # 17

TAXPAYER IDENTIFICATION NUMBER AND CERTIFICATION

Form W-9 (Rev. December 2014) Department of the Treasury Internal Revenue Service	Request for Taxpayer Identification Number and Certification	Give Form to the requester. Do not send to the IRS.
Print or type See Specific Instructions on page 2.	1 Name (as shown on your income tax return). Name is required on this line; do not leave this line blank.	
	2 Business name/disregarded entity name, if different from above	
	3 Check appropriate box for federal tax classification; check only one of the following seven boxes: <input type="checkbox"/> Individual/sole proprietor or single-member LLC <input type="checkbox"/> Limited liability company. Enter the tax classification (C=C corporation, S=S corporation, P=partnership) ▶ _____ <input type="checkbox"/> Other (see instructions) ▶ _____ Note. For a single-member LLC that is disregarded, do not check LLC; check the appropriate box in the line above for the tax classification of the single-member owner.	4 Exemptions (codes apply only to certain entities, not individuals; see instructions on page 3): Exempt payee code (if any) _____ Exemption from FATCA reporting code (if any) _____ (Applies to accounts maintained outside the U.S.)
	5 Address (number, street, and apt. or suite no.)	Requester's name and address (optional)
	6 City, state, and ZIP code	
	7 List account number(s) here (optional)	

Part I Taxpayer Identification Number (TIN)

Enter your TIN in the appropriate box. The TIN provided must match the name given on line 1 to avoid backup withholding. For individuals, this is generally your social security number (SSN). However, for a resident alien, sole proprietor, or disregarded entity, see the Part I instructions on page 3. For other entities, it is your employer identification number (EIN). If you do not have a number, see *How to get a TIN* on page 3.

Note. If the account is in more than one name, see the instructions for line 1 and the chart on page 4 for guidelines on whose number to enter.

	Social security number [] [] [] - [] [] - [] [] [] []
	or Employer identification number [] [] [] [] - [] [] [] [] [] [] [] []

Part II Certification

Under penalties of perjury, I certify that:

- The number shown on this form is my correct taxpayer identification number (or I am waiting for a number to be issued to me); and
- I am not subject to backup withholding because: (a) I am exempt from backup withholding, or (b) I have not been notified by the Internal Revenue Service (IRS) that I am subject to backup withholding as a result of a failure to report all interest or dividends, or (c) the IRS has notified me that I am no longer subject to backup withholding; and
- I am a U.S. citizen or other U.S. person (defined below); and
- The FATCA code(s) entered on this form (if any) indicating that I am exempt from FATCA reporting is correct.

Certification instructions. You must cross out item 2 above if you have been notified by the IRS that you are currently subject to backup withholding because you have failed to report all interest and dividends on your tax return. For real estate transactions, item 2 does not apply. For mortgage interest paid, acquisition or abandonment of secured property, cancellation of debt, contributions to an individual retirement arrangement (IRA), and generally, payments other than interest and dividends, you are not required to sign the certification, but you must provide your correct TIN. See the instructions on page 3.

Sign Here	Signature of U.S. person ▶	Date ▶
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General Instructions

Section references are to the Internal Revenue Code unless otherwise noted.

Future developments. Information about developments affecting Form W-9 (such as legislation enacted after we release it) is at www.irs.gov/fw9.

Purpose of Form

An individual or entity (Form W-9 requester) who is required to file an information return with the IRS must obtain your correct taxpayer identification number (TIN) which may be your social security number (SSN), individual taxpayer identification number (ITIN), adoption taxpayer identification number (ATIN), or employer identification number (EIN), to report on an information return the amount paid to you, or other amount reportable on an information return. Examples of information returns include, but are not limited to, the following:

- Form 1099-INT (interest earned or paid)
- Form 1099-DIV (dividends, including those from stocks or mutual funds)
- Form 1099-MISC (various types of income, prizes, awards, or gross proceeds)
- Form 1099-B (stock or mutual fund sales and certain other transactions by brokers)
- Form 1099-S (proceeds from real estate transactions)
- Form 1099-K (merchant card and third party network transactions)
- Form 1098 (home mortgage interest), 1098-E (student loan interest), 1098-T (tuition)
- Form 1099-C (canceled debt)
- Form 1099-A (acquisition or abandonment of secured property)

Use Form W-9 only if you are a U.S. person (including a resident alien), to provide your correct TIN.

If you do not return Form W-9 to the requester with a TIN, you might be subject to backup withholding. See *What is backup withholding?* on page 2.

By signing the filled-out form, you:

- Certify that the TIN you are giving is correct (or you are waiting for a number to be issued),
- Certify that you are not subject to backup withholding, or
- Claim exemption from backup withholding if you are a U.S. exempt payee. If applicable, you are also certifying that as a U.S. person, your allocable share of any partnership income from a U.S. trade or business is not subject to the withholding tax on foreign partners' share of effectively connected income, and
- Certify that FATCA code(s) entered on this form (if any) indicating that you are exempt from the FATCA reporting, is correct. See *What is FATCA reporting?* on page 2 for further information.

Note. If you are a U.S. person and a requester gives you a form other than Form W-9 to request your TIN, you must use the requester's form if it is substantially similar to this Form W-9.

Definition of a U.S. person. For federal tax purposes, you are considered a U.S. person if you are:

- An individual who is a U.S. citizen or U.S. resident alien;
- A partnership, corporation, company, or association created or organized in the United States or under the laws of the United States;
- An estate (other than a foreign estate); or
- A domestic trust (as defined in Regulations section 301.7701-7).

Special rules for partnerships. Partnerships that conduct a trade or business in the United States are generally required to pay a withholding tax under section 1446 on any foreign partners' share of effectively connected taxable income from such business. Further, in certain cases where a Form W-9 has not been received, the rules under section 1446 require a partnership to presume that a partner is a foreign person, and pay the section 1446 withholding tax. Therefore, if you are a U.S. person that is a partner in a partnership conducting a trade or business in the United States, provide Form W-9 to the partnership to establish your U.S. status and avoid section 1446 withholding on your share of partnership income.

In the cases below, the following person must give Form W-9 to the partnership for purposes of establishing its U.S. status and avoiding withholding on its allocable share of net income from the partnership conducting a trade or business in the United States:

- In the case of a disregarded entity with a U.S. owner, the U.S. owner of the disregarded entity and not the entity;
- In the case of a grantor trust with a U.S. grantor or other U.S. owner, generally, the U.S. grantor or other U.S. owner of the grantor trust and not the trust; and
- In the case of a U.S. trust (other than a grantor trust), the U.S. trust (other than a grantor trust) and not the beneficiaries of the trust.

Foreign person. If you are a foreign person or the U.S. branch of a foreign bank that has elected to be treated as a U.S. person, do not use Form W-9. Instead, use the appropriate Form W-8 or Form 8233 (see Publication 515, Withholding of Tax on Nonresident Aliens and Foreign Entities).

Nonresident alien who becomes a resident alien. Generally, only a nonresident alien individual may use the terms of a tax treaty to reduce or eliminate U.S. tax on certain types of income. However, most tax treaties contain a provision known as a "saving clause." Exceptions specified in the saving clause may permit an exemption from tax to continue for certain types of income even after the payee has otherwise become a U.S. resident alien for tax purposes.

If you are a U.S. resident alien who is relying on an exception contained in the saving clause of a tax treaty to claim an exemption from U.S. tax on certain types of income, you must attach a statement to Form W-9 that specifies the following five items:

1. The treaty country. Generally, this must be the same treaty under which you claimed exemption from tax as a nonresident alien.
2. The treaty article addressing the income.
3. The article number (or location) in the tax treaty that contains the saving clause and its exceptions.
4. The type and amount of income that qualifies for the exemption from tax.
5. Sufficient facts to justify the exemption from tax under the terms of the treaty article.

Example. Article 20 of the U.S.-China income tax treaty allows an exemption from tax for scholarship income received by a Chinese student temporarily present in the United States. Under U.S. law, this student will become a resident alien for tax purposes if his or her stay in the United States exceeds 5 calendar years. However, paragraph 2 of the first Protocol to the U.S.-China treaty (dated April 30, 1984) allows the provisions of Article 20 to continue to apply even after the Chinese student becomes a resident alien of the United States. A Chinese student who qualifies for this exception (under paragraph 2 of the first protocol) and is relying on this exception to claim an exemption from tax on his or her scholarship or fellowship income would attach to Form W-9 a statement that includes the information described above to support that exemption.

If you are a nonresident alien or a foreign entity, give the requester the appropriate completed Form W-8 or Form 8233.

Backup Withholding

What is backup withholding? Persons making certain payments to you must under certain conditions withhold and pay to the IRS 28% of such payments. This is called "backup withholding." Payments that may be subject to backup withholding include interest, tax-exempt interest, dividends, broker and barter exchange transactions, rents, royalties, nonemployee pay, payments made in settlement of payment card and third party network transactions, and certain payments from fishing boat operators. Real estate transactions are not subject to backup withholding.

You will not be subject to backup withholding on payments you receive if you give the requester your correct TIN, make the proper certifications, and report all your taxable interest and dividends on your tax return.

Payments you receive will be subject to backup withholding if:

1. You do not furnish your TIN to the requester,
2. You do not certify your TIN when required (see the Part II instructions on page 3 for details),

3. The IRS tells the requester that you furnished an incorrect TIN,

4. The IRS tells you that you are subject to backup withholding because you did not report all your interest and dividends on your tax return (for reportable interest and dividends only), or

5. You do not certify to the requester that you are not subject to backup withholding under 4 above (for reportable interest and dividend accounts opened after 1983 only).

Certain payees and payments are exempt from backup withholding. See *Exempt payee code* on page 3 and the separate Instructions for the Requester of Form W-9 for more information.

Also see *Special rules for partnerships* above.

What is FATCA reporting?

The Foreign Account Tax Compliance Act (FATCA) requires a participating foreign financial institution to report all United States account holders that are specified United States persons. Certain payees are exempt from FATCA reporting. See *Exemption from FATCA reporting code* on page 3 and the Instructions for the Requester of Form W-9 for more information.

Updating Your Information

You must provide updated information to any person to whom you claimed to be an exempt payee if you are no longer an exempt payee and anticipate receiving reportable payments in the future from this person. For example, you may need to provide updated information if you are a C corporation that elects to be an S corporation, or if you no longer are tax exempt. In addition, you must furnish a new Form W-9 if the name or TIN changes for the account; for example, if the grantor of a grantor trust dies.

Penalties

Failure to furnish TIN. If you fail to furnish your correct TIN to a requester, you are subject to a penalty of \$50 for each such failure unless your failure is due to reasonable cause and not to willful neglect.

Civil penalty for false information with respect to withholding. If you make a false statement with no reasonable basis that results in no backup withholding, you are subject to a \$500 penalty.

Criminal penalty for falsifying information. Willfully falsifying certifications or affirmations may subject you to criminal penalties including fines and/or imprisonment.

Misuse of TINs. If the requester discloses or uses TINs in violation of federal law, the requester may be subject to civil and criminal penalties.

Specific Instructions

Line 1

You must enter one of the following on this line; **do not** leave this line blank. The name should match the name on your tax return.

If this Form W-9 is for a joint account, list first, and then circle, the name of the person or entity whose number you entered in Part I of Form W-9.

a. **Individual.** Generally, enter the name shown on your tax return. If you have changed your last name without informing the Social Security Administration (SSA) of the name change, enter your first name, the last name as shown on your social security card, and your new last name.

Note. ITIN applicant: Enter your individual name as it was entered on your Form W-7 application, line 1a. This should also be the same as the name you entered on the Form 1040/1040A/1040EZ you filed with your application.

b. **Sole proprietor or single-member LLC.** Enter your individual name as shown on your 1040/1040A/1040EZ on line 1. You may enter your business, trade, or "doing business as" (DBA) name on line 2.

c. **Partnership, LLC that is not a single-member LLC, C Corporation, or S Corporation.** Enter the entity's name as shown on the entity's tax return on line 1 and any business, trade, or DBA name on line 2.

d. **Other entities.** Enter your name as shown on required U.S. federal tax documents on line 1. This name should match the name shown on the charter or other legal document creating the entity. You may enter any business, trade, or DBA name on line 2.

e. **Disregarded entity.** For U.S. federal tax purposes, an entity that is disregarded as an entity separate from its owner is treated as a "disregarded entity." See Regulations section 301.7701-2(c)(2)(iii). Enter the owner's name on line 1. The name of the entity entered on line 1 should never be a disregarded entity. The name on line 1 should be the name shown on the income tax return on which the income should be reported. For example, if a foreign LLC that is treated as a disregarded entity for U.S. federal tax purposes has a single owner that is a U.S. person, the U.S. owner's name is required to be provided on line 1. If the direct owner of the entity is also a disregarded entity, enter the first owner that is not disregarded for federal tax purposes. Enter the disregarded entity's name on line 2, "Business name/disregarded entity name." If the owner of the disregarded entity is a foreign person, the owner must complete an appropriate Form W-8 instead of a Form W-9. This is the case even if the foreign person has a U.S. TIN.

Line 2

If you have a business name, trade name, DBA name, or disregarded entity name, you may enter it on line 2.

Line 3

Check the appropriate box in line 3 for the U.S. federal tax classification of the person whose name is entered on line 1. Check only one box in line 3.

Limited Liability Company (LLC). If the name on line 1 is an LLC treated as a partnership for U.S. federal tax purposes, check the "Limited Liability Company" box and enter "P" in the space provided. If the LLC has filed Form 8832 or 2553 to be taxed as a corporation, check the "Limited Liability Company" box and in the space provided enter "C" for C corporation or "S" for S corporation. If it is a single-member LLC that is a disregarded entity, do not check the "Limited Liability Company" box; instead check the first box in line 3 "Individual/sole proprietor or single-member LLC."

Line 4, Exemptions

If you are exempt from backup withholding and/or FATCA reporting, enter in the appropriate space in line 4 any code(s) that may apply to you.

Exempt payee code.

- Generally, individuals (including sole proprietors) are not exempt from backup withholding.
- Except as provided below, corporations are exempt from backup withholding for certain payments, including interest and dividends.
- Corporations are not exempt from backup withholding for payments made in settlement of payment card or third party network transactions.
- Corporations are not exempt from backup withholding with respect to attorneys' fees or gross proceeds paid to attorneys, and corporations that provide medical or health care services are not exempt with respect to payments reportable on Form 1099-MISC.

The following codes identify payees that are exempt from backup withholding. Enter the appropriate code in the space in line 4.

- 1—An organization exempt from tax under section 501(a), any IRA, or a custodial account under section 403(b)(7) if the account satisfies the requirements of section 401(f)(2)
- 2—The United States or any of its agencies or instrumentalities
- 3—A state, the District of Columbia, a U.S. commonwealth or possession, or any of their political subdivisions or instrumentalities
- 4—A foreign government or any of its political subdivisions, agencies, or instrumentalities
- 5—A corporation
- 6—A dealer in securities or commodities required to register in the United States, the District of Columbia, or a U.S. commonwealth or possession
- 7—A futures commission merchant registered with the Commodity Futures Trading Commission
- 8—A real estate investment trust
- 9—An entity registered at all times during the tax year under the Investment Company Act of 1940
- 10—A common trust fund operated by a bank under section 584(a)
- 11—A financial institution
- 12—A middleman known in the investment community as a nominee or custodian
- 13—A trust exempt from tax under section 664 or described in section 4947

The following chart shows types of payments that may be exempt from backup withholding. The chart applies to the exempt payees listed above, 1 through 13.

IF the payment is for . . .	THEN the payment is exempt for . . .
Interest and dividend payments	All exempt payees except for 7
Broker transactions	Exempt payees 1 through 4 and 6 through 11 and all C corporations. S corporations must not enter an exempt payee code because they are exempt only for sales of noncovered securities acquired prior to 2012.
Barter exchange transactions and patronage dividends	Exempt payees 1 through 4
Payments over \$600 required to be reported and direct sales over \$5,000 ¹	Generally, exempt payees 1 through 5 ²
Payments made in settlement of payment card or third party network transactions	Exempt payees 1 through 4

¹ See Form 1099-MISC, Miscellaneous Income, and its instructions.

² However, the following payments made to a corporation and reportable on Form 1099-MISC are not exempt from backup withholding: medical and health care payments, attorneys' fees, gross proceeds paid to an attorney reportable under section 6045(f), and payments for services paid by a federal executive agency.

Exemption from FATCA reporting code. The following codes identify payees that are exempt from reporting under FATCA. These codes apply to persons submitting this form for accounts maintained outside of the United States by certain foreign financial institutions. Therefore, if you are only submitting this form for an account you hold in the United States, you may leave this field blank. Consult with the person requesting this form if you are uncertain if the financial institution is subject to these requirements. A requester may indicate that a code is not required by providing you with a Form W-9 with "Not Applicable" (or any similar indication) written or printed on the line for a FATCA exemption code.

- A—An organization exempt from tax under section 501(a) or any individual retirement plan as defined in section 7701(a)(37)
- B—The United States or any of its agencies or instrumentalities
- C—A state, the District of Columbia, a U.S. commonwealth or possession, or any of their political subdivisions or instrumentalities
- D—A corporation the stock of which is regularly traded on one or more established securities markets, as described in Regulations section 1.1472-1(c)(1)(i)
- E—A corporation that is a member of the same expanded affiliated group as a corporation described in Regulations section 1.1472-1(c)(1)(i)
- F—A dealer in securities, commodities, or derivative financial instruments (including notional principal contracts, futures, forwards, and options) that is registered as such under the laws of the United States or any state
- G—A real estate investment trust
- H—A regulated investment company as defined in section 851 or an entity registered at all times during the tax year under the Investment Company Act of 1940
- I—A common trust fund as defined in section 584(a)
- J—A bank as defined in section 581
- K—A broker
- L—A trust exempt from tax under section 664 or described in section 4947(a)(1)
- M—A tax exempt trust under a section 403(b) plan or section 457(g) plan

Note. You may wish to consult with the financial institution requesting this form to determine whether the FATCA code and/or exempt payee code should be completed.

Line 5

Enter your address (number, street, and apartment or suite number). This is where the requester of this Form W-9 will mail your information returns.

Line 6

Enter your city, state, and ZIP code.

Part I. Taxpayer Identification Number (TIN)

Enter your TIN in the appropriate box. If you are a resident alien and you do not have and are not eligible to get an SSN, your TIN is your IRS individual taxpayer identification number (ITIN). Enter it in the social security number box. If you do not have an ITIN, see *How to get a TIN* below.

If you are a sole proprietor and you have an EIN, you may enter either your SSN or EIN. However, the IRS prefers that you use your SSN.

If you are a single-member LLC that is disregarded as an entity separate from its owner (see *Limited Liability Company (LLC)* on this page), enter the owner's SSN (or EIN, if the owner has one). Do not enter the disregarded entity's EIN. If the LLC is classified as a corporation or partnership, enter the entity's EIN.

Note. See the chart on page 4 for further clarification of name and TIN combinations.

How to get a TIN. If you do not have a TIN, apply for one immediately. To apply for an SSN, get Form SS-5, Application for a Social Security Card, from your local SSA office or get this form online at www.ssa.gov. You may also get this form by calling 1-800-772-1213. Use Form W-7, Application for IRS Individual Taxpayer Identification Number, to apply for an ITIN, or Form SS-4, Application for Employer Identification Number, to apply for an EIN. You can apply for an EIN online by accessing the IRS website at www.irs.gov/businesses and clicking on Employer Identification Number (EIN) under Starting a Business. You can get Forms W-7 and SS-4 from the IRS by visiting IRS.gov or by calling 1-800-TAX-FORM (1-800-829-3676).

If you are asked to complete Form W-9 but do not have a TIN, apply for a TIN and write "Applied For" in the space for the TIN, sign and date the form, and give it to the requester. For interest and dividend payments, and certain payments made with respect to readily tradable instruments, generally you will have 60 days to get a TIN and give it to the requester before you are subject to backup withholding on payments. The 60-day rule does not apply to other types of payments. You will be subject to backup withholding on all such payments until you provide your TIN to the requester.

Note. Entering "Applied For" means that you have already applied for a TIN or that you intend to apply for one soon.

Caution: A disregarded U.S. entity that has a foreign owner must use the appropriate Form W-8.

Part II. Certification

To establish to the withholding agent that you are a U.S. person, or resident alien, sign Form W-9. You may be requested to sign by the withholding agent even if items 1, 4, or 5 below indicate otherwise.

For a joint account, only the person whose TIN is shown in Part I should sign (when required). In the case of a disregarded entity, the person identified on line 1 must sign. Exempt payees, see *Exempt payee code* earlier.

Signature requirements. Complete the certification as indicated in items 1 through 5 below.

1. **Interest, dividend, and barter exchange accounts opened before 1984 and broker accounts considered active during 1983.** You must give your correct TIN, but you do not have to sign the certification.
2. **Interest, dividend, broker, and barter exchange accounts opened after 1983 and broker accounts considered inactive during 1983.** You must sign the certification or backup withholding will apply. If you are subject to backup withholding and you are merely providing your correct TIN to the requester, you must cross out item 2 in the certification before signing the form.
3. **Real estate transactions.** You must sign the certification. You may cross out item 2 of the certification.
4. **Other payments.** You must give your correct TIN, but you do not have to sign the certification unless you have been notified that you have previously given an incorrect TIN. "Other payments" include payments made in the course of the requester's trade or business for rents, royalties, goods (other than bills for merchandise), medical and health care services (including payments to corporations), payments to a nonemployee for services, payments made in settlement of payment card and third party network transactions, payments to certain fishing boat crew members and fishermen, and gross proceeds paid to attorneys (including payments to corporations).
5. **Mortgage interest paid by you, acquisition or abandonment of secured property, cancellation of debt, qualified tuition program payments (under section 529), IRA, Coverdell ESA, Archer MSA or HSA contributions or distributions, and pension distributions.** You must give your correct TIN, but you do not have to sign the certification.

What Name and Number To Give the Requester

For this type of account:	Give name and SSN of:
1. Individual	The individual
2. Two or more individuals (joint account)	The actual owner of the account or, if combined funds, the first individual on the account ¹
3. Custodian account of a minor (Uniform Gift to Minors Act)	The minor ²
4. a. The usual revocable savings trust (grantor is also trustee) b. So-called trust account that is not a legal or valid trust under state law	The grantor-trustee ³ The actual owner ¹
5. Sole proprietorship or disregarded entity owned by an individual	The owner ³
6. Grantor trust filing under Optional Form 1099 Filing Method 1 (see Regulations section 1.671-4(b)(2)(i)(A))	The grantor*
For this type of account:	Give name and EIN of:
7. Disregarded entity not owned by an individual	The owner
8. A valid trust, estate, or pension trust	Legal entity ⁴
9. Corporation or LLC electing corporate status on Form 8832 or Form 2553	The corporation
10. Association, club, religious, charitable, educational, or other tax-exempt organization	The organization
11. Partnership or multi-member LLC	The partnership
12. A broker or registered nominee	The broker or nominee
13. Account with the Department of Agriculture in the name of a public entity (such as a state or local government, school district, or prison) that receives agricultural program payments	The public entity
14. Grantor trust filing under the Form 1041 Filing Method or the Optional Form 1099 Filing Method 2 (see Regulations section 1.671-4(b)(2)(i)(B))	The trust

¹List first and circle the name of the person whose number you furnish. If only one person on a joint account has an SSN, that person's number must be furnished.
²Circle the minor's name and furnish the minor's SSN.

³You must show your individual name and you may also enter your business or DBA name on the "Business name/disregarded entity" name line. You may use either your SSN or EIN (if you have one), but the IRS encourages you to use your SSN.

⁴List first and circle the name of the trust, estate, or pension trust. (Do not furnish the TIN of the personal representative or trustee unless the legal entity itself is not designated in the account title.) Also see *Special rules for partnerships* on page 2.
 *Note. Grantor also must provide a Form W-9 to trustee of trust.

Note. If no name is circled when more than one name is listed, the number will be considered to be that of the first name listed.

Secure Your Tax Records from Identity Theft

Identity theft occurs when someone uses your personal information such as your name, SSN, or other identifying information, without your permission, to commit fraud or other crimes. An identity thief may use your SSN to get a job or may file a tax return using your SSN to receive a refund.

To reduce your risk:

- Protect your SSN,
- Ensure your employer is protecting your SSN, and
- Be careful when choosing a tax preparer.

If your tax records are affected by identity theft and you receive a notice from the IRS, respond right away to the name and phone number printed on the IRS notice or letter.

If your tax records are not currently affected by identity theft but you think you are at risk due to a lost or stolen purse or wallet, questionable credit card activity or credit report, contact the IRS Identity Theft Hotline at 1-800-908-4490 or submit Form 14039.

For more information, see Publication 4535, Identity Theft Prevention and Victim Assistance.

Victims of identity theft who are experiencing economic harm or a system problem, or are seeking help in resolving tax problems that have not been resolved through normal channels, may be eligible for Taxpayer Advocate Service (TAS) assistance. You can reach TAS by calling the TAS toll-free case intake line at 1-877-777-4778 or TTY/TDD 1-800-829-4059.

Protect yourself from suspicious emails or phishing schemes. Phishing is the creation and use of email and websites designed to mimic legitimate business emails and websites. The most common act is sending an email to a user falsely claiming to be an established legitimate enterprise in an attempt to scam the user into surrendering private information that will be used for identity theft.

The IRS does not initiate contacts with taxpayers via emails. Also, the IRS does not request personal detailed information through email or ask taxpayers for the PIN numbers, passwords, or similar secret access information for their credit card, bank, or other financial accounts.

If you receive an unsolicited email claiming to be from the IRS, forward this message to phishing@irs.gov. You may also report misuse of the IRS name, logo, or other IRS property to the Treasury Inspector General for Tax Administration (TIGTA) at 1-800-366-4484. You can forward suspicious emails to the Federal Trade Commission at: spam@uce.gov or contact them at www.ftc.gov/idtheft or 1-877-IDTHEFT (1-877-438-4338).

Visit IRS.gov to learn more about identity theft and how to reduce your risk.

Privacy Act Notice

Section 6109 of the Internal Revenue Code requires you to provide your correct TIN to persons (including federal agencies) who are required to file information returns with the IRS to report interest, dividends, or certain other income paid to you; mortgage interest you paid; the acquisition or abandonment of secured property; the cancellation of debt; or contributions you made to an IRA, Archer MSA, or HSA. The person collecting this form uses the information on the form to file information returns with the IRS, reporting the above information. Routine uses of this information include giving it to the Department of Justice for civil and criminal litigation and to cities, states, the District of Columbia, and U.S. commonwealths and possessions for use in administering their laws. The information also may be disclosed to other countries under a treaty, to federal and state agencies to enforce civil and criminal laws, or to federal law enforcement and intelligence agencies to combat terrorism. You must provide your TIN whether or not you are required to file a tax return. Under section 3406, payers must generally withhold a percentage of taxable interest, dividend, and certain other payments to a payee who does not give a TIN to the payer. Certain penalties may also apply for providing false or fraudulent information.

C. 271 POLITICAL CONTRIBUTION DISCLOSURE FORM

Contractor Instructions

Business entities (contractors) receiving contracts from a public agency that are NOT awarded pursuant to a “fair and open” process (defined at N.J.S.A. 19:44A-20.7) are subject to the provisions of P.L. 2005, c. 271, s.2 (N.J.S.A. 19:44A-20.26). This law provides that 10 days prior to the award of such a contract, the contractor shall disclose contributions to:

- any State, county, or municipal committee of a political party
- any legislative leadership committee*
- any continuing political committee (a.k.a., political action committee)
- any candidate committee of a candidate for, or holder of, an elective office:
 - of the public entity awarding the contract
 - of that county in which that public entity is located
 - of another public entity within that county
 - or of a legislative district in which that public entity is located or, when the public entity is a county, of any legislative district which includes all or part of the county

The disclosure must list reportable contributions to any of the committees that exceed \$300 per election cycle that were made during the 12 months prior to award of the contract. See N.J.S.A. 19:44A-8 and 19:44A-16 for more details on reportable contributions.

N.J.S.A. 19:44A-20.26 itemizes the parties from whom contributions must be disclosed when a business entity is not a natural person. This includes the following:

- individuals with an “interest” ownership or control of more than 10% of the profits or assets of a business entity or 10% of the stock in the case of a business entity that is a corporation for profit
- all principals, partners, officers, or directors of the business entity or their spouses
- any subsidiaries directly or indirectly controlled by the business entity
- IRS Code Section 527 New Jersey based organizations, directly or indirectly controlled by the business entity and filing as continuing political committees, (PACs).

When the business entity is a natural person, “a contribution by that person’s spouse or child, residing therewith, shall be deemed to be a contribution by the business entity.” [N.J.S.A. 19:44A-20.26(b)] The contributor must be listed on the disclosure.

Any business entity that fails to comply with the disclosure provisions shall be subject to a fine imposed by ELEC in an amount to be determined by the Commission which may be based upon the amount that the business entity failed to report.

The enclosed list of agencies is provided to assist the contractor in identifying those public agencies whose elected official and/or candidate campaign committees are affected by the disclosure requirement. It is the contractor’s responsibility to identify the specific committees to which contributions may have been made and need to be disclosed. The disclosed information may exceed the minimum requirement.

The enclosed form, a content-consistent facsimile, or an electronic data file containing the required details (along with a signed cover sheet) may be used as the contractor’s submission and is disclosable to the public under the Open Public Records Act.

The contractor must also complete the attached Stockholder Disclosure Certification. This will assist the agency in meeting its obligations under the law. **NOTE: This section does not apply to Board of Education contracts.**

P.L. 2005, c.271

(Unofficial version, Assembly Committee Substitute to A-3013, First Reprint*)

AN ACT authorizing units of local government to impose limits on political contributions by contractors and supplementing Title 40A of the New Jersey Statutes and Title 19 of the Revised Statutes.

BE IT ENACTED by the Senate and General Assembly of the State of New Jersey:

40A:11-51 1. a. A county, municipality, independent authority, board of education, or fire district is hereby authorized to establish by ordinance, resolution or regulation, as may be appropriate, measures limiting the awarding of public contracts therefrom to business entities that have made a contribution pursuant to P.L.1973, c.83 (C.19:44A-1 et seq.) and limiting the contributions that the holders of a contract can make during the term of a contract, notwithstanding the provisions and parameters of sections 1 through 12 of P.L.2004, c.19 (C. 19:44A-20.2 et al.) and section 22 of P.L.1973, c.83 (C.19:44A-22).

b. The provisions of P.L.2004, c.19 shall not be construed to supersede or preempt any ordinance, resolution or regulation of a unit of local government that limits political contributions by business entities performing or seeking to perform government contracts. Any ordinance, resolution or regulation in effect on the effective date of P.L.2004, c.19 shall remain in effect and those adopted after that effective date shall be valid and enforceable.

c. An ordinance, resolution or regulation adopted or promulgated as provided in this section shall be filed with the Secretary of State.

19:44A-20.26 2. a. Not later than 10 days prior to entering into any contract having an anticipated value in excess of \$17,500, except for a contract that is required by law to be publicly advertised for bids, a State agency, county, municipality, independent authority, board of education, or fire district shall require any business entity bidding thereon or negotiating therefor, to submit along with its bid or price quote, a list of political contributions as set forth in this subsection that are reportable by the recipient pursuant to the provisions of P.L.1973, c.83 (C.19:44A-1 et seq.) and that were made by the business entity during the preceding 12 month period, along with the date and amount of each contribution and the name of the recipient of each contribution. A business entity contracting with a State agency shall disclose contributions to any State, county, or municipal committee of a political party, legislative leadership committee, candidate committee of a candidate for, or holder of, a State elective office, or any continuing political committee. A business entity contracting with a county, municipality, independent authority, other than an independent authority that is a State agency, board of education, or fire district shall disclose contributions to: any State, county, or municipal committee of a political party; any legislative leadership committee; or any candidate committee of a candidate for, or holder of, an elective office of that public entity, of that county in which that public entity is located, of another public entity within that county, or of a legislative district in which that public entity is located or, when the public entity is a county, of any legislative district which includes all or part of the county, or any continuing political committee.

The provisions of this section shall not apply to a contract when a public emergency requires the immediate delivery of goods or services.

b. When a business entity is a natural person, a contribution by that person's spouse or child, residing therewith, shall be deemed to be a contribution by the business entity. When a business entity is other than a natural person, a contribution by any person or other business entity having an interest therein shall be deemed to be a contribution by the business entity. When a business entity is other than a natural person, a contribution by: all principals, partners, officers, or directors of the business entity or their spouses; any subsidiaries directly or indirectly controlled by the business entity; or any political organization organized under section 527 of the Internal Revenue Code that is directly or indirectly controlled by the business entity, other than a candidate committee, election fund, or political party committee, shall be deemed to be a contribution by the business entity.

c. As used in this section:

"business entity" means a natural or legal person, business corporation, professional services corporation, limited liability company, partnership, limited partnership, business trust, association or any other legal commercial entity organized under the laws of this State or of any other state or foreign jurisdiction;

"interest" means the ownership or control of more than 10% of the profits or assets of a business entity or 10% of the stock in the case of a business entity that is a corporation for profit, as appropriate; and

"State agency" means any of the principal departments in the Executive Branch of the State Government, and any division, board, bureau, office, commission or other instrumentality within or created by such department, the Legislature of the State and any office, board, bureau or commission within or created by the Legislative Branch, and any independent State authority, commission, instrumentality or agency.

P.L. 2005,c271

Page 2

d. Any business entity that fails to comply with the provisions of this section shall be subject to a fine imposed by the New Jersey Election Law Enforcement Commission in an amount to be determined by the commission which may be based upon the amount that the business entity failed to report.

19:44A-20.13 3. a. Any business entity making a contribution of money or any other thing of value, including an in-kind contribution, or pledge to make a contribution of any kind to a candidate for or the holder of any public office having ultimate responsibility for the awarding of public contracts, or to a political party committee, legislative leadership committee, political committee or continuing political committee, which has received in any calendar year \$50,000 or more in the aggregate through agreements or contracts with a public entity, shall file an annual disclosure statement with the New Jersey Election Law Enforcement Commission, established pursuant to section 5 of P.L.1973, c.83 (C.19:44A-5), setting forth all such contributions made by the business entity during the 12 months prior to the reporting deadline.

b. The commission shall prescribe forms and procedures for the reporting required in subsection a. of this section which shall include, but not be limited to:

(1) the name and mailing address of the business entity making the contribution, and the amount contributed during the 12 months prior to the reporting deadline;

(2) the name of the candidate for or the holder of any public office having ultimate responsibility for the awarding of public contracts, candidate committee, joint candidates committee, political party committee, legislative leadership committee, political committee or continuing political committee receiving the contribution; and

(3) the amount of money the business entity received from the public entity through contract or agreement, the dates, and information identifying each contract or agreement and describing the goods, services or equipment provided or property sold.

c. The commission shall maintain a list of such reports for public inspection both at its office and through its Internet site.

d. When a business entity is a natural person, a contribution by that person's spouse or child, residing therewith, shall be deemed to be a contribution by the business entity. When a business entity is other than a natural person, a contribution by any person or other business entity having an interest therein shall be deemed to be a contribution by the business entity. When a business entity is other than a natural person, a contribution by: all principals, partners, officers, or directors of the business entity, or their spouses; any subsidiaries directly or indirectly controlled by the business entity; or any political organization organized under section 527 of the Internal Revenue Code that is directly or indirectly controlled by the business entity, other than a candidate committee, election fund, or political party committee, shall be deemed to be a contribution by the business entity.

As used in this section:

"business entity" means a natural or legal person, business corporation, professional services corporation, limited liability company, partnership, limited partnership, business trust, association or any other legal commercial entity organized under the laws of this State or of any other state or foreign jurisdiction; and

"interest" means the ownership or control of more than 10% of the profits or assets of a business entity or 10% of the stock in the case of a business entity that is a corporation for profit, as appropriate.

e. Any business entity that fails to comply with the provisions of this section shall be subject to a fine imposed by the New Jersey Election Law Enforcement Commission in an amount to be determined by the commission which may be based upon the amount that the business entity failed to report.

4. This act shall take effect immediately.

¹ N.J.S.A. 19:44A-3(s): "The term "legislative leadership committee" means a committee established, authorized to be established, or designated by the President of the Senate, the Minority Leader of the Senate, the Speaker of the General Assembly or the Minority Leader of the General Assembly pursuant to section 16 of P.L.1993, c.65 (C.19:44A-10.1) for the purpose of receiving contributions and making expenditures."

* Note: Bold italicized statutory references of new sections are anticipated and not final as of the time this document was prepared. Statutory compilations of N.J.S.A. 18A:18A-51 is anticipated to show a reference to N.J.S.A. 40A:11-51 and to N.J.S.A. 19:44A-20.26

BID FORM ATTACHMENT #18

Chapter 271 POLITICAL CONTRIBUTION DISCLOSURE FORM

(Contracts that Exceed \$17,500.00)
Ref. N.J.S.A. 19:44A-20.26

The undersigned, being authorized and knowledgeable of the circumstances, does hereby certify that _____ (Business Entity) has made the following reportable political contributions to any elected official, political candidate or any political committee as defined in N.J.S.A. 19:44-20.26 during the twelve (12) months preceding this award of contract:

Reportable Contributions

Date of Contribution	Amount of Contribution	Name of Recipient / Elected Official / Committee/Candidate	Name of Contributor

The Business Entity may attach additional pages if needed.

No Reportable Contributions (Please check (✓) if applicable.)

I certify that _____ (Business Entity) made no reportable contributions to any elected official, political candidate or any political committee as defined in N.J.S.A. 19:44-20.26.

Certification

I certify, that the information provided above is in full compliance with Public Law 2005—Chapter 271.

Name of Authorized Agent _____

Signature _____ Title _____

Business Entity _____

**List of Agencies with Elected Officials Required for Political Contribution Disclosure
N.J.S.A. 19:44A-20.26**

County Name: Camden

State: Governor, and Legislative Leadership Committees

Legislative District #s: 4, 5, 6, & 7 State Senator and two members of the General Assembly per district.

County: Freeholders County Clerk Sheriff Surrogate

Municipalities (Mayor and members of governing body, regardless of title):

Audubon Borough	Gloucester City	Pennsauken Township
Audubon Park Borough	Gloucester Township	Pine Hill Borough
Barrington Borough	Haddon Heights Borough	Pine Valley Borough
Bellmawr Borough	Haddon Township	Runnemede Borough
Berlin Borough	Haddonfield Borough	Somerdale Borough
Berlin Township	Hi-nella Borough	Stratford Borough
Brooklawn	Laurel Springs Borough	Tavistock Borough
Borough Camden City	Lawnside Borough	Voorhees Township
Cherry Hill Township	Lindenwold Borough	Waterford Township
Chesilhurst Borough	Magnolia Borough	Winslow Township
Clementon Borough	Merchantville Borough	Woodlynne Borough
Collingswood Borough	Mount Ephraim Borough	
Gibbsboro Borough	Oaklyn Borough	

Boards of Education (Members of the Board):

Audubon Borough	Gibbsboro Borough	Oaklyn Borough
Audubon Park Borough	Gloucester City	Pennsauken Township
Barrington Borough	Gloucester Township	Pine Hill Borough
Bellmawr Borough	Haddon Heights Borough	Runnemede Borough
Berlin Borough	Haddon Township	Somerdale Borough
Berlin Township	Haddonfield Borough	Sterling High School District
Brooklawn	Hi-nella Borough	Stratford Borough
Camden City	Laurel Springs Borough	Voorhees Township
Cherry Hill Township	Lawnside Borough	Waterford Township
Chesilhurst	Lindenwold Borough	Winslow Township
Clementon Borough	Magnolia Borough	Woodlynne Borough
Collingswood Borough	Merchantville Borough	
Eastern Camden County Regional	Mount Ephraim Borough	

Fire Districts (Board of Fire Commissioners):

Berlin Township Fire District No. 1	Haddon Township Fire District No. 1
Cherry Hill Fire District No. 13	Haddon Township Fire District No. 2
Gloucester Township Fire District No. 1	Haddon Township Fire District No. 3
Gloucester Township Fire District No. 2	Haddon Township Fire District No. 4
Gloucester Township Fire District No. 3	Lindenwold Borough Fire District No. 1
Gloucester Township Fire District No. 4	Pine Hill Borough Fire District No. 1
Gloucester Township Fire District No. 5	Voorhees Township Fire District No. 3
Gloucester Township Fire District No. 6	Winslow Township Fire District No. 1g

BID FORM ATTACHMENT # 19

**STATE OF NEW JERSEY -- DIVISION OF PURCHASE AND PROPERTY
DISCLOSURE OF INVESTMENT ACTIVITIES IN IRAN**

Bid/Quote Number: _____ **Bidder/Offeror:** _____

PART 1: CERTIFICATION

BIDDERS MUST COMPLETE PART 1 BY CHECKING EITHER BOX.

FAILURE TO CHECK ONE OF THE BOXES WILL RENDER THE PROPOSAL NON-RESPONSIVE.

Pursuant to Public Law 2012, c. 25, any person or entity that submits a bid or proposal or otherwise proposes to enter into or renew a contract must complete the certification below to attest, under penalty of perjury, that neither the person or entity, nor any of its parents, subsidiaries, or affiliates, is identified on the Department of Treasury's Chapter 25 list as a person or entity engaging in investment activities in Iran. The Chapter 25 list is found on the Division's website at <http://www.state.nj.us/treasury/purchase/pdf/Chapter25List.pdf>. Bidders must review this list prior to completing the below certification. **Failure to complete the certification will render a bidder's proposal non-responsive.** If the Director finds a person or entity to be in violation of 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

PLEASE CHECK THE APPROPRIATE BOX:

I certify, pursuant to Public Law 2012, c. 25, that neither the bidder listed above nor any of the bidder's parents, subsidiaries, or affiliates is listed on the N.J. Department of the Treasury's list of entities determined to be engaged in prohibited activities in Iran pursuant to P.L. 2012, c. 25 ("Chapter 25 List"). I further certify that I am the person listed above, or I am an officer or representative of the entity listed above and am authorized to make this certification on its behalf. **I will skip Part 2 and sign and complete the Certification below.**

OR

I am unable to certify as above because the bidder and/or one or more of its parents, subsidiaries, or affiliates is listed on the Department's Chapter 25 list. I will provide a detailed, accurate and precise description of the activities in Part 2 below and sign and complete the Certification below. Failure to provide such will result in the proposal being rendered as non-responsive and appropriate penalties, fines and/or sanctions will be assessed as provided by law.

PART 2: PLEASE PROVIDE FURTHER INFORMATION RELATED TO INVESTMENT ACTIVITIES IN IRAN

You must provide a detailed, accurate and precise description of the activities of the bidding person/entity, or one of its parents, subsidiaries or affiliates, engaging in the investment activities in Iran outlined above by completing the boxes below.

EACH BOX WILL PROMPT YOU TO PROVIDE INFORMATION RELATIVE TO THE ABOVE QUESTIONS. PLEASE PROVIDE THOROUGH ANSWERS TO EACH QUESTION. IF YOU NEED TO MAKE ADDITIONAL ENTRIES, CLICK THE "ADD AN ADDITIONAL ACTIVITIES ENTRY" BUTTON.

Name _____	Relationship to Bidder/Offeror _____
Description of Activities _____	

Duration of Engagement _____	Anticipated Cessation Date _____
Bidder/Offeror Contact Name _____	Contact Phone Number _____

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; that the State of New Jersey 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 the State to notify the State 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 State, permitting the State to declare any contract(s) resulting from this certification void and unenforceable.

Full Name (Print): _____ Signature: _____

Do Not Enter PIN as a Signature

Title: _____ Date: _____



State of New Jersey

DEPARTMENT OF THE TREASURY
DIVISION OF PURCHASE AND PROPERTY
OFFICE OF THE DIRECTOR
33 WEST STATE STREET
P. O. BOX 039
TRENTON, NEW JERSEY 08625-0039
<https://www.njstart.gov>

Telephone (609) 292-4886 / Facsimile (609) 984-2575

PHILIP D. MURPHY
Governor

SHEILA Y. OLIVER
Lt. Governor

ELIZABETH MAHER MUOIO
State Treasurer

MAURICE A. GRIFFIN
Acting Director

The following list represents entities determined, based on credible information available to the public, to be engaged in prohibited activities in Iran pursuant to P.L. 2012, c. 25 ("Chapter 25"):

1. **Amona**
2. **Bank Markazi Iran (Central Bank of Iran)**
3. **Bank Mellat**
4. **Bank Melli Iran**
5. **Bank Saderat PLC**
6. **Bank Sepah**
7. **Bank Tejarat**
8. **China International United Petroleum & Chemicals Co., Ltd. (Unipecc)**
9. **China National Offshore Oil Corporation (CNOOC)**
10. **China National Petroleum Corporation (CNPC)**
11. **China National United Oil Corporation (ChinaOil)**
12. **China Petroleum & Chemical Corporation (Sinopec)**
13. **China Precision Machinery Import-Export Corp. (CPMIEC)**
14. **Indian Oil Corporation**
15. **Kingdream PLC**
16. **Naftiran Intertrade Company (NICO)**
17. **National Iranian Tanker Company (NITC)**
18. **Oil and Natural Gas Corporation (ONGC)**
19. **Oil India Limited**
20. **Persia International Bank**
21. **Petroleos de Venezuela (PDVSA Petróleo, SA)**
22. **PetroChina Company, Ltd.**
23. **Sameh Afzar Tajak Co. (SATCO)**
24. **Shandong Fin Cnc Machine Company, Ltd.**
25. **Sinohydro Co., Ltd.**
26. **SKS Ventures**
27. **Som Petrol AS**
28. **Zhuhai Zhenrong Company**

List Date: July 30, 2019

BID FORM ATTACHMENT #20

EQUIPMENT CERTIFICATION

Pursuant with N.J.S.A. 18A:18A-23. Certificate of bidder showing ability to perform contract.

"There may be required from any bidder submitting a bid on public work to any board of education, duly advertised for in accordance with law, a certificate showing that he owns, leases, or controls all necessary equipment required by the plans, specifications and advertisements under which bids are asked for and if bidder is not the actual owner or lessee of any such equipment, his certificate shall state the source from which the equipment will be obtained, and shall be accompanied by a certificate from the owner or person in control of the equipment definitely granting to the bidder the control of the equipment required during such time as may be necessary for the completion of that portion of the contract for which it is necessary."

I, _____ of
(Type or Print Name)

(Type or Print Contractor's Name)

CHECK ONE

- certify that we own, lease, or control all necessary equipment required by the plans, specifications and advertisements under which bids are asked for.

OR

- certify that we are not the actual owners, lessee, or have control of all necessary equipment required by the plans, specifications and advertisements under which bids are asked for. We will be obtaining such equipment from the sources listed below. (List names of the sources of the equipment required. If additional space is required attach a separate sheet.) Provide certificates from each owner or person in control of the equipment definitely granting you control of the required equipment.

**REMAINDER OF PAGE INTENTIONALLY LEFT BLANK
SIGNATURE ON FOLLOWING PAGE**

EQUIPMENT CERTIFICATION *(continued)*

I certify that the foregoing statements made by me are true. I am aware that if any of the statements made by me are willfully false, I may be subject to punishment

Bidder's Authorized Representative:

Name: _____
(Printed/Typed)

Title: _____
(Printed/Typed)

Representing: _____
Company/Agency Name (Printed/Typed)

Signature: _____

Date: _____

DRAFT AIA® Document A201™ - 2017

General Conditions of the Contract for Construction

for the following PROJECT:

(Name and location or address)

Exterior Wall Reconstruction and Related Work at:

Cherry Hill High School East
1750 Kresson Road
Cherry Hill, New Jersey 08034

THE OWNER:

(Name, legal status and address)

Cherry Hill Board of Education
Lynn E. Shugars, CPA, Asst. Supt. Bus./BA/BS
Box 5015
45 Ranoldo Terrace
Cherry Hill, New Jersey 08034
Telephone No.: 856-429-5600
Facsimile No.: 856-616-9675
Email: LShugars@chclc.org

THE ARCHITECT:

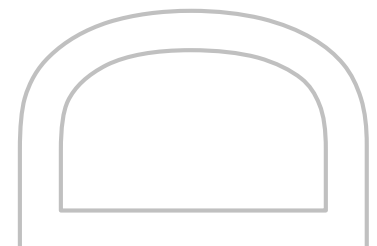
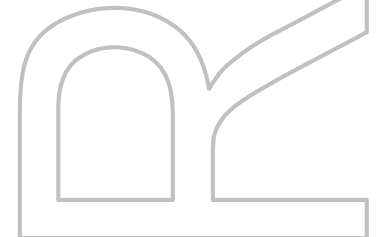
(Name, legal status and address)

Becica Associates, LLC
500 S. Kings Highway
Cherry Hill, New Jersey 08034
Telephone Number: 856-795-1180
Fax Number: 856-354-6367

ADDITIONS AND DELETIONS: The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information as well as revisions to the standard form text is available from the author and should be reviewed.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

For guidance in modifying this document to include supplementary conditions, see AIA Document A503™, Guide for Supplementary Conditions.



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General Conditions of the Contract for Construction

ARTICLE 1 GENERAL PROVISIONS

§ 1.1 Basic Definitions

§ 1.1.1 The Contract Documents

The Contract Documents are enumerated in the Agreement between the Owner and Contractor (hereinafter the Agreement) and consist of the Agreement, Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Specifications, Addenda issued prior to execution of the Contract, other documents listed in the Agreement, and Modifications issued after execution of the Contract. A Modification is (1) a written amendment to the Contract signed by both parties, (2) a Change Order, (3) a Construction Change Directive, or (4) a written order for a minor change in the Work issued by the Architect.

§ 1.1.2 The Contract

The Contract Documents form the Contract for Construction. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations, or agreements, either written or oral. The Contract may be amended or modified only by a Modification. The Contract Documents shall not be construed to create a contractual relationship of any kind (1) between the Contractor and the Architect or the Architect's consultants, (2) between the Owner and a Subcontractor or a Sub-subcontractor, (3) between the Owner and the Architect or the Architect's consultants, or (4) between any persons or entities other than the Owner and the Contractor. The Architect shall, however, be entitled to performance and enforcement of obligations under the Contract intended to facilitate performance of the Architect's duties.

§ 1.1.3 The Work

The term "Work" means the construction and services required by the Contract Documents, whether completed or partially completed, and includes all other labor, materials, equipment, and services provided or to be provided by the Contractor to fulfill the Contractor's obligations. The Work may constitute the whole or a part of the Project.

§ 1.1.4 The Project

The Project is the total construction of which the Work performed under the Contract Documents may be the whole or a part and which may include construction by the Owner and by Separate Contractors.

§ 1.1.5 The Drawings

The Drawings are the graphic and pictorial portions of the Contract Documents showing the design, location and dimensions of the Work, generally including plans, elevations, sections, details, schedules, and diagrams.

§ 1.1.6 The Specifications

The Specifications are that portion of the Contract Documents consisting of the written requirements for materials, equipment, systems, standards and workmanship for the Work, and performance of related services.

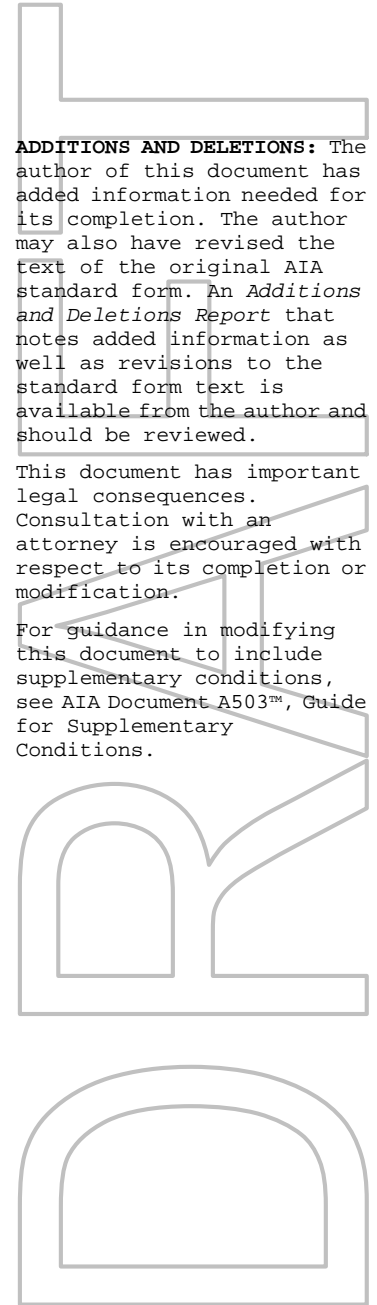
§ 1.1.7 Instruments of Service

Instruments of Service are representations, in any medium of expression now known or later developed, of the tangible and intangible creative work performed by the Architect and the Architect's consultants under their respective professional services agreements. Instruments of Service may include, without limitation, studies, surveys, models, sketches, drawings, specifications, and other similar materials.

ADDITIONS AND DELETIONS: The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information as well as revisions to the standard form text is available from the author and should be reviewed.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

For guidance in modifying this document to include supplementary conditions, see AIA Document A503™, Guide for Supplementary Conditions.



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§ 1.1.8 Initial Decision Maker

The Initial Decision Maker is the person identified in the Agreement to render initial decisions on Claims in accordance with Section 15.2. The Initial Decision Maker shall not show partiality to the Owner or Contractor and shall not be liable for results of interpretations or decisions rendered in good faith.

§ 1.2 Correlation and Intent of the Contract Documents

§ 1.2.1 The intent of the Contract Documents is to include all items necessary for the proper execution and completion of the Work by the Contractor. The Contract Documents are complementary, and what is required by one shall be as binding as if required by all; performance by the Contractor shall be required only to the extent consistent with the Contract Documents and reasonably inferable from them as being necessary to produce the indicated results.

§ 1.2.1.1 The invalidity of any provision of the Contract Documents shall not invalidate the Contract or its remaining provisions. If it is determined that any provision of the Contract Documents violates any law, or is otherwise invalid or unenforceable, then that provision shall be revised to the extent necessary to make that provision legal and enforceable. In such case the Contract Documents shall be construed, to the fullest extent permitted by law, to give effect to the parties' intentions and purposes in executing the Contract.

§ 1.2.2 Organization of the Specifications into divisions, sections and articles, and arrangement of Drawings shall not control the Contractor in dividing the Work among Subcontractors or in establishing the extent of Work to be performed by any trade.

§ 1.2.3 Unless otherwise stated in the Contract Documents, words that have well-known technical or construction industry meanings are used in the Contract Documents in accordance with such recognized meanings.

§ 1.3 Capitalization

Terms capitalized in these General Conditions include those that are (1) specifically defined, (2) the titles of numbered articles, or (3) the titles of other documents published by the American Institute of Architects.

§ 1.4 Interpretation

In the interest of brevity, the Contract Documents frequently omit modifying words such as "all" and "any" and articles such as "the" and "an," but the fact that a modifier or an article is absent from one statement and appears in another is not intended to affect the interpretation of either statement.

§ 1.5 Ownership and Use of Drawings, Specifications, and Other Instruments of Service

§ 1.5.1 The Architect and the Architect's consultants shall be deemed the authors and owners of their respective Instruments of Service, including the Drawings and Specifications, and retain all common law, statutory, and other reserved rights in their Instruments of Service, including copyrights. The Contractor, Subcontractors, Sub-subcontractors, and suppliers shall not own or claim a copyright in the Instruments of Service. Submittal or distribution to meet official regulatory requirements or for other purposes in connection with the Project is not to be construed as publication in derogation of the Architect's or Architect's consultants' reserved rights.

§ 1.5.2 The Contractor, Subcontractors, Sub-subcontractors, and suppliers are authorized to use and reproduce the Instruments of Service provided to them, subject to any protocols established pursuant to Sections 1.7 and 1.8, solely and exclusively for execution of the Work. All copies made under this authorization shall bear the copyright notice, if any, shown on the Instruments of Service. The Contractor, Subcontractors, Sub-subcontractors, and suppliers may not use the Instruments of Service on other projects or for additions to the Project outside the scope of the Work without the specific written consent of the Owner, Architect, and the Architect's consultants.

§ 1.6 Notice

§ 1.6.1 Except as otherwise provided in Section 1.6.2, where the Contract Documents require one party to notify or give notice to the other party, such notice shall be provided in writing to the designated representative of the party to whom the notice is addressed and shall be deemed to have been duly served if delivered in person, by mail, by courier, or by electronic transmission if a method for electronic transmission is set forth in the Agreement.

§ 1.6.2 Notice of Claims as provided in Section 15.2 shall be provided in writing and shall be deemed to have been duly served only if delivered to the designated representative of the party to whom the notice is addressed by certified or registered mail, or by courier providing proof of delivery.

§ 1.7 Digital Data Use and Transmission

The parties shall agree upon protocols governing the transmission and use of Instruments of Service or any other information or documentation in digital form. The parties will use AIA Document E203™–2013, Building Information Modeling and Digital Data Exhibit, to establish the protocols for the development, use, transmission, and exchange of digital data.

§ 1.8 Building Information Models Use and Reliance

Any use of, or reliance on, all or a portion of a building information model without agreement to protocols governing the use of, and reliance on, the information contained in the model and without having those protocols set forth in AIA Document E203™–2013, Building Information Modeling and Digital Data Exhibit, and the requisite AIA Document G202™–2013, Project Building Information Modeling Protocol Form, shall be at the using or relying party's sole risk and without liability to the other party and its contractors or consultants, the authors of, or contributors to, the building information model, and each of their agents and employees.

ARTICLE 2 OWNER

§ 2.1 General

The Owner is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Owner shall designate in writing a representative who shall have express authority to bind the Owner with respect to all matters requiring the Owner's approval or authorization. Except as otherwise provided in the Contract Documents, the Architect does not have such authority. The term "Owner" means the Owner or the Owner's authorized representative.

§ 2.2 Owner's Confidential Information

Where the Owner has designated information furnished under this Section 2.2 as "confidential," the Contractor shall keep the information confidential and shall not disclose it to any other person. However, the Contractor may disclose "confidential" information, after seven (7) days' notice to the Owner, where disclosure is required by law, including a subpoena or other form of compulsory legal process issued by a court or governmental entity, or by court or arbitrator(s) order. After notice to the Owner, the Contractor may also disclose "confidential" information to its employees, consultants, sureties, Subcontractors and their employees, Sub-subcontractors, and others who need to know the content of such information solely and exclusively for the Project and who agree to maintain the confidentiality of such information.

§ 2.3 Information and Services Required of the Owner

§ 2.3.1 Except for permits and fees that are the responsibility of the Contractor under the Contract Documents, including those required under Section 3.7.1, the Owner shall secure and pay for necessary approvals, easements, assessments and charges required for construction, use or occupancy of permanent structures or for permanent changes in existing facilities.

§ 2.3.2 The Owner shall retain an architect lawfully licensed to practice architecture, or an entity lawfully practicing architecture, in the jurisdiction where the Project is located. That person or entity is identified as the Architect in the Agreement and is referred to throughout the Contract Documents as if singular in number.

§ 2.3.3 The Owner shall furnish surveys describing physical characteristics, legal limitations and utility locations for the site of the Project, and a legal description of the site. The Contractor shall be entitled to rely on the accuracy of information furnished by the Owner but shall exercise proper precautions relating to the safe performance of the Work.

§ 2.3.4 The Owner shall furnish information or services required of the Owner by the Contract Documents with reasonable promptness. The Owner shall also furnish any other information or services under the Owner's control and relevant to the Contractor's performance of the Work with reasonable promptness after receiving the Contractor's written request for such information or services.

§ 2.3.5 Unless otherwise provided in the Contract Documents, the Owner shall furnish to the Contractor one copy of the Contract Documents for purposes of making reproductions pursuant to Section 1.5.2.

§ 2.4 Owner's Right to Stop the Work

If the Contractor fails to correct Work that is not in accordance with the requirements of the Contract Documents as required by Section 12.2 or repeatedly fails to carry out Work in accordance with the Contract Documents, the Owner may issue a written order to the Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, the right of the Owner to stop the Work shall not give rise to a duty on the part of the Owner to exercise this right for the benefit of the Contractor or any other person or entity. Owner shall in no way be responsible for any delays or claims arising from delays due to enforcement of this section.

§ 2.5 Owner's Right to Carry Out the Work

If the Contractor defaults or neglects to carry out the Work in accordance with the Contract Documents and fails within a ten-day period after receipt of notice from the Owner to commence and continue correction of such default or neglect with diligence and promptness, the Owner may, without prejudice to other remedies the Owner may have, correct such default or neglect. The Architect may, pursuant to Section 9.5.1, withhold or nullify a Certificate for Payment in whole or in part, to the extent reasonably necessary to reimburse the Owner for the reasonable cost of correcting such default or neglect, including Owner's expenses and compensation for the Architect's additional services made necessary by such default, neglect, or failure. If current and future payments are not sufficient to cover such amounts, the Contractor shall pay the difference to the Owner. If the Contractor disagrees with the actions of the Owner or the Architect, or the amounts claimed as costs to the Owner, the Contractor may file a Claim pursuant to Article 15.

ARTICLE 3 CONTRACTOR

§ 3.1 General

§ 3.1.1 The Contractor is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Contractor shall be lawfully licensed, if required in the jurisdiction where the Project is located and shall maintain as current any approvals or certifications that are required to perform the Work. The term "Contractor" means the Contractor or the Contractor's authorized representative.

§ 3.1.2 The Contractor shall perform the Work in accordance with the Contract Documents.

§ 3.1.3 The Contractor shall not be relieved of its obligations to perform the Work in accordance with the Contract Documents either by activities or duties of the Architect in the Architect's administration of the Contract, or by tests, inspections or approvals required or performed by persons or entities other than the Contractor.

§ 3.2 Review of Contract Documents and Field Conditions by Contractor

§ 3.2.1 Execution of the Contract by the Contractor is a representation that the Contractor has visited the site, become generally familiar with local conditions under which the Work is to be performed, and correlated personal observations with requirements of the Contract Documents. and that said Contract Documents are full and complete, are sufficient to have enabled the Contractor to determine the cost of the Work therein to enter into the Contract and that the Contract Documents are sufficient to enable it to construct the Work outlined therein, and otherwise to fulfill all its obligations hereunder, including, but not limited to, Contractor's obligation to construct the Work for an amount not in excess of the Contract Sum on or before the date(s) of Substantial Completion established in the Agreement. The Contractor further acknowledges and declares that it has visited and examined the site, examined all physical, legal and other conditions affecting the Work and is fully familiar with all of the conditions thereon and thereunder affecting the same. In connection therewith, Contractor specifically represents and warrants to owner that it has, by careful examination, satisfied itself as to:

- (1) The nature, location and character of the Project and the site, including, without limitation, the surface and subsurface conditions of the site and all structures and obstructions thereon and thereunder, both natural and man-made, and all surface and subsurface water conditions of the site and the surrounding area
- (2) The nature, location and character of the general area in which the Project is located, including, without limitation, its climactic conditions, available labor supply and labor costs, and available equipment supply and equipment costs; and
- (3) The quality and quantity of all materials, supplies, tools, equipment, labor and professional services necessary to complete the Work in the manner and within the cost and time frame required by the Contract Documents.

In connection with the foregoing, and having carefully examined all Contract Documents as aforesaid, and having visited the site, the Contractor acknowledges and declares that it has no knowledge of any discrepancies, omissions, ambiguities, or conflicts in said Contract Documents and that if it becomes aware of any such discrepancies, omissions, ambiguities, or conflicts, it will promptly notify Owner and Architect of such knowledge.

§ 3.2.2 Because the Contract Documents are complementary, the Contractor shall, before starting each portion of the Work, carefully study and compare the various Contract Documents relative to that portion of the Work, as well as the information furnished by the Owner pursuant to Section 2.3.3, shall take field measurements of any existing conditions related to that portion of the Work, and shall observe any conditions at the site affecting it. These obligations are for the purpose of facilitating coordination and construction by the Contractor and are not for the purpose of discovering errors, omissions, or inconsistencies in the Contract Documents; however, the Contractor shall promptly give written notice to the Architect any errors, inconsistencies or omissions discovered by or made known to the Contractor as a request for information in such form as the Architect may require. It is recognized that the Contractor's review is made in the Contractor's capacity as a contractor and not as a licensed design professional, unless otherwise specifically provided in the Contract Documents.

§ 3.2.3 The Contractor is not required to ascertain that the Contract Documents are in accordance with applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, but the Contractor shall promptly report to the Architect any nonconformity discovered by or made known to the Contractor as a request for information in such form as the Architect may require. If the Contractor performs any construction activity involving an error, inconsistency or omission in the Contract Documents, that the Contractor recognized or reasonably should have recognized without such notice to the Architect, the Contractor shall assume complete responsibility for such performance and shall bear the full amount of the attributable costs for correction of the Work.

§ 3.2.4 If the Contractor believes that additional cost or time is involved because of clarifications or instructions the Architect issues in response to the Contractor's notices or requests for information pursuant to Sections 3.2.2 or 3.2.3, the Contractor shall submit Claims as provided in Article 15. If the Contractor fails to perform the obligations of Sections 3.2.2 or 3.2.3, the Contractor shall pay such costs and damages to the Owner, subject to Section 15.1, as would have been avoided if the Contractor had performed such obligations. If the Contractor performs those obligations, the Contractor shall not be liable to the Owner or Architect for damages resulting from errors, inconsistencies or omissions in the Contract Documents, for differences between field measurements or conditions and the Contract Documents, or for nonconformities of the Contract Documents to applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities.

§ 3.3 Supervision and Construction Procedures

§ 3.3.1 The Contractor shall supervise and direct the Work, using the Contractor's best skill and attention. The Contractor shall be solely responsible for, and have control over, construction means, methods, techniques, sequences, and procedures, and for coordinating all portions of the Work under the Contract. If the Contract Documents give specific instructions concerning construction means, methods, techniques, sequences, or procedures, the Contractor shall evaluate the jobsite safety thereof and shall be solely responsible for the jobsite safety of such means, methods, techniques, sequences, or procedures. If the Contractor determines that such means, methods, techniques, sequences or procedures may not be safe, the Contractor shall give timely notice to the Owner and Architect, and shall propose alternative means, methods, techniques, sequences, or procedures. The Architect shall evaluate the proposed alternative solely for conformance with the design intent for the completed construction. Unless the Architect objects to the Contractor's proposed alternative, the Contractor shall perform the Work using its alternative means, methods, techniques, sequences, or procedures.

§ 3.3.2 The Contractor shall be responsible to the Owner for acts and omissions of the Contractor's employees, Subcontractors and their agents and employees, and other persons or entities performing portions of the Work for, or on behalf of, the Contractor or any of its Subcontractors.

§ 3.3.3 The Contractor shall be responsible for inspection of portions of Work already performed to determine that such portions are in proper condition to receive subsequent Work.

§ 3.4 Labor and Materials

§ 3.4.1 Unless otherwise provided in the Contract Documents, the Contractor shall provide and pay for labor, materials, equipment, tools, construction equipment and machinery, water, heat, utilities, transportation, and other

facilities and services necessary for proper execution and completion of the Work, whether temporary or permanent and whether or not incorporated or to be incorporated in the Work.

§ 3.4.2 Except in the case of minor changes in the Work approved by the Architect in accordance with Section 3.13.8 or ordered by the Architect in accordance with Section 7.4, the Contractor may make substitutions only with the consent of the Owner, after evaluation by the Architect and in accordance with a Change Order or Construction Change Directive.

§ 3.4.3 The Contractor shall enforce strict discipline and good order among the Contractor's employees and other persons carrying out the Work. The Contractor shall not permit employment of unfit persons or persons not properly skilled in tasks assigned to them. The Contractor represents that, to the best of its knowledge, information and belief, none of its employees is engaged in conduct that constitutes a conflict of interest under, or a violation of, the School Ethics Law, N.J.S.A. 18A:12-21, et seq., and N.J.A.C. 6A:28-1.1.

§ 3.4.4 The Contractor shall be responsible for labor peace on the Project and shall at all times make its best efforts and judgment as an experienced contractor to adopt and implement policies and practices designed to avoid work stoppages, slowdowns, disputes or strikes where reasonably possible and practical under the circumstances, and shall at all times maintain Project-wide labor harmony. Except as specifically provided elsewhere in the Contract Documents, Contractor shall be liable to Owner for all damages suffered by Owner occurring as a result of work stoppages, slowdowns, disputes or strikes.

§ 3.5 Warranty

§ 3.5.1 The Contractor warrants to the Owner and Architect that materials and equipment furnished under the Contract will be of good quality and new unless the Contract Documents require or permit otherwise. The Contractor further warrants that the Work will conform to the requirements of the Contract Documents and will be free from defects, except for those inherent in the quality of the Work the Contract Documents require or permit. Work, materials, or equipment not conforming to these requirements may be considered defective. The Contractor's warranty excludes remedy for damage or defect caused by abuse, alterations to the Work not executed by the Contractor, improper or insufficient maintenance, improper operation, or normal wear and tear and normal usage. If required by the Architect, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment. Such warranty shall continue for a period of one (1) year from the date of Substantial Completion of the Work. Under this warranty, the Contractor shall remedy at his expense any such failure for the Work to be conforming to the requirement of the Contract, or any other defect appearing in the Work. In addition, the Contractor shall remedy at his own expense, any damage to Owner's owned, controlled, real or personal property, when that damage is the result of the Contractor's failure to provide any conforming Work as it relates to the Contract Documents or any other defect of equipment, material, workmanship or design. The Contractor shall also restore any Work damaged in fulfilling its obligations under the terms of this provision. The Contractor's warranty with respect to the Work repaired or replaced hereunder will run for a period of one (1) year from the date of repair or replacement.

§ 3.5.2 Should the Contractor fail to remedy any failure, defect or damage described herein within ten (10) working days after receipt of written notice from the Owner, unless extended in writing by the Owner, the Owner shall have the right to replace, repair or otherwise remedy such failure, defect or damage at the Contractor's expense.

§ 3.5.3 The Contractor agrees that all warranties in the Contract Documents survive acceptance of, delivery of, and payment for, the goods, whether any defect shall be latent or patent, shall warrant and guarantee all materials, equipment and workmanship installed under its contract to be completely in accordance with the Contract Documents. Title to all work, materials and equipment will pass to the Owner free and clear of all liens, claims, security interests or encumbrances.

§ 3.5.4 All material, equipment, or other special warranties required by the Contract Documents shall be issued in the name of the Owner, or shall be transferable to the Owner, and shall commence in accordance with Section 9.8.4.

§ 3.6 Taxes

Schools and school projects are exempt from sales tax. Notwithstanding same, the Contractor shall pay sales, consumer, use and similar taxes for the Work provided by the Contractor that are legally enacted when bids are received or negotiations concluded, whether or not yet effective or merely scheduled to go into effect.

§ 3.7 Permits, Fees, Notices and Compliance with Laws

§ 3.7.1 Unless otherwise provided in the Contract Documents, the Contractor shall secure and pay for the building permit as well as for other permits, fees, licenses, and inspections by government agencies necessary for proper execution and completion of the Work that are customarily secured after execution of the Contract and legally required at the time bids are received or negotiations concluded.

§ 3.7.2 The Contractor shall comply with and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities applicable to performance of the Work.

§ 3.7.3 If the Contractor performs Work knowing it to be contrary to applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, the Contractor shall assume appropriate responsibility for such Work and shall bear the costs attributable to correction.

§ 3.8 Concealed or Unknown Conditions

§ 3.8.1 If the Contractor encounters conditions at the site that are (1) subsurface or otherwise concealed physical conditions that differ materially from those indicated in the Contract Documents or (2) unknown physical conditions of an unusual nature that differ materially from those ordinarily found to exist and generally recognized as inherent in construction activities of the character provided for in the Contract Documents, the Contractor shall promptly provide notice to the Owner and the Architect before conditions are disturbed and in no event later than 14 days after first observance of the conditions. The Architect, after authorization by the Owner, will promptly investigate such conditions and, if the Architect determines that they differ materially and cause an increase or decrease in the Contractor's cost of, or time required for, performance of any part of the Work, will recommend that an equitable adjustment be made in the Contract Sum or Contract Time, or both. If the Architect determines that the conditions at the site are not materially different from those indicated in the Contract Documents and that no change in the terms of the Contract is justified, the Architect shall promptly notify the Owner and Contractor, stating the reasons. If either party disputes the Architect's determination or recommendation, that party may submit a Claim as provided in Article 15.

§ 3.8.2 If, in the course of the Work, the Contractor encounters human remains or recognizes the existence of burial markers, archaeological sites or wetlands not indicated in the Contract Documents, the Contractor shall immediately suspend any operations that would affect them and shall notify the Owner and Architect. Upon receipt of such notice, the Owner shall promptly take any action necessary to obtain governmental authorization required to resume the operations. The Contractor shall continue to suspend such operations until otherwise instructed by the Owner but shall continue with all other operations that do not affect those remains or features. Requests for adjustments in the Contract Sum and Contract Time arising from the existence of such remains or features may be made as provided in Article 15.

§ 3.9 Allowances

§ 3.9.1 The Contractor shall include in the Contract Sum all allowances stated in the Contract Documents. Items covered by allowances shall be supplied for such amounts and by such persons or entities as the Owner may direct.

§ 3.9.2 Unless otherwise provided in the Contract Documents.

- .1 allowances shall cover the cost to the Contractor of materials and equipment delivered at the site and all required taxes, less applicable trade discounts;
- .2 Contractor's costs for unloading and handling at the site, labor, installation costs, overhead, profit, and other expenses contemplated for stated allowance amounts shall be included in the Contract Sum but not in the allowances; and
- .3 whenever costs are more than or less than allowances, the Contract Sum shall be adjusted accordingly by Change Order. The amount of the Change Order shall reflect (1) the difference between actual costs and the allowances under Section 3.9.2.1 and (2) changes in Contractor's costs under Section 3.9.2.2. The unused balance of any allowance shall be deducted from the Contract Sum upon completion and acceptance of the Work by Change Order.

§ 3.9.3 Materials and equipment under an allowance shall be selected by the Owner with reasonable promptness.

§ 3.10 Superintendent

§ 3.10.1 The Contractor shall employ a competent superintendent and necessary assistants who shall be in attendance at the Project site during performance of the Work. The superintendent shall represent the Contractor, and communications given to the superintendent shall be as binding as if given to the Contractor.

§ 3.10.2 The Contractor, as soon as practicable after award of the Contract, shall notify the Owner and Architect of the name and qualifications of a proposed superintendent. Within 14 days of receipt of the information, the Architect may notify the Contractor, stating whether the Owner or the Architect (1) has reasonable objection to the proposed superintendent or (2) requires additional time for review. Failure of the Architect to provide notice within the 14-day period shall constitute notice of no reasonable objection.

§ 3.10.3 The Contractor shall not employ a proposed superintendent to whom the Owner or Architect has made reasonable and timely objection. The Contractor shall not change the superintendent without the Owner's consent, which shall not unreasonably be withheld or delayed.

§ 3.11 Contractor's Construction and Submittal Schedules

§ 3.11.1 The Contractor, promptly after being awarded the Contract, shall submit for the Owner's and Architect's information a Contractor's construction schedule for the Work. The schedule shall contain detail appropriate for the Project, including (1) the date of commencement of the Work, interim schedule milestone dates, and the date of Substantial Completion; (2) an apportionment of the Work by construction activity; and (3) the time required for completion of each portion of the Work. The schedule shall provide for the orderly progression of the Work to completion and shall not exceed time limits current under the Contract Documents. The schedule shall be revised at appropriate intervals as required by the conditions of the Work and Project. The schedule shall be updated every thirty (30) days and must be submitted to the Architect with Contractor's Application for Payment. If the schedule is not submitted with the payment application, no payment will be processed. Each schedule shall contain a comparison of actual progress with the estimated progress for such point in time started in the original work schedule. If any schedule submitted sets forth a date for Substantial Completion for the Work or any phase of the Work beyond the Date(s) of Substantial Completion established in the Contract (as the same may be extended as provided in the Contract Documents), then Contractor shall submit to Architect and Owner for their review and approval a description of the means and methods which Contractor intends to employ to expedite the progress of the Work to ensure timely completion of the various phases of the Work as well as the totality of the Work. To ensure such timely completion, Contractor shall take all necessary action including, without limitation, increasing the number of personnel and labor on the Project and implementing overtime and double shifts.

§ 3.11.2 The Contractor, promptly after being awarded the Contract and thereafter as necessary to maintain a current submittal schedule, shall submit a submittal schedule for the Architect's approval. The Architect's approval shall not be unreasonably delayed or withheld. The submittal schedule shall (1) be coordinated with the Contractor's construction schedule, and (2) allow the Architect reasonable time to review submittals. If the Contractor fails to submit a submittal schedule, or fails to provide submittals in accordance with the approved submittal schedule, the Contractor shall not be entitled to any increase in Contract Sum or extension of Contract Time based on the time required for review of submittals.

§ 3.11.3 The Contractor shall perform the Work in general accordance with the most recent schedules submitted to the Owner and Architect.

§ 3.11.4 Should the Contractor responsible for the scheduling requirements of Section 3 herein fail to comply with said scheduling requirements, said failure shall result in the following:

1. All Claims resulting from the Contractor's failure to prepare or submit a schedule shall be the Contractor's responsibility;
2. Such act shall constitute an act of default and a substantial breach of the Contract giving the Owner remedies under the Contract Documents; and
3. The Owner shall have the right to withhold any payments until the Contractor complies with the scheduling requirements of Section 3, herein.

§ 3.11.5 In the event of a Multiple or Five Prime Contract, the General Contractor shall be responsible for the preparation and submittal of the schedule.

§ 3.12 Documents and Samples at the Site

The Contractor shall make available, at the Project site, the Contract Documents, including Change Orders, Construction Change Directives, and other Modifications, in good order and marked currently to indicate field changes and selections made during construction, and the approved Shop Drawings, Product Data, Samples, and similar required submittals. These shall be in electronic form or paper copy, available to the Architect and Owner, and delivered to the Architect for submittal to the Owner upon completion of the Work as a record of the Work as constructed.

§ 3.13 Shop Drawings, Product Data and Samples

§ 3.13.1 Shop Drawings are drawings, diagrams, schedules, and other data specially prepared for the Work by the Contractor or a Subcontractor, Sub-subcontractor, manufacturer, supplier, or distributor to illustrate some portion of the Work.

§ 3.13.2 Product Data are illustrations, standard schedules, performance charts, instructions, brochures, diagrams, and other information furnished by the Contractor to illustrate materials or equipment for some portion of the Work.

§ 3.13.3 Samples are physical examples that illustrate materials, equipment, or workmanship, and establish standards by which the Work will be judged.

§ 3.13.4 Shop Drawings, Product Data, Samples, and similar submittals are not Contract Documents. Their purpose is to demonstrate how the Contractor proposes to conform to the information given and the design concept expressed in the Contract Documents for those portions of the Work for which the Contract Documents require submittals. Review by the Architect is subject to the limitations of Section 4.2.7. Informational submittals upon which the Architect is not expected to take responsive action may be so identified in the Contract Documents. Submittals that are not required by the Contract Documents may be returned by the Architect without action.

§ 3.13.5 The Contractor shall review for compliance with the Contract Documents, approve, and submit to the Architect, Shop Drawings, Product Data, Samples, and similar submittals required by the Contract Documents, in accordance with the submittal schedule approved by the Architect or, in the absence of an approved submittal schedule, with reasonable promptness and in such sequence as to cause no delay in the Work or in the activities of the Owner or of Separate Contractors.

§ 3.13.6 By submitting Shop Drawings, Product Data, Samples, and similar submittals, the Contractor represents to the Owner and Architect that the Contractor has (1) reviewed and approved them, (2) determined and verified materials, field measurements and field construction criteria related thereto, or will do so, and (3) checked and coordinated the information contained within such submittals with the requirements of the Work and of the Contract Documents.

§ 3.13.7 The Contractor shall perform no portion of the Work for which the Contract Documents require submittal and review of Shop Drawings, Product Data, Samples, or similar submittals, until the respective submittal has been approved by the Architect.

§ 3.13.8 The Work shall be in accordance with approved submittals except that the Contractor shall not be relieved of responsibility for deviations from the requirements of the Contract Documents by the Architect's approval of Shop Drawings, Product Data, Samples, or similar submittals, unless the Contractor has specifically notified the Architect of such deviation at the time of submittal and (1) the Architect has given written approval to the specific deviation as a minor change in the Work, or (2) a Change Order or Construction Change Directive has been issued authorizing the deviation. The Contractor shall not be relieved of responsibility for errors or omissions in Shop Drawings, Product Data, Samples, or similar submittals, by the Architect's approval thereof.

§ 3.13.9 The Contractor shall direct specific attention, in writing or on resubmitted Shop Drawings, Product Data, Samples, or similar submittals, to revisions other than those requested by the Architect on previous submittals. In the absence of such notice, the Architect's approval of a resubmission shall not apply to such revisions.

§ 3.14 Use of Site

§ 3.14.1 The Contractor shall confine operations at the site to areas permitted by applicable laws, statutes, ordinances, codes, rules and regulations, lawful orders of public authorities, and the Contract Documents and shall not unreasonably encumber the site with materials or equipment.

§ 3.14.2 The Contractor shall coordinate the Contractor's operations with, and secure the approval of, the Owner before using any portion of the site.

§ 3.14.3 The Contractor shall store its apparatuses, materials, supplies and equipment in such orderly fashion at the Site of the Work, if permitted, as will not unduly interfere with the progress of the Work or ongoing operations. The Contractor shall provide protective fencing around designated storage areas.

§ 3.14.4 The Contractor shall see that stockpiles of materials and storage of equipment are kept to a minimum and neatly stored where directed by the Owners or the Architect.

§ 3.14.5 If the Work is to be executed in areas occupied by the Owner, the Contractor shall inform the Owner in advance of the areas scheduled to be worked on, so that the Owner's personnel may make proper preparations to protect equipment and records.

§ 3.14.6 The Contractor understands that some or all of the Work of the Contract may be performed while the facilities are occupied by students and the Owner's personnel, and accordingly shall make all reasonable and necessary provisions to ensure that the contract Work will be of minimal disruption to the educational environment.

§ 3.14.7 Materials and equipment that are to be used only directly in the Work shall be brought to and stored on the project site by the Contractor. After equipment is no longer required for the Work, it shall be promptly removed from the Project Site. Protection of construction materials and equipment stored at the Project site from weather, theft, damage and all other adversity is solely the Contractor's responsibility. The Contractor shall bear the responsibility to replace all such materials that may be lost, damaged or stolen at its expense, whether such materials or equipment have been entirely or partially paid for by the Owner.

§ 3.14.8 The Contractor and any entity for whom the Contractor is responsible shall not erect any sign on the Project Site without the prior written consent of the Owner, which may be withheld in the sole discretion of the Owner.

§ 3.14.9 The Contractor shall ensure that the Work is performed, at all times, in a manner that affords reasonable access, both vehicular and pedestrian, to the Site of the Work and all adjacent areas. The Work shall be performed, to the fullest extent reasonably possible, in such a manner that public areas adjacent to the Site of the Work shall be free from all debris, building materials, and equipment likely to cause hazardous conditions.

§ 3.14.10 Without prior approval of the Owner, the Contractor shall not permit any workers to use any existing facilities at the Project Site, including, without limitation, the lavatories, toilets, entrances and parking areas, other than those designated by the Owner. Without limitation of any other provision of the Contract Documents, the Contractor shall use its best efforts to comply with all rules and regulations promulgated by the Owner in connection with the use and occupancy of the Project Site and the Building(s), as amended from time to time. The Contractor shall immediately notify the Owner in writing, if during the performance of the Work, the Contractor finds compliance with any portion of such rules and regulations to be impracticable. This notification shall set forth the problems of such compliance and shall suggest alternatives through which the same results intended by such portions of the rules and regulations can be achieved. The Owner may, in the Owner's sole discretion, adopt such suggestions, develop new alternative or require compliance with the existing requirements of the rules and regulations. The Contractor shall also comply with all insurance policies and requirements and collective bargaining agreements applicable to use and occupancy of the Project Site and the Building(s).

§ 3.15 Cutting and Patching

§ 3.15.1 The Contractor shall be responsible for cutting, fitting, or patching required to complete the Work or to make its parts fit together properly. All areas requiring cutting, fitting, or patching shall be restored to the condition existing prior to the cutting, fitting, or patching, unless otherwise required by the Contract Documents. Any costs incurred by the Owner for defective cutting or patching shall be borne by the Contractor responsible therefor.

§ 3.15.2 The Contractor shall not damage or endanger a portion of the Work or fully or partially completed construction of the Owner or Separate Contractors by cutting, patching, or otherwise altering such construction, or by excavation. The Contractor shall not cut or otherwise alter construction by the Owner or a Separate Contractor except with written consent of the Owner and of the Separate Contractor. Consent shall not be unreasonably withheld. The Contractor shall not unreasonably withhold, from the Owner or a Separate Contractor, its consent to cutting or otherwise altering the Work.

§3.15.3 The Contractor shall be responsible for all fire safety and prevention work relative to the Work of the Contract, and shall complete all such work in a timely manner so as not to delay or damage the work of subsequent trades and other Contractors.

§ 3.16 Cleaning Up

§ 3.16.1 The Contractor shall keep the premises and surrounding area free from accumulation of waste materials and rubbish caused by operations under the Contract. At completion of the Work, the Contractor shall remove waste materials, rubbish, the Contractor's tools, construction equipment, machinery, and surplus materials from and about the Project.

§ 3.16.2 If the Contractor fails to clean up as provided in the Contract Documents, the Owner may do so and the Owner shall be entitled to reimbursement from the Contractor or shall be entitled to reduce the Contract Amount in an amount equal to the Owner's cleaning costs.

§ 3.16.3 The Contractor shall on a daily basis, clean debris resulting from its Work, and protect construction in progress and maintain adjoining materials in place during handling and installation, and provide protective covering where required to assure protection from damage or deterioration until Substantial Completion.

§ 3.16.4 The Contractor shall clean and provide maintenance on completed construction, after installation, as frequently as necessary through the remainder of the construction period.

§ 3.16.5 The Contractor shall supervise its construction operations to assure that no part of the construction, whether completed, or in progress, is subject to harmful, dangerous, damaging or otherwise deleterious exposure during the construction period. The term "clean" shall include the removal of debris from the work area to dumpsters furnished by the Contractor.

§ 3.16.6 Final Clean Up. The Contractor shall perform final clean-up and policing of the entire site after other contractors have removed their own waste materials, rubbish, equipment and tools. In addition, the Contractor, either by himself or through retaining of a professional cleaning company, shall perform the following immediately prior to the Architect's inspection for Substantial Completion:

1. Removal of all manufacturer's temporary labels from materials, equipment and fixtures;
2. Removal of all stains from glass and mirrors, wash, polish, inside and outside;
3. Removal of all marks, stains, fingerprints, other soil, dust and dirt from painted decorated or stained woodwork, plaster or plasterboard, metal, acoustic, tile and equipment surfaces;
4. Removal of spots, paint and soil from resilient flooring;
5. Removal of temporary floor protections, clean, strip and provide three (3) coats of wax on new VCT floors or otherwise treat as directed by the material manufacturer's recommendation, all finished floors and final vacuuming of all carpet;
6. Cleaning of all interior finished surfaces, including doors and window frames, and hardware required to have a polished finish, or oil, stains, dust, dirt, paint and the like; leave without fingerprints and blemishes; and
7. Final site clean-up shall extend beyond the Contract Limit Lines as reasonably required to insure the complete removal of all construction debris from the entire site, including staging areas.

§ 3.17 Access to Work

The Contractor shall provide the Owner and Architect with access to the Work in preparation and progress wherever located.

§ 3.18 Royalties, Patents and Copyrights

The Contractor shall pay all royalties and license fees. The Contractor shall defend suits or claims for infringement of copyrights and patent rights and shall hold the Owner and Architect harmless from loss on account thereof, but shall not be responsible for defense or loss when a particular design, process, or product of a particular manufacturer or manufacturers is required by the Contract Documents, or where the copyright violations are contained in Drawings, Specifications, or other documents prepared by the Owner or Architect. However, if an infringement of a copyright or patent is discovered by, or made known to, the Contractor, the Contractor shall be responsible for the loss unless the information is promptly furnished to the Architect.

§ 3.19 Indemnification

§ 3.19.1 To the fullest extent permitted by law, the Contractor shall indemnify and hold harmless the Owner, the Architect, and their respective agents, officers, employees and servants, from any and all claims, demands, suits, damages, costs and expenses, including reasonable attorney's fees, whether or not caused, in part by any party indemnified hereunder, arising out of or in any way related to the project, and including but not limited to the following:

- .1 the acts or omissions of the Contractor, its agents, servants, officers, employees, subcontractors, sub-consultants or any other person working at the Contractor's request, subject to its discretion, or on its behalf;
- .2 the loss of life or property, or injury or damage to the person, body or property of any person or persons whatsoever, that arises or results directly or indirectly from performance of the work or delivery of deliverables by the Contractor, its agents, servants, officers, employees, subcontractors, sub-consultants, or any other person acting at the Contractor's request, subject to its direction, or on its behalf, including any claims arising out of or resulting from the Contractor's payment or nonpayment to subcontractors, sub-subcontractors, suppliers, fabricators, sources of supply, articles, devices, fixtures, pieces of equipment, materials, processes proposed for each item of work (referred to herein and elsewhere in this agreement as "subcontractors and materials suppliers");
- .3 any negligence, default, breach, or errors or omissions of the Contractor, its agents, servants, officers, employees, subcontractors, sub-consultants, or any other person acting at the Contractor's request, subject to its direction, or on its behalf;
- .4 violation or non-compliance, with federal, state, local, municipal laws and regulations, ordinances, building codes (including without limitation the Americans with Disabilities Act, OSHA, Environmental Protection Act) arising from the performance or non-performance of; or arising out of conditions created or caused to be created by, the Contractor, its agents, servants, officers, employees, subcontractors, sub-consultants, or any other person acting at the Contractor's request, subject to its direction, or on its behalf;
- .5 the use, misuse or failure of any equipment, workmanship, and materials; and
- .6 the use of copyrighted or un-copyrighted materials, composition, secret process, patented or unpatented invention, article or appliance furnished or used in the performance of the work.

§3.19.2 The indemnified parties themselves may defend, at the Contractor's expense, from any claim or lawsuit or the indemnified parties may elect to have the Contractor provide the indemnified parties with legal representation at the Contractor's own expense.

§3.19.3 The Indemnification obligations of the Contractor shall be deemed to include the indemnification Obligations of the Contractor's subcontractors and suppliers.

§3.19.4 The indemnification obligations of the Contractor shall not be limited in any way by any limitation on the amount or type of damages, compensation or benefits payable by or for the Contractor or any Subcontractor under Workmen's Compensation Acts, Disability Benefit Acts or other Employee Benefit Acts. Such obligation shall not

be construed to negate, abridge or diminish other rights or obligations of indemnity which would otherwise exist as to any party or person indemnified herein.

§3.19.5 The provisions of this section entitled “Indemnification” shall survive the termination of the contract documents.

ARTICLE 4 ARCHITECT

§ 4.1 General

§ 4.1.1 The Architect is the person or entity retained by the Owner pursuant to Section 2.3.2 and identified as such in the Agreement.

§ 4.1.2 Duties, responsibilities, and limitations of authority of the Architect as set forth in the Contract Documents shall not be restricted, modified, or extended without written consent of the Owner, Contractor, and Architect. Consent shall not be unreasonably withheld.

§ 4.2 Administration of the Contract

§ 4.2.1 The Architect will provide administration of the Contract as described in the Contract Documents.

§ 4.2.2 The Architect will visit the site at intervals appropriate to the stage of construction, or as otherwise agreed with the Owner, to become generally familiar with the progress and quality of the portion of the Work completed, and to determine in general if the Work observed is being performed in a manner indicating that the Work, when fully completed, will be in accordance with the Contract Documents. However, the Architect will not be required to make exhaustive or continuous on-site inspections to check the quality or quantity of the Work. The Architect will not have control over, charge of, or responsibility for the construction means, methods, techniques, sequences or procedures, or for the safety precautions and programs in connection with the Work, since these are solely the Contractor’s rights and responsibilities under the Contract Documents.

§ 4.2.3 On the basis of the site visits, the Architect will keep the Owner reasonably informed about the progress and quality of the portion of the Work completed, and promptly report to the Owner (1) known deviations from the Contract Documents, (2) known deviations from the most recent construction schedule submitted by the Contractor, and (3) defects and deficiencies observed in the Work. The Architect will not be responsible for the Contractor’s failure to perform the Work in accordance with the requirements of the Contract Documents. The Architect will not have control over or charge of, and will not be responsible for acts or omissions of, the Contractor, Subcontractors, or their agents or employees, or any other persons or entities performing portions of the Work.

§ 4.2.4 Communications

The Owner and Contractor shall include the Architect in all communications that relate to or affect the Architect’s services or professional responsibilities. The Owner shall promptly notify the Architect of the substance of any direct communications between the Owner and the Contractor otherwise relating to the Project. Communications by and with the Architect’s consultants shall be through the Architect. Communications by and with Subcontractors and suppliers shall be through the Contractor. Communications by and with Separate Contractors shall be through the Owner. The Contract Documents may specify other communication protocols.

§ 4.2.5 Based on the Architect’s evaluations of the Contractor’s Applications for Payment, the Architect will review and certify the amounts due the Contractor and will issue Certificates for Payment in such amounts.

§ 4.2.6 The Architect has authority to reject Work that does not conform to the Contract Documents. Whenever the Architect considers it necessary or advisable, the Architect will have authority to require inspection or testing of the Work in accordance with Sections 13.9.2 and 13.9.3, whether or not the Work is fabricated, installed or completed. However, neither this authority of the Architect nor a decision made in good faith either to exercise or not to exercise such authority shall give rise to a duty or responsibility of the Architect to the Contractor, Subcontractors, suppliers, their agents or employees, or other persons or entities performing portions of the Work.

§ 4.2.7 The Architect will review and approve, or take other appropriate action upon, the Contractor’s submittals such as Shop Drawings, Product Data, and Samples, but only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. The Architect’s basic compensation for contract administration includes review of an initial submittal and one re-submittal. Additional services

compensation for the Architect's third and subsequent reviews of submittals will be back-charged to the Contractor with a change order. No change in contract time will be made as a result of a third, and subsequent, review. The Architect's action will be taken in accordance with the submittal schedule approved by the Architect or, in the absence of an approved submittal schedule, with reasonable promptness while allowing sufficient time in the Architect's professional judgment to permit adequate review. Review of such submittals is not conducted for the purpose of determining the accuracy and completeness of other details such as dimensions and quantities, or for substantiating instructions for installation or performance of equipment or systems, all of which remain the responsibility of the Contractor as required by the Contract Documents. The Architect's review of the Contractor's submittals shall not relieve the Contractor of the obligations under Sections 3.3, 3.5, and 3.12. The Architect's review shall not constitute approval of safety precautions or of any construction means, methods, techniques, sequences, or procedures. The Architect's approval of a specific item shall not indicate approval of an assembly of which the item is a component.

§ 4.2.8 The Architect will prepare Change Orders and Construction Change Directives, and may order minor changes in the Work as provided in Section 7.4. The Architect will, upon authorization by the Owner, investigate and make determinations and recommendations regarding concealed and unknown conditions as provided in Section 3.8.

§ 4.2.9 The Architect will conduct inspections to determine the date or dates of Substantial Completion and the date of final completion; issue Certificates of Substantial Completion pursuant to Section 9.8; receive and forward to the Owner, for the Owner's review and records, written warranties and related documents required by the Contract and assembled by the Contractor pursuant to Section 9.10; and issue a final Certificate for Payment pursuant to Section 9.10.

§ 4.2.10 The Architect will interpret and decide matters concerning performance under, and requirements of, the Contract Documents on written request of either the Owner or Contractor. The Architect's response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness.

§ 4.2.11 Interpretations and decisions of the Architect will be consistent with the intent of, and reasonably inferable from, the Contract Documents and will be in writing or in the form of drawings. When making such interpretations and decisions, the Architect will endeavor to secure faithful performance by both Owner and Contractor, will not show partiality to either, and will not be liable for results of interpretations or decisions rendered in good faith.

§ 4.2.12 The Architect will review and respond to requests for information about the Contract Documents. The Architect's response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness, while allowing sufficient time in the Architect's professional judgment to permit adequate review and response. If appropriate, the Architect will prepare and issue supplemental Drawings and Specifications in response to the requests for information.

ARTICLE 5 SUBCONTRACTORS

§ 5.1 Definitions

§ 5.1.1 A Subcontractor is a person or entity who has a direct contract with the Contractor to perform a portion of the Work at the site. The term "Subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Subcontractor or an authorized representative of the Subcontractor. The term "Subcontractor" does not include a Separate Contractor or the subcontractors of a Separate Contractor.

§ 5.1.2 A Sub-subcontractor is a person or entity who has a direct or indirect contract with a Subcontractor to perform a portion of the Work at the site. The term "Sub-subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Sub-subcontractor or an authorized representative of the Sub-subcontractor.

§ 5.2 Award of Subcontracts and Other Contracts for Portions of the Work

§ 5.2.1 Identification of subcontractors required by N.J.S.A. 18A:18A-18, shall be provided with the bid submission in accordance with the requirements of that statute. Names of persons or entities for any subcontractor not referenced by the above statutes shall be furnished within ten (10) days of notification of the Award of Contract. The Owner will notify the Contractor in writing if the Owner has reasonable objection to any such proposed subcontractor. The list of proposed subcontractors shall include a description of the materials and equipment each proposes to furnish and install in the Work. The description shall be in sufficient detail to allow the Architect to determine general conformance to the Contract requirements. Approval of the submittals as required under this Section shall not relieve the Contractor from complying with the requirements of the Contract Documents.

§ 5.2.2 Subcontractors shall comply with the statutory requirements of N.J.S.A. 34:11-56.25 and N.J.S.A. 34:11-56.48 (prevailing wage and contractor registration). Any subcontractor who fails to comply with these statutory provisions shall be rejected. All subcontractors, including those subcontractors not listed in N.J.S.A. 18A:18A-18, must be classified by the Department of Treasury, Division of Property, Management and Construction.

§ 5.2.3 Written confirmation of award of each subcontractor shall be submitted to the Owner, in form subject to its approval, within seven (7) days after receipt of Owner's approval of proposed subcontractor list as provided under this Section. Every subcontract shall be in writing, shall be submitted to the Owner for review and approval prior to execution, and shall specifically provide that the Owner is an intended third (3rd) party beneficiary of such subcontract.

§ 5.2.4 The Contractor shall not contract with a proposed person or entity to whom the Owner or Architect has made reasonable and timely objection. The Contractor shall not be required to contract with anyone to whom the Contractor has made reasonable objection.

§ 5.2.5 The Contractor shall not substitute a Subcontractor, person, or entity for one previously selected without prior approval by the Owner or Architect..

§ 5.3 Subcontractual Relations

§ 5.3.1 By appropriate written agreement, the Contractor shall require each Subcontractor, to the extent of the Work to be performed by the Subcontractor, to be bound to the Contractor by terms of the Contract Documents, and to assume toward the Contractor all the obligations and responsibilities, including the responsibility for safety of the Subcontractor's Work that the Contractor, by these Contract Documents, assumes toward the Owner and Architect. Each subcontract agreement shall preserve and protect the rights of the Owner and Architect under the Contract Documents and the law. No subcontract shall diminish in any way any rights or benefits conferred upon the Owner by these Contract Documents. Where appropriate, the Contractor shall require each Subcontractor to enter into similar agreements with Sub-subcontractors. The Contractor shall make available to each proposed Subcontractor, prior to the execution of the subcontract agreement, copies of the Contract Documents to which the Subcontractor will be bound, and, upon written request of the Subcontractor, identify to the Subcontractor terms and conditions of the proposed subcontract agreement that may be at variance with the Contract Documents. Subcontractors will similarly make copies of applicable portions of such documents available to their respective proposed Sub-subcontractors.

§ 5.3.2 Where the Contractor sublets portions of the Work, the entire responsibility for the subdividing of Work rests with the Contractor. The Owner and the Architect are not responsible for the manner of the subdivision of the Work, nor will they enter into or settle disagreements or disputes between the Contractor and subcontractors. The Contractor is, and will be held, responsible for the proper execution of the Work of any and all subcontractors.

§ 5.4 Contingent Assignment of Subcontracts

Each subcontract agreement for a portion of the Work is assigned by the Contractor to the Owner, provided that assignment is effective only after termination of the Contract by the Owner for cause pursuant to Section 14.2 and only for those subcontract agreements that the Owner accepts by notifying the Subcontractor and Contractor.

ARTICLE 6 CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS

§ 6.1 Owner's Right to Perform Construction and to Award Separate Contracts

§ 6.1.1 The term "Separate Contractor(s)" shall mean other contractors retained by the Owner under separate agreements. The Owner reserves the right to perform construction or operations related to the Project, including the performance of Work to correct the Contractor's deficient Work, if any, with the Owner's own forces, and with Separate Contractors retained.

§ 6.1.2 When separate contracts are awarded for different portions of the Project or other construction or operations on the site, the term "Contractor" in the Contract Documents in each case shall mean the Contractor who executes each separate Owner-Contractor Agreement.

§ 6.2 Mutual Responsibility

§ 6.2.1 The Contractor shall afford the Owner and Separate Contractors reasonable opportunity for introduction and storage of their materials and equipment and performance of their activities, and shall connect and coordinate the Contractor's construction and operations with theirs as required by the Contract Documents.

§ 6.2.2 If part of the Contractor's Work depends for proper execution or results upon construction or operations by the Owner or a Separate Contractor, the Contractor shall, prior to proceeding with that portion of the Work, promptly notify the Architect of apparent discrepancies or defects in the construction or operations by the Owner or Separate Contractor that would render it unsuitable for proper execution and results of the Contractor's Work. Failure of the Contractor to notify the Architect of apparent discrepancies or defects prior to proceeding with the Work shall constitute an acknowledgment that the Owner's or Separate Contractor's completed or partially completed construction is fit and proper to receive the Contractor's Work.

§ 6.2.3 The Contractor shall reimburse the Owner for costs the Owner incurs that are payable to a Separate Contractor because of the Contractor's delays, improperly timed activities or defective construction. The Owner shall be responsible to the Contractor for costs the Contractor incurs because of a Separate Contractor's delays, improperly timed activities, damage to the Work or defective construction.

§ 6.2.4 The Contractor shall promptly remedy damage that the Contractor wrongfully causes to completed or partially completed construction or to property of the Owner or Separate Contractor as provided in Section 10.2.5.

§ 6.2.5 The Owner and each Separate Contractor shall have the same responsibilities for cutting and patching as are described for the Contractor in Section 3.15.

§ 6.2.6 Costs caused by delays, improperly timed activities or defective construction, caused by the Contractor, shall be borne by the Contractor.

§ 6.3 Owner's Right to Clean Up

If a dispute arises among the Contractor, Separate Contractors, and the Owner as to the responsibility under their respective contracts for maintaining the premises and surrounding area free from waste materials and rubbish, the Owner may clean up and the Architect will allocate the cost among those whom the Owner, in its sole discretion, deems responsible.

ARTICLE 7 CHANGES IN THE WORK

§ 7.1 General

§ 7.1.1 Changes in the Work may be accomplished after execution of the Contract, and without invalidating the Contract, by Change Order, Construction Change Directive or order for a minor change in the Work, subject to the limitations stated in this Article 7 and elsewhere in the Contract Documents. Change Orders and Construction Change Directives shall be subject to and processed in accordance with N.J.A.C. 6A:26-4.9 (Capital Projects only) and N.J.A.C. 6A:23A-21.1, where applicable.

§ 7.1.2 A Change Order shall be based upon agreement among the Owner, Contractor, and Architect. A Construction Change Directive requires agreement by the Owner and Architect and may or may not be agreed to by the Contractor. An order for a minor change in the Work, which does not extend the Contract time, increase the Contract Sum or change the Project Scope, may be issued by the Architect alone.

§ 7.1.3 Changes in the Work shall be performed under applicable provisions of the Contract Documents. The Contractor shall proceed promptly with changes in the Work, unless otherwise provided in the Change Order, Construction Change Directive, or order for a minor change in the Work.

§ 7.1.4 In order to facilitate checking of quotations for extras or credits, all proposals shall be accompanied by a complete itemization of costs including labor, materials and subcontracts. Labor and materials shall be itemized in the manner prescribed above. Where major cost items are subcontracts, they shall also be itemized. In no case will a change be approved without such itemization.

§ 7.2 Change Orders

§ 7.2.1 A Change Order is a written instrument prepared by the Architect and signed by the Owner, Contractor, and Architect stating their agreement upon all of the following:

- .1 The change in the Work;
- .2 The amount of the adjustment, if any, in the Contract Sum; and
- .3 The extent of the adjustment, if any, in the Contract Time.

§ 7.2.2 Agreement on any Change Order shall constitute a final settlement of all matters relating to the change in the Work that is the subject of the Change Order, including, but not limited to, all direct and indirect costs associated with such change, and any and all adjustments to the Contract Sum and the construction schedule. In the event a Change Order increases the Contract Sum, the Contractor shall include the Work covered by such Change Order in the Application for Payment as if such work were originally part of the Contract Documents.

§ 7.3 Construction Change Directives

§ 7.3.1 A Construction Change Directive is a written order prepared by the Architect and signed by the Owner and Architect, directing a change in the Work prior to agreement on adjustment, if any, in the Contract Sum or Contract Time, or both. The Owner may by Construction Change Directive, without invalidating the Contract, order changes in the Work within the general scope of the Contract consisting of additions, deletions, or other revisions, the Contract Sum and Contract Time being adjusted accordingly.

§ 7.3.2 A Construction Change Directive shall be used in the absence of total agreement on the terms of a Change Order.

§ 7.3.3 If the Construction Change Directive provides for an adjustment to the Contract Sum, the adjustment shall be based on one of the following methods:

- .1 Mutual acceptance of a lump sum properly itemized and supported by sufficient substantiating data to permit evaluation;
- .2 Unit prices stated in the Contract Documents or subsequently agreed upon;
- .3 Cost to be determined in a manner agreed upon by the parties and a mutually acceptable fixed or percentage fee; or
- .4 As provided in Section 7.3.4.

§ 7.3.4 If the Contractor does not respond promptly or disagrees with the method for adjustment in the Contract Sum, the Architect shall determine the adjustment on the basis of reasonable expenditures and savings of those performing the Work attributable to the change, including, in case of an increase in the Contract Sum, an amount for overhead and profit as set forth in the Agreement, or if no such amount is set forth in the Agreement, a reasonable amount. In such case, and also under Section 7.3.3.3, the Contractor shall keep and present, in such form as the Architect may prescribe, an itemized accounting together with appropriate supporting data. Unless otherwise provided in the Contract Documents, costs for the purposes of this Section 7.3.4 shall be limited to the following:

- .1 Costs of labor, including applicable payroll taxes, fringe benefits required by agreement or custom, workers' compensation insurance, and other employee costs approved by the Architect;
- .2 Costs of materials, supplies, and equipment, including cost of transportation, whether incorporated or consumed;
- .3 Rental costs of machinery and equipment, exclusive of hand tools, whether rented from the Contractor or others; and
- .4 Costs of premiums for all bonds and insurance, permit fees, and sales, use, or similar taxes, directly related to the change.

§ 7.3.5 If the Contractor disagrees with the adjustment in the Contract Time, the Contractor may make a Claim in accordance with applicable provisions of Article 15.

§ 7.3.6 Upon receipt of a Construction Change Directive, the Contractor shall promptly proceed with the change in the Work involved and advise the Architect of the Contractor's agreement or disagreement with the method, if any, provided in the Construction Change Directive for determining the proposed adjustment in the Contract Sum or Contract Time.

§ 7.3.7 A Construction Change Directive signed by the Contractor indicates the Contractor's agreement therewith, including adjustment in Contract Sum and Contract Time or the method for determining them. Such agreement shall be effective immediately and shall be recorded as a Change Order.

§ 7.3.8 The amount of credit to be allowed by the Contractor to the Owner for a deletion or change that results in a net decrease in the Contract Sum shall be actual net cost as confirmed by the Architect. When both additions and credits covering related Work or substitutions are involved in a change, the allowance for overhead and profit shall be figured on the basis of net increase, if any, with respect to that change.

§ 7.3.9 Pending final determination of the total cost of a Construction Change Directive to the Owner, the Contractor may request payment for Work completed under the Construction Change Directive in Applications for Payment. The Architect will make an interim determination for purposes of monthly certification for payment for those costs and certify for payment the amount that the Architect determines, in the Architect's professional judgment, to be reasonably justified. The Architect's interim determination of cost shall adjust the Contract Sum on the same basis as a Change Order, subject to the right of either party to disagree and assert a Claim in accordance with Article 15.

§ 7.3.10 When the Owner and Contractor agree with a determination made by the Architect concerning the adjustments in the Contract Sum and Contract Time, or otherwise reach agreement upon the adjustments, such agreement shall be effective immediately and the Architect will prepare a Change Order. Change Orders may be issued for all or any part of a Construction Change Directive.

§ 7.3.11 Lump sum quotations for changes in the Work will not be accepted. Proposals shall be completely itemized and broken down. The Proposals shall be accompanied by such supporting data as the Architect may require, such as copies of subcontractor's or vendor's quotations, quantity take-off sheets, or other similar information. § 7.4 Minor Changes in the Work The Architect may order minor changes in the Work that are consistent with the intent of the Contract Documents and do not involve an adjustment in the Contract Sum or an extension of the Contract Time. The Architect's order for minor changes shall be in writing. If the Contractor believes that the proposed minor change in the Work will affect the Contract Sum or Contract Time, the Contractor shall notify the Architect and shall not proceed to implement the change in the Work. If the Contractor performs the Work set forth in the Architect's order for a minor change without prior notice to the Architect that such change will affect the Contract Sum or Contract Time, the Contractor waives any adjustment to the Contract Sum or extension of the Contract Time.

§ 7.3.12 In subparagraphs 7.2.1, 7.3.3, 7.3.4 or any other applicable provisions of the Contract Documents pertaining to overhead and profit, the allowance for overhead and profit combined shall be based upon the following schedule:

1. For the Contractor, for work performed by its own forces, 10% of cost;
2. For each subcontractor, for the work performed by its own forces, 10% of cost;
3. For the Contractor, for work performed by a subcontractor, 5% of cost.

ARTICLE 8 TIME

§ 8.1 Definitions

§ 8.1.1 Unless otherwise provided, Contract Time is the period of time, including authorized adjustments, allotted in the Contract Documents for all Work and services as required under the Contract. Substantial Completion of the Work shall be accomplished within a period of consecutive calendar days (or by the date) as stated in the Agreement, plus any authorized extensions of time as approved by written agreement. Final Completion of the Work shall be no later than thirty (30) consecutive calendar days from the date of Substantial Completion of the Work, unless otherwise set forth in Article 3 of the Agreement.

§ 8.1.2 The term "day" as used in the Contract Documents shall mean calendar day unless otherwise specifically defined.

§ 8.2 Progress and Completion

§ 8.2.1 Time limits stated in the Contract Documents are of the essence of the Contract. By executing the Agreement, the Contractor confirms that the Contract Time is a reasonable period for performing the Work. No bonus or incentive shall be paid should the Work or any portion thereof, be completed in advance of the specified activity milestone dates.

§ 8.2.2 The Contractor shall not knowingly, except by agreement or instruction of the Owner in writing, commence the Work prior to the effective date of insurance required to be furnished by the Contractor and Owner.

§ 8.2.3 The Contractor shall proceed expeditiously with adequate forces and shall achieve Substantial Completion within the Contract Time.

§ 8.3 Delays and Extensions of Time

§ 8.3.1 Claims relating to time shall be made in accordance with applicable provisions of Article 15.

§ 8.3.2 No payment, compensation or adjustment of any kind shall be made to the Contractor by the Owner for damages resulting from hindrances or delays caused by the delays of other contractors, or from foreseeable circumstances not attributable to the Owner's conduct. The Contractor agrees that it will make no claim against the Owner for payment, compensation, damages, mitigation of Liquidated Damages, or adjustment of any kind for such hindrances or delays, and will accept such extension of time as may be granted by the Owner in the Owner's sole discretion in full satisfaction for any and all alleged claims against the Owner for any and all such hindrances or delays. For purposes of this Agreement, disputes arising between contractors before or during construction, adverse weather conditions, and delays on the part of local authorities issuing permits shall be considered foreseeable circumstances. Any costs incurred by the Owner including, but not limited to, wages and other expenditures paid by the Owner to the Architect, if any, other individual or entity, or to any inspector or inspectors necessarily employed by it on the work, for any number of days in excess of the Contract Time, shall be deducted from the Contract Sum.

§ 8.3.3 The provision of this Article shall not be so interpreted or construed as to preclude or prevent the Contractor from making and prosecuting any claim against any separate Contractor employed or engaged by the Owner for damages alleged to have been caused or occasioned by any such separate Contractor.

§ 8.3.4 Should the Contractor fail to complete fully, and in conformity with all provisions of the Contract within the Contract Time, the Contractor shall, and hereby agrees to pay the Owner liquidated damages in the per-day amount set forth in Article 3 of the Standard Form of Agreement between Owner and Contractor (A101 Document – 2017) for missed milestones, for each consecutive calendar day beyond the number of days allowed by the Contractor or by agreement with the Owner. Said liquidated damages sum is agreed upon as reasonable and a proper measure of damages that the Owner will sustain per diem by failure of Contractor to complete Work within time as stipulated; it being recognized by Owner and Contractor that the injury to Owner that could result from a failure of the Contractor to complete on schedule, is uncertain and cannot be computed exactly. In no way shall costs of Liquidated Damages be construed as a penalty to the Contractor.

§ 8.3.5 It is expressly understood and agreed by and between the Contractor and Owner that the Contract Time prescribed herein is a reasonable time for the completion of the Work.

ARTICLE 9 PAYMENTS AND COMPLETION

§ 9.1 Contract Sum

§ 9.1.1 The Contract Sum is stated in the Agreement and, including authorized adjustments, is the total amount payable by the Owner to the Contractor for performance of the Work under the Contract Documents.

§ 9.1.2 If unit prices are stated in the Contract Documents or subsequently agreed upon, and if quantities originally contemplated are materially changed so that application of such unit prices to the actual quantities causes substantial inequity to the Owner or Contractor, the applicable unit prices shall be equitably adjusted.

§ 9.2 Schedule of Values

Where the Contract is based on a stipulated sum or Guaranteed Maximum Price, the Contractor shall submit a schedule of values to the Architect before the first Application for Payment, allocating the entire Contract Sum to the various portions of the Work. The schedule of values shall be prepared in the form, and supported by the data to substantiate its accuracy, required by the Architect. This schedule, unless objected to by the Architect, shall be used as a basis for reviewing the Contractor's Applications for Payment. Any changes to the schedule of values shall be submitted to the Architect and supported by such data to substantiate its accuracy as the Architect may require, and unless objected to by the Architect, shall be used as a basis for reviewing the Contractor's subsequent Applications for Payment.

§ 9.3 Applications for Payment

§ 9.3.1 The Contractor shall submit to the Architect an itemized Application for Payment prepared in accordance with the Contract Documents and schedule of values, if required under Section 9.2, for completed portions of the Work. The application shall be notarized, if required, and supported by all data substantiating the Contractor's right to payment that the Owner or Architect require, such as copies of requisitions, and releases and waivers of liens from Subcontractors and suppliers, and shall reflect retainage if provided for in the Contract Documents.

§ 9.3.1.1 Applications for Payments may include requests for payment on account of changes in the Work which have been properly authorized by Construction Change Directives but not yet included in Change Orders.

§ 9.3.1.2 Applications for Payment shall not include requests for payment for portions of the Work for which the Contractor does not intend to pay a Subcontractor or supplier, unless such Work has been performed by others whom the Contractor intends to pay.

§ 9.3.1.3 All applications for payment shall be accompanied by the Application and Certificate for Payment, AIA Document G702 and the Continuation Sheet, AIA Document G703, fully completed as required.

§ 9.3.1.4 In cases where the work is awarded on a Single Overall Contract basis, payments shall be made in accordance with applicable State of New Jersey statutes.

§ 9.3.2 Unless otherwise provided in the Contract Documents, payments shall be made on account of materials and equipment delivered and suitably stored at the site for subsequent incorporation in the Work. If approved in advance by the Owner, payment may similarly be made for materials and equipment suitably stored off the site at a location agreed upon in writing. Payment for materials and equipment stored on or off the site shall be conditioned upon compliance by the Contractor with procedures satisfactory to the Owner to establish the Owner's title to such materials and equipment or otherwise protect the Owner's interest, and shall include the costs of applicable insurance, storage, and transportation to the site, for such materials and equipment stored off the site.

§ 9.3.2.1 The Contractor warrants that title to all Work covered by an Application for Payment will pass to the Owner no later than the time of payment. The Contractor further warrants that upon submittal of an Application for Payment all Work for which Certificates for Payment have been previously issued and payments received from the Owner shall, to the best of the Contractor's knowledge, information, and belief, be free and clear of liens, claims, security interests, or encumbrances, in favor of the Contractor, Subcontractors, suppliers, or other persons or entities that provided labor, materials, and equipment relating to the Work.

§ 9.3.2.2 All municipal mechanic's liens filed by a lien claimant shall be governed by N.J.S.A. 2A:44-125 et seq. In the event a municipal mechanic's lien is filed, the Owner reserves the right to withhold the full amount of the lien. The Owner may release the funds to the party against whose account the lien is claimed, only after that party files with the Owner's financial officer, a bond in an amount double of all sums claimed ("Double Bond") under the lien, and such bond's form has been approved by the Owner's financial officer, per N.J.S.A. 2A:44-130 or if an acceptable release of liens is filed by the lien claimant.

§ 9.4 Certificates for Payment

§ 9.4.1 The Architect will, within seven days after receipt of the Contractor's Application for Payment, either (1) issue to the Owner a Certificate for Payment in the full amount of the Application for Payment, with a copy to the Contractor; or (2) issue to the Owner a Certificate for Payment for such amount as the Architect determines is properly due, and notify the Contractor and Owner of the Architect's reasons for withholding certification in part as provided in Section 9.5.1; or (3) withhold certification of the entire Application for Payment, and notify the Contractor and Owner of the Architect's reason for withholding certification in whole as provided in Section 9.5.1.

§ 9.4.2 The issuance of a Certificate for Payment will constitute a representation by the Architect to the Owner, based on the Architect's evaluation of the Work and the data in the Application for Payment, that, to the best of the Architect's knowledge, information, and belief, the Work has progressed to the point indicated, the quality of the Work is in accordance with the Contract Documents, and that the Contractor is entitled to payment in the amount certified. The foregoing representations are subject to an evaluation of the Work for conformance with the Contract Documents upon Substantial Completion, to results of subsequent tests and inspections, to correction of minor deviations from the Contract Documents prior to completion, and to specific qualifications expressed by the Architect. However, the issuance of a Certificate for Payment will not be a representation that the Architect has (1) made exhaustive or continuous on-site inspections to check the quality or quantity of the Work; (2) reviewed construction means, methods, techniques, sequences, or procedures; (3) reviewed copies of requisitions received from Subcontractors and suppliers and other data requested by the Owner to substantiate the Contractor's right to payment; or (4) made examination to ascertain how or for what purpose the Contractor has used money previously paid on account of the Contract Sum.

§ 9.5 Decisions to Withhold Certification

§ 9.5.1 The Architect may withhold a Certificate for Payment in whole or in part, to the extent reasonably necessary to protect the Owner, if in the Architect's opinion the representations to the Owner required by Section 9.4.2 cannot be made. If the Architect is unable to certify payment in the amount of the Application, the Architect will notify the Contractor and Owner as provided in Section 9.4.1. If the Contractor and Architect cannot agree on a revised amount, the Architect will promptly issue a Certificate for Payment for the amount for which the Architect is able to make such representations to the Owner. The Architect may also withhold a Certificate for Payment or, because of subsequently discovered evidence, may nullify the whole or a part of a Certificate for Payment previously issued, to such extent as may be necessary in the Architect's opinion to protect the Owner from loss for which the Contractor is responsible, including loss resulting from acts and omissions described in Section 3.3.2, because of

- .1 defective Work not remedied;
- .2 third party claims filed or reasonable evidence indicating probable filing of such claims, unless security acceptable to the Owner is provided by the Contractor;
- .3 failure of the Contractor to make payments properly to Subcontractors or suppliers for labor, materials or equipment;
- .4 reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract Sum;
- .5 damage to the Owner or a Separate Contractor;
- .6 reasonable evidence that the Work will not be completed within the Contract Time, and that the unpaid balance would not be adequate to cover actual or liquidated damages for the anticipated delay; or
- .7 repeated failure to carry out the Work in accordance with the Contract Documents.

§ 9.5.2 When either party disputes the Architect's decision regarding a Certificate for Payment under Section 9.5.1, in whole or in part, that party may submit a Claim in accordance with Article 15.

§ 9.5.3 When the reasons for withholding certification are removed, certification will be made for amounts previously withheld.

§ 9.5.4 If the Architect withholds certification for payment under Section 9.5.1.3, the Owner may, at its sole option, issue joint checks to the Contractor and to any Subcontractor or supplier to whom the Contractor failed to make payment for Work properly performed or material or equipment suitably delivered. If the Owner makes payments by joint check, the Owner shall notify the Architect and the Contractor shall reflect such payment on its next Application for Payment.

§ 9.6 Progress Payments

§ 9.6.1 The Owner shall only make payment in the manner and within the time provided in the Contract Documents

§ 9.6.2 The Contractor shall pay each Subcontractor, if any, upon receipt of payment from the Owner, out of the amount paid to the Contractor the amount to which each subcontractor is entitled, reflecting percentages actually retained from payments to the Contractor on account of the Subcontractor's portion of the Work. The Contractor shall, by appropriate agreement with each Subcontractor, require each Subcontractor to make payments to Sub-subcontractors in a similar manner.

§ 9.6.3 The Architect will, on request, furnish to a Subcontractor, if practicable, information regarding percentages of completion or amounts applied for by the Contractor and action taken thereon by the Architect and Owner on account of portions of the Work done by such Subcontractor.

§ 9.6.4 The Owner has the right to request written evidence from the Contractor that the Contractor has properly paid Subcontractors and suppliers amounts paid by the Owner to the Contractor for subcontracted Work. If the Contractor fails to furnish such evidence within seven days, the Owner shall have the right to contact Subcontractors and suppliers to ascertain whether they have been properly paid. Neither the Owner nor Architect shall have an obligation to pay, or to see to the payment of money to, a Subcontractor or supplier, except as may otherwise be required by law.

§ 9.6.5 Payments to suppliers shall be treated in a manner similar to that provided in Sections 9.6.2, 9.6.3 and 9.6.4.

§ 9.6.6 A Certificate for Payment, a progress payment, or partial or entire use or occupancy of the Project by the Owner shall not constitute acceptance of Work not in accordance with the Contract Documents.

§ 9.6.7 Provided the Owner has fulfilled its payment obligations under the Contract Documents, the Contractor shall defend and indemnify the Owner from all loss, liability, damage or expense, including reasonable attorney's fees and litigation expenses, arising out of any lien claim or other claim for payment by any Subcontractor or supplier of any tier. Upon receipt of notice of a lien claim or other claim for payment, the Owner shall notify the Contractor. If approved by the applicable court, when required, the Contractor may substitute a surety bond for the property against which the lien or other claim for payment has been asserted.

§ 9.7 Failure of Payment

If the Owner is entitled to any reimbursement or payment from the Contractor under, or pursuant to, the Contract Documents, such payments shall be made promptly upon demand by the Owner. Notwithstanding anything contained in the Contract Documents to the contrary, if the Contractor fails to promptly make any payment due the Owner, or the Owner incurs any costs and expenses to cure any default of the Contractor or to correct defective Work, the Owner shall have an absolute right to offset such amount against the Contract Sum and may, in the Owner's sole discretion, elect either to: (1) deduct an amount equal to that which the Owner is entitled from any payment then, or thereafter, due the contractor from the Owner, or (2) issue a written notice to the Contractor reducing the Contract Sum by an amount equal to that which the Owner is entitled.

§ 9.8 Substantial Completion

§ 9.8.1 Substantial Completion is the stage in the progress of the Work when the Work or designated portion thereof is sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work for its intended use, provided, however, that a condition precedent to Substantial Completion shall be the Owner's receipt of all certificates of occupancy and any other permits, approvals, licenses, and other documents from any governmental authority having jurisdiction thereof necessary for the occupancy of the Project. The Architect may withhold a certification of Substantial Completion if temporary installations or temporary construction exists in areas requesting certification, or if certificates of occupancy are temporary or conditional.

§ 9.8.2 When the Contractor considers that the Work, or a portion thereof which the Owner agrees to accept separately, is substantially complete, the Contractor shall prepare and submit to the Architect a comprehensive list of items to be completed or corrected prior to final payment. Failure to include an item on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents.

§ 9.8.3 Upon receipt of the Contractor's list, the Architect will make an inspection to determine whether the Work or designated portion thereof is substantially complete. If the Architect's inspection discloses any item, whether or not included on the Contractor's list, which is not sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work or designated portion thereof for its intended use, the Contractor shall, before issuance of the Certificate of Substantial Completion, complete or correct such item upon notification by the Architect. In such case, the Contractor shall then submit a request for another inspection by the Architect to determine Substantial Completion.

§ 9.8.4 When the Work or designated portion thereof is substantially complete, the Architect will prepare a Certificate of Substantial Completion that shall establish the date of Substantial Completion; establish responsibilities of the Owner and Contractor for security, maintenance, heat, utilities, damage to the Work and insurance; and fix the time within which the Contractor shall finish all items on the list accompanying the Certificate. Warranties required by the Contract Documents shall commence on the date of Substantial Completion of the Work or designated portion thereof unless otherwise provided in the Certificate of Substantial Completion.

§ 9.8.5 The Certificate of Substantial Completion shall be submitted to the Owner and Contractor for their written acceptance of responsibilities assigned to them in the Certificate. Upon such acceptance, and consent of surety if any, the Owner shall make payment of retainage applying to the Work or designated portion thereof. Such payment shall be adjusted for Work that is incomplete or not in accordance with the requirements of the Contract Documents.

§ 9.9 Partial Occupancy or Use

§ 9.9.1 The Owner may occupy or use any completed or partially completed portion of the Work at any stage when such portion is designated by separate agreement with the Contractor who shall obtain all necessary modifications to its insurance coverage to permit such occupancy or use. In addition, the Contractor shall obtain consent of those public authorities having jurisdiction over the Work. Such partial occupancy or use may commence whether or not the portion is substantially complete pursuant to the terms of that Agreement. When the Contractor considers a portion

substantially complete, the Contractor shall prepare and submit a list to the Architect as provided under Section 9.8.2. Consent of the Contractor to partial occupancy or use shall not be unreasonably withheld.

§ 9.9.2 Immediately prior to such partial occupancy or use, the Owner, Contractor, and Architect shall jointly inspect the area to be occupied or portion of the Work to be used in order to determine and record the condition of the Work.

§ 9.9.3 Unless otherwise agreed upon, partial occupancy or use of a portion or portions of the Work shall not constitute acceptance of Work not complying with the requirements of the Contract Documents.

§ 9.9.4 The occupancy of any portion of the Work shall not constitute acceptance of any work, except as hereinafter stated, nor does it waive the Owner's right to Liquidated Damages. Final Acceptance of the Work shall be for the whole Work only and not part.

§ 9.9.5 Occupancy by the Owner shall not be deemed to constitute a waiver of existing claims on behalf of the Owner or Contractor against each other.

§ 9.10 Final Completion and Final Payment

§ 9.10.1 Upon receipt of the Contractor's notice that the Work is ready for final inspection and acceptance and upon receipt of a final Application for Payment, the Architect will promptly make such inspection. When the Architect finds the Work acceptable under the Contract Documents and the Contract fully performed, the Architect will promptly issue a final Certificate for Payment stating that to the best of the Architect's knowledge, information and belief, and on the basis of the Architect's on-site visits and inspections, the Work has been completed in accordance with the Contract Documents and that the entire balance found to be due the Contractor and noted in the final Certificate is due and payable. The Architect's final Certificate for Payment will constitute a further representation that conditions listed in Section 9.10.2 as precedent to the Contractor's being entitled to final payment have been fulfilled.

§ 9.10.2 Neither final payment nor any remaining retained percentage shall become due until the Contractor complies with all requirements set forth in Article 5 of the Standard Form of Agreement between Owner and Contractor and the Contractor submits to the Architect (1) an affidavit that payrolls, bills for materials and equipment, and other indebtedness connected with the Work for which the Owner or the Owner's property might be responsible or encumbered (less amounts withheld by Owner) have been paid or otherwise satisfied, (2) a certificate evidencing that insurance required by the Contract Documents to remain in force after final payment is currently in effect, (3) a written statement that the Contractor knows of no reason that the insurance will not be renewable to cover the period required by the Contract Documents, (4) consent of surety, if any, to final payment, (5) documentation of any special warranties, such as manufacturers' warranties or specific Subcontractor warranties, and (6) if required by the Owner, other data establishing payment or satisfaction of obligations, such as receipts and releases and waivers of liens, claims, security interests, or encumbrances arising out of the Contract, to the extent and in such form as may be designated by the Owner. If a Subcontractor refuses to furnish a release or waiver required by the Owner, the Contractor may furnish a bond satisfactory to the Owner to indemnify the Owner against such lien, claim, security interest, or encumbrance. If a lien, claim, security interest, or encumbrance remains unsatisfied after payments are made, the Contractor shall refund to the Owner all money that the Owner may be compelled to pay in discharging the lien, claim, security interest, or encumbrance, including all costs and reasonable attorneys' fees.

§ 9.10.3 Acceptance of final payment by the Contractor, a Subcontractor, or a supplier, shall constitute a waiver of claims by that payee.

ARTICLE 10 PROTECTION OF PERSONS AND PROPERTY

§ 10.1 Safety Precautions and Programs

§ 10.1.1 The Contractor shall be responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the performance of the Contract.

§ 10.1.2 The Contractor shall ensure that the Project Site is maintained in a clean and safe condition at all times, based upon Owner's sole discretion. If the Contractor fails to keep the Project Site in a clean and safe condition, such failure shall result in the following:

- .1 All claims resulting from the Contractor's failure shall be the Contractor's responsibility;
- .2 Said failure shall constitute an act of default and a substantial breach of the Contract giving the Owner remedies under the Contract Documents; and

.3 The Owner shall have the right to withhold any payment until the Contractor cures its failure.

Failure to do so shall authorize the Owner to withhold any Applications for Payment until such time as the Contractor has rectified same. Further, if the Contractor fails to clean up as provided in the Contract Documents, the owner may do so and the cost thereof shall be charged to the Contractor.

§ 10.2 Safety of Persons and Property

§ 10.2.1 The Contractor shall take reasonable precautions for safety of, and shall provide reasonable protection to prevent damage, injury, or loss to

- .1 employees on the Work and other persons who may be affected thereby;
- .2 the Work and materials and equipment to be incorporated therein, whether in storage on or off the site, under care, custody, or control of the Contractor, a Subcontractor, or a Sub-subcontractor;
- .3 other property at the site or adjacent thereto, such as trees, shrubs, lawns, walks, pavements, roadways, structures, and utilities not designated for removal, relocation, or replacement in the course of construction; and
- .4 Construction or operations by the Owner or other contractors.

§ 10.2.2 The Contractor shall comply with, and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities, bearing on safety of persons or property or their protection from damage, injury, or loss.

§ 10.2.3 The Contractor shall implement, erect, and maintain, as required by existing conditions and performance of the Contract, reasonable safeguards for safety and protection, including posting danger signs and other warnings against hazards; promulgating safety regulations; and notifying the owners and users of adjacent sites and utilities of the safeguards.

§ 10.2.4 When use or storage of explosives or other hazardous materials or equipment, or unusual methods are necessary for execution of the Work, the Contractor shall exercise utmost care and carry on such activities under supervision of properly qualified personnel.

§ 10.2.5 The Contractor shall promptly remedy damage and loss (other than damage or loss insured under property insurance required by the Contract Documents) to property referred to in Sections 10.2.1.2 and 10.2.1.3 caused in whole or in part by the Contractor, a Subcontractor, a Sub-subcontractor, or anyone directly or indirectly employed by any of them, or by anyone for whose acts they may be liable and for which the Contractor is responsible under Sections 10.2.1.2 and 10.2.1.3. The Contractor may make a Claim for the cost to remedy the damage or loss to the extent such damage or loss is attributable to acts or omissions of the Owner or Architect or anyone directly or indirectly employed by either of them, or by anyone for whose acts either of them may be liable, and not attributable to the fault or negligence of the Contractor. The foregoing obligations of the Contractor are in addition to the Contractor's obligations under Section 3.19.

§ 10.2.6 The Contractor shall designate a responsible member of the Contractor's organization at the site whose duty shall be the prevention of accidents. This person shall be the Contractor's superintendent unless otherwise designated by the Contractor in writing to the Owner and Architect.

§ 10.2.7 The Contractor shall not permit any part of the construction or site to be loaded so as to cause damage or create an unsafe condition.

§ 10.3 Injury or Damage to Person or Property

§ 10.3.1 If either party suffers injury or damage to person or property because of an act or omission of the other party, or of others for whose acts such party is legally responsible, notice of the injury or damage, whether or not insured, shall be given to the other party and the Architect within a reasonable time not exceeding 21 days after discovery, unless a different time is required by law. The notice shall provide sufficient detail to enable the other party to investigate the matter.

§ 10.3.2 The Contractor shall immediately report all accidents, injuries or health hazards to the Owner, or its designated representative, in writing. This shall not obviate any mandatory reporting under the provisions of the Occupational Safety and Health Administration Act of 1970 ("OSHA").

§ 10.3.3 The Contractor shall:

- .1 Conduct an orientation session for all employees, subcontractors and other persons who it admits to the work site. This session shall include a thorough review of these general safety guidelines; and
- .2 Conduct a special safety meeting when job conditions change, abnormal working conditions exist or work is being done in a new area to assure that adequate precautions are taken. § 10.3 Hazardous Materials and Substances.

§ 10.3.4 The Contractor is responsible for compliance with any requirements included in the Contract Documents regarding hazardous materials or substances. If the Contractor encounters a hazardous material or substance not addressed in the Contract Documents and if reasonable precautions will be inadequate to prevent foreseeable bodily injury or death to persons resulting from a material or substance, including but not limited to asbestos or polychlorinated biphenyl (PCB), encountered on the site by the Contractor, the Contractor shall, upon recognizing the condition, immediately stop Work in the affected area and notify the Owner and Architect of the condition. The Work in the affected area shall not thereafter be resumed except by written agreement of the Owner and Contractor if in fact the material is asbestos or polychlorinated biphenyl (PCB) and has not been rendered harmless. The Work in the affected area shall be resumed in the absence of asbestos or PCB, or when such material has been rendered harmless, by written agreement of the Owner and Contractor or by written directive of the Owner. The term “rendered harmless” shall be interpreted to mean that levels of asbestos and/or PCB are less than any applicable exposure standards set forth in OSHA regulations. In no event shall the Owner or the Architect have any responsibility for any substance or material that is brought to the Project Site by the contractor, any Subcontractor, any material-man, or supplier, or any entity from whom any of them is responsible. The Contractor agrees not to use any fill or other materials to be incorporated into the Work, or to permit same to be brought onto the Project Site that are hazardous, toxic, or comprised of any items that are hazardous or toxic.

§ 10.3.5 Upon receipt of the Contractor’s notice, the Owner shall obtain the services of a licensed laboratory to verify the presence or absence of the material or substance reported by the Contractor and, in the event such material or substance is found to be present, to cause it to be rendered harmless. Unless otherwise required by the Contract Documents, the Owner shall furnish in writing to the Contractor and Architect the names and qualifications of persons or entities who are to perform tests verifying the presence or absence of the material or substance or who are to perform the task of removal or safe containment of the material or substance. By Change Order, the Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor’s reasonable additional costs of shutdown, delay, and start-up.

§ 10.3.6 The Owner shall not be responsible under this Section 10.3 for hazardous materials or substances the Contractor brings to the site. The Owner shall be responsible for hazardous materials or substances required by the Contract Documents.

§ 10.3.7 The Contractor shall reimburse the Owner for the cost and expense the Owner incurs (1) for remediation of hazardous materials or substances the Contractor brings to the site and negligently handles, or (2) where the Contractor fails to perform its obligations under Section 10.3.1, except to the extent that the cost and expense are due to the Owner’s fault or negligence.

§ 10.3.8 The Contractor and any Subcontractors shall comply with all regulations and standards pursuant to the Public Employees Occupational Safety and Health Act (“PEOSHA”), N.J.A.C. 12:100-13, et seq., as promulgated by the New Jersey Department of Health and Senior Services, Division of Epidemiology, Environmental and Occupational Health.

§ 10.3.9 The Contractor shall not store explosives or other hazardous material or utilize unusual or non-generally accepted equipment or methods for execution of the Work, without the Owner’s prior written consent.

§ 10.4 Emergencies

In an emergency affecting safety of persons or property, the Contractor shall act, at the Contractor’s discretion, to prevent threatened damage, injury, or loss.

§ 10.5 Other Safety and Property Loss Requirements

§ 10.5.1 The Contractor shall, at all times, safely guard and protect the property from damage or loss.

§ 10.5.2 The Contractor shall at all times, absolutely prevent water from entering the building as a result of its work, or as a result of damage to the building caused by such work.

§ 10.5.3 The Contractor shall protect its materials and work at the Work Site against damage and injury from weather or other causes. If, in the opinion of the Architect, any material or Work shall have been damaged or injured by reason of failure on the part of the Contractor to protect its Work, such materials and Work shall be removed and replaced at the expense of the Contractor.

§ 10.5.4 In case any direct or indirect injury is done to existing conditions or Work, in consequence of any act or omission on the part of the Contractor, its employees or agents, the Contractor at its own cost and expense shall restore such structures to the satisfaction of the Owner, property and materials to a condition equal or similar to that existing before such damage or injury was done.

§ 10.5.5 The Contractor shall not load or permit any part of the construction or site to be loaded so as to endanger its safety. Contractor's ingress and egress shall comply with all standards of care in complying with the law.

§ 10.5.6 The Contractor shall issue all employees and Subcontractors of the Contractor, photo identification or temporary badges that must be worn at all times. The Contractor will immediately provide the most current log of such badges or identification cards to the Architect, and immediately upon each change or addition to the log. The Owner shall have the right to remove any employee found without a badge or identification card.

§ 10.5.7 The Contractor shall ensure Work is completed only during designated hours, set jointly by the Owner and Architect.

§ 10.5.8 All dumpsters and contractor equipment and storage shall be located within the construction fence.

§ 10.5.9 The Contractor will provide temporary plywood barricades, acoustically and thermally improved with rigid insulation and sealed dust tight with a polyethylene membrane, at locations within the existing building as determined by the Owner or Architect. The Contractor shall not install temporary barricades where egress is required.

§ 10.5.10 The use of televisions, AM/FM radios, and all other forms of recorded music on the site is prohibited.

§ 10.6 Employees/Subcontractors of the Contractor shall:

- .1 Confine their movements to the contract limits;
- .2 Park within designated areas;
- .3 Wear ID/Temporary badges at all times;
- .4 Work during designated hours only;
- .5 Follow Employer's safety procedures and protocols;
- .6 Not enter the existing building or venture outside the construction area without an escort authorized by the Owner;
- .7 Not use products that generate odors during existing building occupying hours;
- .8 Assign a reasonable number of fire-watchers as required by the work in progress. Fire-watchers must not leave the job unprotected. Contractor must train fire-watchers in the proper use and limitations of fire extinguishers and in turning on a fire alarm;
- .9 Never raise or swing loads over people or over occupied buildings; and
- .10 Maintain and protect all material and equipment for which it is responsible, which is stored at the site for incorporation in or that has been incorporated into the Work. The Contractor shall replace all material and equipment that may be lost or stolen at its own expense, regardless of whether it has been entirely or partially paid for by the Owner.

ARTICLE 11 INSURANCE AND BONDS

§ 11.1 CONTRACTOR'S LIABILITY INSURANCE

§ 11.1.1 Contractor's and subcontractor's insurance: The Contractor shall not commence Work under the Agreement until it has obtained all the insurance required under this Article, and such insurance has been approved by the Owner,

nor shall the Contractor allow any subcontractor to commence Work on its subcontract until the insurance required of the subcontractor has been so obtained and approved. The required insurance shall include:

- .1 Commercial General Liability Insurance: The Owner, Contractor and all subcontractor(s) must maintain Commercial General Liability Insurance covering any and all bodily injury and property damage arising out of, or in connection with, the Work performed hereunder. The primary policy shall include coverage for contractual liability, products, completed operations, explosion and collapse and underground operations in an amount not less than \$1,000,000.00 (One Million Dollars), except and unless another amount is agreed upon in writing by both the Owner and Contractor. The Excess policy shall provide the same coverages as the primary and shall provide coverage in an additional amount not less than \$2,000,000.00 (Two Million Dollars), except and unless a different amount is agreed upon in writing by both the Owner and Contractor. The Owner, Architect, State of New Jersey, New Jersey Department of Education and the New Jersey Schools Development Authority, if applicable, shall be named as additional insureds.
- .2 Comprehensive Automobile Liability Insurance: The Contractor and all subcontractors must maintain Comprehensive Automobile Liability Insurance, including coverage for any and all owned, non-owned, hired or borrowed vehicles, covering bodily injury and property damage. Such coverage shall be in an amount of \$1,000,000.00 (One Million Dollars) combined single limit. The Owner, Architect, State of New Jersey, New Jersey Department of Education and the New Jersey Schools Development Authority, if applicable, shall be named as additional insureds.
- .3 Worker's Compensation Insurance: The Owner, Contractor and all subcontractors must maintain Worker's Compensation Insurance in accordance with the laws of the State of New Jersey.
- .4 Builder's Risk Insurance: The Contractor must maintain Builder's Risk Insurance, providing coverage for all risk of physical loss or damage to the project and property of the Owner, Contractor and all subcontractors in an amount equal to the completed value of the Work contracted herein and furnished under Construction Contracts for School Facilities Project, excepting excavations, foundations and other structures customarily excluded by such insurance. The Owner, Architect, State of New Jersey, New Jersey Department of Education and the New Jersey Schools Development Authority, if applicable, shall be named as additional insureds.

§ 11.1.2 All insurance required by Section 11.1.1 shall remain in effect for the duration of the Project, i.e., from beginning of construction until final payment and closeout.

§ 11.1.3 All insurance required by Section 11.1.1. shall be issued by insurance companies authorized to do business in the State of New Jersey and rated as "B+" or better as determined by A.M. Best Company.

§ 11.1.4 The Contractor waives all rights against the Owner for damages caused by fire or other perils to the extent covered by insurance provided under this Article. Any deductibles, co-insurance or contribution to the loss will be born solely by the Contractor.

§ 11.1.5 A certificate of insurance evidencing the coverages required by Section 11.1.1 AND A COPY OF THE INSURANCE POLICY ENDORSEMENT PAGE shall be submitted to the Owner's attorney for approval and transmittal to the Owner prior to the commencement of the Work. The certificate must be submitted on the ACORD Form Certificate of Insurance. These certificates and the insurance policies required by this Section 11.1 shall contain a provision that coverages afforded under the policies will not be canceled or allowed to expire until at least thirty (30) days' written notice has been given to the Owner. If requested by the Owner, the Contractor shall provide complete copies of any policies of insurance required by this Contract or be obtained by the Contractor and subcontractor(s). Information concerning any reduction of coverage shall be furnished by the Contractor with reasonable promptness in accordance with the Contractor's information and belief.

§ 11.2 PROPERTY INSURANCE

§ 11.2.1 Unless otherwise provided, the Owner shall purchase and maintain, in a company or companies lawfully authorized to do business in the jurisdiction in which the Project is located, property insurance in the amount of the initial Contract Sum, as well as subsequent modifications thereto for the entire Work at the site on a replacement cost basis without voluntary deductibles. Such property insurance shall be maintained, unless otherwise provided in the Contract Documents or otherwise agreed upon in writing by all person and entitled who are beneficiaries of such insurance, until final payment has been made as provided in Section 9.9 or until no person or entity other than the Owner has an insurance interest in the property required by this Section 11.2 to be covered, whichever is earlier. This insurance shall include interest of the Owner, Contractor, subcontractor(s) and sub-subcontractor(s) in the Work.

§ 11.2.1.1 Property insurance shall be on an "all-risk" policy form and shall insure against the perils of fire and physical loss or damage including, without duplication of coverage, theft, vandalism, malicious mischief, collapse, earthquake, flood, windstorm, falsework, temporary buildings and debris removal including demolition occasioned

by enforcement of any applicable legal requirements, and shall cover reasonable compensation for Architect's and Contractor's services and expenses required as a result of such insured loss. Coverage for other perils shall not be required unless otherwise provided in the Contract Documents.

§ 11.2.1.2 If the Owner does not intend to purchase such property insurance required by the Contract and with all of the coverages in the amount described above, the Owner shall so inform the Contractor in writing prior to commencement of the Work. The Contractor may then effect insurance that will protect the interests of the Contractor, Subcontractors and Sub-subcontractors in the Work. If the Contractor is damaged by the failure or neglect of the Owner to purchase or maintain insurance as described above, without so notifying the Contractor in writing, then the Owner shall bear all reasonable costs properly attributable thereto.

§ 11.2.1.3 If the property insurance requires minimum deductibles and such deductibles are identified in the Contract Documents, the Contractor shall pay costs not covered because of such deductibles. If the Owner or insurer increases the required minimum deductibles above the amounts so identified or if the Owner elects to purchase this insurance with voluntary deductible amounts, the Owner shall be responsible for payment of the additional costs not covered because of such increased or voluntary deductibles..

§ 11.2.1.4 Unless otherwise provided in the Contract Documents, this property insurance shall cover portions of the Work stored off-site after written approval of the Owner at the value established in the approval and also portions of the Work in transit..

§ 11.2.1.5 The insurance required by this Section 11.2 is not intended to cover machinery, tools or equipment owned or rented by the Contractor which are utilized in the performance of the Work but not incorporated into the permanent improvements. The Contractor shall, at the Contractor's own expense, provide insurance coverage for owned or rented machinery, tools or equipment..

§ 11.2.2 BOILER AND MACHINERY INSURANCE

The Owner shall purchase and maintain boiler and machinery insurance required by the Contract Documents or by law, which shall specifically cover such insured objects during installation and until final acceptance by the Owner; this insurance shall include interests of the Owner, Contractor, Subcontractors and Sub-subcontractors in the Work, and the Owner and Contractor shall be named insureds.

§ 11.2.3 LOSS OF USE INSURANCE

The Owner, at the Owner's option, may purchase and maintain such insurance as will insure the Owner against loss of use of the Owner's property due to fire or other hazards, however caused.

§ 11.2.4 If the Contractor requests in writing that insurance for risks other than those described herein or other special causes of loss be included in the property insurance policy, the Owner shall, if possible, include such insurance, and the cost thereof shall be charged to the Contractor by appropriate Change Order.

§ 11.2.5 A loss insured under the Owner's property insurance shall be adjusted by the Owner as fiduciary and made payable to the Owner as fiduciary for the insureds, as their interests may appear, subject to requirements of any applicable mortgagee clause. The Contractor shall pay subcontractors their just shares of insurance proceeds received by the Contractor and, by appropriate agreements, written where legally required for validity, shall require subcontractors to make payments to their sub-subcontractors in a similar manner.

§ 11.2.6 The Owner as fiduciary shall have the power to adjust and settle a loss with insurers.

§ 11.2.7 Partial occupancy or use in accordance with Section 9.9 shall not commence until the insurance company or companies providing property insurance have consented to such partial occupancy or use by endorsement or otherwise. The Owner and Contractor shall take reasonable steps to obtain consent of the insurance company or companies and shall, without mutual written consent, take no action with respect to partial occupancy or use that would cause cancellation, lapse or reduction of insurance.

§ 11.3 PERFORMANCE BOND, PAYMENT BOND and MAINTENANCE BOND

§ 11.3.1 The Contractor, at its sole expense, shall furnish bonds covering faithful performance of the Contract and payment of obligations arising thereunder as stipulated in bidding requirements or specifically required in the Contract Documents on the date of execution of the Contract, including material and labor.

§ 11.3.2 Upon the request of any person or entity appearing to be a potential beneficiary of bonds covering payment of obligations arising under the Contract, the Contractor shall promptly furnish a copy of the bonds or shall authorize a copy to be furnished.

§ 11.3.3 The Contractor shall file with the Owner, as a condition of final acceptance, a statement from the Surety of its Performance bond and Payment Bond, that the Surety is satisfied that all claims for labor and materials supplied under its contract have been satisfactorily settled.

§ 11.3.4 As a condition of final completion of the Work, the Contractor shall provide an acceptable Maintenance Bond to the Owner for fifteen percent ("15%") of the completed Project value. This Maintenance Bond shall remain in effect for the one (1) year warranty period.

§ 11.5 Loss of Use, Business Interruption, and Delay in Completion Insurance

§ 11.5.1 The Owner, at the Owner's option, may purchase and maintain insurance that will protect the Owner against loss of use of the Owner's property, or the inability to conduct normal operations, due to fire or other causes of loss.

§ 11.5.2 If the Contractor requests in writing that insurance for risks other than those described herein or other special causes of loss be included in the property insurance policy, the Owner shall, if possible, include such insurance, and the cost thereof shall be charged to the Contractor by appropriate Change Order.

§ 11.6 Adjustment and Settlement of Insured Loss

§ 11.6.1 A loss insured under the Owner's property insurance shall be adjusted by the Owner as fiduciary and made payable to the Owner as fiduciary for the insureds, as their interests may appear, subject to requirements of any applicable mortgagee clause and of Section 11.6.2. The Contractor shall pay subcontractors their just shares of insurance proceeds received by the Contractor and, by appropriate agreements, written where legally required for validity, shall require subcontractors to make payments to their sub-subcontractors in a similar manner.

§ 11.6.2 The Owner as fiduciary shall have the power to adjust and settle a loss with insurers. Prior to settlement of an insured loss, the Owner shall notify the Contractor of the terms of the proposed settlement as well as the proposed allocation of the insurance proceeds. The Contractor shall have 14 days from receipt of notice to object to the proposed settlement or allocation of the proceeds. If the Contractor does not object, the Owner shall settle the loss and the Contractor shall be bound by the settlement and allocation. Upon receipt, the Owner shall deposit the insurance proceeds in a separate account and make the appropriate distributions. Thereafter, if no other agreement is made or the Owner does not terminate the Contract for convenience, the Owner and Contractor shall execute a Change Order for reconstruction of the damaged or destroyed Work in the amount allocated for that purpose. If the Contractor timely objects to either the terms of the proposed settlement or the allocation of the proceeds, the Owner may proceed to settle the insured loss, and any dispute between the Owner and Contractor arising out of the settlement or allocation of the proceeds shall be resolved pursuant to Article 15. Pending resolution of any dispute, the Owner may issue a Construction Change Directive for the reconstruction of the damaged or destroyed Work.

ARTICLE 12 UNCOVERING AND CORRECTION OF WORK

§ 12.1 Uncovering of Work

§ 12.1.1 If a portion of the Work is covered contrary to the Architect's request or to requirements specifically expressed in the Contract Documents, it must, if requested in writing by the Architect, be uncovered for the Architect's examination and be replaced at the Contractor's expense without change in the Contract Time.

§ 12.1.2 If a portion of the Work has been covered that the Architect has not specifically requested to examine prior to its being covered, the Architect may request to see such Work and it shall be uncovered by the Contractor. If such Work is in accordance with the Contract Documents, the Contractor shall be entitled to an equitable adjustment to the Contract Sum and Contract Time as may be appropriate. If such Work is not in accordance with the Contract Documents, the costs of uncovering the Work, and the cost of correction, shall be at the Contractor's expense.

§ 12.2 Correction of Work

§ 12.2.1 Before Substantial Completion

The Contractor shall promptly correct Work rejected by the Architect or failing to conform to the requirements of the Contract Documents, discovered before Substantial Completion and whether or not fabricated, installed or completed. Costs of correcting such rejected Work, including additional testing and inspections, the cost of uncovering and replacement, and compensation for the Architect's services and expenses made necessary thereby, shall be at the Contractor's expense.

§ 12.2.2 After Substantial Completion

§ 12.2.2.1 In addition to the Contractor's obligations under Section 3.5, if, within one year after the date of Substantial Completion of the Work or the designated portion thereof or after the date for commencement of warranties, by terms of any applicable special warranty required by the Contract Documents, any of the Work is found to be not in accordance with the requirements of the Contract Documents, the Contractor shall correct it promptly after receipt of notice from the Owner to do so, unless the Owner has previously given the Contractor a written acceptance of such condition. The Owner shall give such notice promptly after discovery of the condition. If the Contractor fails to correct nonconforming Work within a reasonable time during that period after receipt of notice from the Owner or Architect,

the Owner may correct it in accordance with Section 2.5. This obligation under this Section 12.2.2.1 shall survive acceptance of the Work under the Contract and termination of the Contract.

§ 12.2.2.2 The one-year period for correction of Work shall be extended with respect to portions of Work first performed after Substantial Completion by the period of time between Substantial Completion and the actual completion of that portion of the Work.

§ 12.2.3 The Contractor shall remove from the site portions of the Work that are not in accordance with the requirements of the Contract Documents and are neither corrected by the Contractor nor accepted by the Owner.

§ 12.2.4 The Contractor shall bear the cost of correcting destroyed or damaged construction of the Owner or Separate Contractors, whether completed or partially completed, caused by the Contractor's correction or removal of Work that is not in accordance with the requirements of the Contract Documents.

§ 12.2.5 Nothing contained in this Section 12.2 shall be construed to establish a period of limitation with respect to other obligations the Contractor has under the Contract Documents. Establishment of the one-year period for correction of Work as described in Section 12.2.2 relates only to the specific obligation of the Contractor to correct the Work, and has no relationship to the time within which the obligation to comply with the Contract Documents may be sought to be enforced, nor to the time within which proceedings may be commenced to establish the Contractor's liability with respect to the Contractor's obligations other than specifically to correct the Work.

§ 12.3 Acceptance of Nonconforming Work

If the Owner prefers to accept Work that is not in accordance with the requirements of the Contract Documents, the Owner may do so instead of requiring its removal and correction, in which case the Contract Sum will be reduced as appropriate and equitable. Such adjustment shall be effected whether or not final payment has been made. However, there shall be no implied or expressed acceptance of Work not in compliance with applicable law.

ARTICLE 13 MISCELLANEOUS PROVISIONS

§ 13.1 Governing Law

§ 13.1.1 The contract shall be governed by the laws of the State of New Jersey.

§ 13.1.2 Nothing in the Contract Documents shall be construed to permit deviation from the governing law.

§ 13.1.3 In accordance with N.J.S.A. 18A:18A-20, manufactured and farm products of only the United States, wherever available, shall be used in the Work.

§ 13.2 Rate of Wages

§ 13.2.1 In accordance with the New Jersey Prevailing Wage Act, N.J.S.A. 34:11-56.25, et seq., the Contractor and any subcontractors are required to do the following:

§ 13.2.2 Pay to all workmen engaged in the performance of services, directly upon a public work, the prevailing rate of wages, which shall be those in effect for the Project Site on the Contract Date and such rates shall remain in effect for two (2) years, unless superseded by a subsequent determination.

§ 13.2.3 Before final payment, furnish the Owner with an affidavit stating that all workmen have been paid the prevailing rate of wages specified in the contract.

§ 13.2.4 Keep an accurate record showing the name, craft or trade and actual hourly rate of wages paid to each workman employed by it in connection with any public work. Records shall be preserved for two (2) years from date of payment.

§ 13.2.5 Post the prevailing wage rates for each craft and classification involved, as determined by the Commissioner of Labor and Industry, including the effective date of any changes thereof in prominent and easily accessible places at the site of the Work, and at such place or places as are used by them to pay workmen their wages.

§ 13.2.6 Submit to the Owner certified payroll records for each payroll period within ten (10) days of the payment of wages. A certified payroll record is defined as "a payroll record that is attested by the employer, or the owner of the

company doing business as the employer, or a corporate officer of such company, or an authorized agent of the employer.”

§ 13.2.7 In the event the Owner finds that any workers employed by the Contractor or subcontractor, covered by said contract, have been paid a rate of wages less than the prevailing wage required to be paid by such contract, the Owner may terminate the Contractor’s or Subcontractor’s right to proceed with the Work, or such part of the Work as to which there has been a failure to pay required wages, and to prosecute the Work to completion or otherwise. The Contractor and its sureties shall be liable to the Owner for any excess costs occasioned thereby.

§ 13.3 Safety and Health Regulations (OSHA)

§ 13.3.1 The Contractor shall comply with laws, rules, regulations and codes dealing with occupational safety and health, including, but not limited to, the latest amendments of the following:

§ 13.3.2 Williams-Steiger Occupational Safety and Health Act of 1970, P.L. 91-595.

§ 13.3.3 Part 1910 – Occupational Safety and Health Standards Chapter XVII of Title 29, Code of Federal Regulations.

§ 13.3.4 Part 126 – Safety and Health Regulations for Construction, Chapter XVII of Title 29, Code of Federal Regulations.

§ 13.3.5 N.J.A.C. 8:59-5, 1-50.10 (requirements to properly label any substances stored in containers) of the Worker and Community Right to Know Act, P.L. 1983, c.315.

§ 13.4 Environmental Regulations

The Contractor shall comply with laws, rules, regulations and codes dealing with the prevention of environmental pollution and the preservation of public natural resources.

§ 13.5 Equal Employment Opportunity

§ 13.5.1 The Contractor agrees to comply with the terms of the Mandatory Equal Employment Opportunity Language, a copy of which is annexed to the Contract Documents as an Exhibit and incorporated as if fully set forth herein.

§ 13.5.2 Contractor shall submit a copy of its Monthly Project Workforce Report, New Jersey Department of Treasury Form AA-202, to the Owner and to the New Jersey Department of Treasury’s Division of Public Contracts Equal Employment Opportunity Compliance.

§ 13.5.3 Contractor shall complete and submit to the Owner an Initial Project Workforce Report, New Jersey Department of Treasury Form AA-201, upon notification of award and no later than the execution of this Agreement. Failure to submit this completed form may result in the termination of this Agreement.

§ 13.6 Mandatory Language – Law Against Discrimination

§ 13.6.1 The parties to this contract do hereby agree that the provisions of N.J.S.A. 10:2-1 through N.J.S.A. 10:2-4, dealing with discrimination in employment on public contracts, and the rules and regulations promulgated pursuant thereto, are hereby made a part of this Contract and are binding upon the parties.

§ 13.6.2 Pursuant to the provisions of N.J.S.A. 10:2-1 through N.J.S.A. 10:2-4, no Contractor shall discriminate, by reason of race, creed, color, national origin, ancestry, marital status, gender identify or expression, affectional or sexual orientation, or sex, against any person who is qualified and available to perform the Work to which the employment relates, 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.

§ 13.6.3 No contractor, including, without limitation, the Contractor, subcontractor nor any person acting on its 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.

§ 13.6.4 There may be deducted from the amount payable to the Contractor by the Owner, under this Contract, a penalty of fifty dollars (\$50.00) for each person for each calendar day during which such person is discriminated against or intimidated in violation of the provisions of this Contract.

§ 13.6.5 This Contract may be canceled or terminated by the Owner, 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.

§ 13.7 Successors and Assigns

The Owner and Contractor respectively bind themselves, their partners, successors, assigns, and legal representatives to covenants, agreements, and obligations contained in the Contract Documents. Neither party to the Contract shall assign the Contract as a whole without written consent of the other. If either party attempts to make an assignment without such consent, that party shall nevertheless remain legally responsible for all obligations under the Contract.

§ 13.8 Rights and Remedies

§ 13.8.1 Duties and obligations imposed by the Contract Documents and rights and remedies available thereunder shall be in addition to and not a limitation of duties, obligations, rights, and remedies otherwise imposed or available by law.

§ 13.8.2 No action or failure to act by the Owner, Architect, or Contractor shall constitute a waiver of a right or duty afforded them under the Contract, nor shall such action or failure to act constitute approval of or acquiescence in a breach thereunder, except as may be specifically agreed upon in writing.

§ 13.9 Tests and Inspections

§ 13.9.1 Tests, inspections, and approvals of portions of the Work shall be made as required by the Contract Documents and by applicable laws, statutes, ordinances, codes, rules, and regulations or lawful orders of public authorities. Unless otherwise provided, the Contractor shall make arrangements for such tests, inspections, and approvals with an independent testing laboratory or entity acceptable to the Owner, or with the appropriate public authority, and shall bear all related costs of tests, inspections, and approvals. The Contractor shall give the Architect timely notice of when and where tests and inspections are to be made so that the Architect may be present for such procedures. The Owner shall bear costs of tests, inspections, or approvals that do not become requirements until after bids are received or negotiations concluded. The Owner shall directly arrange and pay for tests, inspections, or approvals where building codes or applicable laws or regulations so require.

§ 13.9.2 If the Architect, Owner, or public authorities having jurisdiction determine that portions of the Work require additional testing, inspection, or approval not included under Section 13.9.1, the Architect will, upon written authorization from the Owner, instruct the Contractor to make arrangements for such additional testing, inspection, or approval, by an entity acceptable to the Owner, and the Contractor shall give timely notice to the Architect of when and where tests and inspections are to be made so that the Architect may be present for such procedures. Such costs, except as provided in Section 13.9.3, shall be at the Owner's expense.

§ 13.9.3 If procedures for testing, inspection, or approval under Sections 13.9.1 and 13.9.2 reveal failure of the portions of the Work to comply with requirements established by the Contract Documents, all costs made necessary by such failure, including those of repeated procedures and compensation for the Architect's services and expenses, shall be at the Contractor's expense.

§ 13.9.4 Required certificates of testing, inspection, or approval shall, unless otherwise required by the Contract Documents, be secured by the Contractor and promptly delivered to the Architect.

§ 13.9.5 If the Architect is to observe tests, inspections, or approvals required by the Contract Documents, the Architect will do so promptly and, where practicable, at the normal place of testing.

§ 13.9.6 Tests or inspections conducted pursuant to the Contract Documents shall be made promptly to avoid unreasonable delay in the Work.

§ 13.10 Interest

Payments due and unpaid under the Contract Documents shall in no instance bear interest, except as required by law under N.J.S.A. 2A:30A-1 et seq.

ARTICLE 14 TERMINATION OR SUSPENSION OF THE CONTRACT

§ 14.1 Termination by the Contractor

§ 14.1.1 The Contractor may terminate the Contract if the Work is stopped for a period of 30 consecutive days through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, their agents or employees, or any other persons or entities performing portions of the Work, for any of the following reasons:

- .1 Issuance of an order of a court or other public authority having jurisdiction that requires all Work to be stopped; and
- .2 An act of government, such as a declaration of national emergency, that requires all Work to be stopped;

§ 14.1.2 If one of the reasons described in Section 14.1.1 exists, the Contractor may, upon thirty (30) days' notice to the Owner and Architect, terminate the Contract.

§ 14.2 Termination by the Owner for Cause

§ 14.2.1 The Owner may terminate the Contract if the Contractor, after notice and an opportunity to cure,

- .1 Refuses or fails to supply enough properly skilled workers or proper materials;
- .2 Fails to make payment to Subcontractors for materials or labor in accordance with the respective agreements between the Contractor and the Subcontractors;
- .3 Disregards applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of a public authority;
- .4 Fails to furnish the Owner with assurances satisfactory to the Owner, evidencing the Contractor's ability to complete the Work in compliance with all the requirements of the Contract Documents;
- .5 Fails, after commencement of the Work, to proceed continuously with the construction and completion of the Work, for more than three (3) days, except as permitted by the Contract Documents;
- .6 Disregards orders of the Owner and/or Architect, if any;
- .7 Fails to maintain the Site in a clean and orderly manner;
- .8 Fails to comply with a Construction Change Directive; or
- .9 Otherwise is guilty of any breach of a provision of the Contract Documents.

§ 14.2.2 When any of the reasons described in Section 14.2.1 exist, and upon certification by the Architect that sufficient cause exists to justify such action, the Owner may, without prejudice to any other rights or remedies of the Owner and after giving the Contractor and the Contractor's surety, if any, seven days' notice, terminate employment of the Contractor and may, subject to any prior rights of the surety:

- .1 Exclude the Contractor from the site and take possession of all materials, equipment, tools, and construction equipment and machinery thereon owned by the Contractor;
- .2 Accept assignment of subcontracts pursuant to Section 5.4; and
- .3 Finish the Work by whatever reasonable method the Owner may deem expedient.

§ 14.2.3 When the Owner terminates the Contract for one of the reasons stated in Section 14.2.1, the Contractor shall not be entitled to receive further payment until the Work is finished.

§ 14.2.4 If the unpaid balance of the Contract Sum exceeds costs of finishing the Work, including compensation for the Architect's and Attorney's services and expenses made necessary thereby, such excess shall be paid to the Contractor. If such costs and damages exceed the unpaid balance, the Contractor shall pay the difference to the Owner. The amount to be paid to the Contractor or Owner, as the case may be, shall, upon application, be certified by the Architect, and this obligation for payment shall survive termination of the Contract.

§ 14.3 Suspension by the Owner for Convenience

§ 14.3.1 The Owner may, without cause, order the Contractor in writing to suspend, delay or interrupt the Work, in whole or in part for such period of time as the Owner may determine.

§ 14.3.2 The Contract Sum and Contract Time shall be adjusted by Change Order for increases in the cost and time caused by suspension, delay, or interruption under Section 14.3.1. No Change Order adjustment shall be made to the extent

- .1 that performance is, was, or would have been, so suspended, delayed, or interrupted, by another cause for which the Contractor is responsible; or
- .2 that an equitable adjustment is made or denied under another provision of the Contract.

§ 14.4 Termination by the Owner for Convenience

The Owner shall have the right to terminate the Contract without cause after thirty (30) days' written notice to Contractor. Upon such termination, the Contractor shall immediately cease Work and remove from the Site all of its labor forces and such of its materials as Owner elects not to purchase or to assume in the manner hereinafter provided. Upon such termination, the Contractor shall take such steps as Owner may require assignment to the Owner the Contractor's interest in all Subcontracts and purchase orders designated by Owner. After all such steps have been taken to Owner's satisfaction, the Contractor shall receive as full compensation for termination and assignment the following:

- .1 all amounts then otherwise due under the terms of this Agreement that have been duly certified by the Architect;
- .2 amounts due for Work performed in accordance with the Contract Documents subsequent to the latest approved Schedule of Values and Application for Payment through the date of termination; and
- .3 reasonable compensation for the actual cost of demobilization incurred by the Contractor as a direct result of such termination. The Contractor shall not be entitled to any compensation or damages for lost profits or for any other type of contractual compensation or damages other than those provided by the preceding sentence. Upon payment of the foregoing, Owner shall have no further obligations to Contractor of any nature.

In no event shall termination for the convenience of the Owner terminate the obligations of the Contractor's surety on its payment and performance bonds.

ARTICLE 15 CLAIMS AND DISPUTES

§ 15.1 Definition of Claim

A Claim is a demand or assertion by one of the parties seeking, as a matter of right, payment of money, a change in the Contract Time, or other relief with respect to the terms of the Contract. The term "Claim" also includes other disputes and matters in question between the Owner and Contractor arising out of or relating to the Contract. The responsibility to substantiate Claims shall rest with the party making the Claim. This Section 15.1 does not require the Owner to file a Claim in order to impose liquidated damages in accordance with the Contract Documents. Any Contractor Claim seeking the payment of money shall not include consequential damages, which Contractor hereby waives, and shall be calculated in accordance with Section 7.3.

§ 15.2 Notice and Time Limits of Claims

§ 15.2.1 Claims by either the Owner or Contractor must be initiated by written notice to the other party and the Architect. Claims made by the Contractor must be made within twenty-one (21) calendar days after occurrence of the event giving rise to such Claim or within twenty-one (21) calendar days after the claimant first recognizes the condition giving rise to the Claim, whichever is later. There shall be no time limitation on Claims made by the Owner. Once an initial Claim is implemented by Change Order, an additional Claim made after changes relating to the initial Claim has been implemented by Change Order will not be considered unless submitted pursuant to the requirements of this Section. Notice shall be deemed effective upon the Owner's receipt of the Notice.

§ 15.2.2 Claims by either the Owner or Contractor, where the condition giving rise to the Claim is first discovered after expiration of the period for correction of the Work set forth in Section 12.2.2, shall be initiated by notice to the other party.

§ 15.3 Continuing Contract Performance

Pending final resolution of a Claim, except as otherwise agreed in writing or as provided in Section 9.7 and Article 14, the Contractor shall proceed diligently with performance of the Contract and the Owner shall continue to make payments in accordance with the Contract Documents.

§ 15.4 Claims for Sealed or Unknown Conditions

If conditions are encountered at the Site which are; (1) subsurface or otherwise concealed physical conditions which differ materially from those indicated in the Contract Documents; or (2) unknown physical conditions of an unusual nature, which differ materially from those ordinarily found to exist and generally recognized as inherent in construction activities of the character provided for in the Contract Documents, the Owner and Contractor mutually agree to give written notice to each other, including the Architect, if any, and any affected contractor or subcontractor, upon the observation of the condition within twenty-four (24) hours of first observation of the condition. The Architect will investigate such conditions within seventy-two (72) hours and will diligently proceed and render a recommendation within twenty-one (21) days unless otherwise agreed to in writing. If the Architect determines that the conditions at the site are not materially different from those indicated in the Contract Documents and that no change in the terms of the Contract is justified, the Architect shall so notify the Owner and Contractor in writing, stating the reasons. Claims by either party in opposition to such determination must be made within seven (7) days after the Architect has given notice of the condition.

§ 15.5. Claims for Additional Cost

If the Contractor wishes to make a Claim for an increase in the Contract Sum, notice as provided in Section 15.2 shall be given before proceeding to execute the portion of the Work that is the subject of the Claim. Prior notice is not required for Claims relating to an emergency endangering life or property arising under Section 10.4.

§ 15.6 Claims for Additional Time

§ 15.6.1 If the Contractor wishes to make a Claim for an increase in the Contract Time, notice as provided in Section 15.2 shall be given. The Contractor's Claim shall include an estimate of cost and of probable effect of delay on progress of the Work. In the case of a continuing delay, only one Claim is necessary.

§ 15.6.2 If adverse weather conditions are the basis for a Claim for additional time, such Claim shall be documented by data substantiating that weather conditions were abnormal for the period of time, could not have been reasonably anticipated and had an adverse effect on the scheduled construction. The term "abnormal" as used here shall be construed according to the following formula: average rainfall (or snow, low temperature, etc.) for the past five (5) years for the month in question, plus ten percent (10%). Accordingly, weather is not deemed to be abnormal unless it is ten percent (10%) worse than the average for the month over the last five (5) years. Claims relating to weather must be submitted within five (5) calendar days of the occurrence of any such delays.

§ 15.6.3 If either party to the Contract suffers injury or damage to person or property because of an act or omission of the other party, of any of the other party's employees or agents, or of others for whose acts such party is legally liable, written notice of such injury or damage, whether or not insured, shall be given to the other party, including the Architect, if any, within a reasonable time not exceeding fourteen (14) days after first occurrence, unless another time period is required by law. The notice shall provide sufficient detail to enable the other party to investigate the matter. If a Claim for additional cost or time for such damage is to be asserted, it shall be filed as provided for in Section 15.

§ 15.6.4 The Owner is not required to institute a Claim under this Section in order to terminate this Agreement.

§ 15.7 Resolution of Claims and Disputes

§ 15.7.1 The Owner will review Claims made by the Contractor and take one or more of the following preliminary actions within ten (10) days of receipt of a Claim: (1) request additional supporting data from the Claimant; (2) reject the Claim in whole or in part, stating reasons for rejection; (3) approve the claim; or (4) suggest a compromise.

§ 15.7.2 If a Claim has not been resolved after consideration of the foregoing and of further evidence presented by the parties or requested by the Decision Maker, in instances where the services of an Architect or independent evaluator are retained, the decision of the Architect or evaluator shall be final, including any change in the Contract Sum or Contract Time. When the services of an Architect or independent evaluator have not been retained, the parties may institute action in an appropriate forum to address the issue. The parties may retain the services of the Architect or evaluator at any time in the Claims resolution process.

§ 15.8 Mediation

§ 15.8.1 Claims, disputes, or other matters in controversy arising out of or related to the Contract, except those waived as provided for in Sections 9.10.3, and 15.1, shall be subject to mediation as a condition precedent to binding dispute resolution.

§ 15.8.2 The parties shall endeavor to resolve their Claims by mediation which, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association in accordance with its Construction Industry Mediation Procedures in effect on the date of the Agreement. A request for mediation shall be made in writing, delivered to the other party to the Contract, and filed with the person or entity administering the mediation.

§ 15.8.3 Either party may, within 30 days from the date that mediation has been concluded without resolution of the dispute or 60 days after mediation has been demanded without resolution of the dispute, demand in writing that the other party file for binding dispute resolution. If such a demand is made and the party receiving the demand fails to file for binding dispute resolution within 60 days after receipt thereof, then both parties waive their rights to binding dispute resolution proceedings with respect to the initial decision.

§ 15.8.3. The parties shall share the mediator's fee and any filing fees equally. The mediation shall be held in the place where the Project is located, unless another location is mutually agreed upon. Agreements reached in mediation shall be enforceable as settlement agreements in any court having jurisdiction thereof.

§ 15.9 Arbitration/Court of Competent Jurisdiction

Unless otherwise required under N.J.S.A. 2A:30A-1 et seq. ("Prompt Payment Act"), claims disputes or other matters in question between the parties to this Contract arising out of or relating to the project or to this Contract, or the alleged breach thereof, shall be subject to, and decided in, a Court of competent jurisdiction venued in the New Jersey jurisdiction where the Project is located. The Owner may not be compelled to submit any dispute concerning the Project to arbitration. By accepting award of the Contract and executing the Agreement, the Contractor consents to its joinder as a party in any litigation, mediation, arbitration or any other legal proceeding involving the Project.

ARTICLE 16 INTERPRETATIONS IN WRITING

§ 16.1 Neither the price bid for the work of any Contract, nor the Contract Sum, shall be based in any manner upon oral opinions, or real or alleged instructions of an oral nature, regardless of whether such opinions or instructions are expressed by the Owner, the Architect, if any, the Contractor or any of their agents or representatives, and no such oral communications shall form the basis of a Claim.

§ 16.2 These provisions do not intend to deny, on an oral basis, normal discussion, recommendations, explanations, suggestions, approvals, rejections and similar activity in pursuit of the work of the Project, such as at job conferences and otherwise at the Site. In such instances, the written minutes, correspondences, shop drawing records, written field orders and other written data shall govern over personal claims regarding statements made contrary to the written data.

DRAFT AIA® Document A101™ - 2017

Standard Form of Agreement Between Owner and Contractor where the basis of payment is a Stipulated Sum

AGREEMENT made as of the « » day of « » in the year «2020»
(In words, indicate day, month and year.)

BETWEEN the Owner:
(Name, legal status, address and other information)

Cherry Hill Board of Education
Lynn E. Shugars, CPA, Asst. Supt. Bus./BA/BS
Box 5015
45 Ranoldo Terrace
Cherry Hill, New Jersey 08034
Telephone No.: 856-429-5600
Facsimile No.: 856-616-9675
Email: LShugars@chclc.org

and the Contractor:
(Name, legal status, address and other information)

for the following Project:
(Name, location and detailed description)

Exterior Wall Reconstruction and Related Work at

Cherry Hill High School East
1750 Kresson Road
Cherry Hill, New Jersey 08034

The Architect:
(Name, legal status, address and other information)

Becica Associates, LLC
500 S. Kings Highway
Cherry Hill, New Jersey 08034
Telephone Number: 856-795-1180
Fax Number: 856-354-6367

The Owner and Contractor agree as follows.

ADDITIONS AND DELETIONS: The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information as well as revisions to the standard form text is available from the author and should be reviewed.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

The parties should complete A101™-2017, Exhibit A, Insurance and Bonds, contemporaneously with this Agreement. AIA Document A201™-2017, General Conditions of the Contract for Construction, is adopted in this document by reference. Do not use with other general conditions unless this document is modified.

ELECTRONIC COPYING of any portion of this AIA® Document to another electronic file is prohibited and constitutes a violation of copyright laws as set forth in the footer of this document.

TABLE OF ARTICLES

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EXHIBIT A INSURANCE AND BONDS

ARTICLE 1 THE CONTRACT DOCUMENTS

The Contract Documents consist of this Agreement, Conditions of the Contract (General, Supplementary, and other Conditions), Drawings, Specifications, Addenda issued prior to execution of this Agreement, other documents listed in this Agreement, and Modifications issued after execution of this Agreement, all of which form the Contract, and are as fully a part of the Contract as if attached to this Agreement or repeated herein. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations, or agreements, either written or oral. An enumeration of the Contract Documents, other than Modifications, appears in Article 9.

ARTICLE 2 THE WORK OF THIS CONTRACT

The Contractor shall fully execute the Work described in the Contract Documents, except as specifically indicated in the Contract Documents to be the responsibility of others. The Contractor will not be compensated for labor or materials outside the scope of Work that is not properly authorized.

ARTICLE 3 DATE OF COMMENCEMENT AND SUBSTANTIAL COMPLETION

§ 3.1 The date of commencement of the Work shall be:
(Check one of the following boxes.)

- [] The date of this Agreement.
- [] A date set forth in a notice to proceed issued by the Owner. **See also milestone dates in Section 3.31.**
- [] Established as follows:
(Insert a date or a means to determine the date of commencement of the Work.)

<< >>

If a date of commencement of the Work is not selected, then the date of commencement shall be the date of this Agreement.

§ 3.2 The Contract Time shall be measured from the date of commencement of the Work.

§ 3.3 Substantial and Final Completion (Milestone Dates)

§ 3.3.1 Subject to adjustments of the Contract Time as provided in the Contract Documents, the Contractor shall commence Work and achieve Substantial Completion of the various phases of the Work:
(Check one of the following boxes and complete the necessary information.)

[« »] Not later than « » (« ») calendar days from the date of commencement of the Work.

[« X »] By the following dates (refer to Phasing Plan A-02 for locations and scope of work for each Phase):

Asbestos Abatement: Start 2nd Shift on April 3 and complete by end of shift April 10, 2020.

Phases 1, 1A, and 1B: April 6, 2020 to November 30, 2020 Substantial Completion.

Phase 2 – Wall 4: April 6, 2020 to August 14, 2020 Substantial Completion.

Phase 2A – Wall 5 (Alternate Bid): June 19, 2020 to August 14, 2020 Substantial Completion if Alternate Bid is awarded.

Phase 3 – Wall 1: April 6, 2020 to September 30, 2020 Substantial Completion.

Phase 4 – Wall 2: April 6, 2020 to October 31, 2020 Substantial Completion.

Phase 5 – Wall 3: April 6, 2020 to November 30, 2020 Substantial Completion.

Phase 6 – Wall 6 (Alternate Bid): Interior Work: June 19, 2020 to August 14, 2020 Substantial Completion; Exterior Work: June 19, 2020 to November 30, 2020 Substantial Completion if Alternate Bid is awarded.

§ 3.3.2 Subject to adjustments of the Contract Time as provided in the Contract Documents, if portions of the Work are to be completed prior to Substantial Completion of the entire Work, the Contractor shall achieve Substantial Completion of such portions by the following dates:

Portion of Work	Substantial Completion Date

§ 3.3.3 Final completion of the entire Work shall be no later than thirty (30) consecutive calendar days after Substantial Completion of the entire Work.

§ 3.3.4 If the Contractor fails to achieve Substantial Completion of the entire Work, Substantial Completion in accordance with the milestone dates for a portion of the Work or Final Completion, as provided in this Section 3.3, liquidated damages, if any, shall be assessed in the amount set forth in Section 4.5.

ARTICLE 4 CONTRACT SUM

§ 4.1 The Owner shall pay the Contractor the Contract Sum in current funds for the Contractor's performance of the Contract. The Contract Sum shall be (\$), subject to additions and deductions as provided in the Contract Documents.

§ 4.2 Alternates

§ 4.2.1 Alternates, if any, included in the Contract Sum:

Item	Price

§ 4.2.2 Subject to the conditions noted below, the following alternates may be accepted by the Owner following execution of this Agreement. Upon acceptance, the Owner shall issue a Modification to this Agreement. (Insert below each alternate and the conditions that must be met for the Owner to accept the alternate.)

Item	Price	Conditions for Acceptance

§ 4.3 Allowances, if any, included in the Contract Sum:
(Identify each allowance.)

Item	Price

§ 4.4 Unit prices, if any:
(Identify the item and state the unit price and quantity limitations, if any, to which the unit price will be applicable.)

Item	Units and Limitations	Price per Unit (\$0.00)

§ 4.5 Liquidated damages, if any:
(Insert terms and conditions for liquidated damages, if any.)

«By submission of the bid proposal and execution of the Contract, the Contractor agrees that the Milestone Dates set forth in Article 3 of this Agreement are reasonable, taking into consideration the average climatic range, labor availability and material delivery time experience in the Contractor’s industry. Should the Contractor fail to complete the Work in accordance with any said Milestone Date, the Contractor shall and hereby agrees to pay the Owner the sum of **\$500 (Five Hundred Dollars)** for each consecutive calendar day which elapses between the relevant Milestone Date and the date the Work associated therewith is completed in accordance with the Architect’s certification and the Owner’s approval. This liquidated damage sum is agreed upon as a reasonable and proper measure of damages which the Owner will sustain per day by failure of Contractor to complete Work within the time as stipulated; it being recognized by Owner and Contractor that the damages suffered by Owner which could result from a failure of the Contractor to complete the Work on schedule is uncertain and cannot be calculated with any degree of mathematical certainty. In no way shall costs of Liquidated Damages be construed as a penalty to the Contractor. Nothing in this paragraph shall limit the right of Owner to complete the Work following the Contractor’s breach of contract.

»

ARTICLE 5 PAYMENTS

§ 5.1 Progress Payments

§ 5.1.1 Based upon Applications for Payment submitted to the Architect by the Contractor and Certificates for Payment issued by the Architect, the Owner shall make progress payments on account of the Contract Sum to the Contractor as provided below and elsewhere in the Contract Documents.

§ 5.1.2 The period covered by each Application for Payment shall be one calendar month ending on the last day of the month.

§ 5.1.3 The Contractor shall submit a Request for Payment in the form of a Pencil Requisition to the Architect on the first (1st) day of any given calendar month for Work performed during the prior month. Within seven (7) calendar days of receipt of the Pencil Requisition from the Contractor, the Architect shall return same to the Contractor with those changes that are approved or disapproved, if any, by the Architect for Contractor’s incorporation into an Application for Payment. Within two (2) calendar days of return of the Pencil Requisition to the Contractor, the Contractor shall submit a formal Application for Payment to the Architect for review and approval by the Architect incorporating any revisions made by the Architect in the Pencil Requisition. Within five (5) calendar days of receipt of the Application for Payment, the Architect shall do the following:

1. Certify the entire Application for Payment
2. Certify partial payment and provide the Contractor with reasons for withholding the remaining portion of payment; or

3. Withhold certification of the entire Application for Payment and provide the Contractor with reasons for withholding the entire payment.

Once an Application for Payment is approved by the Architect in whole or in part, the Owner shall make payment to the Contractor for the Certified Payment Amount by no later than thirty (30) days following the approval of the Application for Payment by the Board of Education. Approval of any Application for Payment may be withheld should the Contractor fail to submit Manning Reports in a timely manner.

§ 5.1.3.1 The form for Application for Payment shall be a notarized AIA Document G702, Application and Certification for Payment, supported by AIA document G703 Continuation Sheets. Each Application for Payment must be accompanied by three (3) sets of Certified Payroll Records for the period covered by the Application. The payroll records shall indicate the proper classification of employees and the payment of overtime, if any. These records shall include each Contractor's and subcontractor's certified payroll. Payment will not be authorized if the required payroll records have not been submitted.

§ 5.1.3.2 Pursuant to *N.J.S.A. 2A:30A-1, et seq.* (Prompt Payment Act'), the Owner is not required to approve payment to the Contractor until the next scheduled public meeting of the Board of Education following the Owner's receipt of the Architect's Certificate for Payment. In accordance with the Prompt Payment Act, the Owner shall make payment to the Contractor for the payment amount following its approval of the payment.

§ 5.1.3.3 Disputes regarding whether a party has failed to make payments required by the Prompt Payment Act may be submitted to a process of alternative dispute resolution, notwithstanding anything to the contrary in the Contract Documents. Alternative dispute resolution permitted under the Prompt Payment Act shall apply to disputes over payment only and shall not apply to disputes concerning any other matters that may arise under or from this Contract.

§ 5.1.4 Each Application for Payment shall be based on the most recent schedule of values submitted by the Contractor in accordance with the Contract Documents. The schedule of values shall allocate the entire Contract Sum among the various portions of the Work. The schedule of values shall be prepared in such form, and supported by such data to substantiate its accuracy, as the Architect may require. This schedule of values shall be used as a basis for reviewing the Contractor's Applications for Payment.

§ 5.1.5 Applications for Payment shall show the percentage of completion of each portion of the Work as of the end of the period covered by the Application for Payment.

§ 5.1.6 The Architect may decide to disapprove an Application for Payment, or withhold payment, in whole or in part, to the extent reasonably necessary to protect the Owner if, in the Architect's opinion, the representations as described in Section 5.1.6.1 below cannot be made to the Owner. If the Architect withholds a Certificate for Payment, the Architect will notify the Contractor and Owner as provided in this Article 5. The Architect may also decide to withhold certifying payment in whole or in part, or, because of subsequently discovered evidence or subsequent observations, to such extent as may be necessary to protect the Owner from loss because of:

1. Defective Work which has not been remedied;
2. Third party claims filed or reasonable evidence indicating probable filing of such claims;
3. Failure of the Contractor to make payments properly to vendors, subcontractors or for labor, materials and equipment;
4. Reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract sum;
5. Damage to the Owner or another contractor;
6. Reasonable evidence that the Work will not be completed within the Contract Time, and that the unpaid balance would not be adequate to cover actual or liquidated damages for the anticipated delay;
7. Failure to carry out the Work in accordance with the Contract Documents;
8. Avoidable delay in the progress of the Work;
9. Deliberate delay in the submission for approval of names of Subcontractors, material men, sources of supply, shop drawings and samples;
10. Failure to maintain the Project Site in a safe and satisfactory condition in accordance with good construction practices as recommended by the Construction Manager and determined by the Architect after consultation with the Contractor; and
11. Failure to submit updates as requested by the District or as required by the General Conditions, attached

hereto.

When the foregoing reasons for withholding payment are resolved, certification will be made for amounts previously withheld in the manner set forth in Section 5.1.3 above.

§ 5.1.6.1 The issuance of a separate Certificate for Payment will constitute representations made separately by the Architect to the Owner, based on its individual observations at the Site and the data comprising the Application for Payment submitted by the Contractor, that the Work has progressed to the point indicated and that, to the best of the Architect's knowledge, information and belief, quality of the Work is in accordance with the Contract Documents. The foregoing representations are subject to an evaluation of the Work for conformance with the Contract Documents upon Substantial Completion, to results of subsequent tests and inspections, to minor deviations from the Contract Documents correctable prior to completion and to specific qualifications expressed by the Architect. The issuance of a separate Certificate for Payment will further constitute a representation that the Contractor is entitled to payment in the amount certified. However, the issuance of a separate Certificate for Payment will not be a representation that the Architect has: (1) made exhaustive or continuous on-site inspections to check the quality or quantity of the Work; (2) reviewed the Contractor's construction means, methods, techniques, sequences or procedures; (3) reviewed copies of requisitions received from Subcontractors and material suppliers and other data requested by the Owner to substantiate the Contractor's right to payment; or (4) made examination to ascertain how or for what purpose the Contractor has used money previously paid on account of the Contract Sum.

§ 5.1.7 In accordance with modified AIA Document A201™-2017, General Conditions of the Contract for Construction, and subject to other provisions of the Contract Documents, the amount of each progress payment shall be computed as follows:

§ 5.1.7.1 The amount of each progress payment shall first include:

- .1 That portion of the Contract Sum properly allocable to completed Work;
- .2 That portion of the Contract Sum properly allocable to materials and equipment delivered and suitably stored at the site for subsequent incorporation in the completed construction, or, if approved in advance by the Owner, suitably stored off the site at a location agreed upon in writing; and
- .3 That portion of Construction Change Directives that the Architect determines, in the Architect's professional judgment, to be reasonably justified.

§ 5.1.7.2 The amount of each progress payment shall then be reduced by:

- .1 The aggregate of any amounts previously paid by the Owner;
- .2 The amount, if any, for Work that remains uncorrected and for which the Architect has previously withheld a Certificate for Payment as provided in Article 9 of modified AIA Document A201-2017;
- .3 Any amount for which the Contractor does not intend to pay a Subcontractor or material supplier, unless the Work has been performed by others the Contractor intends to pay;
- .4 For Work performed or defects discovered since the last payment application, any amount for which the Architect may withhold payment, or nullify a Certificate of Payment in whole or in part, as provided in Article 9 of modified AIA Document A201-2017; and
- .5 Retainage withheld pursuant to Section 5.1.8.

§ 5.1.8 Retainage

§ 5.1.8.1 For each progress payment made prior to Substantial Completion of the Work, the Owner may withhold the following amount, as retainage, from the payment otherwise due:

(Insert a percentage or amount to be withheld as retainage from each Application for Payment. The amount of retainage may be limited by governing law.)

«Pursuant to N.J.S.A. 18A:18A-40.3, the Owner will withhold two percent (2%) of the amount due on each partial payment when the outstanding balance of the Contract exceeds Five Hundred Thousand Dollars (\$500,000.00) and the Owner will withhold five percent (5%) of the amount due on each partial payment when the outstanding balance of the Contract is Five Hundred Thousand Dollars (\$500,000.00) or less.»

§ 5.1.7.1.1 The following items are not subject to retainage:

(Insert any items not subject to the withholding of retainage, such as general conditions, insurance, etc.)

«None»

§ 5.1.7.2 Reduction or limitation of retainage, if any, shall be as follows:

(If the retainage established in Section 5.1.7.1 is to be modified prior to Substantial Completion of the entire Work, including modifications for Substantial Completion of portions of the Work as provided in Section 3.3.2, insert provisions for such modifications.)

«No reduction»

§ 5.1.8 Except with the Owner's prior approval, the Contractor shall not make advance payments to suppliers for materials or equipment which have not been delivered and stored at the site.

§ 5.2 Final Payment

Final Payment, as described in Section 9.10 of modified AIA Document A201-2007, constituting payment of the entire unpaid balance of the Contract Sum, including retainage, shall be made by the Owner to the Contractor when the following conditions and the conditions set forth in the above referenced contract documents have been met: (1) the Contract has been fully performed by the Contractor and all Work has been duly accepted by the Owner, except for the Contractor's responsibility to correct Work as provided in Section 12.2 of modified AIA Document A201-2007, and to satisfy other requirements, if any, which necessarily survive final payment; (2) an unconditional Certificate of Occupancy has been issued by the appropriate local official; (3) the Contractor has completed all punch list items to the satisfaction of the Owner; (4) the Contractor has transmitted all Close-Out documents including As-Built Drawings, Warranties and Maintenance Bonds to the Architect, with copies to the Owner, and the Owner has deemed them acceptable; (5) training sessions, if any, are completed; (6) all non-conforming Work known at the time of submission of the Final Payment Application has been corrected; and (7) the Architect certifies the Final Payment Application.

§ 5.2.2 The Owner's final payment to the Contractor shall be made no later than 30 days after the issuance of the Architect's final Certificate for Payment, or as follows:

In accordance with the procedures for processing payment applications set forth in the Article 5.

§ 5.3 Release of Liens

Neither the final payment nor any part of the retained percentage shall become due until the Contractors shall deliver to the Owner a complete Release of All Liens arising out of this Contract and an affidavit that so far as he has knowledge or information, the releases include all labor and material for which a lien could be filed, but the Contractor may, if any subcontractor refuses to furnish a release in full, furnish a bond satisfactory to the Owner, to indemnify the Owner against any liens. If any claim remains unsatisfied after all payments are made, the Contractor shall indemnify, defend and hold harmless the Owner and refund to the Owner all monies that the latter may be compelled to pay in discharging such a lien, including all costs and reasonable attorney's fees.

§ 5.4 Receipted Bills for Materials, Etc.

It is hereby understood and agreed that no payments after the first payment shall be made by the Owner to any contractor for materials delivered and accepted during any month covered by this contract or any work done or labor furnished during the same period, unless and until receipts and any and all other vouchers showing payment by the Contractor for materials and labor, including payments to subcontractors from the preceding payment to Contractor on the same basis set forth in the Certificate for Payment, having been filed with the Owner and annexed to the Certificate covering said payment applied for; anything to the contrary in any of the Contract Documents referred to herein notwithstanding. It is further agreed and understood that the General Contractor will require all subcontractors within thirty (30) days after any payment is made to subcontractors to submit sufficient proof of payment, covering both labor and material men so that the Contractor is satisfied that no stop notices can be filed against him for any money due the subcontractor or their labor or material men.

§ 5.5 Interest

Payments due and unpaid under the Contract shall in no instance bear interest, except as required by law pursuant to the Prompt Payment Act.

ARTICLE 6 DISPUTE RESOLUTION

§ 6.1 Binding Dispute Resolution

With the exception of disputes involving payment under the Prompt Payment Act, for any Claim subject to, but not resolved by mediation pursuant to Article 15 of modified AIA Document A201–2017, the method of binding dispute resolution shall be as follows:

(Check the appropriate box.)

Arbitration

Litigation in a court of competent jurisdiction

Other *(Specify)*

ARTICLE 7 TERMINATION OR SUSPENSION

§ 7.1 The Contract may be terminated by the Owner or the Contractor as provided in Article 14 of modified AIA Document A201–2017.

§ 7.2 The Work may be suspended by the Owner as provided in Article 14 of modified AIA Document A201–2017.

ARTICLE 8 MISCELLANEOUS PROVISIONS

§ 8.1 Where reference is made in this Agreement to a provision of modified AIA Document A201–2017 or another Contract Document, the reference refers to that provision as amended or supplemented by other provisions of the Contract Documents.

§ 8.2 The Owner’s representative:
(Name, address, email address, and other information)

Cherry Hill Board of Education
Lynn E. Shugars, CPA, Asst. Supt. Bus./BA/BS
Box 5015
45 Ranoldo Terrace
Cherry Hill, New Jersey 08034
Telephone No.: 856-429-5600
Facsimile No.: 856-616-9675
Email: LShugars@chclc.org

§ 8.3 The Contractor’s representative:
(Name, address, email address, and other information)

§ 8.4 Neither the Owner’s nor the Contractor’s representative shall be changed without ten days’ prior notice to the other party.

§ 8.5 Insurance and Bonds

§ 8.5.1 The Owner and the Contractor shall purchase and maintain insurance as set forth in AIA Document A201™–2017, General Conditions of the Contract for Construction, and the Contract Documents.

§ 8.5.2 The Contractor shall provide bonds as set forth in AIA Document A201™–2017, General Conditions of the Contract for Construction and other provisions contained in the Contract Documents.

§ 8.5.3 It is the obligation of the Contractor to provide a full and complete copy of all insurance policies held by it, at the Contractor’s sole expense, upon reasonable request by the Owner, in the amounts specified in the Bid Documents and/or accompanying AIA Document A201-2017 General Conditions Form. The Contractor’s failure to obtain or maintain adequate insurance coverage shall result in the immediate termination of this Agreement. The Board shall be named as an additional insured on all insurance policies required under this Agreement.

§ 8.6 Notice in electronic format, pursuant to Article 1 of modified AIA Document A201–2017, may be given in accordance with AIA Document E203™–2013, Building Information Modeling and Digital Data Exhibit, if completed, or as otherwise set forth below:

(If other than in accordance with AIA Document E203–2013, insert requirements for delivering notice in electronic format such as name, title, and email address of the recipient and whether and how the system will be required to generate a read receipt for the transmission.)

<< >>

§ 8.7 Other provisions

§ 8.7.1 Affirmative Action: The Contractor shall comply with the New Jersey Law Against Discrimination, *N.J.S.A.* 10:5-1, *et seq.*, and all provisions regarding equal employment opportunity, *N.J.S.A.* 10:5-31, *et seq.* and *N.J.A.C.* 17:27-1.1. The Owner and the Contractor guaranty to afford equal opportunity in the performance of this Contract in accordance with an affirmative action program approved by the State Treasurer. The Contractor shall also comply with the anti-discrimination provisions of *N.J.S.A.* 10:2-1, *et seq.* set forth in the modified AIA Document A2011-2017.

§ 8.7.2 To perform the services provided for herein, the Contractor and its prime subcontractors shall be appropriately classified by the New Jersey Department of Treasury, Division of Property, Management and Construction. The failure to obtain or maintain such classification(s) shall result in the immediate termination of this Agreement.

§ 8.7.3 The Contractor represents that, to the best of its knowledge, information and belief, none of its employees is engaged in conduct that constitutes a conflict of interest under, or a violation of, the School Ethics Act, *N.J.S.A.* 18A:12-21, *et seq.*, and *N.J.A.C.* 6A:28-1.1, *et seq.*

§ 8.7.4 *N.J.S.A.* 52:32-44 imposes the following requirements on the Contractor and all subcontractors that knowingly provide goods or perform services for the Contractor under this Agreement:

§ 8.7.4.1 No contract with a subcontractor shall be entered into until the subcontractor provides a copy of a valid Business Registration Certificate to the Contractor. The Contractor shall provide copies of its current Business Registration Certificate for each subcontractor immediately upon entering into each subcontract. The requirement of proof of business registration extends down through all levels (tiers) of the project.

§ 8.7.4.2 The Contractor shall maintain and submit a current, updated list of subcontractors and their current Business Registration Certificate as a continuing obligation under this Contract. Before final payment on the Contract is made by the contracting agency, the Contractor shall submit an accurate list and the proof of business registration of each subcontractor or supplier used in the fulfillment of the Contract, or shall attest that no subcontractors were used.

§ 8.7.5 For the term of the Agreement, the Contractor, any subcontractor and each of their affiliates, so designated pursuant to *N.J.S.A.* 52:32-44(g)(3), shall collect and remit to the New Jersey Director of the Division of Taxation in the Department of Treasury, the use tax due pursuant to the Sales and Use Tax Act, *N.J.S.A.* 52:32B-1, *et seq.*, on all of their sales of tangible personal property delivered into the State of New Jersey, regardless of whether the tangible personal property is intended for a contract with a contracting agency.

§ 8.7.6 The Contractor and Subcontractor, as applicable, shall comply with the New Jersey Prevailing Wage Act, *N.J.S.A.* 34:11-56.25 *et seq.* The Owner shall not hire any Contractor or Subcontractor to perform any work for the Owner who is listed or is on record in the Office of the Commissioner of the New Jersey Department of Labor and Workforce Development, as having failed to pay prevailing wages in accordance with the New Jersey Prevailing Wage Act. The Contractor must be registered with the New Jersey Department of Labor and Workforce Development in accordance with *N.J.S.A.* 34:11-56.48 *et seq.* In the event the Contractor or a subcontractor is not registered, the Board reserves the right to terminate this contract and cause the work to be completed by another contractor.

§ 8.7.7 Where in the course of the Work, the Contractor believes that conflicts exist between the Drawings and Specifications, the Architect will interpret the intent thereof. It is expressly stipulated that neither the Drawings nor the Specification shall take precedence over the other.

§8.7.8 This Agreement and the General Conditions of the Contract as modified or supplemented (modified AIA Document A201-2017), shall control in the case of conflict between these documents and the Project Specifications or any other exhibits incorporated by reference into this Agreement in Article 9 herein.

§ 8.7.9 Waiver –No action or failure to act by the Owner shall constitute a waiver of any right it may have under the terms of this Contract.

§ 8.7.10 The Contractor is subject to the warranty provisions at Sections 3.5.1, 3.5.2, 3.5.3 and 3.5.4, as well as the indemnification provisions at Section 3.19 of the modified AIA document A201-2007 for this Project, and said provisions are incorporated into this Agreement and made a part hereof as if fully set forth at length herein.

§ 8.7.11 Pursuant to N.J.A.C. 17:44-2.2, the Contractor 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.»

ARTICLE 9 ENUMERATION OF CONTRACT DOCUMENTS

§ 9.1 This Agreement is comprised of the following documents:

- .1 Modified AIA Document A101™–2017, Standard Form of Agreement Between Owner and Contractor
- .2 AIA Document A101™–2017, Exhibit A, Insurance and Bonds
- .3 Modified AIA Document A201™–2017, General Conditions of the Contract for Construction
- .4 ~~AIA Document E203™–2013, Building Information Modeling and Digital Data Exhibit, dated as indicated below:~~
(Insert the date of the E203–2013 incorporated into this Agreement.)

« »

- .5 Drawings

Number	Title	Date
See Drawing Index-Project Manual		

- .6 Specifications

Section	Title	Date	Pages
See Project Manual Index-Project Manual			

- .7 Addenda, if any:

Number	Date	Pages

Portions of Addenda relating to bidding or proposal requirements are not part of the Contract Documents unless the bidding or proposal requirements are also enumerated in this Article 9.

- .8 Other Exhibits:

(Check all boxes that apply and include appropriate information identifying the exhibit where required.)

[« »] AIA Document E204™–2017, Sustainable Projects Exhibit, dated as indicated below:
(Insert the date of the E204-2017 incorporated into this Agreement.)

« »

[« »] The Sustainability Plan:

Title	Date	Pages

[« »] Supplementary and other Conditions of the Contract:

Document	Title	Date	Pages

.9 Other documents, if any, listed below:

(List here any additional documents that are intended to form part of the Contract Documents. AIA Document A201™-2017 provides that the advertisement or invitation to bid, Instructions to Bidders, sample forms, the Contractor's bid or proposal, portions of Addenda relating to bidding or proposal requirements, and other information furnished by the Owner in anticipation of receiving bids or proposals, are not part of the Contract Documents unless enumerated in this Agreement. Any such documents should be listed here only if intended to be part of the Contract Documents.)

- Equal Employment Opportunity and Americans with Disabilities Act Mandatory Language
- Board Resolution of Award
- Notice and Instructions to Bidders
- The Contractor's bid documents submitted for the bid opening, including any post-bid documentation submitted by the Contractor
- Sample forms and other information furnished by the Owner in anticipation of receiving bids
- New Jersey Department of Labor and Workforce Development Prevailing Wage Rate Determination»

This Agreement entered into as of the day and year first written above.

OWNER (Signature)

Lynn E. Shugars,
 Business Administrator/Board Secretary

(Printed name and title)

CONTRACTOR (Signature)

(Printed name and title)

AIA A101 EXHIBIT (continued):

**MANDATORY EQUAL EMPLOYMENT OPPORTUNITY LANGUAGE – CONSTRUCTION
CONTRACTS (continued)**

STANDARD BID DOCUMENT REFERENCE	
	Reference: None
Name of Form:	MANDATORY AFFIRMATIVE ACTION LANGUAGE FOR CONSTRUCTION CONTRACTS
Statutory Reference:	N.J.S.A. 10:5-31 and N.J.A.C. 17:27
Instructions Reference:	Statutory and Other Requirements
Description:	Exhibit of Bid Specification for Construction

Exhibit of the model Instructions to Bidders and Statutory Requirements is the current and complete mandatory language for construction bid specifications and contracts.

The document is the mandatory language for construction bid specifications and contracts pursuant to N.J.A.C. 17:27-3.5, and the mandatory bid specification and contract language for employment goal compliance for construction contracts at N.J.A.C. 17:27-3.7. A complete review of both rule provisions is recommended.

AIA A101 EXHIBIT (continued):

**MANDATORY EQUAL EMPLOYMENT OPPORTUNITY LANGUAGE – CONSTRUCTION
CONTRACTS (continued)**

(REVISED 4/10)

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
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.

AIA A101 EXHIBIT (continued):

**MANDATORY EQUAL EMPLOYMENT OPPORTUNITY LANGUAGE – CONSTRUCTION
CONTRACTS (continued)**

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

AIA A101 EXHIBIT (continued):

**MANDATORY EQUAL EMPLOYMENT OPPORTUNITY LANGUAGE – CONSTRUCTION
CONTRACTS (continued)**

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 contractor 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

AIA A101 EXHIBIT (continued):

**MANDATORY EQUAL EMPLOYMENT OPPORTUNITY LANGUAGE – CONSTRUCTION
CONTRACTS (continued)**

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.

AIA A101 EXHIBIT (continued):

**MANDATORY EQUAL EMPLOYMENT OPPORTUNITY LANGUAGE – CONSTRUCTION
CONTRACTS (continued)**

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 work-force 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 Division 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 the job 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 **Subchapter I0 of the Administrative Code (NJAC 17:27)**.

END of AIA A101 EXHIBIT C

SECTION 011000 - SUMMARY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Project information.
2. Work covered by Contract Documents.
3. Access to site.
4. Coordination with occupants.
5. Work restrictions.
6. Specification and drawing conventions.
7. Miscellaneous provisions.

B. Related Requirements:

1. Section 015000 "Temporary Facilities and Controls" for limitations and procedures governing temporary use of Owner's facilities.

1.3 PROJECT INFORMATION

A. Project Identification: **Exterior Wall Reconstruction and Related Work at Cherry Hill High School East**

1. Project Number:
 - a. Architect's: 19CHS17078

2. Project Location:

High School East
1750 Kresson Road
Cherry Hill, NJ 08003
(856) 424-2222
Lot 1/Block 524.18

B. Owner: Cherry Hill Board of Education, Malberg Administration Building, Box 5015 – 45 Ranoldo Terrace, Cherry Hill, NJ 08034

1. Owner's Representative: Lynn E. Shugars CPA, Asst. Superintendent Business/Business Administrator/Board Secretary, Phone: (856) 429-5600 x4328, Fax: (856) 616-9675, LShugars@chclc.org

- C. Architect: Becica Associates LLC, 500 South Kings Highway, Cherry Hill, NJ 08034, Phone: (856) 795-1180, Fax: 856-354-6367
1. Project Principal: John J. Middleton
- D. The Work shall be completed as follows:
1. **Notice of Award:** on or about February 12, 2020
 2. **Milestones Dates:** Refer to Phasing Plan A-02 for locations and scope of work for each Phase.
 - **Asbestos Abatement:** Start 2nd Shift on April 3 and complete by end of shift April 10, 2020
 - **Phases 1, 1A, and 1B:** April 6, 2020 to November 30, 2020 Substantial Completion.
 - **Phase 2 – Wall 4:** April 6, 2020 to August 14, 2020 Substantial Completion.
 - **Phase 2A – Wall 5 (Alternate Bid):** June 19, 2020 to August 14, 2020 Substantial Completion if Alternate Bid is awarded.
 - **Phase 3 – Wall 1:** April 6, 2020 to September 30, 2020 Substantial Completion.
 - **Phase 4 – Wall 2:** April 6, 2020 to October 31, 2020 Substantial Completion.
 - **Phase 5 – Wall 3:** April 6, 2020 to November 30, 2020 Substantial Completion.
 - **Phase 6 – Wall 6 (Alternate Bid):** Interior Work: June 19, 2020 to August 14, 2020 Substantial Completion; Exterior Work: June 19, 2020 to November 30, 2020 Substantial Completion if Alternate Bid is awarded.

1.4 WORK COVERED BY CONTRACT DOCUMENTS

- A. The Scope of Work for the Project is defined by the Contract Documents and consists, but not limited to the following:
1. **Exterior Wall Reconstruction and Related Work:**
 - a. Temporary facilities for weathertightness and security including temporary partitions and fencing; protection of existing adjacent site, roofing, and interior finishes to facilitate wall replacement construction.
 - b. Abatement of interior door, window, and exterior caulk; floor tile and mastic, and pipe insulation.
 - c. Temporary shoring of roof system to remain.
 - d. Demolition of existing exterior masonry walls and associated HVAC and electrical system components.
 - e. Construction of new exterior walls with masonry or metal wall panel system over CMU load bearing back-up, with aluminum framed curtainwall system, windows, and exterior doors.
 - f. Installation of new unit ventilators and associated HVAC work; repair and replacement of associated HVAC building systems impacted by construction.
 - g. Repair and replacement of associated electrical building systems impacted by construction.
 - h. Repair and replacement of existing interior finishes impacted by construction.
 - i. Installation of new concrete sidewalk and concrete pads.
 - j. Restoration of site after construction is complete.
 - k. Miscellaneous structural repairs.
- B. Type of Contract:

1. Project will be constructed under a single prime contract (single overall contract).

1.5 ACCESS TO SITE

- A. General: Contractor shall have limited use of Project site for construction operations as indicated on Drawings by the Contract limits and as indicated by requirements of this Section.
- B. Use of Site: Limit use of Project site to work in areas indicated. Do not disturb portions of Project site beyond areas in which the Work is indicated.
 1. Limits: Confine construction operations to areas indicated on construction documents.
 2. Driveways, Walkways and Entrances: Keep driveways, parking areas, loading areas, and entrances serving premises clear and available to Owner, Owner's employees, and emergency vehicles at all times. Do not use these areas for parking or storage of materials.
 - a. Schedule deliveries to minimize use of driveways and entrances by construction operations.
 - b. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.
- C. Condition of Existing Building: Maintain portions of existing building affected by construction operations in a weathertight condition throughout construction period. Repair damage caused by construction operations.

1.6 COORDINATION WITH OCCUPANTS

- A. Full Owner Occupancy: Owner will occupy site and existing building during entire construction period. Cooperate with Owner during construction operations to minimize conflicts and facilitate Owner usage. Perform the Work so as not to interfere with Owner's day-to-day operations. Maintain existing exits unless otherwise indicated.
 1. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities. Do not close or obstruct walkways, corridors, or other occupied or used facilities without written permission from Owner and approval of authorities having jurisdiction.
 2. Notify Owner not less than 72 hours in advance of activities that will affect Owner's operations.

1.7 WORK RESTRICTIONS

- A. Work Restrictions, General: Comply with restrictions on construction operations.
 1. Comply with limitations on use of public streets and with other requirements regarding noise and working hour limitations of authorities having jurisdiction.
 2. Work area shall be enclosed. All adjacent spaces used to communicate to/from the work area shall be thoroughly cleaned and restored to the condition that existed prior to commencement of the work activity.
- B. On-Site Work Hours:
 1. When school is in session: 7:00 A.M. – 2:45 P.M., Monday through Friday.
 - a) Mobilization and demobilization shall be permitted during school hours.
 - b) Demolition Work shall NOT be permitted during school hours.
 - c) New Construction shall be permitted during school hours.

The building will be available for after school hours work activities until approximately 11:00 p.m. and for weekend and holiday work (except Thanksgiving Day, Christmas Eve, Christmas Day, New Year's Eve and New Year's Day) from approximately 7:00 a.m. until 11:00 p.m.

2. When school is not in session: Limit work in the existing building to normal business working hours of 7:00 a.m. to 11:00 p.m., Monday through Friday, unless otherwise indicated. See attached Cherry Hill Public Schools 2019-2020 and 2020-2021 calendars for additional days school is not in session.
 3. Weekend Hours: As permitted by the Owner, at no additional cost to the Owner.
 4. Early Morning Hours: As permitted by the Owner, at no additional cost to the Owner.
 5. Hours for Extended work day: as permitted by the Owner, at no additional cost to the Owner.
 6. Hours for use of odor/dust causing operations: No odor generating activities will be permitted during school hours, and the area must be thoroughly ventilated to the building exterior when any odor generating activities are undertaken.
 7. Hours for use of Hazardous/flammable materials in the building: No hazardous materials shall be used during school hours.
 8. No overhead lifting shall be permitted while the building space below is occupied by the Owner.
 9. The building and the work shall be maintained in an operable and safe condition.
 10. The ventilation and exhaust systems shall be operational at all times while the building is occupied.
- C. Existing Utility Interruptions: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after providing temporary utility services according to requirements indicated:
1. Notify Architect not less than two days in advance of proposed utility interruptions.
 2. Obtain Architect's written permission before proceeding with utility interruptions.
- D. Noise, Vibration, and Odors: Coordinate operations that may result in high levels of noise and vibration, odors, or other disruption to Owner occupancy with Owner.
1. Notify Architect not less than two days in advance of proposed disruptive operations.
 2. Obtain Architect's written permission before proceeding with disruptive operations.
- E. Nonsmoking Building: Smoking is not permitted within the building or on the project site.
- F. Controlled Substances: Use of tobacco products and other controlled substances on Project site is not permitted.
- G. Employee Identification: Provide identification tags for Contractor personnel working on Project site. Require personnel to use identification tags at all times.
- H. Employee Screening: Comply with Owner's requirements for drug and background screening of Contractor personnel working on Project site.
1. Maintain list of approved screened personnel with Owner's representative.
- 1.8 SPECIFICATION AND DRAWING CONVENTIONS
- A. Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:

1. Imperative mood and streamlined language are generally used in the Specifications. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.
 2. Specification requirements are to be performed by Contractor unless specifically stated otherwise.
- B. Division 01 General Requirements: Requirements of Sections in Division 01 apply to the Work of all Sections in the Specifications.
- C. Drawing Coordination: Requirements for materials and products identified on Drawings are described in detail in the Specifications. One or more of the following are used on Drawings to identify materials and products:
1. Terminology: Materials and products are identified by the typical generic terms used in the individual Specifications Sections.
 2. Abbreviations: Materials and products are identified by abbreviations published as part of the U.S. National CAD Standard and scheduled on Drawings.
 3. Keynoting: Materials and products are identified by reference keynotes referencing Specification Section numbers found in this Project Manual.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

CHERRY HILL PUBLIC SCHOOLS 2019-2020 CALENDAR

AUGUST 2019						
S	M	T	W	TH	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

FEBRUARY 2020						
S	M	T	W	TH	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	22	22
23	24	25	26	27	28	29

August

29,30 Full Day Teacher in-service

September (19 Student Days)

2 Labor Day
 3 Students report - 1st Day
 Early Dismissal - Elementary Only
 30 Schools Closed

October (21 Student Days)

1 Schools Closed
 9 Schools Closed

November (17 Student Days)

7,8 NJEA Convention
 27 Early Dismissal Students & Staff
 28,29 Thanksgiving Recess

December (15 Student Days)

TBD Early Dismissal ES & MS
 Conferences
 23-31 Winter Recess

January (21 Student Days)

1 Winter Recess
 20 Martin Luther King's Birthday

February (18 Student Days)

14 Full Day Teacher in-service
 17 Presidents' Day

March (22 Student Days)

April (16 Student Days)

6-10 Spring Break
 13 Full Day Teacher in-service

May (20 Student Days)

25 Memorial Day

June (13 Student Days)

TBD Graduation – East
 TBD Graduation – West
 17 Last Day of School
 18 Full Day Teacher in-service
 (FLEX DAY)

182 Student Days/187 Teacher Days

Inclement Weather Make Up Days:

February 14
 February 17
 April 13
 April 6
 April 7
 April 8

SEPTEMBER 2019						
S	M	T	W	TH	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30					

MARCH 2020						
S	M	T	W	TH	F	S
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15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

OCTOBER 2019						
S	M	T	W	TH	F	S
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6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

APRIL 2020						
S	M	T	W	TH	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	

NOVEMBER 2019						
S	M	T	W	TH	F	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30

MAY 2020						
S	M	T	W	TH	F	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

DECEMBER 2019						
S	M	T	W	TH	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

JUNE 2020						
S	M	T	W	TH	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30			

JANUARY 2020						
S	M	T	W	TH	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

If additional days are needed for either students and/or staff, they will be added to the end of the school year accordingly.

- No classes on days that are shaded.
- Circle indicates early dismissal for all students and staff.
- Last three days of school are early dismissal for elementary & middle schools. Schools will provide details.
- Early dismissal times: Grades Pre-K-5: 1pm; Grades 6-8: 12:15 pm; Grades 9-12: 11:45 am.

This calendar is subject to change! Check the district website (www.chcl.org) for updates.

DRAFT CHERRY HILL PUBLIC SCHOOLS **DRAFT**
 4/1/19 2020-2021 CALENDAR 4/1/19

SEPTEMBER 2020						
S	M	T	W	TH	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30			

FEBRUARY 2021						
S	M	T	W	TH	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28						

- September (16 Student Days)**
- 3 Full Day Teacher in-service
 - 4 Full Day Teacher in-service
 - 7 Labor Day
 - 8 Students report - 1st Day
 - Early Dismissal - Elem. Only
 - 28 Schools Closed

OCTOBER 2020						
S	M	T	W	TH	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

MARCH 2021						
S	M	T	W	TH	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

- October (22 student days)**
- November (16 Student Days)**
- 5,6 NJEA Convention
 - 13 Full Day Teacher in-service
 - 25 Early Dismissal All Schools
 - 26,27 Thanksgiving Recess
- December (17 Student Days)**
- TBD Early Dismissal Elementary & Middle School Conferences
 - 23 Early Dismissal All Schools
 - 24-31 Winter Recess

NOVEMBER 2020						
S	M	T	W	TH	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30					

APRIL 2021						
S	M	T	W	TH	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	

- January (19 Student Days)**
- 1 Winter Recess
 - 18 Martin Luther King's Birthday

DECEMBER 2020						
S	M	T	W	TH	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

MAY 2021						
S	M	T	W	TH	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

- February (18 Student Days)**
- 12 Full Day Teacher in-service
 - 15 Presidents' Day

JANUARY 2021						
S	M	T	W	TH	F	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

JUNE 2021						
S	M	T	W	TH	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30			

- March (20 Student Days)**
- 29-31 Spring Break
- April (20 Student Days)**
- 1 - 2 Spring Break
- May (20 Student Days)**
- 31 Memorial Day
- June (14 Student Days)**
- TBD Graduation - East
 - TBD Graduation - West
 - 18 Last Day of School
 - 21 Full Day Teacher in-service (FLEX DAY)

182 Student Days/187 Teacher Days

- Inclement Weather Make Up Days:**
- Feb. 15th
 - Mar. 29th
 - Mar. 30th
 - Mar. 31st
 - Apr. 1st

Approved May 28, 2019

If additional days are needed for either students and/or staff, they will be added to the end of the school year accordingly.

- No classes on days that are shaded.
- Circle indicates early dismissal for all students and staff.
- Last three days of school are early dismissal for elementary & middle schools. Schools will provide details.
- Early dismissal times: Grades Pre-K-5: 1pm; Grades 6-8: 12:15 pm; Grades 9-12: 11:45 am.

This calendar is subject to change! Check the district website (www.chcic.org) for updates.

END OF SECTION 011000

SUMMARY

SECTION 012100 - ALLOWANCES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements governing allowances.
 - 1. Certain items are specified in the Contract Documents by allowances. Allowances have been established in lieu of additional requirements and to defer selection of actual materials and equipment to a later date when direction will be provided to Contractor. If necessary, additional requirements will be issued by Change Order.
- B. Types of allowances include the following:
 - 1. Contingency allowances.
 - 2. Lump-sum allowances.
- C. Related Requirements:
 - 1. Section 014000 "Quality Requirements" for procedures governing the use of allowances for testing and inspecting.

1.3 SELECTION AND PURCHASE

- A. At the earliest practical date after award of the Contract, advise Architect of the date when final selection and purchase of each product or system described by an allowance must be completed to avoid delaying the Work.
- B. At Architect's request, obtain proposals for each allowance for use in making final selections. Include recommendations that are relevant to performing the Work.
- C. Purchase products and systems selected by Architect from the designated supplier.

1.4 ACTION SUBMITTALS

- A. Submit proposals for purchase of products or systems included in allowances, in the form specified for Change Orders.

1.5 INFORMATIONAL SUBMITTALS

- A. Submit invoices or delivery slips to show actual quantities of materials delivered to the site for use in fulfillment of each allowance.

- B. Submit time sheets and other documentation to show labor time and cost for installation of allowance items that include installation as part of the allowance.
- C. Coordinate and process submittals for allowance items in same manner as for other portions of the Work.

1.6 COORDINATION

- A. Coordinate allowance items with other portions of the Work. Furnish templates as required to coordinate installation.

1.7 LUMP-SUM ALLOWANCES

- A. Allowance shall include cost to Contractor of specific products and materials ordered by Owner or selected by Architect under allowance and shall include freight and delivery to Project site.
- B. Unless otherwise indicated, Contractor's costs for receiving and handling at Project site, labor, installation, overhead and profit, and similar costs related to products and materials ordered by Owner under allowance shall be included as part of the Contract Sum and not part of the allowance.

1.8 CONTINGENCY ALLOWANCES

- A. Use the contingency allowance only as directed by Architect for Owner's purposes and only by Change Orders that indicate amounts to be charged to the allowance.
- B. Contractor's overhead, profit, and related costs for products and equipment ordered by Owner under the contingency allowance are included in the allowance and are not part of the Contract Sum. These costs include delivery, installation, insurance, equipment rental, and similar costs.
- C. Change Orders authorizing use of funds from the contingency allowance will include Contractor's related costs and reasonable overhead and profit margins.
- D. At Project closeout, credit unused amounts remaining in the contingency allowance to Owner by Change Order.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine products covered by an allowance promptly on delivery for damage or defects. Return damaged or defective products to manufacturer for replacement.

3.2 PREPARATION

- A. Coordinate materials and their installation for each allowance with related materials and installations to ensure that each allowance item is completely integrated and interfaced with related work.

3.3 SCHEDULE OF ALLOWANCES

- A. Allowance No. 1: Provide an allowance of \$250,000 for correction of existing unforeseen conditions as directed by the project architect ***to be included in the Base Bid.***

END OF SECTION 012100

SECTION 012300 - ALTERNATES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for alternates.

1.3 DEFINITIONS

- A. Alternate: An amount proposed by bidders and stated on the Bid Form for certain work defined in the bidding requirements that may be added to or deducted from the base bid amount if Owner decides to accept a corresponding change either in the amount of construction to be completed or in the products, materials, equipment, systems, or installation methods described in the Contract Documents.
 - 1. Alternates described in this Section are part of the Work only if enumerated in the Agreement.
 - 2. The cost or credit for each alternate is the net addition to or deduction from the Contract Sum to incorporate alternate into the Work. No other adjustments are made to the Contract Sum.

1.4 PROCEDURES

- A. Coordination: Revise or adjust affected adjacent work as necessary to completely integrate work of the alternate into Project.
 - 1. Include as part of each alternate, miscellaneous devices, accessory objects, and similar items incidental to or required for a complete installation whether or not indicated as part of alternate.
- B. Notification: Immediately following award of the Contract, notify each party involved, in writing, of the status of each alternate. Indicate if alternates have been accepted, rejected, or deferred for later consideration. Include a complete description of negotiated revisions to alternates.
- C. Execute accepted alternates under the same conditions as other work of the Contract.
- D. Schedule: A schedule of alternates is included at the end of this Section. Specification Sections referenced in schedule contain requirements for materials necessary to achieve the work described under each alternate.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 SCHEDULE OF ALTERNATES

Note: Alternates shall be awarded in the following order:

- A. Alternate No. SOC-1A (Add to Base Bid): Installation of Solar Shades as indicated on construction documents.
- B. Alternate No. SOC-1B (Add to Base Bid): Scope of work for reconstruction of Wall 5 as indicated on construction documents.
- C. Alternate No. SOC-1C (Add to Base Bid): Scope of work for reconstruction of Wall 6 as indicated on construction documents.

END OF SECTION 012300

SECTION 012500 - SUBSTITUTION PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for substitutions.
- B. Related Requirements:
 - 1. Section 012100 "Allowances" for products selected under an allowance.
 - 2. Section 012300 "Alternates" for products selected under an alternate.
 - 3. Section 016000 "Product Requirements" for requirements for submitting comparable product submittals for products by listed manufacturers.

1.3 DEFINITIONS

- A. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor.
 - 1. Substitutions for Cause: Changes proposed by Contractor that are required due to changed Project conditions, such as unavailability of product, regulatory changes, or unavailability of required warranty terms.

1.4 ACTION SUBMITTALS

- A. Substitution Requests: Submit three copies of each request for consideration. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
 - 1. Substitution Request Form: Use CSI Form 13.1A.
 - 2. Documentation: Show compliance with requirements for substitutions and the following, as applicable:
 - a. Statement indicating why specified product or fabrication or installation cannot be provided, if applicable.
 - b. Coordination information, including a list of changes or revisions needed to other parts of the Work and to construction performed by Owner and separate contractors, that will be necessary to accommodate proposed substitution.
 - c. Detailed comparison of significant qualities of proposed substitution with those of the Work specified. Include annotated copy of applicable Specification Section. Significant qualities may include attributes such as performance, weight, size, durability, visual effect, sustainable design characteristics, warranties, and specific features and requirements indicated. Indicate deviations, if any, from the Work specified.

- d. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
 - e. Samples, where applicable or requested.
 - f. Certificates and qualification data, where applicable or requested.
 - g. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners.
 - h. Material test reports from a qualified testing agency indicating and interpreting test results for compliance with requirements indicated.
 - i. Research reports evidencing compliance with building code in effect for Project, from ICC-ES.
 - j. Detailed comparison of Contractor's construction schedule using proposed substitution with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating date of receipt of purchase order, lack of availability, or delays in delivery.
 - k. Cost information, including a proposal of change, if any, in the Contract Sum.
 - l. Contractor's certification that proposed substitution complies with requirements in the Contract Documents except as indicated in substitution request, is compatible with related materials, and is appropriate for applications indicated.
 - m. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.
3. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within seven days of receipt of a request for substitution. Architect will notify Contractor of acceptance or rejection of proposed substitution within 15 days of receipt of request, or seven days of receipt of additional information or documentation, whichever is later.
- a. Forms of Acceptance: Change Order, Construction Change Directive, or Architect's Supplemental Instructions for minor changes in the Work.
 - b. Use product specified if Architect does not issue a decision on use of a proposed substitution within time allocated.

1.5 QUALITY ASSURANCE

- A. Compatibility of Substitutions: Investigate and document compatibility of proposed substitution with related products and materials. Engage a qualified testing agency to perform compatibility tests recommended by manufacturers.

1.6 PROCEDURES

- A. Coordination: Revise or adjust affected work as necessary to integrate work of the approved substitutions.

PART 2 - PRODUCTS

2.1 SUBSTITUTIONS

- A. Substitutions for Cause: Submit requests for substitution immediately on discovery of need for change, but not later than 15 days prior to time required for preparation and review of related submittals.

1. Conditions: Architect will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Architect will return requests without action, except to record noncompliance with these requirements:
 - a. Requested substitution is consistent with the Contract Documents and will produce indicated results.
 - b. Substitution request is fully documented and properly submitted.
 - c. Requested substitution will not adversely affect Contractor's construction schedule.
 - d. Requested substitution has received necessary approvals of authorities having jurisdiction.
 - e. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.

- B. Substitutions for Convenience: Not allowed unless otherwise indicated.

PART 3 - EXECUTION (Not Used)

END OF SECTION 012500

SECTION 012600 - CONTRACT MODIFICATION PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for handling and processing Contract modifications.
- B. Related Requirements:
 - 1. Section 012500 "Substitution Procedures" for administrative procedures for handling requests for substitutions made after the Contract award.

1.3 MINOR CHANGES IN THE WORK

- A. Architect will issue supplemental instructions authorizing minor changes in the Work, not involving adjustment to the Contract Sum or the Contract Time, on AIA Document G710, "Architect's Supplemental Instructions."

1.4 PROPOSAL REQUESTS

- A. Owner-Initiated Proposal Requests: Architect will issue a detailed description of proposed changes in the Work that may require adjustment to the Contract Sum or the Contract Time. If necessary, the description will include supplemental or revised Drawings and Specifications.
 - 1. Construction Change Proposal Requests issued by Architect are not instructions either to stop work in progress or to execute the proposed change.
 - 2. Within time specified in Proposal Request after receipt of Proposal Request, submit a quotation estimating cost adjustments to the Contract Sum and the Contract Time necessary to execute the change.
 - a. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
 - b. Indicate applicable delivery charges, equipment rental, and amounts of trade discounts.
 - c. Include costs of labor and supervision directly attributable to the change.
 - d. Include an updated Contractor's construction schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
 - e. Proposal Request Form: Use forms acceptable to Architect.

- B. Contractor-Initiated Proposals: If latent or changed conditions require modifications to the Contract, Contractor may initiate a claim by submitting a request for a change to Architect.
1. Include a statement outlining reasons for the change and the effect of the change on the Work. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the Contract Sum and the Contract Time.
 2. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
 3. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
 4. Include costs of labor and supervision directly attributable to the change.
 5. Include an updated Contractor's construction schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
 6. Comply with requirements in Section 012500 "Substitution Procedures" if the proposed change requires substitution of one product or system for product or system specified.
 7. Proposal Request Form: Use form acceptable to Architect.

1.5 ADMINISTRATIVE CHANGE ORDERS

- A. Allowance Adjustment: See Section 012100 "Allowances" for administrative procedures for preparation of Change Order Proposal for adjusting the Contract Sum to reflect actual costs of allowances.
- B. Unit-Price Adjustment: See Section 012200 "Unit Prices" for administrative procedures for preparation of Change Order Proposal for adjusting the Contract Sum to reflect measured scope of unit-price work.

1.6 CHANGE ORDER PROCEDURES

- A. On Owner's approval of a Work Changes Proposal Request, Architect will issue a Change Order for signatures of Owner and Contractor on AIA Document G701.

1.7 CONSTRUCTION CHANGE DIRECTIVE

- A. Construction Change Directive: Architect may issue a Construction Change Directive on AIA Document G714. Construction Change Directive instructs Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order.
1. Construction Change Directive contains a complete description of change in the Work. It also designates method to be followed to determine change in the Contract Sum or the Contract Time.
- B. Documentation: Maintain detailed records on a time and material basis of work required by the Construction Change Directive.
1. After completion of change, submit an itemized account and supporting data necessary to substantiate cost and time adjustments to the Contract.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 012600

SECTION 012900 - PAYMENT PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements necessary to prepare and process Applications for Payment.
- B. Related Requirements:
 - 1. Section 012100 "Allowances" for procedural requirements governing the handling and processing of allowances.
 - 2. Section 012600 "Contract Modification Procedures" for administrative procedures for handling changes to the Contract.
 - 3. Section 013200 "Construction Progress Documentation" for administrative requirements governing the preparation and submittal of the Contractor's construction schedule.

1.3 DEFINITIONS

- A. Schedule of Values: A statement furnished by Contractor allocating portions of the Contract Sum to various portions of the Work and used as the basis for reviewing Contractor's Applications for Payment.

1.4 SCHEDULE OF VALUES

- A. Coordination: Coordinate preparation of the schedule of values with preparation of Contractor's construction schedule.
 - 1. Coordinate line items in the schedule of values with other required administrative forms and schedules, including the following:
 - a. Application for Payment forms with continuation sheets.
 - b. Submittal schedule.
 - c. Items required to be indicated as separate activities in Contractor's construction schedule.
 - 2. Submit the schedule of values to Architect at earliest possible date, but no later than seven days before the date scheduled for submittal of the draft submission of the initial Applications for Payment.
 - 3. Subschedules for Separate Elements of Work: Where the Contractor's construction schedule defines separate elements of the Work, provide subschedules showing values coordinated with each element.

- B. Format and Content: Use Project Manual table of contents as a guide to establish line items for the schedule of values. Provide at least one line item for each Specification Section.
1. Identification: Include the following Project identification on the schedule of values:
 - a. Project name and location.
 - b. Name of Architect.
 - c. Architect's project number.
 - d. Contractor's name and address.
 - e. Date of submittal.
 2. Arrange schedule of values consistent with format of AIA Document G703.
 3. Arrange the schedule of values in tabular form with separate columns to indicate the following for each item listed:
 - a. Related Specification Section or Division.
 - b. Description of the Work.
 - c. Name of subcontractor.
 - d. Name of manufacturer or fabricator.
 - e. Name of supplier.
 - f. Change Orders (numbers) that affect value.
 - g. Dollar value of the following, as a percentage of the Contract Sum to nearest one-hundredth percent, adjusted to total 100 percent.
 - 1) Labor.
 - 2) Materials.
 - 3) Equipment.
 4. Provide a breakdown of the Contract Sum in enough detail to facilitate continued evaluation of Applications for Payment and progress reports. Coordinate with Project Manual table of contents. Provide multiple line items for principal subcontract amounts in excess of five percent of the Contract Sum.
 5. Round amounts to nearest whole dollar; total shall equal the Contract Sum.
 6. Provide a separate line item in the schedule of values for each part of the Work where Applications for Payment may include materials or equipment purchased or fabricated and stored, but not yet installed.
 - a. Differentiate between items stored on-site and items stored off-site. If required, include evidence of insurance.
 7. Provide separate line items in the schedule of values for initial cost of materials, for each subsequent stage of completion, and for total installed value of that part of the Work.
 8. Each item in the schedule of values and Applications for Payment shall be complete. Include total cost and proportionate share of general overhead and profit for each item.
 - a. Temporary facilities and other major cost items that are not direct cost of actual work-in-place may be shown either as separate line items in the schedule of values or distributed as general overhead expense, at Contractor's option.
 9. In addition to other requirements of this Section, provide separate line items for the following:
 - a. Bonds and Insurance
 - b. Quality Control Services
 - c. Professional Services

- d. Project closeout (not less than 3% of Contract amount).
 - e. Testing and balancing
 - f. Final cleaning.
10. For projects involving more than one site, provide a separate Schedule of Values for each site.
 11. For projects that involve Asbestos Abatement, provide a separate Application for Payment for only Asbestos Abatement work.
 12. For each part of the Work where an Application for Payment may include materials or equipment, purchased or fabricated and stored, but not yet installed, provide separate line items on the Schedule of Values for initial cost of the materials, for each subsequent stage of completion, and for total installed value of that part of the Work.
 13. Margins of Cost: Show line items for indirect costs, and margins on actual costs, only to the extent that such items will be listed individually in Applications for Payment. Each item in the Schedule of Values and Applications for Payment shall be complete including its total cost and proportionate share of general overhead and profit margin.
 - a. At the Contractor's option, temporary facilities and other major cost items that are not direct cost of actual work-in-place may be shown as separate line items in the Schedule of values or distributed as general overhead expense.
 14. Schedule Updating: Update and resubmit the schedule of values before the next Applications for Payment when Change Orders or Construction Change Directives result in a change in the Contract Sum.

1.5 APPLICATIONS FOR PAYMENT

- A. Each Application for Payment following the initial Application for Payment shall be consistent with previous applications and payments as certified by Architect paid for by Owner.
 1. Initial Application for Payment, Application for Payment at time of Substantial Completion, and final Application for Payment involve additional requirements.
- B. Payment Application Times: The date for each progress payment is indicated in the Agreement between Owner and Contractor. The period of construction work covered by each Application for Payment is the period indicated in the Agreement.
- C. Application for Payment Forms: Use AIA Document G702 and AIA Document G703.
- D. Application Preparation: Complete every entry on form. Notarize and execute by a person authorized to sign legal documents on behalf of Contractor. Architect will return incomplete applications without action.
 1. Entries shall match data on the schedule of values and Contractor's construction schedule. Use updated schedules if revisions were made.
 2. Include amounts for work completed following previous Application for Payment, whether or not payment has been received. Include only amounts for work completed at time of Application for Payment.
 3. Include amounts of Change Orders and Construction Change Directives issued before last day of construction period covered by application.
 4. Indicate separate amounts for work being carried out under Owner-requested project acceleration.
- E. Stored Materials: Include in Application for Payment amounts applied for materials or equipment purchased or fabricated and stored, but not yet installed. Differentiate between items stored on-site and items stored off-site.

1. Provide certificate of insurance, evidence of transfer of title to Owner, and consent of surety to payment, for stored materials.
 2. Provide supporting documentation that verifies amount requested, such as paid invoices. Match amount requested with amounts indicated on documentation; do not include overhead and profit on stored materials.
 3. Provide summary documentation for stored materials indicating the following:
 - a. Value of materials previously stored and remaining stored as of date of previous Applications for Payment.
 - b. Value of previously stored materials put in place after date of previous Application for Payment and on or before date of current Application for Payment.
 - c. Value of materials stored since date of previous Application for Payment and remaining stored as of date of current Application for Payment.
 4. Each payment application shall be consistent with previous applications and payments as certified by the Architect and paid for by the Owner.
 - a. The initial Payment Application, the Payment Application at time of Substantial Completion, and the final Payment Application involve additional requirements.
 - b. Payment Application Times: Each progress payment date is as indicated in the Agreement. The period of construction Work covered by each Application or Payment is the period indicated in the Agreement.
 - c. Use AIA Document 702 and continuation 703 as the form for Application for Payment.
 - d. Additional documentation to be included with each Payment Application:
 - 1) Certified payroll forms associated with N.J.S.A. 34:11-56.27 et. Seq. Prevailing Wage Act are to be submitted weekly to the Board of Education, Certified payrolls must be in the Boards possession within 10 days of the pay period.
 - a) The Contractor will be responsible for all fines for not having certified payroll forms up to date. Contractors payments will be withheld by the Board of Education until Certified payroll forms are brought up to date.
 - 2) The Board of Education's standard payment voucher.
 - 3) The Board of Education's purchase order for the project.
- F. Transmittal: Submit three signed and notarized original copies of each Application for Payment to Architect by a method ensuring receipt within 24 hours. One copy shall include waivers of lien and similar attachments if required.
1. Transmit each copy with a transmittal form listing attachments and recording appropriate information about application.
- G. Initial Application for Payment: Administrative actions and submittals that must precede or coincide with submittal of first Application for Payment include the following:
1. List of subcontractors.
 2. Schedule of values.
 3. Contractor's construction schedule (preliminary if not final).
 4. Products list (preliminary if not final).
 5. Schedule of unit prices.
 6. Submittal schedule (preliminary if not final).
 7. Copies of building permits.
 8. Copies of authorizations and licenses from authorities having jurisdiction for performance of the Work.

9. Initial progress report.
 10. Report of preconstruction conference.
 11. Certificates of insurance and insurance policies.
 12. Performance and payment bonds.
 13. Data needed to acquire Owner's insurance.
- H. Application for Payment at Substantial Completion: After Architect issues the Certificate of Substantial Completion, submit an Application for Payment showing 100 percent completion for portion of the Work claimed as substantially complete.
1. Include documentation supporting claim that the Work is substantially complete and a statement showing an accounting of changes to the Contract Sum.
 2. This application shall reflect Certificate(s) of Substantial Completion issued previously for Owner occupancy of designated portions of the Work.
 3. Administrative actions and submittals that shall proceed or coincide with this application include:
 - a. Occupancy permits and similar approvals;
 - b. Warranties (guarantees) and maintenance agreements;
 - c. Test/adjust/balance records;
 - d. Maintenance and operating instructions;
 - e. Maintenance manuals;
 - f. Meter readings;
 - g. Start-up performance reports;
 - h. Change-over information related to Owner's occupancy, use, operation and maintenance;
 - i. Final cleaning;
 - j. Consent of surety;
 - k. Advice on shifting insurance coverage;
 - l. Final progress photographs;
 - m. List of incomplete Work, recognized as exceptions to Architect's Certificate of Substantial Completion;
 - n. Record Documents.
- I. Final Payment Application: After completing Project closeout requirements, submit final Application for Payment with releases and supporting documentation not previously submitted and accepted, including, but not limited, to the following:
1. Evidence of completion of Project closeout requirements.
 2. Insurance certificates for products and completed operations where required and proof that taxes, fees, and similar obligations were paid.
 3. Updated final statement, accounting for final changes to the Contract Sum.
 4. AIA Document G706, "Contractor's Affidavit of Payment of Debts and Claims."
 5. AIA Document G706A, "Contractor's Affidavit of Release of Liens."
 6. AIA Document G707, "Consent of Surety to Final Payment."
 7. Evidence that claims have been settled.
 8. Contractor's one year guarantee.
 9. Maintenance Bond, as specified.
 10. Architect's final inspection list, signed by the contractor, affirming completion of all items in the final inspection list.
 11. Transmittal of required Project construction records to Owner.
 12. Removal of temporary facilities and services.
 13. Removal of surplus materials, rubbish and similar elements.
 14. Change of door locks to Owner's access.

PART 2 - PRODUCTS (Not Used)
PART 3 - EXECUTION (Not Used)

EXHIBIT "A"

PAYROLL VERIFICATION

State of New Jersey

County of _____

_____ being duly sworn on his oath deposes and says:

I swear that the payroll on the job indicated below, under Contract with the _____, New Jersey, and for the times indicated, was fully paid and that nothing is due and owing to any workmen thereunder, and that the wages paid were in no case less than the applicable rates contained in the wage determination decision of the Secretary of Labor of New Jersey, and that the job classification for each workman conformed to the actual work he performed. The above statements apply to full to all of the Sub-Contractors under this contract.

Job Site: _____

Nature of Contract: _____

Pay Period: _____

Contractor: _____

By: _____ Title: _____

To Be Notarized

Sworn to and subscribed before me this _____ day of _____, 20____.

Notary Public

NOTE: This form shall be submitted with each request for payment.

END OF SECTION 012900

SECTION 013100 - PROJECT MANAGEMENT AND COORDINATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative provisions for coordinating construction operations on Project including, but not limited to, the following:
 - 1. General coordination procedures.
 - 2. Coordination drawings.
 - 3. Requests for Information (RFIs).
 - 4. Project meetings.
- B. Related Requirements:
 - 1. Section 013200 "Construction Progress Documentation" for preparing and submitting Contractor's construction schedule.
 - 2. Section 017300 "Execution" for procedures for coordinating general installation and field-engineering services, including establishment of benchmarks and control points.
 - 3. Section 017700 "Closeout Procedures" for coordinating closeout of the Contract.

1.3 DEFINITIONS

- A. RFI: Request from Owner, Architect, or Contractor seeking information required by or clarifications of the Contract Documents.

1.4 INFORMATIONAL SUBMITTALS

- A. Subcontract List: Prepare a written summary identifying individuals or firms proposed for each portion of the Work, including those who are to furnish products or equipment fabricated to a special design. Include the following information in tabular form:
 - 1. Name, address, and telephone number of entity performing subcontract or supplying products.
 - 2. Number and title of related Specification Section(s) covered by subcontract.
 - 3. Drawing number and detail references, as appropriate, covered by subcontract.
- B. Key Personnel Names: Within 15 days of starting construction operations, submit a list of key personnel assignments, including superintendent and other personnel in attendance at Project site. Identify individuals and their duties and responsibilities; list addresses and telephone numbers, including home, office, and cellular telephone numbers and e-mail addresses. Provide names, addresses, and telephone numbers of individuals assigned as alternates in the absence of individuals assigned to Project.

1. Post copies of list in project meeting room, in temporary field office, on Project Web site, and by each temporary telephone. Keep list current at all times.

1.5 GENERAL COORDINATION PROCEDURES

- A. Coordination: Coordinate construction operations included in different Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations, included in different Sections, that depend on each other for proper installation, connection, and operation.
 1. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
 2. Coordinate installation of different components to ensure maximum performance and accessibility for required maintenance, service, and repair.
 3. Make adequate provisions to accommodate items scheduled for later installation.
- B. Prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and list of attendees at meetings.
 1. Prepare similar memoranda for Owner and separate contractors if coordination of their Work is required.
- C. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities and activities of other contractors to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:
 1. Preparation of Contractor's construction schedule.
 2. Preparation of the schedule of values.
 3. Installation and removal of temporary facilities and controls.
 4. Delivery and processing of submittals.
 5. Progress meetings.
 6. Preinstallation conferences.
 7. Project closeout activities.
 8. Startup and adjustment of systems.
- D. Conservation: Coordinate construction activities to ensure that operations are carried out with consideration given to conservation of energy, water, and materials. Coordinate use of temporary utilities to minimize waste.
 1. Salvage materials and equipment involved in performance of, but not actually incorporated into, the Work. See other Sections for disposition of salvaged materials that are designated as Owner's property.

1.6 COORDINATION DRAWINGS

- A. Coordination Drawings, General: Prepare coordination drawings according to requirements in individual Sections, and additionally where installation is not completely shown on Shop Drawings, where limited space availability necessitates coordination, or if coordination is required to facilitate integration of products and materials fabricated or installed by more than one entity.

1. Content: Project-specific information, drawn accurately to a scale large enough to indicate and resolve conflicts. Do not base coordination drawings on standard printed data. Include the following information, as applicable:
 - a. Use applicable Drawings as a basis for preparation of coordination drawings. Prepare sections, elevations, and details as needed to describe relationship of various systems and components.
 - b. Indicate functional and spatial relationships of components of architectural, structural, civil, mechanical, and electrical systems.
 - c. Indicate space requirements for routine maintenance and for anticipated replacement of components during the life of the installation.
 - d. Show location and size of access doors required for access to concealed dampers, valves, and other controls.
 - e. Indicate required installation sequences.
 - f. Indicate dimensions shown on the Drawings. Specifically note dimensions that appear to be in conflict with submitted equipment and minimum clearance requirements. Provide alternate sketches to Architect indicating proposed resolution of such conflicts. Minor dimension changes and difficult installations will not be considered changes to the Contract.

- B. Coordination Drawing Organization: Organize coordination drawings as follows:
 1. Floor Plans and Reflected Ceiling Plans: Show architectural and structural elements, and mechanical, plumbing, fire-protection, fire-alarm, and electrical Work. Show locations of visible ceiling-mounted devices relative to acoustical ceiling grid. Supplement plan drawings with section drawings where required to adequately represent the Work.
 2. Plenum Space: Indicate subframing for support of ceiling and wall systems, mechanical and electrical equipment, and related Work. Locate components within ceiling plenum to accommodate layout of light fixtures indicated on Drawings. Indicate areas of conflict between light fixtures and other components.
 3. Mechanical Rooms: Provide coordination drawings for mechanical rooms showing plans and elevations of mechanical, plumbing, fire-protection, fire-alarm, and electrical equipment.
 4. Structural Penetrations: Indicate penetrations and openings required for all disciplines.
 5. Slab Edge and Embedded Items: Indicate slab edge locations and sizes and locations of embedded items for metal fabrications, sleeves, anchor bolts, bearing plates, angles, door floor closers, slab depressions for floor finishes, curbs and housekeeping pads, and similar items.
 6. Mechanical and Plumbing Work: Show the following:
 - a. Sizes and bottom elevations of ductwork, piping, and conduit runs, including insulation, bracing, flanges, and support systems.
 - b. Dimensions of major components, such as dampers, valves, diffusers, access doors, cleanouts and electrical distribution equipment.
 - c. Fire-rated enclosures around ductwork.
 7. Electrical Work: Show the following:
 - a. Runs of vertical and horizontal conduit 1-1/4 inches in diameter and larger.
 - b. Light fixture, exit light, emergency battery pack, smoke detector, and other fire-alarm locations.
 - c. Panel board, switch board, switchgear, transformer, busway, generator, and motor control center locations.
 - d. Location of pull boxes and junction boxes, dimensioned from column center lines.
 8. Fire-Protection System: Show the following:

- a. Locations of standpipes, mains piping, branch lines, pipe drops, and sprinkler heads.
9. Review: Architect will review coordination drawings to confirm that the Work is being coordinated, but not for the details of the coordination, which are Contractor's responsibility. If Architect determines that coordination drawings are not being prepared in sufficient scope or detail, or are otherwise deficient, Architect will so inform Contractor, who shall make changes as directed and resubmit.
10. Coordination Drawing Prints: Prepare coordination drawing prints according to requirements in Section 013300 "Submittal Procedures."

1.7 REQUESTS FOR INFORMATION (RFIs)

- A. General: Immediately on discovery of the need for additional information or interpretation of the Contract Documents, Contractor shall prepare and submit an RFI in the form specified.
 1. Architect will return RFIs submitted to Architect by other entities controlled by Contractor with no response.
 2. Coordinate and submit RFIs in a prompt manner so as to avoid delays in Contractor's work or work of subcontractors.
- B. Content of the RFI: Include a detailed, legible description of item needing information or interpretation and the following:
 1. Project name.
 2. Project number.
 3. Date.
 4. Name of Contractor.
 5. Name of Architect.
 6. RFI number, numbered sequentially.
 7. RFI subject.
 8. Specification Section number and title and related paragraphs, as appropriate.
 9. Drawing number and detail references, as appropriate.
 10. Field dimensions and conditions, as appropriate.
 11. Contractor's suggested resolution. If Contractor's suggested resolution impacts the Contract Time or the Contract Sum, Contractor shall state impact in the RFI.
 12. Contractor's signature.
 13. Attachments: Include sketches, descriptions, measurements, photos, Product Data, Shop Drawings, coordination drawings, and other information necessary to fully describe items needing interpretation.
 - a. Include dimensions, thicknesses, structural grid references, and details of affected materials, assemblies, and attachments on attached sketches.
- C. RFI Forms: Form bound in Project Manual.
 1. Attachments shall be electronic files in Adobe Acrobat PDF format.
- D. Architect's Action: Architect will review each RFI, determine action required, and respond. Allow seven working days for Architect's response for each RFI. RFIs received by Architect after 1:00 p.m. will be considered as received the following working day.
 1. The following Contractor-generated RFIs will be returned without action:

- a. Requests for approval of submittals.
 - b. Requests for approval of substitutions.
 - c. Requests for approval of Contractor's means and methods.
 - d. Requests for coordination information already indicated in the Contract Documents.
 - e. Requests for adjustments in the Contract Time or the Contract Sum.
 - f. Requests for interpretation of Architect's actions on submittals.
 - g. Incomplete RFIs or inaccurately prepared RFIs.
2. Architect's action may include a request for additional information, in which case Architect's time for response will date from time of receipt of additional information.
 3. Architect's action on RFIs that may result in a change to the Contract Time or the Contract Sum may be eligible for Contractor to submit Change Proposal according to Section 012600 "Contract Modification Procedures."
 - a. If Contractor believes the RFI response warrants change in the Contract Time or the Contract Sum, notify Architect in writing within 7 days of receipt of the RFI response.
- E. RFI Log: Prepare, maintain, and submit a tabular log of RFIs organized by the RFI number. Submit log weekly when there are open RFIs. Include the following:
1. Project name.
 2. Name and address of Contractor.
 3. Name and address of Architect.
 4. RFI number including RFIs that were returned without action or withdrawn.
 5. RFI description.
 6. Date the RFI was submitted.
 7. Date Architect's response was received.
- F. On receipt of Architect's action, update the RFI log and immediately distribute the RFI response to affected parties. Review response and notify Architect within seven days if Contractor disagrees with response.
1. Identification of related Minor Change in the Work, Construction Change Directive, and Proposal Request, as appropriate.
- 1.8 PROJECT MEETINGS
- A. General: Schedule and conduct meetings and conferences at Project site unless otherwise indicated.
1. Attendees: Inform participants and others involved, and individuals whose presence is required, of date and time of each meeting. Notify Owner and Architect of scheduled meeting dates and times.
 2. Agenda: Prepare the meeting agenda. Distribute the agenda to all invited attendees.
 3. Minutes: Entity responsible for conducting meeting will record significant discussions and agreements achieved. Distribute the meeting minutes to everyone concerned, including Owner and Architect, within three days of the meeting.
- B. Preconstruction Conference: Architect will schedule and conduct a preconstruction conference before starting construction, at a time convenient to Owner and Architect, but no later than 15 days after execution of the Agreement.
1. Conduct the conference to review responsibilities and personnel assignments.

2. Attendees: Authorized representatives of Owner, Architect, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the conference. Participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
 3. Agenda: Discuss items of significance that could affect progress, including the following:
 - a. Tentative construction schedule.
 - b. Phasing.
 - c. Critical work sequencing and long-lead items.
 - d. Designation of key personnel and their duties.
 - e. Lines of communications.
 - f. Procedures for processing field decisions and Change Orders.
 - g. Procedures for RFIs.
 - h. Procedures for testing and inspecting.
 - i. Procedures for processing Applications for Payment.
 - j. Distribution of the Contract Documents.
 - k. Submittal procedures.
 - l. Preparation of record documents.
 - m. Use of the premises and existing building.
 - n. Work restrictions.
 - o. Working hours.
 - p. Owner's occupancy requirements.
 - q. Responsibility for temporary facilities and controls.
 - r. Procedures for disruptions and shutdowns.
 - s. Construction waste management and recycling.
 - t. Parking availability.
 - u. Office, work, and storage areas.
 - v. Equipment deliveries and priorities.
 - w. First aid.
 - x. Security.
 - y. Progress cleaning.
 4. Minutes: Entity responsible for conducting meeting will record and distribute meeting minutes.
- C. Preinstallation Conferences: Conduct a preinstallation conference at Project site before each construction activity that requires coordination with other construction.
1. Attendees: Installer and representatives of manufacturers and fabricators involved in or affected by the installation and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting. Advise Architect of scheduled meeting dates.
 2. Agenda: Review progress of other construction activities and preparations for the particular activity under consideration, including requirements for the following:
 - a. Contract Documents.
 - b. Options.
 - c. Related RFIs.
 - d. Related Change Orders.
 - e. Purchases.
 - f. Deliveries.
 - g. Submittals.
 - h. Review of mockups.
 - i. Possible conflicts.
 - j. Compatibility requirements.
 - k. Time schedules.

- l. Weather limitations.
 - m. Manufacturer's written instructions.
 - n. Warranty requirements.
 - o. Compatibility of materials.
 - p. Acceptability of substrates.
 - q. Temporary facilities and controls.
 - r. Space and access limitations.
 - s. Regulations of authorities having jurisdiction.
 - t. Testing and inspecting requirements.
 - u. Installation procedures.
 - v. Coordination with other work.
 - w. Required performance results.
 - x. Protection of adjacent work.
 - y. Protection of construction and personnel.
3. Record significant conference discussions, agreements, and disagreements, including required corrective measures and actions.
 4. Reporting: Distribute minutes of the meeting to each party present and to other parties requiring information.
 5. Do not proceed with installation if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of the Work and reconvene the conference at earliest feasible date.

D. Progress Meetings: Conduct progress meetings at intervals.

1. Coordinate dates of meetings with preparation of payment requests.
2. Attendees: In addition to representatives of Owner and Architect, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
3. Agenda: Review and correct or approve minutes of previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.
 - a. Contractor's Construction Schedule: Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Contractor's construction schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
 - 1) Review schedule for next period.
 - b. Review present and future needs of each entity present, including the following:
 - 1) Interface requirements.
 - 2) Sequence of operations.
 - 3) Status of submittals.
 - 4) Deliveries.
 - 5) Off-site fabrication.
 - 6) Access.
 - 7) Site utilization.
 - 8) Temporary facilities and controls.
 - 9) Progress cleaning.
 - 10) Quality and work standards.

- 11) Status of correction of deficient items.
 - 12) Field observations.
 - 13) Status of RFIs.
 - 14) Status of proposal requests.
 - 15) Pending changes.
 - 16) Status of Change Orders.
 - 17) Pending claims and disputes.
 - 18) Documentation of information for payment requests.
4. Minutes: Entity responsible for conducting the meeting will record and distribute the meeting minutes to each party present and to parties requiring information.
- a. Schedule Updating: Revise Contractor's construction schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with the report of each meeting.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 013100

SECTION 013200 - CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for documenting the progress of construction during performance of the Work, including the following:
 - 1. Startup construction schedule.
 - 2. Contractor's construction schedule.
 - 3. Construction schedule updating reports.
 - 4. Daily construction reports.
 - 5. Material location reports.
 - 6. Site condition reports.
 - 7. Special reports.
- B. Related Requirements:
 - 1. Section 013300 "Submittal Procedures" for submitting schedules and reports.
 - 2. Section 014000 "Quality Requirements" for submitting a schedule of tests and inspections.

1.3 DEFINITIONS

- A. Activity: A discrete part of a project that can be identified for planning, scheduling, monitoring, and controlling the construction project. Activities included in a construction schedule consume time and resources.
 - 1. Critical Activity: An activity on the critical path that must start and finish on the planned early start and finish times.
 - 2. Predecessor Activity: An activity that precedes another activity in the network.
 - 3. Successor Activity: An activity that follows another activity in the network.
- B. CPM: Critical path method, which is a method of planning and scheduling a construction project where activities are arranged based on activity relationships. Network calculations determine when activities can be performed and the critical path of Project.
- C. Event: The starting or ending point of an activity.
- D. Resource Loading: The allocation of manpower and equipment necessary for the completion of an activity as scheduled.

1.4 INFORMATIONAL SUBMITTALS

- A. Format for Submittals: Submit required submittals in the following format:
 - 1. Working electronic copy of schedule file, where indicated.
 - 2. Two paper copies.
- B. Startup construction schedule.
- C. Contractor's Construction Schedule: Initial schedule, of size required to display entire schedule for entire construction period.
- D. Construction Schedule Updating Reports: Submit with Applications for Payment.
- E. Daily Construction Reports: Submit at monthly intervals.
- F. Material Location Reports: Submit at biweekly intervals.
- G. Site Condition Reports: Submit at time of discovery of differing conditions.
- H. Special Reports: Submit at time of unusual event.

1.5 COORDINATION

- A. Coordinate preparation and processing of schedules and reports with performance of construction activities and with scheduling and reporting of separate contractors.
- B. Coordinate Contractor's construction schedule with the schedule of values, list of subcontracts, submittal schedule, progress reports, payment requests, and other required schedules and reports.
 - 1. Secure time commitments for performing critical elements of the Work from entities involved.
 - 2. Coordinate each construction activity in the network with other activities and schedule them in proper sequence.

PART 2 - PRODUCTS

2.1 CONTRACTOR'S CONSTRUCTION SCHEDULE, GENERAL

- A. Time Frame: Extend schedule from date established for the Notice of Award to date of final completion.
 - 1. Contract completion date shall not be changed by submission of a schedule that shows an early completion date, unless specifically authorized by Change Order.
- B. Activities: Treat each story or separate area as a separate numbered activity for each main element of the Work. Comply with the following:
 - 1. Activity Duration: Define activities so no activity is longer than 20 days, unless specifically allowed by Architect.
 - 2. Procurement Activities: Include procurement process activities for the following long lead items and major items, requiring a cycle of more than 60 days, as separate activities in schedule.

- Procurement cycle activities include, but are not limited to, submittals, approvals, purchasing, fabrication, and delivery.
3. Submittal Review Time: Include review and resubmittal times indicated in Section 013300 "Submittal Procedures" in schedule. Coordinate submittal review times in Contractor's construction schedule with submittal schedule.
 4. Startup and Testing Time: Include no fewer than 15 days for startup and testing.
 5. Substantial Completion: Indicate completion in advance of date established for Substantial Completion, and allow time for Architect's administrative procedures necessary for certification of Substantial Completion.
 6. Punch List and Final Completion: Include not more than 30 days for completion of punch list items and final completion.
- C. Constraints: Include constraints and work restrictions indicated in the Contract Documents and as follows in schedule, and show how the sequence of the Work is affected.
1. Phasing: Arrange list of activities on schedule by phase.
 2. Work under More Than One Contract: Include a separate activity for each contract.
 3. Work by Owner: Include a separate activity for each portion of the Work performed by Owner.
 4. Products Ordered in Advance: Include a separate activity for each product. Include delivery date indicated in Section 011000 "Summary." Delivery dates indicated stipulate the earliest possible delivery date.
 5. Owner-Furnished Products: Include a separate activity for each product. Include delivery date indicated in Section 011000 "Summary." Delivery dates indicated stipulate the earliest possible delivery date.
 6. Work Restrictions: Show the effect of the following items on the schedule:
 - a. Coordination with existing construction.
 - b. Limitations of continued occupancies.
 - c. Uninterruptible services.
 - d. Partial occupancy before Substantial Completion.
 - e. Use of premises restrictions.
 - f. Provisions for future construction.
 - g. Seasonal variations.
 - h. Environmental control.
 7. Work Stages: Indicate important stages of construction for each major portion of the Work, including, but not limited to, the following:
 - a. Subcontract awards.
 - b. Submittals.
 - c. Purchases.
 - d. Mockups.
 - e. Fabrication.
 - f. Sample testing.
 - g. Deliveries.
 - h. Installation.
 - i. Tests and inspections.
 - j. Adjusting.
 - k. Curing.
 - l. Building flush-out.
 - m. Startup and placement into final use and operation.

8. Construction Areas: Identify each major area of construction for each major portion of the Work. Indicate where each construction activity within a major area must be sequenced or integrated with other construction activities to provide for the following:
 - a. Structural completion.
 - b. Temporary enclosure and space conditioning.
 - c. Permanent space enclosure.
 - d. Completion of mechanical installation.
 - e. Completion of electrical installation.
 - f. Substantial Completion.

- D. Milestones: Include milestones indicated in the Contract Documents in schedule, including, but not limited to, the Notice to Proceed, Substantial Completion, and final completion and the following interim milestones:
 1. Temporary enclosure and space conditioning.

- E. Cost Correlation: Superimpose a cost correlation timeline, indicating planned and actual costs. On the line, show planned and actual dollar volume of the Work performed as of planned and actual dates used for preparation of payment requests.
 1. See Section 012900 "Payment Procedures" for cost reporting and payment procedures.

- F. Upcoming Work Summary: Prepare summary report indicating activities scheduled to occur or commence prior to submittal of next schedule update. Summarize the following issues:
 1. Unresolved issues.
 2. Unanswered Requests for Information.
 3. Rejected or unreturned submittals.
 4. Notations on returned submittals.
 5. Pending modifications affecting the Work and Contract Time.

- G. Recovery Schedule: When periodic update indicates the Work is 14 or more calendar days behind the current approved schedule, submit a separate recovery schedule indicating means by which Contractor intends to regain compliance with the schedule. Indicate changes to working hours, working days, crew sizes, and equipment required to achieve compliance, and date by which recovery will be accomplished.

2.2 STARTUP CONSTRUCTION SCHEDULE

- A. Bar-Chart Schedule: Submit startup, horizontal, bar-chart-type construction schedule within seven days of date established for the Notice of Award.

- B. Preparation: Indicate each significant construction activity separately. Identify first workday of each week with a continuous vertical line. Outline significant construction activities for first 90 days of construction. Include skeleton diagram for the remainder of the Work and a cash requirement prediction based on indicated activities.

2.3 CONTRACTOR'S CONSTRUCTION SCHEDULE (GANTT CHART)

- A. Gantt-Chart Schedule: Submit a comprehensive, fully developed, horizontal, Gantt-chart-type, Contractor's construction schedule within 14 days of date of the Notice of Award. Base schedule on the startup construction schedule and additional information received since the start of Project.

- B. Preparation: Indicate each significant construction activity separately. Identify first workday of each week with a continuous vertical line.
 - 1. For construction activities that require three months or longer to complete, indicate an estimated completion percentage in **10** percent increments within time bar.

2.4 REPORTS

- A. Daily Construction Reports: Prepare a daily construction report recording the following information concerning events at Project site:
 - 1. List of subcontractors at Project site.
 - 2. List of separate contractors at Project site.
 - 3. Approximate count of personnel at Project site.
 - 4. Equipment at Project site.
 - 5. Material deliveries.
 - 6. High and low temperatures and general weather conditions, including presence of rain or snow.
 - 7. Accidents.
 - 8. Meetings and significant decisions.
 - 9. Unusual events (see special reports).
 - 10. Stoppages, delays, shortages, and losses.
 - 11. Meter readings and similar recordings.
 - 12. Emergency procedures.
 - 13. Orders and requests of authorities having jurisdiction.
 - 14. Change Orders received and implemented.
 - 15. Construction Change Directives received and implemented.
 - 16. Services connected and disconnected.
 - 17. Equipment or system tests and startups.
 - 18. Partial completions and occupancies.
 - 19. Substantial Completions authorized.
- B. Material Location Reports: At biweekly intervals, prepare and submit a comprehensive list of materials delivered to and stored at Project site. List shall be cumulative, showing materials previously reported plus items recently delivered. Include with list a statement of progress on and delivery dates for materials or items of equipment fabricated or stored away from Project site. Indicate the following categories for stored materials:
 - 1. Material stored prior to previous report and remaining in storage.
 - 2. Material stored prior to previous report and since removed from storage and installed.
 - 3. Material stored following previous report and remaining in storage.
- C. Site Condition Reports: Immediately on discovery of a difference between site conditions and the Contract Documents, prepare and submit a detailed report. Submit with a Request for Information. Include a detailed description of the differing conditions, together with recommendations for changing the Contract Documents.

2.5 SPECIAL REPORTS

- A. General: Submit special reports to Architect and directly to the Owner within one day of an occurrence. Distribute copies of report to parties affected by the occurrence.

- B. Reporting Unusual Events: When an event of an unusual and significant nature occurs at Project site, whether or not related directly to the Work, prepare and submit a special report. List chain of events, persons participating, response by Contractor's personnel, evaluation of results or effects, and similar pertinent information. Advise Owner in advance when these events are known or predictable.

PART 3 - EXECUTION

3.1 CONTRACTOR'S CONSTRUCTION SCHEDULE

- A. Scheduling Consultant: Engage a consultant to provide planning, evaluation, and reporting using CPM scheduling.
 - 1. In-House Option: Owner may waive the requirement to retain a consultant if Contractor employs skilled personnel with experience in CPM scheduling and reporting techniques. Submit qualifications.
 - 2. Meetings: Scheduling consultant shall attend all meetings related to Project progress, alleged delays, and time impact.
- B. Contractor's Construction Schedule Updating: At monthly intervals, update schedule to reflect actual construction progress and activities. Issue schedule one week before each progress meeting.
 - 1. Revise schedule immediately after each meeting or other activity where revisions have been recognized or made. Issue updated schedule concurrently with the report of each such meeting.
 - 2. Include a report with updated schedule that indicates every change, including, but not limited to, changes in logic, durations, actual starts and finishes, and activity durations.
 - 3. As the Work progresses, indicate final completion percentage for each activity.
- C. Distribution: Distribute copies of approved schedule to Architect, Owner, separate contractors, testing and inspecting agencies, and other parties identified by Contractor with a need-to-know schedule responsibility.
 - 1. Post copies in Project meeting rooms and temporary field offices.
 - 2. When revisions are made, distribute updated schedules to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in performance of construction activities.

END OF SECTION 013200

SECTION 013300 - SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes requirements for the submittal schedule and administrative and procedural requirements for submitting Shop Drawings, Product Data, Samples, and other submittals.
- B. Related Requirements:
 - 1. Section 012900 "Payment Procedures" for submitting Applications for Payment and the schedule of values.
 - 2. Section 013200 "Construction Progress Documentation" for submitting schedules and reports, including Contractor's construction schedule.
 - 3. Section 017823 "Operation and Maintenance Data" for submitting operation and maintenance manuals.
 - 4. Section 017839 "Project Record Documents" for submitting record Drawings, record Specifications, and record Product Data.
 - 5. Section 017900 "Demonstration and Training" for submitting video recordings of demonstration of equipment and training of Owner's personnel.

1.3 DEFINITIONS

- A. Action Submittals: Written and graphic information and physical samples that require Architect's responsive action. Action submittals are those submittals indicated in individual Specification Sections as "action submittals."
- B. Informational Submittals: Written and graphic information and physical samples that do not require Architect's responsive action. Submittals may be rejected for not complying with requirements. Informational submittals are those submittals indicated in individual Specification Sections as "informational submittals."
- C. File Transfer Protocol (FTP): Communications protocol that enables transfer of files to and from another computer over a network and that serves as the basis for standard Internet protocols. An FTP site is a portion of a network located outside of network firewalls within which internal and external users are able to access files.
- D. Portable Document Format (PDF): An open standard file format licensed by Adobe Systems used for representing documents in a device-independent and display resolution-independent fixed-layout document format.

1.4 ACTION SUBMITTALS

- A. Submittal Schedule: Submit a schedule of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, ordering, manufacturing, fabrication, and delivery when establishing dates. Include additional time required for making corrections or revisions to submittals noted by Architect and additional time for handling and reviewing submittals required by those corrections.
1. Coordinate submittal schedule with list of subcontracts, the schedule of values, and Contractor's construction schedule.
 2. Initial Submittal: Submit concurrently with startup construction schedule. Include submittals required during the first 60 days of construction. List those submittals required to maintain orderly progress of the Work and those required early because of long lead time for manufacture or fabrication.
 3. Final Submittal: Submit concurrently with the first complete submittal of Contractor's construction schedule.
 - a. Submit revised submittal schedule to reflect changes in current status and timing for submittals.
 4. Format: Arrange the following information in a tabular format:
 - a. Scheduled date for first submittal.
 - b. Specification Section number and title.
 - c. Submittal category: Action; informational.
 - d. Name of subcontractor.
 - e. Description of the Work covered.
 - f. Scheduled date for Architect's final release or approval.
 - g. Scheduled date of fabrication.
 - h. Scheduled dates for purchasing.
 - i. Scheduled dates for installation.
 - j. Activity or event number.

1.5 SUBMITTAL ADMINISTRATIVE REQUIREMENTS

- A. Architect's Digital Data Files: Electronic digital data files of the Contract Drawings will not be provided by Architect for Contractor's use in preparing submittals.
- B. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.
1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
 2. Submit all submittal items required for each Specification Section concurrently unless partial submittals for portions of the Work are indicated on approved submittal schedule.
 3. Submit action submittals and informational submittals required by the same Specification Section as separate packages under separate transmittals.
 4. Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed because of need to review submittals concurrently for coordination.
 - a. Architect reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.

- C. Processing Time: Allow time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Architect's receipt of submittal. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including resubmittals.
1. Initial Review: Allow 15 days for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. Architect will advise Contractor when a submittal being processed must be delayed for coordination.
 2. Intermediate Review: If intermediate submittal is necessary, process it in same manner as initial submittal.
 3. Resubmittal Review: Allow 15 days for review of each resubmittal.
 4. No extension of Contract Time will be authorized because of failure to transmit submittals sufficiently in advance of the Work to permit processing.
 5. Concurrent Consultant Review: Where the Contract Documents indicate that submittals may be transmitted simultaneously to Architect and to Architect's consultants, allow 15 days for review of each submittal. Submittal will be returned to Architect before being returned to Contractor.
- D. Paper Submittals: Place a permanent label or title block on each submittal item for identification.
1. Indicate name of firm or entity that prepared each submittal on label or title block.
 2. Provide a space approximately **6 by 8 inches** on label or beside title block to record Contractor's review and approval markings and action taken by Architect.
 3. Include the following information for processing and recording action taken:
 - a. Project name.
 - b. Date.
 - c. Name of Architect.
 - d. Name of Contractor.
 - e. Name of subcontractor.
 - f. Name of supplier.
 - g. Name of manufacturer.
 - h. Submittal number or other unique identifier, including revision identifier.
 - 1) Submittal number shall use Specification Section number followed by a decimal point and then a sequential number (e.g., 061000.01). Resubmittals shall include an alphabetic suffix after another decimal point (e.g., 061000.01.A).
 - i. Number and title of appropriate Specification Section.
 - j. Drawing number and detail references, as appropriate.
 - k. Location(s) where product is to be installed, as appropriate.
 - l. Other necessary identification.
 4. Additional Paper Copies: Unless additional copies are required for final submittal, and unless Architect observes noncompliance with provisions in the Contract Documents, initial submittal may serve as final submittal.
 - a. Submit one copy of submittal to concurrent reviewer in addition to specified number of copies to Architect.
 5. Transmittal for Paper Submittals: Assemble each submittal individually and appropriately for transmittal and handling. Transmit each submittal using a transmittal form. Architect will discard submittals received from sources other than Contractor.
 - a. Transmittal Form for Paper Submittals: Use facsimile of sample form included in Project Manual.

- E. Options: Identify options requiring selection by Architect.
- F. Deviations and Additional Information: On an attached separate sheet, prepared on Contractor's letterhead, record relevant information, requests for data, revisions other than those requested by Architect on previous submittals, and deviations from requirements in the Contract Documents, including minor variations and limitations. Include same identification information as related submittal.
- G. Resubmittals: Make resubmittals in same form and number of copies as initial submittal.
 - 1. Note date and content of previous submittal.
 - 2. Note date and content of revision in label or title block and clearly indicate extent of revision.
 - 3. Resubmit submittals until they are marked with approval notation from Architect's action stamp.
 - 4. The Architect will review an initial submittal and a maximum of two (2) resubmittals. Additional reviewing will constitute failure of the Contractor to perform in accordance with the Contract.
 - 5. Resubmittal of products that received "Approved" or "Approved as Noted" status will not be accepted.
- H. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.
- I. Use for Construction: Retain complete copies of submittals on Project site. Use only final action submittals that are marked with approval notation from Architect's action stamp.

PART 2 - PRODUCTS

2.1 SUBMITTAL PROCEDURES

- A. General Submittal Procedure Requirements: Prepare and submit submittals required by individual Specification Sections. Types of submittals are indicated in individual Specification Sections.
 - 1. Action Submittals: Submit three paper copies of each submittal unless otherwise indicated. Architect will return two copies.
 - 2. Informational Submittals: Submit two paper copies of each submittal unless otherwise indicated. Architect will not return copies.
 - 3. Certificates and Certifications Submittals: Provide a statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity.
- B. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.
 - 1. If information must be specially prepared for submittal because standard published data are not suitable for use, submit as Shop Drawings, not as Product Data.
 - 2. Mark each copy of each submittal to show which products and options are applicable.
 - 3. Include the following information, as applicable:
 - a. Manufacturer's catalog cuts.
 - b. Manufacturer's product specifications.
 - c. Standard color charts.
 - d. Statement of compliance with specified referenced standards.
 - e. Testing by recognized testing agency.

- f. Application of testing agency labels and seals.
 - g. Notation of coordination requirements.
 - h. Availability and delivery time information.
 4. For equipment, include the following in addition to the above, as applicable:
 - a. Wiring diagrams showing factory-installed wiring.
 - b. Printed performance curves.
 - c. Operational range diagrams.
 - d. Clearances required to other construction, if not indicated on accompanying Shop Drawings.
 5. Submit Product Data before or concurrent with Samples.
 6. Submit Product Data in the following format:
 - a. Three paper copies of Product Data unless otherwise indicated. Architect will return two copies.
- C. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data, unless submittal based on Architect's digital data drawing files is otherwise permitted.
 1. Preparation: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:
 - a. Identification of products.
 - b. Schedules.
 - c. Compliance with specified standards.
 - d. Notation of coordination requirements.
 - e. Notation of dimensions established by field measurement.
 - f. Relationship and attachment to adjoining construction clearly indicated.
 - g. Seal and signature of professional engineer if specified.
 2. Sheet Size: Except for templates, patterns, and similar full-size drawings, submit Shop Drawings on sheets at least 8-1/2 by 11 inches , but no larger than 30 by 42 inches.
 3. Submit Shop Drawings in the following format:
 - a. Three opaque copies of each submittal. Architect will retain two copies; remainder will be returned.
- D. Samples: Submit Samples for review of kind, color, pattern, and texture for a check of these characteristics with other elements and for a comparison of these characteristics between submittal and actual component as delivered and installed.
 1. Transmit Samples that contain multiple, related components such as accessories together in one submittal package.
 2. Identification: Attach label on unexposed side of Samples that includes the following:
 - a. Generic description of Sample.
 - b. Product name and name of manufacturer.
 - c. Sample source.
 - d. Number and title of applicable Specification Section.
 - e. Specification paragraph number and generic name of each item.
 3. Disposition: Maintain sets of approved Samples at Project site, available for quality-control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.

- a. Samples not incorporated into the Work, or otherwise designated as Owner's property, are the property of Contractor.
 4. Samples for Initial Selection: Submit manufacturer's color charts consisting of units or sections of units showing the full range of colors, textures, and patterns available.
 - a. Number of Samples: Submit one full set of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line. Architect will return submittal with options selected.
- E. Product Schedule: As required in individual Specification Sections, prepare a written summary indicating types of products required for the Work and their intended location. Include the following information in tabular form:
 1. Type of product. Include unique identifier for each product indicated in the Contract Documents or assigned by Contractor if none is indicated.
 2. Manufacturer and product name, and model number if applicable.
 3. Number and name of room or space.
 4. Location within room or space.
 5. Submit product schedule in the following format:
 - a. Three paper copies of product schedule or list unless otherwise indicated. Architect will return two copies.
- F. Coordination Drawing Submittals: Comply with requirements specified in Section 013100 "Project Management and Coordination."
- G. Contractor's Construction Schedule: Comply with requirements specified in Section 013200 "Construction Progress Documentation."
- H. Application for Payment and Schedule of Values: Comply with requirements specified in Section 012900 "Payment Procedures."
- I. Test and Inspection Reports and Schedule of Tests and Inspections Submittals: Comply with requirements specified in Section 014000 "Quality Requirements."
- J. Closeout Submittals and Maintenance Material Submittals: Comply with requirements specified in Section 017700 "Closeout Procedures."
- K. Maintenance Data: Comply with requirements specified in Section 017823 "Operation and Maintenance Data."
- L. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, contact information of architects and owners, and other information specified.
- M. Welding Certificates: Prepare written certification that welding procedures and personnel comply with requirements in the Contract Documents. Submit record of Welding Procedure Specification and Procedure Qualification Record on AWS forms. Include names of firms and personnel certified.
- N. Installer Certificates: Submit written statements on manufacturer's letterhead certifying that Installer complies with requirements in the Contract Documents and, where required, is authorized by manufacturer for this specific Project.

- O. Manufacturer Certificates: Submit written statements on manufacturer's letterhead certifying that manufacturer complies with requirements in the Contract Documents. Include evidence of manufacturing experience where required.
- P. Product Certificates: Submit written statements on manufacturer's letterhead certifying that product complies with requirements in the Contract Documents. A Product Certification is acceptable only when it is acceptable to the Architect. A Hardware Product Certification letter is not acceptable in lieu of a Hardware Product Submittal.
- Q. Material Certificates: Submit written statements on manufacturer's letterhead certifying that material complies with requirements in the Contract Documents.
- R. Material Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements in the Contract Documents.
- S. Product Test Reports: Submit written reports indicating that current product produced by manufacturer complies with requirements in the Contract Documents. Base reports on evaluation of tests performed by manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.
- T. Research Reports: Submit written evidence, from a model code organization acceptable to authorities having jurisdiction, that product complies with building code in effect for Project. Include the following information:
 - 1. Name of evaluation organization.
 - 2. Date of evaluation.
 - 3. Time period when report is in effect.
 - 4. Product and manufacturers' names.
 - 5. Description of product.
 - 6. Test procedures and results.
 - 7. Limitations of use.
- U. Preconstruction Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of tests performed before installation of product, for compliance with performance requirements in the Contract Documents.
- V. Compatibility Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of compatibility tests performed before installation of product. Include written recommendations for primers and substrate preparation needed for adhesion.
- W. Field Test Reports: Submit written reports indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for compliance with requirements in the Contract Documents.
- X. Design Data: Prepare and submit written and graphic information, including, but not limited to, performance and design criteria, list of applicable codes and regulations, and calculations. Include list of assumptions and other performance and design criteria and a summary of loads. Include load diagrams if applicable. Provide name and version of software, if any, used for calculations. Include page numbers.

2.2 DELEGATED-DESIGN SERVICES

- A. Performance and Design Criteria: Where professional design services or certifications by a design professional are specifically required of Contractor by the Contract Documents, provide products and systems complying with specific performance and design criteria indicated.
 - 1. If criteria indicated are not sufficient to perform services or certification required, submit a written request for additional information to Architect.
- B. Delegated-Design Services Certification: In addition to Shop Drawings, Product Data, and other required submittals, submit digitally signed PDF electronic file and three paper copies of certificate, signed and sealed by the responsible design professional, for each product and system specifically assigned to Contractor to be designed or certified by a design professional.
 - 1. Indicate that products and systems comply with performance and design criteria in the Contract Documents. Include list of codes, loads, and other factors used in performing these services.

PART 3 - EXECUTION

3.1 CONTRACTOR'S REVIEW

- A. Action and Informational Submittals: Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Architect.
- B. Project Closeout and Maintenance Material Submittals: See requirements in Section 017700 "Closeout Procedures."
- C. Approval Stamp: Stamp each submittal with a uniform, approval stamp. Include Project name and location, submittal number, Specification Section title and number, name of reviewer, date of Contractor's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.
- D. The Contractor may submit a Product Certification Form for products to be provided in full compliance with the Contract requirements; see Form attached at end of section.

3.2 ARCHITECT'S ACTION

- A. Action Submittals: Architect will review each submittal, make marks to indicate corrections or revisions required, and return it. Architect will stamp each submittal with an action stamp and will mark stamp appropriately to indicate action as follows:
 - 1. Action Stamp: The Architect will stamp each submittal with a uniform, action stamp. The stamp will be appropriately marked, as follows, to indicate the action taken:
 - a. Final Unrestricted Release: Where submittals are marked "Approved", that part of the Work covered by the submittal may proceed provided it complies with requirements of the Contract Documents; final acceptance will depend upon that compliance.
 - b. Final-But-Restricted Release: When submittals are marked "Approved as Noted", that part of the Work covered by the submittal may proceed provided it complies with notations or

- corrections on the submittal and requirements of the Contract Documents; final acceptance will depend on that compliance.
- c. Returned for Resubmittal: When submittal is marked “Not Approved”, or “Revised and Resubmit”, do not proceed with that part of the Work covered by the submittal, including purchasing, fabrication, delivery, or other activity. Revise or prepare a new submittal in accordance with the notations; resubmit without delay. Repeat if necessary to obtain a different action mark.
 - 1) Do not permit submittals marked “Not Approved”, or “Revise and Resubmit” to be used at the Project site, or elsewhere where Work is in progress.
 - d. Other Action: Where a submittal is primarily for information or record purposes, special processing or other activity, the submittal will be returned, marked “Action Not Required”.
- B. Informational Submittals: Architect will review each submittal and will not return it, or will return it if it does not comply with requirements. Architect will forward each submittal to appropriate party.
 - C. Partial submittals prepared for a portion of the Work will be reviewed when use of partial submittals has received prior approval from Architect.
 - D. Incomplete submittals are unacceptable, will be considered nonresponsive, and will be returned for resubmittal without review.
 - E. Submittals not required by the Contract Documents may be returned by the Architect without action.

3.3 CONTRACTOR DISTRIBUTION

- A. Upon receipt of shop drawings, product data or other submittals with the Architect’s “Approved” or “Approved as Noted” action stamp, prepare and distribute copies as follows:
 - 1. One copy Owner
 - 2. One copy Project Field Office
 - 3. One Copy Contractor’s Office
 - 4. One Copy Each Prime Contractor
 - 5. One Copy Each Contract Consultant
 - 6. One Copy Supplier or Fabricator
 - 7. One Copy for Record Document Submittal

[Date]

[To Contractor of Record]

Re: [Project Description]
[Name and address of the Architect]
[Architect's Commission Number]
[Name and Address of Manufacturer]
[Name and Address of Supplier]
[Specification Section Number]
[Product] Manufacturer's Certification

[Product] has been checked for compliance with the project specifications and performance criteria listed in the Project Manual.

We certify that the [Product] delivered to the project site is as specified and will perform in accordance with [Manufacturer's Name] published technical literature and project specifications above.

Respectfully submitted,

[Corporate Officer]

[Corporate or Notary Seal]

END OF SECTION 013300

SECTION 014000 - QUALITY REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for quality assurance and quality control.
- B. Testing and inspection services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Document requirements.
 - 1. Specific quality-assurance and quality-control requirements for individual work results are specified in their respective Specification Sections. Requirements in individual Sections may also cover production of standard products.
 - 2. Specified tests, inspections, and related actions do not limit Contractor's other quality-assurance and quality-control procedures that facilitate compliance with the Contract Document requirements.
 - 3. Requirements for Contractor to provide quality-assurance and quality-control services required by Architect, Owner, or authorities having jurisdiction are not limited by provisions of this Section.
 - 4. Specific test and inspection requirements are not specified in this Section.

1.3 DEFINITIONS

- A. Experienced: When used with an entity or individual, "experienced" unless otherwise further described means having successfully completed a minimum of **five** previous projects similar in nature, size, and extent to this Project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.
- B. Field Quality-Control Tests: Tests and inspections that are performed on-site for installation of the Work and for completed Work.
- C. Installer/Applicator/Erector: Contractor or another entity engaged by Contractor as an employee, Subcontractor, or Sub-subcontractor, to perform a particular construction operation, including installation, erection, application, assembly, and similar operations.
 - 1. Use of trade-specific terminology in referring to a trade or entity does not require that certain construction activities be performed by accredited or unionized individuals, or that requirements specified apply exclusively to specific trade(s).

- D. Preconstruction Testing: Tests and inspections performed specifically for Project before products and materials are incorporated into the Work, to verify performance or compliance with specified criteria.
- E. Product Tests: Tests and inspections that are performed by a nationally recognized testing laboratory (NRTL) according to 29 CFR 1910.7, by a testing agency accredited according to NIST's National Voluntary Laboratory Accreditation Program (NVLAP), or by a testing agency qualified to conduct product testing and acceptable to authorities having jurisdiction, to establish product performance and compliance with specified requirements.
- F. Source Quality-Control Tests: Tests and inspections that are performed at the source; for example, plant, mill, factory, or shop.
- G. Testing Agency: An entity engaged to perform specific tests, inspections, or both. Testing laboratory shall mean the same as testing agency.
- H. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and substantiate that proposed construction will comply with requirements.
- I. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that actual products incorporated into the Work and completed construction comply with requirements. Contractor's quality-control services do not include contract administration activities performed by Architect .
- J. Mockups: full size, physical assemblies that are constructed on site. Markups are used to verify selections made under submittals determine and demonstrate aesthetic effects and qualities of materials and execution and to review construction coordination testing or operation. They are not samples. Approved mockups established a standard by which the work will be judged.
- K. Laboratory mockups: full size, physical assemblies that are constructed at testing facility to verify performance characteristics.

1.4 DELEGATED-DESIGN SERVICES

- A. Performance and Design Criteria: Where professional design services or certifications by a design professional are specifically required of Contractor by the Contract Documents, provide products and systems complying with specific performance and design criteria indicated.
 - 1. If criteria indicated are not sufficient to perform services or certification required, submit a written request for additional information to Architect.

1.5 CONFLICTING REQUIREMENTS

- A. Conflicting Standards and Other Requirements: If compliance with two or more standards or requirements are specified and the standards or requirements establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer conflicting requirements that are different, but apparently equal, to Architect for direction before proceeding.

- B. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. Refer uncertainties to Architect for a decision before proceeding.

1.6 ACTION SUBMITTALS

- A. Delegated-Design Services Submittal: In addition to Shop Drawings, Product Data, and other required submittals, submit a statement signed and sealed by the responsible design professional, for each product and system specifically assigned to Contractor to be designed or certified by a design professional, indicating that the products and systems are in compliance with performance and design criteria indicated. Include list of codes, loads, and other factors used in performing these services.

1.7 INFORMATIONAL SUBMITTALS

- A. Contractor's Quality-Control Plan: For quality-assurance and quality-control activities and responsibilities.
- B. Qualification Data: For Contractor's quality-control personnel.
- C. Testing Agency Qualifications: For testing agencies specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include proof of qualifications in the form of a recent report on the inspection of the testing agency by a recognized authority.
- D. Schedule of Tests and Inspections: Prepare in tabular form and include the following:
 - 1. Specification Section number and title.
 - 2. Entity responsible for performing tests and inspections.
 - 3. Description of test and inspection.
 - 4. Identification of applicable standards.
 - 5. Identification of test and inspection methods.
 - 6. Number of tests and inspections required.
 - 7. Time schedule or time span for tests and inspections.
 - 8. Requirements for obtaining samples.
 - 9. Unique characteristics of each quality-control service.
- E. Reports: Prepare and submit certified written reports and documents as specified.
- F. Permits, Licenses, and Certificates: For Owner's record, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents established for compliance with standards and regulations bearing on performance of the Work.

1.8 CONTRACTOR'S QUALITY-CONTROL PLAN

- A. Quality-Control Plan, General: Submit quality-control plan within 10 days of Notice of Award, and not less than five days prior to preconstruction conference. Submit in format acceptable to Architect. Identify personnel, procedures, controls, instructions, tests, records, and forms to be used to carry out Contractor's quality-assurance and quality-control responsibilities. Coordinate with Contractor's Construction Schedule.
- B. Quality-Control Personnel Qualifications: Engage qualified personnel trained and experienced in managing and executing quality-assurance and quality-control procedures similar in nature and extent to those required for Project.
 - 1. Project quality-control manager may also serve as Project superintendent.
- C. Submittal Procedure: Describe procedures for ensuring compliance with requirements through review and management of submittal process. Indicate qualifications of personnel responsible for submittal review.
- D. Testing and Inspection: In quality-control plan, include a comprehensive schedule of Work requiring testing or inspection, including the following:
 - 1. Contractor-performed tests and inspections including Subcontractor-performed tests and inspections. Include required tests and inspections and Contractor-elected tests and inspections. Distinguish source quality-control tests and inspections from field quality-control tests and inspections.
 - 2. Special inspections required by authorities having jurisdiction and indicated on the Statement of Special Inspections.
 - 3. Owner-performed tests and inspections indicated in the Contract Documents.
- E. Continuous Inspection of Workmanship: Describe process for continuous inspection during construction to identify and correct deficiencies in workmanship in addition to testing and inspection specified. Indicate types of corrective actions to be required to bring work into compliance with standards of workmanship established by Contract requirements and approved mockups.
- F. Monitoring and Documentation: Maintain testing and inspection reports including log of approved and rejected results. Include work Architect has indicated as nonconforming or defective. Indicate corrective actions taken to bring nonconforming work into compliance with requirements. Comply with requirements of authorities having jurisdiction.

1.9 REPORTS AND DOCUMENTS

- A. Test and Inspection Reports: Prepare and submit certified written reports specified in other Sections. Include the following:
 - 1. Date of issue.
 - 2. Project title and number.
 - 3. Name, address, telephone number, and email address of testing agency.
 - 4. Dates and locations of samples and tests or inspections.

5. Names of individuals making tests and inspections.
 6. Description of the Work and test and inspection method.
 7. Identification of product and Specification Section.
 8. Complete test or inspection data.
 9. Test and inspection results and an interpretation of test results.
 10. Record of temperature and weather conditions at time of sample taking and testing and inspection.
 11. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
 12. Name and signature of laboratory inspector.
 13. Recommendations on retesting and reinspecting.
- B. Manufacturer's Technical Representative's Field Reports: Prepare written information documenting manufacturer's technical representative's tests and inspections specified in other Sections. Include the following:
1. Name, address, telephone number, and email address of technical representative making report.
 2. Statement on condition of substrates and their acceptability for installation of product.
 3. Statement that products at Project site comply with requirements.
 4. Summary of installation procedures being followed, whether they comply with requirements and, if not, what corrective action was taken.
 5. Results of operational and other tests and a statement of whether observed performance complies with requirements.
 6. Statement whether conditions, products, and installation will affect warranty.
 7. Other required items indicated in individual Specification Sections.
- C. Factory-Authorized Service Representative's Reports: Prepare written information documenting manufacturer's factory-authorized service representative's tests and inspections specified in other Sections. Include the following:
1. Name, address, telephone number, and email address of factory-authorized service representative making report.
 2. Statement that equipment complies with requirements.
 3. Results of operational and other tests and a statement of whether observed performance complies with requirements.
 4. Statement whether conditions, products, and installation will affect warranty.
 5. Other required items indicated in individual Specification Sections.
- 1.10 QUALITY ASSURANCE
- A. General: Qualifications paragraphs in this article establish the minimum qualification levels required; individual Specification Sections specify additional requirements.
- B. Manufacturer Qualifications: A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units. As applicable, procure products from manufacturers able to meet qualification requirements, warranty requirements, and technical or factory-authorized service representative requirements.

- C. Fabricator Qualifications: A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- D. Installer Qualifications: A firm or individual experienced in installing, erecting, applying, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.
- E. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of the system, assembly, or product that are similar in material, design, and extent to those indicated for this Project.
- F. Specialists: Certain Specification Sections require that specific construction activities shall be performed by entities who are recognized experts in those operations. Specialists shall satisfy qualification requirements indicated and shall be engaged for the activities indicated.
 - 1. Requirements of authorities having jurisdiction shall supersede requirements for specialists.
- G. Testing Agency Qualifications: An NRTL, an NVLAP, or an independent agency with the experience and capability to conduct testing and inspection indicated, as documented according to ASTM E 329; and with additional qualifications specified in individual Sections; and, where required by authorities having jurisdiction, that is acceptable to authorities.
- H. Manufacturer's Technical Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to observe and inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.
- I. Factory-Authorized Service Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.
- J. Preconstruction Testing: Where testing agency is indicated to perform preconstruction testing for compliance with specified requirements for performance and test methods, comply with the following:
 - 1. Contractor responsibilities include the following:
 - a. Provide test specimens representative of proposed products and construction.
 - b. Submit specimens in a timely manner with sufficient time for testing and analyzing results to prevent delaying the Work.
 - c. Provide sizes and configurations of test assemblies, mockups, and laboratory mockups to adequately demonstrate capability of products to comply with performance requirements.
 - d. Build site-assembled test assemblies and mockups using installers who will perform same tasks for Project.

- e. Build laboratory mockups at testing facility using personnel, products, and methods of construction indicated for the completed Work.
 - f. When testing is complete, remove test specimens and test assemblies, **and** mockups; do not reuse products on Project.
2. Testing Agency Responsibilities: Submit a certified written report of each test, inspection, and similar quality-assurance service to Architect, with copy to Contractor. Interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from the Contract Documents.
- K. Markups: before installing portions of the work requiring mockups, build mockups for each form of construction and finish required to comply with the following requirements , using materials indicated for the completed Work:
1. Build mockups in location and size indicated or if not indicated as directed by the Architect. Mockups may be installed at locations of the finished work as in place mock-ups.
 2. Notify architect seven days in advance of dates and times when mockups will be constructed.
 3. Demonstrate proposed range of aesthetic effects and workmanship.
 4. Obtain Manufacturers approval of mock-ups before obtaining architects approval of mark-ups.
 5. Obtain Architect's approval of mockups before starting production Work.
 6. Maintain mockups during construction in an undisturbed condition as a standard for judging the complete work.
 7. Demolish and remove mockups when directed unless otherwise indicated.
- L. Laboratory markup: comply with requirements of pre-construction testing those specified in the Contract Document.

1.11 QUALITY CONTROL

- A. Owner Responsibilities: Where quality-control services are indicated as Owner's responsibility, Owner will engage a qualified testing agency to perform these services.
1. Owner will furnish Contractor with names, addresses, and telephone numbers of testing agencies engaged and a description of types of testing and inspection they are engaged to perform.
 2. Costs for retesting and reinspecting construction that replaces or is necessitated by work that failed to comply with the Contract Documents will be charged to Contractor.
- B. Contractor Responsibilities: Tests and inspections not explicitly assigned to Owner are Contractor's responsibility. Perform additional quality-control activities, whether specified or not, to verify and document that the Work complies with requirements.
1. Unless otherwise indicated, provide quality-control services specified and those required by authorities having jurisdiction. Perform quality-control services required of Contractor by authorities having jurisdiction, whether specified or not.
 2. Engage a qualified testing agency to perform quality-control services.

- a. Contractor shall not employ same entity engaged by Owner, unless agreed to in writing by Owner.
 3. Notify testing agencies at least 24 hours in advance of time when Work that requires testing or inspection will be performed.
 4. Where quality-control services are indicated as Contractor's responsibility, submit a certified written report, in duplicate, of each quality-control service.
 5. Testing and inspection requested by Contractor and not required by the Contract Documents are Contractor's responsibility.
 6. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.
- C. Retesting/Reinspecting: Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services, including retesting and reinspecting, for construction that replaced Work that failed to comply with the Contract Documents.
- D. Testing Agency Responsibilities: Cooperate with Architect and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.
1. Notify Architect and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
 2. Determine the locations from which test samples will be taken and in which in-situ tests are conducted.
 3. Conduct and interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from requirements.
 4. Submit a certified written report, in duplicate, of each test, inspection, and similar quality-control service through Contractor.
 5. Do not release, revoke, alter, or increase the Contract Document requirements or approve or accept any portion of the Work.
 6. Do not perform duties of Contractor.
- E. Manufacturer's Field Services: Where indicated, engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including service connections. Report results in writing as specified in Section 013300 "Submittal Procedures."
- F. Manufacturer's Technical Services: Where indicated, engage a manufacturer's technical representative to observe and inspect the Work. Manufacturer's technical representative's services include participation in preinstallation conferences, examination of substrates and conditions, verification of materials, observation of Installer activities, inspection of completed portions of the Work, and submittal of written reports.
- G. Associated Contractor Services: Cooperate with agencies and representatives performing required tests, inspections, and similar quality-control services, and provide reasonable auxiliary services as requested. Notify agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:
1. Access to the Work.
 2. Incidental labor and facilities necessary to facilitate tests and inspections.

3. Adequate quantities of representative samples of materials that require testing and inspection. Assist agency in obtaining samples.
 4. Facilities for storage and field curing of test samples.
 5. Preliminary design mix proposed for use for material mixes that require control by testing agency.
 6. Security and protection for samples and for testing and inspection equipment at Project site.
- H. Coordination: Coordinate sequence of activities to accommodate required quality-assurance and quality-control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspection.
1. Schedule times for tests, inspections, obtaining samples, and similar activities.
- I. Schedule of Tests and Inspections: Prepare a schedule of tests, inspections, and similar quality-control services required by the Contract Documents as a component of Contractor's quality-control plan. Coordinate and submit concurrently with Contractor's Construction Schedule. Update as the Work progresses.
1. Distribution: Distribute schedule to Owner, Architect, testing agencies, and each party involved in performance of portions of the Work where tests and inspections are required.

1.12 SPECIAL TESTS AND INSPECTIONS

- A. Special Tests and Inspections: Owner will engage a qualified testing agency and special inspector to conduct special tests and inspections required by authorities having jurisdiction as the responsibility of Owner, as indicated in individual Specification Sections in the Statement of Special Inspections in Section 014001, and as follows:
1. Verifying that manufacturer maintains detailed fabrication and quality-control procedures and reviewing the completeness and adequacy of those procedures to perform the Work.
 2. Notifying Architect and Contractor promptly of irregularities and deficiencies observed in the Work during performance of its services.
 3. Submitting a certified written report of each test, inspection, and similar quality-control service to Architect with copy to Contractor and to authorities having jurisdiction.
 4. Submitting a final report of special tests and inspections at Substantial Completion, which includes a list of unresolved deficiencies.
 5. Interpreting tests and inspections and stating in each report whether tested and inspected work complies with or deviates from the Contract Documents.
 6. Retesting and reinspecting corrected work.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 TEST AND INSPECTION LOG

- A. Test and Inspection Log: Prepare a record of tests and inspections. Include the following:
 - 1. Date test or inspection was conducted.
 - 2. Description of the Work tested or inspected.
 - 3. Date test or inspection results were transmitted to Architect.
 - 4. Identification of testing agency or special inspector conducting test or inspection.
- B. Maintain log at Project site. Post changes and revisions as they occur. Provide access to test and inspection log for Architect's reference during normal working hours.
 - 1. Submit log at Project closeout as part of Project Record Documents.

3.2 REPAIR AND PROTECTION

- A. General: On completion of testing, inspection, sample taking, and similar services, repair damaged construction and restore substrates and finishes.
 - 1. Provide materials and comply with installation requirements specified in other Specification Sections or matching existing substrates and finishes. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible. Comply with the Contract Document requirements for cutting and patching in Section 017300 "Execution."
- B. Protect construction exposed by or for quality-control service activities.
- C. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

END OF SECTION 014000

SECTION 014001 – STATEMENT OF SPECIAL INSPECTIONS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
- B. Refer to Division 01 Section 014000 “Quality Requirements” for special tests and inspections requirements.

1.2 SUMMARY

- A. Section Includes special inspections requirements for:
 - 1. Steel construction.
 - a. Structural steel and welding.
 - b. Open-web steel joists and joist girders.
 - 2. Cast-in-place concrete.
 - 3. Unit masonry.
 - 4. Soils.
 - 5. Fabricated items.
 - 6. Fire-resistant penetrations and joints.
 - 7. Mock ups

1.3 DEFINITIONS

- A. All terms provided in this Section shall be defined in accordance with the Uniform Construction Code of New Jersey (NJUCC) and the International Building Code 2018, New Jersey Edition (NJ IBC 2018).
- B. Special Inspection: Inspection of construction requiring the expertise of an approved special inspector in order to ensure compliance with the Building Code and the approved Construction Documents.
- C. Special Inspection, Continuous: Special inspection by the special inspector who is present continuously when and where the work to be inspected is being performed.
- D. Special Inspection, Periodic: Special inspection by the special inspector who is intermittently present where the work to be inspected has been or is being performed.
- E. Special Inspector (Approved Special Inspector, Qualified Special Inspector): A qualified person employed or retained by an approved agency and approved by the construction official as having the competence necessary to inspect a particular type of construction requiring special inspection. Special inspectors shall be certified in accordance with the administrative

provisions of the Uniform Construction Code of New Jersey and Chapter 17 of the Building Code.

1.4 REFERENCED STANDARDS

- A. ACI 318: ACI 318-14, *Building Code Requirements for Structural Concrete*
- B. AISC 360: AISC 360-10, *Specification for Structural Steel Buildings*
- C. AWS D1.1: AWS D1.1-2004, *Structural Welding Code-Steel*
- D. AWS D1.4: AWS D1.4-2011, *Structural Welding Code-Reinforcing Steel Including Metal Inserts and Connections in Reinforced Concrete Construction.*
- E. SDI: SDI QA/QC-2011, *Standard for Quality Control and Quality Assurance for Installation of Steel Deck*
- F. SJI: SJI CJ-10, *Standard Specification for Composite Steel Joists, CJ-series*
- G. SJI: SJI JG-10, *Standard Specification for Joist Girders*
- H. SJI: SJI K-10, *Standard Specification for Open Web Steel Joists, K-series*
- I. SJI: SJI LH/DLH-10, *Standard Specification for Longspan Steel Joists, LH-series and Deep Longspan Steel Joists, DLH-series*
- J. TMS 402-13/ACI 530-13/ASCE 5-13, *Building Code Requirements for Masonry Structures*
- K. TMS 602-13/ACI 530.1-13/ASCE 6-13, *Specifications for Masonry Structures*

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 SPECIAL TESTS AND INSPECTIONS

- A. The Owner shall engage a Special Inspector for each special inspection outlined in this Section.
- B. Special tests and inspections shall be provided in accordance with the requirements of the New Jersey Uniform Construction Code and the International Building Code, 2018, New Jersey Edition, and as outlined in this Section.
- C. Specific quality-assurance and quality-control requirements for individual work results are specified in their respective Specification Sections. Requirements in individual Sections may also address production of standard products. All inspections outlined in this Section are in

addition to minimum Quality Assurance requirements contained in the Project Manual, including all project requirements which are designated as the responsibility of the Contractor. Should a conflict between inspections specified in this Section and as specified in the individual Sections, the requirements of this Section shall govern.

- D. Special inspectors shall keep records of inspections and shall furnish inspection reports to the Construction official and to the person in responsible charge in accordance with N.J.A.C 5:23-2.21(c). Reports shall indicate that work inspected was done in conformance with approved construction documents. Inspection reports shall be provided in a timely manner.
- E. In addition to the submittal of reports of special inspections and tests, reports and certificates shall be submitted by the owner or the owner's authorized agent to the building official for each of the following:
 - 1. Certificates of compliance for the fabrication of structural, load-bearing or lateral load-resisting members or assemblies on the premises of an approved fabricator in accordance with NJ IBC 2018 Section 1704.2.5.1.
 - 2. Certificates of compliance for the seismic qualification of nonstructural components, supports and attachments in accordance with NJ IBC 2018 Section 1705.13.2.
 - 3. Certificates of compliance for designated seismic systems in accordance with NJ IBC 2018 Section 1705.13.3.
 - 4. Reports of preconstruction tests for shotcrete in accordance with NJ IBC 2018 Section 1908.5.
 - 5. Certificates of compliance for open web steel joists and joist girders in accordance with NJ IBC 2018 Section 2207.5.
 - 6. Reports of material properties verifying compliance with the requirements of AWS D1.4 for weldability as specified in Section 26.6.4 of ACI 318 for reinforcing bars in concrete complying with a standard other than ASTM A706 that are to be welded.
 - 7. Reports of mill tests in accordance with Section 20.2.2.5 of ACI 318 for reinforcing bars complying with ASTM A615 and used to resist earthquake-induced flexural or axial forces in the special moment frames, special structural walls or coupling beams connecting special structural walls of seismic force-resisting systems in structures assigned to Seismic Design Category D, E or F.
- F. The Contractor shall notify the Architect/Engineer of the expected availability of the Work Area a minimum of 24 hours in advance of availability.
- G. The Contractor shall schedule and notify the Special Inspector a minimum of 24 hours in advance of availability. The Contractor shall include in the project schedule all inspections to be during normal working hours. Inspections may not be scheduled for weekends or 2nd or 3rd shift without prior approval by the Owner. No allowances shall be made in the Contract, including schedule, to accommodate off-hour inspections. The Contractor shall be responsible for compensation to the Special Inspection Agency, the Architect, and the Owner for last-minute notice of inspection cancelation and off-hours inspections. There will be no schedule adjustments approved due to Contractor's failure to accommodate normal working hours inspections.
- H. Off-site fabrication inspections: When shop fabrication special inspections are required by the Contract Documents, the Contractor shall submit list of subcontractors providing the fabricated items for approval by the Owner before the start of Work, with all pertinent

information including fabrication shop address and relevant certifications. When shop fabrication inspections are not required by the Contract Documents and become necessary during the course of the Work due to Contractor deficiencies in the Work, all costs of the inspections, including that of the Architect and Owner, shall be paid by the Contractor, and there shall be no schedule adjustments approved.

1. **In-plant structural steel fabrication inspections are required when Fabricator's plant is not designated as AISC-certified fabricator with Building QMS certification (BU). All costs of in-plant structural steel fabrication inspections will be paid by the contractor.**
- I. Discrepancies shall be brought to the immediate attention of the Contractor for correction. If the discrepancies are not corrected, the discrepancies shall be brought to the attentions of the Construction Official and the Registered Design Professional in Responsible Charge (Architect), prior to the completion of that phase of the work.
- J. Each required Special Test/Inspection shall be completed and approved by the Registered Design Professional in Responsible Charge (Architect/Engineer), including any required corrective action(s), before proceeding with any other Work which would obscure or enclose that Work prohibitively from inspection and/or re-inspection.
- K. A final report documenting required special inspection and correction of any discrepancies noted in the inspection reports shall be submitted at a point in time agreed upon by the permit applicant and the construction official prior to the start of the work, but no later than the request for Substantial Completion Certificate, Temporary Occupancy Permit, Certificate of Approval or Certificate of Completion whichever occurs first.

3.2 STEEL CONSTRUCTION

- A. Structural steel: Special inspections and nondestructive testing of structural steel elements shall be in accordance with quality assurance inspection requirements of AISC 360-10 and referenced standards AWS D1.1, AWS D1.4 and ACI 318 as applicable.
 1. Provide nondestructive testing and documentation of welded joints indicated in AISC 361-10 Section N5 and as indicated in the tables in this Section. **All complete joint penetration welds require nondestructive testing (UT for example) and continuous observation.**
 2. Provide inspection of high-strength bolting in accordance with AISC 360-10 Section N6 and as indicated in the tables in this Section.
- B. Contractor shall provide Welding Certifications prior to the start of any welding onsite. All welders working on the project shall submit proof of possession of the appropriate welding certifications to the Special Inspector.

Quality Assurance (QA), Quality Assurance Inspector (QAI), Quality Control (QC), and Quality Control Inspector (QCI) as defined in accordance with AISC.

O – Observe these items on a random basis. Operations need not be delayed pending these inspections.

P – Perform these tasks for each welded joint bolted connection, as applicable.

Other Inspection Tasks

The fabricator's QCI shall inspect the fabricated steel to verify compliance with the details shown on the shop drawings, such as proper application of joint details at each connection. The erector's QCI shall inspect the erected steel frame to verify compliance with the details shown on the erection drawings, such as braces, stiffeners, member locations and proper application of joint details at each connection.

The QAI shall be on the premises for inspection during the placement of anchor rods and other embedments supporting structural steel for compliance with the construction documents. As minimum, the diameter, grade, type and length of the anchor rod or embedded item, and the extent or depth of embedment into the concrete, shall be verified and documented prior to placement of concrete.

The QAI shall inspect the fabricated steel or erected steel frame, as appropriate, to verify compliance with the details shown on the construction documents, such as braces, stiffeners, member locations and proper application of joint details at each connection.

QA inspection is permitted to be waived when the work is performed in a fabricating shop or by an erector approved by the AHJ to perform the work without QA.

NDT of welds completed in an approved fabricator's shop is permitted to be performed by that fabricator when approved by the AHJ. When the fabricator performs the NDT, the QA agency shall review the fabricator's NDT reports.

At completion of fabrication, the approved fabricator shall submit a certificate of compliance to the AHJ stating that the materials supplied and work performed by the fabricator are in accordance with the construction documents. At completion of erection, the approved erector shall submit a certificate of compliance to the AHJ stating that the materials supplied and work performed by the erector are in accordance with the construction documents.

Identification and rejection of material or workmanship that is not in conformance with the construction documents is permitted at any time during the progress of the work. However, this provision shall not relieve the owner or inspector of the obligation for timely, in-sequence inspections. Nonconforming material and workmanship shall be brought to the immediate attention of the fabricator or erector, as applicable.

Nonconforming material or workmanship shall be brought into conformance or made suitable for its intended purpose as determined by the EOR.

Concurrent with the submittal of such reports to the AHJ, EOR or owner, the QA agency shall submit to the fabricator and erector:

- (a) Nonconformance reports
- (b) Reports of repair, replacement or acceptance of nonconforming items

AISC 360: Table N5.4-1		
Inspection Tasks Prior to Welding	QC	QA
Welder qualification records and continuity records	P	O
Welding procedure specifications (WPSs) available	P	P
Manufacturer certifications for welding consumables available	P	P
Material identification (type/grade)	O	O
Welder identification system ^[a]	O	O
Fit-up of groove welds (including joint geometry) <ul style="list-style-type: none"> • Joint preparation • Dimensions (alignment, root opening, root face, bevel) • Cleanliness (condition of steel surfaces) • Tacking (tack weld quality and location) • Backing type and fit (if applicable) 	O	O
Fit-up of CJP groove welds of HSS T-, CJP groove welds of HSS T-, Y-, and K-joints without backing (including joint geometry) <ul style="list-style-type: none"> • Joint preparations • Dimensions (alignment, root opening, root face, bevel) • Cleanliness (condition of steel surfaces) • Tacking (tack weld quality and location) 	O	O
Configuration and finish of access holes	O	O
Fit-up of fillet welds <ul style="list-style-type: none"> • Dimensions (alignment, gaps at root) • Cleanliness (condition of steel surfaces) • Tacking (tack weld quality and location) 	O	O
Check welding equipment	O	-

^[a] The fabricator or erector, as applicable, shall maintain a system by which a welder who has welded a joint or member can be identified. Stamps, if used, shall be the low-stress type.

AISC 360: Table N5.4-2		
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Inspection Tasks During Welding	QC	QA
Control and handling of welding consumables <ul style="list-style-type: none"> • Packaging • Exposure control 	O	O
No welding over cracked tack welds	O	O
Environmental conditions <ul style="list-style-type: none"> • Wind speed within limits • Precipitation and temperature 	O	O
WPS followed <ul style="list-style-type: none"> • Settings on welding equipment • Travel speed • Selected welding materials • Shielding gas type/flow rate • Preheat applied • Interpass temperature maintained (min./max.) • Proper position (F, V, H, OH) 	O	O
Welding techniques <ul style="list-style-type: none"> • Interpass and final cleaning • Each pass within profile limitations • Each pass meets quality requirements 	O	O
Placement and installation of steel headed stud anchors	P	P

AISC 360: Table N5.4-3	QC	QA
Inspection Tasks After Welding	QC	QA
Welds cleaned	O	O
Size, length and location of welds	P	P
Welds meet visual acceptance criteria <ul style="list-style-type: none"> • Crack prohibition • Weld/base-metal fusion • Crater cross section • Weld profiles • Weld size • Undercut • Porosity 	P	P
Arc strikes	P	P
<i>k</i> -area ^[a]	P	P
Weld access holes in rolled heavy shapes and built-up heavy shapes ^[b]	P	P
Backing removed and weld tabs removed (if required)	P	P
Repair activities	P	P
Document acceptance or rejection of welded	P	P

joint or member		
No prohibited welds have been added without the approval of the EOR	O	O

^[a] When welding of doubler plates, continuity plates or stiffeners has been performed in the *k*-area, visually inspect the web *k*-area for cracks within 3 in. (75 mm) of the weld.

^[b] After rolled heavy shapes (see Section A3.1c) and built-up heavy shapes (see Section A3.1d) are welded, visually inspect the weld access hole for cracks.

AISC 360: Table N5.6-1		
Inspection Tasks Prior to Bolting	QC	QA
Manufacturer's certifications available for fastener materials	O	P
Fasteners marked in accordance with ASTM requirements	O	O
Correct fasteners selected for the joint detail (grade, type, bolt length if threads are to be excluded from shear plane)	O	O
Correct bolting procedure selected for joint detail	O	O
Connecting elements, including the appropriate faying surface condition and hole preparation, if specified, meet applicable requirements	O	O
Pre-installation verification testing by installation personnel observed and documented for fastener assemblies and methods used	P	O
Protected storage provided for bolts, nuts, washer and other fastener components	O	O

AISC 360: Table N5.6-2		
Inspection Tasks During Bolting	QC	QA
Fastener assemblies placed in all holes and washers and nuts are positioned as required	O	O
Joint brought to the snug-tight condition prior to the pretensioning operation	O	O
Fastener component not turned by the wrench prevented from rotating	O	O
Fasteners are pretensioned in accordance with the RCSC Specification, progressing systematically from the most rigid point toward the free edges	O	O

AISC 360: Table N5.6-3		
Inspection Tasks After Bolting	QC	QA
Document acceptance or rejection of bolted connections	P	P

AISC 360: Table N6.1		
Inspection of Steel Elements of Composite Construction Prior to Concrete Placement	QC	QA
Placement and installation of steel deck	P	P
Placement and installation of steel headed stud anchors	P	P
Document acceptance or rejection of steel elements	P	P

- C. Open web steel joists and joist girders: Special inspections of open-web steel joists and joist girders in buildings, structures, and portions thereof shall be in accordance with the following:
1. Periodic Special Inspection, in accordance with the following SJI specifications, as applicable.
 2. For end connections, welded or bolted.
 3. For bridging, horizontal or diagonal.

3.3 COLD FORMED METAL FRAMING

- A. When CFMF is structural, load bearing, or part of the lateral load resisting system periodic special inspections are required when indicated.
1. Inspections shall verify compliance with Contract Documents, Contractor’s SSE documents and approved/approved as noted shop/erection drawings:
 - Element sizes and spacing;
 - Fastener sizes and quantities installed at connections and connection hardware’
 - Connection hardware and spacing;
 - Welding

3.4 CONCRETE CONSTRUCTION

- A. Special inspections and tests shall not be required for:
1. Isolated spread concrete footings of buildings three stories or less above grade that are fully supported on earth or rock.
 2. Continuous concrete footings supporting walls of buildings three stories or less above grade that are fully supported on earth or rock where the footings support walls of light-frame construction.

3. Concrete slabs on grade, including patios, driveways, and sidewalks.
- B. Required Special Inspections and Tests of Concrete Construction:
1. Welding of reinforcing bars: Special inspections of welding and qualifications of special inspectors for reinforcing bars shall be in accordance with the requirements of AWS D1.4 for special inspection and of AWS D1.4 for special inspector qualifications.
 2. Post-installed anchors: Specific requirements for special inspection shall be as included in the research report for the anchor issued by an approved source in accordance with 17.8.2 in ACI 318.
 3. Provide special inspections in accordance with the following schedule:

TYPE	CONTINUOUS SPECIAL INSPECTION	PERIODIC SPECIAL INSPECTION	REFERENCED STANDARDS
1. Inspect reinforcement, including prestressing tendons, and verify placement.		X	ACI 318 Ch. 20, 25.2, 25.3, 26.6.1-26.6.3 IBC1908.4
2. Reinforcing bar welding:			
a. Verify weldability of reinforcing bars other than ASTM A706;		X	AWS D1.4 ACI 318: 26.6.4
b. Inspect single-pass fillet welds, maximum 5/16"		X	AWS D1.4 ACI 318: 26.6.4
c. Inspect all other welds.	X		AWS D1.4 ACI 318: 26.6.4
3. Inspect anchors cast in concrete.		X	ACI 318: 17.8.2
4. Inspect anchors post-installed in hardened concrete members.			
a. Adhesive anchors installed in horizontally or upwardly including orientation to resist sustained tension loads.	X		ACI 318: 17.8.2.4
b. Mechanical anchors and adhesive anchors not defined above.		X	ACI 318: 17.8.2
5. Verify use of required design mix.		X	ACI 318: Ch. 19, 26.4.3, 26.4.4 IBC 1904.1, 1904.2, 1908.2, 1908.3
6. Prior to concrete placement, fabricate specimens for strength tests, perform slump and air content tests, and determine the temperature of the concrete.	X		ASTM C172, ASTM C31, ACI 318: 26.5, 26.12 IBC 1908.10
7. Inspect concrete and shotcrete placement for proper application techniques.	X		ACI 318: 26.5 IBC 1908.6, 1908.7, 1908.8
8. Verify maintenance of specified		X	ACI 318: 26.5.3-

curing temperature and techniques.			26.5.5 IBC 1908.9
9. Inspect prestressed concrete for:			
a. Application of prestressing forces.	X		ACI 318: 26.10
b. Grouting of bonded prestressing tendons.	X		ACI 318: 26.10
10. Inspect erection of precast concrete members.		X	ACI 318: 26.9
11. Verify in-situ concrete strength, prior to stressing of tendons in post-tensioned concrete and prior to removal of shores and forms from beams and structural slabs.		X	ACI 318: 26.11.2
12. Inspect formwork for shape, location and dimension of the concrete member being formed.		X	ACI 318: 26.11.1.2(b)

3.5 MASONRY CONSTRUCTION

- A. Provide special inspections and tests of masonry construction per TMS 402 and TMS 602, Table 4 (Level B) unless otherwise indicated.
- B. Sampling and testing of self-consolidating grout:
 - 1. Fresh property testing shall be in accordance with slump flow procedures of ASTM C1611 for flowable condition, and ASTM C939 for fluid condition.
 - 2. Compressive strength testing of hardened properties shall be in accordance with ASTM C1019.
- C. Post installed anchors.
- D. Continuous Special Inspection is required for grout placements included in the mock-up work.

TMS 402: Table 4 – Level B Quality Assurance

TYPE	CONTINUOUS SPECIAL INSPECTION (a)	PERIODIC SPECIAL INSPECTION (a)	REFERENCED STANDARDS
1. Verify compliance with the approved submittals		X	TMS 602 Art. 1.5
2. As masonry construction begins, verify that the following are in compliance:			
a. Proportions of site-prepared mortar		X	TMS 602 Art. 2.1, 2.6 A
b. Construction of mortar joints		X	TMS 602 Art. 3.3 B

c. Grade and size of prestressing tendons and anchorages		X	TMS 602 Art. 2.4B, 2.4H
d. Location of reinforcement, connectors, and prestressing tendons and anchorages		X	TMS 602 Art. 3.4, 3.6 A
e. Prestressing technique		X	TMS 602 Art. 3.6 B
f. Properties of thin-bed mortar for AAC masonry	X ^(b)	X [©]	TMS 602 Art. 2.1 C
3. Prior to grouting, verify that the following are in compliance:			
a. Grout space		X	TMS 602 Art. 3.2D, 3.2 F
b. Grade, type, and size of reinforcement and anchor bolts, and prestressing tendons and anchorages		X	TMS 602 Art. 2.4, 3.4 TMS 402 Sec. 6.1
c. Placement of reinforcement, connectors, and prestressing tendons and anchorages		X	TMS 602 Art. 3.2 E, 3.4, 3.6 A TMS 402 Sec. 6.1, 6.2.1, 6.2.6, 6.2.7
d. Proportions of site-prepared grout and prestressing grout for bonded tendons		X	TMS 602 Art. 2.6B, 2.4 G.1.b
e. Construction of mortar joints		X	TMS 602 Art. 3.3 B
4. Verify during construction:			
a. Size and location of structural elements		X	TMS 602 Art. 3.3 F
b. Type, size, and location of anchors, including other details of anchors, including other details of anchorage of masonry to structural members, frames, or other construction		X	TMS 402 Sec. 1.2.1(e), 6.1.4.3, 6.2.1
c. Welding of reinforcement	X		TMS 402 Sec. 8.1.6.7.2, 9.3.3.4 (c), 11.3.3.4 (b)
d. Preparation, construction, and protection of masonry during cold weather (temperature below 40°F (4.4°C)) or hot weather (temperature above 90°F(32°))		X	TMS 602 Art. 1.8 C, 1.8 D
e. Application and measurement of prestressing force	X		TMS 602 Art. 3.6 B
f. Placement of grout and prestressing grout for bonded tendons is in compliance	X		TMS 602 Art. 3.5, 3.6 C
g. Placement of AAC masonry	X	X	TMS 602 Art. 3.3

units and construction of thin-bed mortar joints			B.9, 3.3 F 1.b
5. Observe preparation of grout, specimens, mortar specimens, and/or prisms		X	TMS 602 Art. 1.4 B.2.a.3, 1.4 B.2.b.3, 1.4 B.2.c.3, 1.4 B.3, 1.4B.4

(a) Frequency refers to the frequency of Special Inspection, which may be continuous during the task listed or periodic during the listed task, as defined in the table.

(b) Required for the first 5000 square feet (465 square meters) of AAC masonry.

(c) Required after the first 5000 square feet (465 square meters) of AAC masonry.

3.6 SOILS

A. Special inspections and tests of existing site soil conditions, fill placement and load-bearing requirements shall be performed in accordance with the following schedule:

TYPE	CONTINUOUS SPECIAL INSPECTION	PERIODIC SPECIAL INSPECTION
1. Verify materials below shallow foundations are adequate to achieve the design bearing capacity.		X
2. Verify excavations are extended to proper depth and have reached proper material.		X
3. Perform classification and testing of compacted fill materials.		X
4. Verify use of proper materials, densities and lift thicknesses during placement and compaction of compacted fill.	X	
5. Prior to placement of compacted fill, inspect subgrade and verify that site has been prepared properly.		X

B. The approved geotechnical report and the construction documents prepared by the registered design professional shall be used to determine compliance. During fill placement, the special inspector shall verify that proper materials and procedures are used in accordance with the provisions of the approved geotechnical report.

3.7 FABRICATED ITEMS

A. Where fabrication of structural, load-bearing or lateral load-resisting members or assemblies is being conducted on the premises of a fabricator's shop, special inspections of the fabricated items shall be performed during fabrication, except where the fabricator has been approved to perform work without special inspections.

1. Special inspections during fabrication are not required where the fabricator maintains approved detailed fabrication and quality control procedures that provide a basis for control of the workmanship and fabricator's ability to conform to approved

construction documents and the code. Approval shall be based upon review of fabrication and quality control procedures and periodic inspection of fabrication practices by the building official.

2. Special inspections are not required where the fabricator is registered and approved in accordance with NJ IBC Section 1704.2.5.1 and as follows:
 - a. Prior to fabrication, contractor shall provide written procedural and quality control manuals and evidence of periodic auditing of fabrication practices by an approved agency for review and approval by the Registered Design Professional in Responsible Charge (Architect/Engineer).
 - b. At completion of fabrication, the approved fabricator shall submit a certificate of compliance to the Registered Design Professional in Responsible Charge (Architect/Engineer) and the Special Inspector for submittal to the building official as specified in NJ IBC 2018 Section 1704.5. Certificate of compliance shall state that the work was performed in accordance with the approved construction documents and the NJ IBC 2018.

3.8 FIRE-RESISTANT PENETRATIONS AND JOINTS

- A. In high rise buildings or in buildings assigned to Risk Category III or IV, special inspections for through-penetrations, membrane penetration firestops, fire-resistant joint systems and perimeter fire barrier systems that are tested and listed in accordance with Sections 714.4.1.2, 714.5.1.2, 715.3, and 715.4 shall be conducted by an approved agency in accordance with ASTM E2174 and NJ IBC 2018 Section 1705.17.1 or 1705.17.2..

END OF SECTION 014001

SECTION 014200 - REFERENCES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 DEFINITIONS

- A. General: Basic Contract definitions are included in the Conditions of the Contract.
- B. "Approved": When used to convey Architect's action on Contractor's submittals, applications, and requests, "approved" is limited to Architect's duties and responsibilities as stated in the Conditions of the Contract.
- C. "Directed": A command or instruction by Architect. Other terms including "requested," "authorized," "selected," "required," and "permitted" have the same meaning as "directed."
- D. "Indicated": Requirements expressed by graphic representations or in written form on Drawings, in Specifications, and in other Contract Documents. Other terms including "shown," "noted," "scheduled," and "specified" have the same meaning as "indicated."
- E. "Regulations": Laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, and rules, conventions, and agreements within the construction industry that control performance of the Work.
- F. "Furnish": Supply and deliver to Project site, ready for unloading, unpacking, assembly, installation, and similar operations.
- G. "Install": Unload, temporarily store, unpack, assemble, erect, place, anchor, apply, work to dimension, finish, cure, protect, clean, and similar operations at Project site.
- H. "Provide": Furnish and install, complete and ready for the intended use.
- I. "Project Site": Space available for performing construction activities. The extent of Project site is shown on Drawings and may or may not be identical with the description of the land on which Project is to be built.

1.3 INDUSTRY STANDARDS

- A. Applicability of Standards: Unless the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into the Contract Documents to the extent referenced. Such standards are made a part of the Contract Documents by reference.
- B. Publication Dates: Comply with standards in effect as of date of the Contract Documents unless otherwise indicated.

- C. Copies of Standards: Each entity engaged in construction on Project should be familiar with industry standards applicable to its construction activity. Copies of applicable standards are not bound with the Contract Documents.
1. Where copies of standards are needed to perform a required construction activity, obtain copies directly from publication source.

1.4 ABBREVIATIONS AND ACRONYMS

- A. Industry Organizations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. This information is subject to change and is believed to be accurate as of the date of the Contract Documents.

1. AABC - Associated Air Balance Council; www.aabc.com.
2. AAMA - American Architectural Manufacturers Association; www.aamanet.org.
3. AAPFCO - Association of American Plant Food Control Officials; www.aapfco.org.
4. AASHTO - American Association of State Highway and Transportation Officials; www.transportation.org.
5. AATCC - American Association of Textile Chemists and Colorists; www.aatcc.org.
6. ABMA - American Bearing Manufacturers Association; www.americanbearings.org.
7. ACI - American Concrete Institute; (Formerly: ACI International); www.concrete.org.
8. ACPA - American Concrete Pipe Association; www.concrete-pipe.org.
9. AEIC - Association of Edison Illuminating Companies, Inc. (The); www.aeic.org.
10. AF&PA - American Forest & Paper Association; www.afandpa.org.
11. AGA - American Gas Association; www.aga.org.
12. AHAM - Association of Home Appliance Manufacturers; www.aham.org.
13. AHRI - Air-Conditioning, Heating, and Refrigeration Institute (The); www.ahrinet.org.
14. AI - Asphalt Institute; www.asphaltinstitute.org.
15. AIA - American Institute of Architects (The); www.aia.org.
16. AISC - American Institute of Steel Construction; www.aisc.org.
17. AISI - American Iron and Steel Institute; www.steel.org.
18. AITC - American Institute of Timber Construction; www.aitc-glulam.org.
19. AMCA - Air Movement and Control Association International, Inc.; www.amca.org.
20. ANSI - American National Standards Institute; www.ansi.org.
21. AOSA - Association of Official Seed Analysts, Inc.; www.aosaseed.com.
22. APA - APA - The Engineered Wood Association; www.apawood.org.
23. APA - Architectural Precast Association; www.archprecast.org.
24. API - American Petroleum Institute; www.api.org.
25. ARI - Air-Conditioning & Refrigeration Institute; (See AHRI).
26. ARI - American Refrigeration Institute; (See AHRI).
27. ARMA - Asphalt Roofing Manufacturers Association; www.asphaltroofing.org.
28. ASCE - American Society of Civil Engineers; www.asce.org.
29. ASCE/SEI - American Society of Civil Engineers/Structural Engineering Institute; (See ASCE).
30. ASHRAE - American Society of Heating, Refrigerating and Air-Conditioning Engineers; www.ashrae.org.
31. ASME - ASME International; (American Society of Mechanical Engineers); www.asme.org.
32. ASSE - American Society of Safety Engineers (The); www.asse.org.
33. ASSE - American Society of Sanitary Engineering; www.asse-plumbing.org.
34. ASTM - ASTM International; (American Society for Testing and Materials International); www.astm.org.
35. ATIS - Alliance for Telecommunications Industry Solutions; www.atis.org.
36. AWEA - American Wind Energy Association; www.awea.org.
37. AWI - Architectural Woodwork Institute; www.awinet.org.
38. AWMAC - Architectural Woodwork Manufacturers Association of Canada; www.awmac.com.

39. AWWA - American Water Works Association; www.awwa.org.
40. AWS - American Welding Society; www.aws.org.
41. AWWA - American Water Works Association; www.awwa.org.
42. BHMA - Builders Hardware Manufacturers Association; www.buildershardware.com.
43. BIA - Brick Industry Association (The); www.gobrick.com.
44. BICSI - BICSI, Inc.; www.bicsi.org.
45. BIFMA - BIFMA International; (Business and Institutional Furniture Manufacturer's Association); www.bifma.com.
46. BISSC - Baking Industry Sanitation Standards Committee; www.bissc.org.
47. BOCA - BOCA; (Building Officials and Code Administrators International Inc.); (See ICC).
48. BWF - Badminton World Federation; (Formerly: International Badminton Federation); www.bwfbadminton.org.
49. CDA - Copper Development Association; www.copper.org.
50. CEA - Canadian Electricity Association; www.electricity.ca.
51. CEA - Consumer Electronics Association; www.ce.org.
52. CFFA - Chemical Fabrics & Film Association, Inc.; www.chemicalfabricsandfilm.com.
53. CFSEI - Cold-Formed Steel Engineers Institute; www.cfsei.org.
54. CGA - Compressed Gas Association; www.cganet.com.
55. CIMA - Cellulose Insulation Manufacturers Association; www.cellulose.org.
56. CISCA - Ceilings & Interior Systems Construction Association; www.cisca.org.
57. CISPI - Cast Iron Soil Pipe Institute; www.cispi.org.
58. CLFMI - Chain Link Fence Manufacturers Institute; www.chainlinkinfo.org.
59. CPA - Composite Panel Association; www.pbmdf.com.
60. CRI - Carpet and Rug Institute (The); www.carpet-rug.org.
61. CRRC - Cool Roof Rating Council; www.coolroofs.org.
62. CRSI - Concrete Reinforcing Steel Institute; www.crsi.org.
63. CSA - Canadian Standards Association; www.csa.ca.
64. CSA - CSA International; (Formerly: IAS - International Approval Services); www.csa-international.org.
65. CSI - Construction Specifications Institute (The); www.csinet.org.
66. CSSB - Cedar Shake & Shingle Bureau; www.cedarbureau.org.
67. CTI - Cooling Technology Institute; (Formerly: Cooling Tower Institute); www.cti.org.
68. CWC - Composite Wood Council; (See CPA).
69. DASMA - Door and Access Systems Manufacturers Association; www.dasma.com.
70. DHI - Door and Hardware Institute; www.dhi.org.
71. ECA - Electronic Components Association; www.ec-central.org.
72. ECAMA - Electronic Components Assemblies & Materials Association; (See ECA).
73. EIA - Electronic Industries Alliance; (See TIA).
74. EIMA - EIFS Industry Members Association; www.eima.com.
75. EJMA - Expansion Joint Manufacturers Association, Inc.; www.ejma.org.
76. ESD - ESD Association; (Electrostatic Discharge Association); www.esda.org.
77. ESTA - Entertainment Services and Technology Association; (See PLASA).
78. EVO - Efficiency Valuation Organization; www.evo-world.org.
79. FIBA - Federation Internationale de Basketball; (The International Basketball Federation); www.fiba.com.
80. FIVB - Federation Internationale de Volleyball; (The International Volleyball Federation); www.fivb.org.
81. FM Approvals - FM Approvals LLC; www.fmglobal.com.
82. FM Global - FM Global; (Formerly: FMG - FM Global); www.fmglobal.com.
83. FRSA - Florida Roofing, Sheet Metal & Air Conditioning Contractors Association, Inc.; www.floridarroof.com.
84. FSA - Fluid Sealing Association; www.fluidsealing.com.
85. FSC - Forest Stewardship Council U.S.; www.fscus.org.
86. GA - Gypsum Association; www.gypsum.org.

87. GANA - Glass Association of North America; www.glasswebsite.com.
88. GS - Green Seal; www.greenseal.org.
89. HI - Hydraulic Institute; www.pumps.org.
90. HI/GAMA - Hydronics Institute/Gas Appliance Manufacturers Association; (See AHRI).
91. HMMA - Hollow Metal Manufacturers Association; (See NAAMM).
92. HPVA - Hardwood Plywood & Veneer Association; www.hpva.org.
93. HPW - H. P. White Laboratory, Inc.; www.hpwhite.com.
94. IAPSC - International Association of Professional Security Consultants; www.iapsc.org.
95. IAS - International Approval Services; (See CSA).
96. ICBO - International Conference of Building Officials; (See ICC).
97. ICC - International Code Council; www.iccsafe.org.
98. ICEA - Insulated Cable Engineers Association, Inc.; www.icea.net.
99. ICPA - International Cast Polymer Alliance; www.icpa-hq.org.
100. ICRI - International Concrete Repair Institute, Inc.; www.icri.org.
101. IEC - International Electrotechnical Commission; www.iec.ch.
102. IEEE - Institute of Electrical and Electronics Engineers, Inc. (The); www.ieee.org.
103. IES - Illuminating Engineering Society; (Formerly: Illuminating Engineering Society of North America); www.ies.org.
104. IESNA - Illuminating Engineering Society of North America; (See IES).
105. IEST - Institute of Environmental Sciences and Technology; www.iest.org.
106. IGMA - Insulating Glass Manufacturers Alliance; www.igmaonline.org.
107. IGSHPA - International Ground Source Heat Pump Association; www.igshpa.okstate.edu.
108. ILI - Indiana Limestone Institute of America, Inc.; www.iliai.com.
109. Intertek - Intertek Group; (Formerly: ETL SEMCO; Intertek Testing Service NA); www.intertek.com.
110. ISA - International Society of Automation (The); (Formerly: Instrumentation, Systems, and Automation Society); www.isa.org.
111. ISAS - Instrumentation, Systems, and Automation Society (The); (See ISA).
112. ISFA - International Surface Fabricators Association; (Formerly: International Solid Surface Fabricators Association); www.isfanow.org.
113. ISO - International Organization for Standardization; www.iso.org.
114. ISSFA - International Solid Surface Fabricators Association; (See ISFA).
115. ITU - International Telecommunication Union; www.itu.int/home.
116. KCMA - Kitchen Cabinet Manufacturers Association; www.kcma.org.
117. LMA - Laminating Materials Association; (See CPA).
118. LPI - Lightning Protection Institute; www.lightning.org.
119. MBMA - Metal Building Manufacturers Association; www.mbma.com.
120. MCA - Metal Construction Association; www.metalconstruction.org.
121. MFMA - Maple Flooring Manufacturers Association, Inc.; www.maplefloor.org.
122. MFMA - Metal Framing Manufacturers Association, Inc.; www.metalframingmfg.org.
123. MHIA - Material Handling Industry of America; www.mhia.org.
124. MIA - Marble Institute of America; www.marble-institute.com.
125. MMPA - Moulding & Millwork Producers Association; (Formerly: Wood Moulding & Millwork Producers Association); www.wmmpa.com.
126. MPI - Master Painters Institute; www.paintinfo.com.
127. MSS - Manufacturers Standardization Society of The Valve and Fittings Industry Inc.; www.mss-hq.org.
128. NAAMM - National Association of Architectural Metal Manufacturers; www.naamm.org.
129. NACE - NACE International; (National Association of Corrosion Engineers International); www.nace.org.
130. NADCA - National Air Duct Cleaners Association; www.nadca.com.
131. NAIMA - North American Insulation Manufacturers Association; www.naima.org.
132. NBGQA - National Building Granite Quarries Association, Inc.; www.nbgqa.com.
133. NCAA - National Collegiate Athletic Association (The); www.ncaa.org.
134. NCMA - National Concrete Masonry Association; www.ncma.org.

135. NEBB - National Environmental Balancing Bureau; www.nebb.org.
136. NECA - National Electrical Contractors Association; www.necanet.org.
137. NeLMA - Northeastern Lumber Manufacturers Association; www.nelma.org.
138. NEMA - National Electrical Manufacturers Association; www.nema.org.
139. NETA - InterNational Electrical Testing Association; www.netaworld.org.
140. NFHS - National Federation of State High School Associations; www.nfhs.org.
141. NFPA - NFPA; (National Fire Protection Association); www.nfpa.org.
142. NFPA - NFPA International; (See NFPA).
143. NFRC - National Fenestration Rating Council; www.nfrc.org.
144. NHLA - National Hardwood Lumber Association; www.nhla.com.
145. NLGA - National Lumber Grades Authority; www.nlga.org.
146. NOFMA - National Oak Flooring Manufacturers Association; (See NWFA).
147. NOMMA - National Ornamental & Miscellaneous Metals Association; www.nomma.org.
148. NRCA - National Roofing Contractors Association; www.nrca.net.
149. NRMCA - National Ready Mixed Concrete Association; www.nrmca.org.
150. NSF - NSF International; (National Sanitation Foundation International); www.nsf.org.
151. NSPE - National Society of Professional Engineers; www.nspe.org.
152. NSSGA - National Stone, Sand & Gravel Association; www.nssga.org.
153. NTMA - National Terrazzo & Mosaic Association, Inc. (The); www.ntma.com.
154. NWFA - National Wood Flooring Association; www.nwfa.org.
155. PCI - Precast/Prestressed Concrete Institute; www.pci.org.
156. PDI - Plumbing & Drainage Institute; www.pdionline.org.
157. PLASA - PLASA; (Formerly: ESTA - Entertainment Services and Technology Association); www.plasa.org.
158. RCSC - Research Council on Structural Connections; www.boltcouncil.org.
159. RFCI - Resilient Floor Covering Institute; www.rfci.com.
160. RIS - Redwood Inspection Service; www.redwoodinspection.com.
161. SAE - SAE International; (Society of Automotive Engineers); www.sae.org.
162. SCTE - Society of Cable Telecommunications Engineers; www.scte.org.
163. SDI - Steel Deck Institute; www.sdi.org.
164. SDI - Steel Door Institute; www.steeldoor.org.
165. SEFA - Scientific Equipment and Furniture Association; www.sefalabs.com.
166. SEI/ASCE - Structural Engineering Institute/American Society of Civil Engineers; (See ASCE).
167. SIA - Security Industry Association; www.siaonline.org.
168. SJI - Steel Joist Institute; www.steeljoist.org.
169. SMA - Screen Manufacturers Association; www.smainfo.org.
170. SMACNA - Sheet Metal and Air Conditioning Contractors' National Association; www.smacna.org.
171. SMPTE - Society of Motion Picture and Television Engineers; www.smpte.org.
172. SPFA - Spray Polyurethane Foam Alliance; www.sprayfoam.org.
173. SPIB - Southern Pine Inspection Bureau; www.spib.org.
174. SPRI - Single Ply Roofing Industry; www.spri.org.
175. SRCC - Solar Rating and Certification Corporation; www.solar-rating.org.
176. SSINA - Specialty Steel Industry of North America; www.ssina.com.
177. SSPC - SSPC: The Society for Protective Coatings; www.sspc.org.
178. STI - Steel Tank Institute; www.steeltank.com.
179. SWI - Steel Window Institute; www.steelwindows.com.
180. SWPA - Submersible Wastewater Pump Association; www.swpa.org.
181. TCA - Tilt-Up Concrete Association; www.tilt-up.org.
182. TCNA - Tile Council of North America, Inc.; (Formerly: Tile Council of America); www.tileusa.com.
183. TEMA - Tubular Exchanger Manufacturers Association, Inc.; www.tema.org.
184. TIA - Telecommunications Industry Association; (Formerly: TIA/EIA - Telecommunications Industry Association/Electronic Industries Alliance); www.tiaonline.org.
185. TIA/EIA - Telecommunications Industry Association/Electronic Industries Alliance; (See TIA).

186. TMS - The Masonry Society; www.masonrysociety.org.
187. TPI - Truss Plate Institute; www.tpinst.org.
188. TPI - Turfgrass Producers International; www.turfgrassod.org.
189. TRI - Tile Roofing Institute; www.tilerroofing.org.
190. UBC - Uniform Building Code; (See ICC).
191. UL - Underwriters Laboratories Inc.; www.ul.com.
192. UNI - Uni-Bell PVC Pipe Association; www.uni-bell.org.
193. USAV - USA Volleyball; www.usavolleyball.org.
194. USGBC - U.S. Green Building Council; www.usgbc.org.
195. USITT - United States Institute for Theatre Technology, Inc.; www.usitt.org.
196. WASTEC - Waste Equipment Technology Association; www.wastec.org.
197. WCLIB - West Coast Lumber Inspection Bureau; www.wclib.org.
198. WCMA - Window Covering Manufacturers Association; www.wcmanet.org.
199. WDMA - Window & Door Manufacturers Association; www.wdma.com.
200. WI - Woodwork Institute; (Formerly: WIC - Woodwork Institute of California); www.wicnet.org.
201. WMMPA - Wood Moulding & Millwork Producers Association; (See MMPA).
202. WSRCA - Western States Roofing Contractors Association; www.wsrca.com.
203. WPA - Western Wood Products Association; www.wwpa.org.

B. Code Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. This information is believed to be accurate as of the date of the Contract Documents.

1. DIN - Deutsches Institut für Normung e.V.; www.din.de.
2. IAPMO - International Association of Plumbing and Mechanical Officials; www.iapmo.org.
3. ICC - International Code Council; www.iccsafe.org.
4. ICC-ES - ICC Evaluation Service, LLC; www.icc-es.org.

C. Federal Government Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. Information is subject to change and is up-to-date as of the date of the Contract Documents.

1. COE - Army Corps of Engineers; www.usace.army.mil.
2. CPSC - Consumer Product Safety Commission; www.cpsc.gov.
3. DOC - Department of Commerce; National Institute of Standards and Technology; www.nist.gov.
4. DOD - Department of Defense; <http://dodssp.daps.dla.mil>.
5. DOE - Department of Energy; www.energy.gov.
6. EPA - Environmental Protection Agency; www.epa.gov.
7. FAA - Federal Aviation Administration; www.faa.gov.
8. FG - Federal Government Publications; www.gpo.gov.
9. GSA - General Services Administration; www.gsa.gov.
10. HUD - Department of Housing and Urban Development; www.hud.gov.
11. LBL - Lawrence Berkeley National Laboratory; Environmental Energy Technologies Division; <http://eetd.lbl.gov>.
12. OSHA - Occupational Safety & Health Administration; www.osha.gov.
13. SD - Department of State; www.state.gov.
14. TRB - Transportation Research Board; National Cooperative Highway Research Program; www.trb.org.
15. USDA - Department of Agriculture; Agriculture Research Service; U.S. Salinity Laboratory; www.ars.usda.gov.
16. USDA - Department of Agriculture; Rural Utilities Service; www.usda.gov.
17. USDJ - Department of Justice; Office of Justice Programs; National Institute of Justice; www.ojp.usdoj.gov.
18. USP - U.S. Pharmacopeia; www.usp.org.
19. USPS - United States Postal Service; www.usps.com.

- D. Standards and Regulations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the standards and regulations in the following list. This information is subject to change and is believed to be accurate as of the date of the Contract Documents.
1. CFR - Code of Federal Regulations; Available from Government Printing Office; www.gpo.gov/fdsys.
 2. DOD - Department of Defense; Military Specifications and Standards; Available from Department of Defense Single Stock Point; <http://dodssp.daps.dla.mil>.
 3. DSCC - Defense Supply Center Columbus; (See FS).
 4. FED-STD - Federal Standard; (See FS).
 5. FS - Federal Specification; Available from Department of Defense Single Stock Point; <http://dodssp.daps.dla.mil>.
 - a. Available from Defense Standardization Program; www.dsp.dla.mil.
 - b. Available from General Services Administration; www.gsa.gov.
 - c. Available from National Institute of Building Sciences/Whole Building Design Guide; www.wbdg.org/ccb.
 6. MILSPEC - Military Specification and Standards; (See DOD).
 7. USAB - United States Access Board; www.access-board.gov.
 8. USATBCB - U.S. Architectural & Transportation Barriers Compliance Board; (See USAB).
- E. State Government Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. This information is subject to change and is believed to be accurate as of the date of the Contract Documents.
1. CBHF - State of California; Department of Consumer Affairs; Bureau of Electronic Appliance and Repair, Home Furnishings and Thermal Insulation; www.bearhfti.ca.gov.
 2. CCR - California Code of Regulations; Office of Administrative Law; California Title 24 Energy Code; www.calregs.com.
 3. CDHS - California Department of Health Services; (See CDPH).
 4. CDPH - California Department of Public Health; Indoor Air Quality Program; www.cal-iaq.org.
 5. CPUC - California Public Utilities Commission; www.cpuc.ca.gov.
 6. SCAQMD - South Coast Air Quality Management District; www.aqmd.gov.
 7. TFS - Texas Forest Service; Forest Resource Development and Sustainable Forestry; <http://txforests-service.tamu.edu>.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 014200

SECTION 015000 - TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes requirements for temporary utilities, support facilities, and security and protection facilities.
- B. Related Requirements:
 - 1. Section 011000 "Summary" for work restrictions and limitations on utility interruptions.

1.3 USE CHARGES

- A. General: Installation and removal of and use charges for temporary facilities shall be included in the Contract Sum unless otherwise indicated. Allow other entities to use temporary services and facilities without cost, including, but not limited to, Owner's construction forces, Architect, occupants of Project, testing agencies, and authorities having jurisdiction.
- B. Water and Sewer Service from Existing System: Water from Owner's existing water system is available for use without metering and without payment of use charges. Provide connections and extensions of services as required for construction operations.
- C. Electric Power Service from Existing System: Electric power from Owner's existing system is available for use without metering and without payment of use charges. Provide connections and extensions of services as required for construction operations.

1.4 INFORMATIONAL SUBMITTALS

- A. Site Plan: Show temporary facilities, utility hookups, staging areas, and parking areas for construction personnel.
- B. Erosion- and Sedimentation-Control Plan: Show compliance with requirements of EPA Construction General Permit or authorities having jurisdiction, whichever is more stringent.
- C. Fire-Safety Program: Show compliance with requirements of NFPA 241 and authorities having jurisdiction. Indicate Contractor personnel responsible for management of fire-prevention program.
- D. Moisture-Protection Plan: Describe procedures and controls for protecting materials and construction from water absorption and damage.

1. Describe delivery, handling, and storage provisions for materials subject to water absorption or water damage.
2. Indicate procedures for discarding water-damaged materials, protocols for mitigating water intrusion into completed Work, and replacing water-damaged Work.
3. Indicate sequencing of work that requires water, such as sprayed fire-resistive materials, plastering, and terrazzo grinding, and describe plans for dealing with water from these operations. Show procedures for verifying that wet construction has dried sufficiently to permit installation of finish materials.

1.5 QUALITY ASSURANCE

- A. Electric Service: Comply with NECA, NEMA, and UL standards and regulations for temporary electric service. Install service to comply with NFPA 70.
- B. Tests and Inspections: Arrange for authorities having jurisdiction to test and inspect each temporary utility before use. Obtain required certifications and permits.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Portable Chain-Link Fencing: Minimum 2-inch , 0.148-inch- thick, galvanized-steel, chain-link fabric fencing; minimum 6 feet high with galvanized-steel pipe posts; minimum 2-3/8-inch- OD line posts and 2-7/8-inch- OD corner and pull posts, with 1-5/8-inch- OD top and bottom rails. Provide concrete bases for supporting posts.
- B. Dust-Control Adhesive-Surface Walk-off Mats: Provide mats minimum 36 by 60 inches .
- C. Insulation: Unfaced mineral-fiber blanket, manufactured from glass, slag wool, or rock wool; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively.
- D. Lumber and Plywood: Comply with requirements in Division 6 Section "Rough Carpentry Miscellaneous Carpentry."
- E. Gypsum Board: Minimum ½ inch thick by 48 inches wide by maximum available lengths; regular-type panels with tapered edges. Comply with ASTM C 36.
- F. Paint: Comply with requirements in Division 9 Section "Painting."
- G. Tarpaulins: Fire-resistive labeled with flame-spread rating of 15 or less.
- H. Water: Potable.

2.2 TEMPORARY FACILITIES

- A. Storage and Fabrication Sheds: Provide sheds sized, furnished, and equipped to accommodate materials and equipment for construction operations.
 1. Store combustible materials apart from building.

2.3 EQUIPMENT

- A. Fire Extinguishers: Portable, UL rated; with class and extinguishing agent as required by locations and classes of fire exposures.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Locate facilities where they will serve Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required by progress of the Work.
 - 1. Locate facilities to limit site disturbance as specified in Section 011000 "Summary."
- B. Provide each facility ready for use when needed to avoid delay. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

3.2 TEMPORARY UTILITY INSTALLATION

- A. General: Install temporary service or connect to existing service.
 - 1. Arrange with utility company, Owner, and existing users for time when service can be interrupted, if necessary, to make connections for temporary services.
- B. Sewers and Drainage: Provide temporary utilities to remove effluent lawfully.
 - 1. Connect temporary sewers to municipal system as directed by authorities having jurisdiction.
- C. Water Service: Connect to Owner's existing water service facilities. Clean and maintain water service facilities in a condition acceptable to Owner. At Substantial Completion, restore these facilities to condition existing before initial use.
- D. Sanitary Facilities: Provide temporary toilets, wash facilities, and drinking water for use of construction personnel. Comply with requirements of authorities having jurisdiction for type, number, location, operation, and maintenance of fixtures and facilities.
 - 1. Toilets: Use of Owner's existing toilet facilities will be permitted, as long as facilities are cleaned and maintained in a condition acceptable to Owner. At Substantial Completion, restore these facilities to condition existing before initial use.
- E. Temporary Heating and Cooling: Provide temporary heating and cooling required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of low temperatures or high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed.
 - 1. Provide temporary dehumidification systems when required to reduce ambient and substrate moisture levels to level required to allow installation or application of finishes and their proper curing or drying.
- F. Isolation of Work Areas in Occupied Facilities: Prevent dust, fumes, and odors from entering occupied areas.

1. Prior to commencing work, isolate the HVAC system in area where work is to be performed according to coordination drawings.
 - a. Disconnect supply and return ductwork in work area from HVAC systems servicing occupied areas.
 - b. Maintain negative air pressure within work area using HEPA-equipped air-filtration units, starting with commencement of temporary partition construction, and continuing until removal of temporary partitions is complete.
 2. Maintain dust partitions during the Work. Use vacuum collection attachments on dust-producing equipment. Isolate limited work within occupied areas using portable dust-containment devices.
 3. Perform daily construction cleanup and final cleanup using approved, HEPA-filter-equipped vacuum equipment.
- G. Electric Power Service: Connect to Owner's existing electric power service. Maintain equipment in a condition acceptable to Owner.
- H. Lighting: Provide temporary lighting with local switching that provides adequate illumination for construction operations, observations, inspections, and traffic conditions.
1. Install and operate temporary lighting that fulfills security and protection requirements without operating entire system.
- I. Telephone Service: Provide temporary telephone service in common-use facilities for use by all construction personnel. Install one telephone line for each field office.
1. Provide additional telephone lines for the following:
 - a. Provide a dedicated telephone line for each facsimile machine in each field office.
 - b. Provide one telephone line for Owner's use.
 2. At each telephone, post a list of important telephone numbers.
 - a. Police and fire departments.
 - b. Ambulance service.
 - c. Contractor's home office.
 - d. Contractor's emergency after-hours telephone number.
 - e. Architect's office.
 - f. Engineers' offices.
 - g. Owner's office.
 - h. Principal subcontractors' field and home offices.
 3. Provide superintendent with cellular telephone or portable two-way radio for use when away from field office.

3.3 SUPPORT FACILITIES INSTALLATION

- A. General: Comply with the following:
1. Maintain support facilities until Architect schedules Substantial Completion inspection. Remove before Substantial Completion. Personnel remaining after Substantial Completion will be permitted to use permanent facilities, under conditions acceptable to Owner.
- B. Traffic Controls: Comply with requirements of authorities having jurisdiction.

1. Protect existing site improvements to remain including curbs, pavement, and utilities.
 2. Maintain access for fire-fighting equipment and access to fire hydrants.
- C. Parking: Use designated areas of Owner's existing parking areas for construction personnel.
- D. Dewatering Facilities and Drains: Comply with requirements of authorities having jurisdiction. Maintain Project site, excavations, and construction free of water.
1. Dispose of rainwater in a lawful manner that will not result in flooding Project or adjoining properties or endanger permanent Work or temporary facilities.
- E. Waste Disposal Facilities: Provide waste-collection containers in sizes adequate to handle waste from construction operations. Comply with requirements of authorities having jurisdiction. Comply with progress cleaning requirements in Section 017300 "Execution."
- F. Lifts and Hoists: Provide facilities necessary for hoisting materials and personnel.
1. Truck cranes and similar devices used for hoisting materials are considered "tools and equipment" and not temporary facilities.

3.4 SECURITY AND PROTECTION FACILITIES INSTALLATION

- A. Protection of Existing Facilities: Protect existing vegetation, equipment, structures, utilities, and other improvements at Project site and on adjacent properties, except those indicated to be removed or altered. Repair damage to existing facilities.
- B. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction as required to comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects.
1. Comply with work restrictions specified in Section 011000 "Summary."
- C. Temporary Erosion and Sedimentation Control: Provide measures to prevent soil erosion and discharge of soil-bearing water runoff and airborne dust to undisturbed areas and to adjacent properties and walkways, according to requirements of 2003 EPA Construction General Permit or authorities having jurisdiction, whichever is more stringent.
1. Verify that flows of water redirected from construction areas or generated by construction activity do not enter or cross tree- or plant- protection zones.
 2. Inspect, repair, and maintain erosion- and sedimentation-control measures during construction until permanent vegetation has been established.
 3. Clean, repair, and restore adjoining properties and roads affected by erosion and sedimentation from Project site during the course of Project.
 4. Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.
- D. Stormwater Control: Comply with requirements of authorities having jurisdiction. Provide barriers in and around excavations and subgrade construction to prevent flooding by runoff of stormwater from heavy rains.
- E. Tree and Plant Protection: Install temporary fencing located as indicated or outside the drip line of trees to protect vegetation from damage from construction operations. Protect tree root systems from damage, flooding, and erosion.

- F. Site Enclosure Fence: Before construction operations begin furnish and install site enclosure fence in a manner that will prevent people and animals from easily entering site except by entrance gates.
1. Extent of Fence: As indicated on Drawings.
 2. Maintain security by limiting number of keys and restricting distribution to authorized personnel. Furnish one set of keys to Owner.
- G. Barricades, Warning Signs, and Lights: Comply with requirements of authorities having jurisdiction for erecting structurally adequate barricades, including warning signs and lighting.
- H. Temporary Fire Protection: Install and maintain temporary fire-protection facilities of types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 241; manage fire-prevention program.
1. Prohibit smoking in construction areas.
 2. Supervise welding operations, combustion-type temporary heating units, and similar sources of fire ignition according to requirements of authorities having jurisdiction.
 3. Develop and supervise an overall fire-prevention and -protection program for personnel at Project site. Review needs with local fire department and establish procedures to be followed. Instruct personnel in methods and procedures. Post warnings and information.
- I. Temporary Enclosures: Provide temporary enclosures for protection of construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities. Provide temporary weathertight enclosure for building exterior.
1. Where heating or cooling is needed and permanent enclosure is incomplete, insulate temporary enclosures.
- J. Temporary Partitions: Provide floor to structure above, secure, weather-tight, insulated dustproof partitions, to limit dust and dirt migration and to separate areas occupied by Owner from fumes and noise.
1. Construct dustproof metal stud partitions with gypsum wallboard, with joints taped on occupied side, and fire-retardant-treated plywood on construction operations side. Provide insulation at temporary partitions exposed to the weather.
 2. Construct dustproof partitions with two layers of 6-mil (0.14-mm) polyethylene sheet on each side. Cover floor with two layers of 6-mil (0.14-mm) polyethylene sheet, extending sheets 18 inches (460 mm) up the sidewalls. Overlap and tape full length of joints. Cover floor with fire-retardant-treated plywood.
 - a. Construct vestibule and airlock at each entrance through temporary partition with not less than 48 inches (1219 mm) between doors. Maintain water-dampened foot mats in vestibule.
 3. Where fire-resistance-rated temporary partitions are indicated or are required by authorities having jurisdiction, construct partitions according to the rated assemblies.
 4. Insulate partitions to control noise transmission to occupied areas.
 5. Seal joints and perimeter. Equip partitions with gasketed dustproof doors and security locks where openings are required.
 6. Protect air-handling equipment.
 7. Provide walk-off mats at each entrance through temporary partition.

3.5 OPERATION, TERMINATION, AND REMOVAL

- A. Supervision: Enforce strict discipline in use of temporary facilities. To minimize waste and abuse, limit availability of temporary facilities to essential and intended uses.
- B. Maintenance: Maintain facilities in good operating condition until removal.
 - 1. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation, and similar facilities on a 24-hour basis where required to achieve indicated results and to avoid possibility of damage.
- C. Temporary Facility Changeover: Do not change over from using temporary security and protection facilities to permanent facilities until Substantial Completion.
- D. Termination and Removal: Remove each temporary facility when need for its service has ended, when it has been replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.
 - 1. Materials and facilities that constitute temporary facilities are property of Contractor. Owner reserves right to take possession of Project identification signs.
 - 2. At Substantial Completion, repair, renovate, and clean permanent facilities used during construction period. Comply with final cleaning requirements specified in Section 017700 "Closeout Procedures."

END OF SECTION 015000

SECTION 016000 - PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for selection of products for use in Project; product delivery, storage, and handling; manufacturers' standard warranties on products; special warranties; and comparable products.
- B. Related Requirements:
 - 1. Section 012100 "Allowances" for products selected under an allowance.
 - 2. Section 012300 "Alternates" for products selected under an alternate.
 - 3. Section 012500 "Substitution Procedures" for requests for substitutions.
 - 4. Section 014200 "References" for applicable industry standards for products specified.

1.3 DEFINITIONS

- A. Products: Items obtained for incorporating into the Work, whether purchased for Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.
 - 1. Named Products: Items identified by manufacturer's product name, including make or model number or other designation shown or listed in manufacturer's published product literature, that is current as of date of the Contract Documents.
 - 2. New Products: Items that have not previously been incorporated into another project or facility. Products salvaged or recycled from other projects are not considered new products.
 - 3. Comparable Product: Product that is demonstrated and approved through submittal process to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.
 - 4. Foreign Products", as distinguished from "domestic products", are items substantially manufactured (50 percent or more of value) outside of the United States and its possessions; or produced or supplied by entities substantially owned (more than 50 percent) by persons who are not citizens of nor living within the United States and its possessions.
- B. "Materials" are products that are substantially shaped, cut, worked, mixed, finished, refined or otherwise fabricated, processed, or installed to form a part of the Work.
- C. "Equipment" is a product with operational parts, whether motorized or manually operated, that requires service connections such as wiring or piping.
- D. Basis-of-Design Product Specification: A specification in which a specific manufacturer's product is named and accompanied by the words "basis-of-design product," including make or model number or

other designation, to establish the significant qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics for purposes of evaluating comparable products of additional manufacturers named in the specification.

1.4 ACTION SUBMITTALS

- A. Comparable Product Requests: Submit request for consideration of each comparable product. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
1. Include data to indicate compliance with the requirements specified in "Comparable Products" Article.
 2. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within one week of receipt of a comparable product request. Architect will notify Contractor of approval or rejection of proposed comparable product request within 15 days of receipt of request, or seven days of receipt of additional information or documentation, whichever is later.
 - a. Form of Approval: As specified in Section 013300 "Submittal Procedures."
 - b. Use product specified if Architect does not issue a decision on use of a comparable product request within time allocated.
- B. Basis-of-Design Product Specification Submittal: Comply with requirements in Section 013300 "Submittal Procedures." Show compliance with requirements.

1.5 QUALITY ASSURANCE

- A. Compatibility of Options: If Contractor is given option of selecting between two or more products for use on Project, select product compatible with products previously selected, even if previously selected products were also options.

1.6 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, and handle products using means and methods that will prevent damage, deterioration, and loss, including theft and vandalism. Comply with manufacturer's written instructions.
- B. Delivery and Handling:
1. Schedule delivery to minimize long-term storage at Project site and to prevent overcrowding of construction spaces.
 2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.
 3. Deliver products to Project site in an undamaged condition in manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
 4. Inspect products on delivery to determine compliance with the Contract Documents and to determine that products are undamaged and properly protected.
- C. Storage:
1. Store products to allow for inspection and measurement of quantity or counting of units.

2. Store materials in a manner that will not endanger Project structure.
3. Store products that are subject to damage by the elements, under cover in a weathertight enclosure above ground, with ventilation adequate to prevent condensation.
4. Protect foam plastic from exposure to sunlight, except to extent necessary for period of installation and concealment.
5. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.
6. Protect stored products from damage and liquids from freezing.
7. Provide a secure location and enclosure at Project site for storage of materials and equipment by Owner's construction forces. Coordinate location with Owner.

1.7 PRODUCT WARRANTIES

- A. Warranties specified in other Sections 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.
 1. Manufacturer's Warranty: Written warranty furnished by individual manufacturer for a particular product and specifically endorsed by manufacturer to Owner.
 2. Special Warranty: Written warranty required by the Contract Documents to provide specific rights for Owner.
- B. Special Warranties: Prepare a written document that contains appropriate terms and identification, ready for execution.
 1. Manufacturer's Standard Form: Modified to include Project-specific information and properly executed.
 2. See other Sections for specific content requirements and particular requirements for submitting special warranties.
- C. Submittal Time: Comply with requirements in Section 017700 "Closeout Procedures."

PART 2 - PRODUCTS

2.1 PRODUCT SELECTION PROCEDURES

- A. General Product Requirements: Provide products that comply with the Contract Documents, are undamaged and, unless otherwise indicated, are new at time of installation.
 1. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.
 2. Standard Products: If available, and unless custom products or nonstandard options are specified, provide standard products of types that have been produced and used successfully in similar situations on other projects.
 3. Owner reserves the right to limit selection to products with warranties not in conflict with requirements of the Contract Documents.
 4. Where products are accompanied by the term "as selected," Architect will make selection.
 5. Descriptive, performance, and reference standard requirements in the Specifications establish salient characteristics of products.

6. Or Equal: For products specified by name and accompanied by the term "or equal," or "or approved equal," or "or approved," comply with requirements in "Comparable Products" Article to obtain approval for use of an unnamed product.
- B. Product Selection Procedures:
1. Product: Where Specifications name a single manufacturer and product, provide the named product that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.
 2. Manufacturer/Source: Where Specifications name a single manufacturer or source, provide a product by the named manufacturer or source that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.
 3. Products:
 - a. Restricted List: Where Specifications include a list of names of both manufacturers and products, provide one of the products listed that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered unless otherwise indicated.
 - b. Nonrestricted List: Where Specifications include a list of names of both available manufacturers and products, provide one of the products listed, or an unnamed product, that complies with requirements. Comply with requirements in "Comparable Products" Article for consideration of an unnamed product.
 4. Manufacturers:
 - a. Restricted List: Where Specifications include a list of manufacturers' names, provide a product by one of the manufacturers listed that complies with requirements. Comparable products or substitutions for Contractor's convenience [will] [will not] be considered[**unless otherwise indicated**].
 - b. Nonrestricted List: Where Specifications include a list of available manufacturers, provide a product by one of the manufacturers listed, or a product by an unnamed manufacturer, that complies with requirements. Comply with requirements in "Comparable Products" Article for consideration of an unnamed manufacturer's product.
 5. Basis-of-Design Product: Where Specifications name a product, or refer to a product indicated on Drawings, and include a list of manufacturers, provide the specified or indicated product or a comparable product by one of the other named manufacturers. Drawings and Specifications indicate sizes, profiles, dimensions, and other characteristics that are based on the product named. Comply with requirements in "Comparable Products" Article for consideration of an unnamed product by one of the other named manufacturers.
- C. Visual Matching Specification: Where Specifications require "match Architect's sample", provide a product that complies with requirements and matches Architect's sample. Architect's decision will be final on whether a proposed product matches.
1. If no product available within specified category matches and complies with other specified requirements, comply with requirements in Section 012500 "Substitution Procedures" for proposal of product.
- D. Visual Selection Specification: Where Specifications include the phrase "as selected by Architect from manufacturer's full range" or similar phrase, select a product that complies with requirements. Architect will select color, gloss, pattern, density, or texture from manufacturer's product line that includes both standard and premium items.

2.2 COMPARABLE PRODUCTS

- A. Conditions for Consideration: Architect will consider Contractor's request for comparable product when the following conditions are satisfied. If the following conditions are not satisfied, Architect may return requests without action, except to record noncompliance with these requirements:
1. Evidence that the proposed product does not require revisions to the Contract Documents, that it is consistent with the Contract Documents and will produce the indicated results, and that it is compatible with other portions of the Work.
 2. Detailed comparison of significant qualities of proposed product with those named in the Specifications. Significant qualities include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.
 3. Evidence that proposed product provides specified warranty.
 4. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners, if requested.
 5. Samples, if requested.

PART 3 - EXECUTION (Not Used)

END OF SECTION 016000

SECTION 017300 - EXECUTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes general administrative and procedural requirements governing execution of the Work including, but not limited to, the following:
 - 1. Installation of the Work.
 - 2. Cutting and patching.
 - 3. Progress cleaning.
 - 4. Starting and adjusting.
 - 5. Protection of installed construction.
- B. Related Requirements:
 - 1. Section 011000 "Summary" for limits on use of Project site.
 - 2. Section 013300 "Submittal Procedures" for submitting surveys.
 - 3. Section 017700 "Closeout Procedures" for submitting final property survey with Project Record Documents, recording of Owner-accepted deviations from indicated lines and levels, and final cleaning.
 - 4. Section 024119 "Selective Demolition" for demolition and removal of selected portions of the building.

1.3 DEFINITIONS

- A. Cutting: Removal of in-place construction necessary to permit installation or performance of other work.
- B. Patching: Fitting and repair work required to restore construction to original conditions after installation of other work.

1.4 INFORMATIONAL SUBMITTALS

- A. Cutting and Patching Plan: Submit plan describing procedures at least 10 days prior to the time cutting and patching will be performed. Include the following information:
 - 1. Extent: Describe reason for and extent of each occurrence of cutting and patching.
 - 2. Changes to In-Place Construction: Describe anticipated results. Include changes to structural elements and operating components as well as changes in building appearance and other significant visual elements.
 - 3. Products: List products to be used for patching and firms or entities that will perform patching work.
 - 4. Dates: Indicate when cutting and patching will be performed.

5. Utilities and Mechanical and Electrical Systems: List services and systems that cutting and patching procedures will disturb or affect. List services and systems that will be relocated and those that will be temporarily out of service. Indicate length of time permanent services and systems will be disrupted.
 - a. Include description of provisions for temporary services and systems during interruption of permanent services and systems.
- B. Landfill Receipts: Submit copy of receipts issued by a landfill facility, licensed to accept hazardous materials, for hazardous waste disposal.

1.5 QUALITY ASSURANCE

- A. Cutting and Patching: Comply with requirements for and limitations on cutting and patching of construction elements.
 1. Structural Elements: When cutting and patching structural elements, notify Architect of locations and details of cutting and await directions from Architect before proceeding. Shore, brace, and support structural elements during cutting and patching. Do not cut and patch structural elements in a manner that could change their load-carrying capacity or increase deflection
 2. Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that results in increased maintenance or decreased operational life or safety. Operational elements include the following:
 - a. Primary operational systems and equipment.
 - b. Fire separation assemblies.
 - c. Air or smoke barriers.
 - d. Fire-suppression systems.
 - e. Mechanical systems piping and ducts.
 - f. Control systems.
 - g. Communication systems.
 - h. Fire-detection and -alarm systems.
 - i. Conveying systems.
 - j. Electrical wiring systems.
 - k. Operating systems of special construction.
 3. Other Construction Elements: Do not cut and patch other construction elements or components in a manner that could change their load-carrying capacity, that results in reducing their capacity to perform as intended, or that results in increased maintenance or decreased operational life or safety. Other construction elements include but are not limited to the following:
 - a. Water, moisture, or vapor barriers.
 - b. Membranes and flashings.
 - c. Exterior curtain-wall construction.
 - d. Sprayed fire-resistive material.
 - e. Equipment supports.
 - f. Piping, ductwork, vessels, and equipment.
 - g. Noise- and vibration-control elements and systems.
 4. Visual Elements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch exposed construction in a manner that would, in Architect's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.

- B. Cutting and Patching Conference: Before proceeding, meet at Project site with parties involved in cutting and patching, including mechanical and electrical trades. Review areas of potential interference and conflict. Coordinate procedures and resolve potential conflicts before proceeding.
- C. Manufacturer's Installation Instructions: Obtain and maintain on-site manufacturer's written recommendations and instructions for installation of products and equipment.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. General: Comply with requirements specified in other Sections.
- B. In-Place Materials: Use materials for patching identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.
 - 1. If identical materials are unavailable or cannot be used, use materials that, when installed, will provide a match acceptable to Architect for the visual and functional performance of in-place materials.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Existing Conditions: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning sitework, investigate and verify the existence and location of underground utilities, mechanical and electrical systems, and other construction affecting the Work.
 - 1. Before construction, verify the location and invert elevation at points of connection of sanitary sewer, storm sewer, and water-service piping; underground electrical services, and other utilities.
 - 2. Furnish location data for work related to Project that must be performed by public utilities serving Project site.
- B. Examination and Acceptance of Conditions: Before proceeding with each component of the Work, examine substrates, areas, and conditions, with Installer or Applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.
 - 1. Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.
 - 2. Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.
 - 3. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
- C. Written Report: Where a written report listing conditions detrimental to performance of the Work is required by other Sections, include the following:
 - 1. Description of the Work.

2. List of detrimental conditions, including substrates.
3. List of unacceptable installation tolerances.
4. Recommended corrections.

- D. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

3.2 PREPARATION

- A. Existing Utility Information: Furnish information to local utility and Owner that is necessary to adjust, move, or relocate existing utility structures, utility poles, lines, services, or other utility appurtenances located in or affected by construction. Coordinate with authorities having jurisdiction.
- B. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
- C. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.
- D. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents caused by differing field conditions outside the control of Contractor, submit a request for information to Architect according to requirements in Section 013100 "Project Management and Coordination."

3.3 CONSTRUCTION LAYOUT

- A. Verification: Before proceeding to lay out the Work, verify layout information shown on Drawings, in relation to the property survey and existing benchmarks. If discrepancies are discovered, notify Architect promptly.
- B. Site Improvements: Locate and lay out site improvements, including pavements, grading, fill and topsoil placement, utility slopes, and rim and invert elevations.

3.4 INSTALLATION

- A. General: Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.
1. Make vertical work plumb and make horizontal work level.
 2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
 3. Conceal pipes, ducts, and wiring in finished areas unless otherwise indicated.
 4. Maintain minimum headroom clearance of 96 inches in occupied spaces and 90 inches in unoccupied spaces unless otherwise indicated.
- B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.

- C. Install products at the time and under conditions that will ensure the best possible results. Maintain conditions required for product performance until Substantial Completion.
- D. Conduct construction operations so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy.
- E. Sequence the Work and allow adequate clearances to accommodate movement of construction items on site and placement in permanent locations.
- F. Tools and Equipment: Do not use tools or equipment that produce harmful noise levels.
- G. Templates: Obtain and distribute to the parties involved templates for work specified to be factory prepared and field installed. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.
- H. Attachment: Provide blocking and attachment plates and anchors and fasteners of adequate size and number to securely anchor each component in place, accurately located and aligned with other portions of the Work. Where size and type of attachments are not indicated, verify size and type required for load conditions.
 - 1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by Architect.
 - 2. Allow for building movement, including thermal expansion and contraction.
 - 3. Coordinate installation of anchorages. 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.
- I. Joints: Make joints of uniform width. Where joint locations in exposed work are not indicated, arrange joints for the best visual effect. Fit exposed connections together to form hairline joints.
- J. Hazardous Materials: Use products, cleaners, and installation materials that are not considered hazardous.

3.5 CUTTING AND PATCHING

- A. Cutting and Patching, General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.
 - 1. Cut in-place construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.
- B. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during installation or cutting and patching operations, by methods and with materials so as not to void existing warranties.
- C. Temporary Support: Provide temporary support of work to be cut.
- D. Protection: Protect in-place construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.

- E. Adjacent Occupied Areas: Where interference with use of adjoining areas or interruption of free passage to adjoining areas is unavoidable, coordinate cutting and patching according to requirements in Section 011000 "Summary."
- F. Existing Utility Services and Mechanical/Electrical Systems: Where existing services/systems are required to be removed, relocated, or abandoned, bypass such services/systems before cutting to prevent interruption to occupied areas.
- G. Cutting: Cut in-place construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.
 - 1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots neatly to minimum size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
 - 2. Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
 - 3. Concrete and Masonry: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
 - 4. Excavating and Backfilling: Comply with requirements in applicable Sections where required by cutting and patching operations.
 - 5. Mechanical and Electrical Services: Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.
 - 6. Proceed with patching after construction operations requiring cutting are complete.
- H. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other work. Patch with durable seams that are as invisible as practicable. Provide materials and comply with installation requirements specified in other Sections, where applicable.
 - 1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate physical integrity of installation.
 - 2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will minimize evidence of patching and refinishing.
 - a. Clean piping, conduit, and similar features before applying paint or other finishing materials.
 - b. Restore damaged pipe covering to its original condition.
 - 3. Floors and Walls: Where walls or partitions that are removed extend one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish, color, texture, and appearance. Remove in-place floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.
 - a. Where patching occurs in a painted surface, prepare substrate and apply primer and intermediate paint coats appropriate for substrate over the patch, and apply final paint coat over entire unbroken surface containing the patch. Provide additional coats until patch blends with adjacent surfaces.
 - 4. Ceilings: Patch, repair, or rehang in-place ceilings as necessary to provide an even-plane surface of uniform appearance.
 - 5. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weathertight condition and ensures thermal and moisture integrity of building enclosure.

- I. Cleaning: Clean areas and spaces where cutting and patching are performed. Remove paint, mortar, oils, putty, and similar materials from adjacent finished surfaces.

3.6 PROGRESS CLEANING

- A. General: Clean Project site and work areas daily, including common areas. Enforce requirements strictly. Dispose of materials lawfully.
 1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.
 2. Do not hold waste materials more than seven days during normal weather or three days if the temperature is expected to rise above 80 deg F .
 3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.
 - a. Use containers intended for holding waste materials of type to be stored.
 4. Coordinate progress cleaning for joint-use areas where Contractor and other contractors are working concurrently.
- B. Site: Maintain Project site free of waste materials and debris.
- C. Work Areas: Clean areas where work is in progress to the level of cleanliness necessary for proper execution of the Work.
 1. Remove liquid spills promptly.
 2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.
- D. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.
- E. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.
- F. Exposed Surfaces in Finished Areas: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.
- G. Waste Disposal: Do not bury or burn waste materials on-site. Do not wash waste materials down sewers or into waterways. Comply with waste disposal requirements in Section 01500 "Temporary Facilities and Controls."
- H. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.
- I. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.
- J. Limiting Exposures: Supervise construction operations to assure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

3.7 STARTING AND ADJUSTING

- A. Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest.
- B. Adjust equipment for proper operation. Adjust operating components for proper operation without binding.
- C. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
- D. Manufacturer's Field Service: Comply with qualification requirements in Section 014000 "Quality Requirements."

3.8 PROTECTION OF INSTALLED CONSTRUCTION

- A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.
- B. Comply with manufacturer's written instructions for temperature and relative humidity.

END OF SECTION 017300

SECTION 017700 - CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:
 - 1. Substantial Completion procedures.
 - 2. Final completion procedures.
 - 3. Warranties.
 - 4. Final cleaning.
 - 5. Repair of the Work.
- B. Related Requirements:
 - 1. Section 017300 "Execution" for progress cleaning of Project site.
 - 2. Section 017823 "Operation and Maintenance Data" for operation and maintenance manual requirements.
 - 3. Section 017839 "Project Record Documents" for submitting record Drawings, record Specifications, and record Product Data.
 - 4. Section 017900 "Demonstration and Training" for requirements for instructing Owner's personnel.

1.3 ACTION SUBMITTALS

- A. Product Data: For cleaning agents.
- B. Contractor's List of Incomplete Items: Initial submittal at Substantial Completion.
- C. Certified List of Incomplete Items: Final submittal at Final Completion.

1.4 CLOSEOUT SUBMITTALS

- A. Certificates of Release: From authorities having jurisdiction.
- B. Certificate of Insurance: For continuing coverage.

1.5 MAINTENANCE MATERIAL SUBMITTALS

- A. Schedule of Maintenance Material Items: For maintenance material submittal items specified in other Sections.

1.6 SUBSTANTIAL COMPLETION PROCEDURES

- A. Contractor's List of Incomplete Items: Prepare and submit a list of items to be completed and corrected (Contractor's punch list), indicating the value of each item on the list and reasons why the Work is incomplete.
- B. Submittals Prior to Substantial Completion: Complete the following a minimum of 10 days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.
1. Certificates of Release: Obtain and submit releases from authorities having jurisdiction permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
 2. Submit closeout submittals specified in other Division 01 Sections, including project record documents, operation and maintenance manuals, final completion construction photographic documentation, damage or settlement surveys, property surveys, and similar final record information.
 3. Submit closeout submittals specified in individual Sections, including specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
 4. Submit maintenance material submittals specified in individual Sections, including tools, spare parts, extra materials, and similar items, and deliver to location designated by Architect. Label with manufacturer's name and model number where applicable.
 - a. Schedule of Maintenance Material Items: Prepare and submit schedule of maintenance material submittal items, including name and quantity of each item and name and number of related Specification Section. Obtain Architect's signature for receipt of submittals.
 5. Submit test/adjust/balance records.
 6. Submit in-service demonstration and training records.
 7. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.
- C. Procedures Prior to Substantial Completion: Complete the following a minimum of 10 days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.
1. Advise Owner of pending insurance changeover requirements.
 2. Make final changeover of permanent locks and deliver keys to Owner. Advise Owner's personnel of changeover in security provisions.
 3. Complete startup and testing of systems and equipment.
 4. Perform preventive maintenance on equipment used prior to Substantial Completion.
 5. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems. Submit demonstration and training video recordings specified in Section 017900 "Demonstration and Training."
 6. Advise Owner of changeover in heat and other utilities.
 7. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
 8. Complete final cleaning requirements, including touchup painting.
 9. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.
- D. Inspection: Submit a written request for inspection to determine Substantial Completion a minimum of 10 days prior to date the work will be completed and ready for final inspection and tests. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare the Certificate of Substantial Completion after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by Architect, that must be completed or corrected before certificate will be issued.

1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.
2. Results of completed inspection will form the basis of requirements for final completion.

1.7 FINAL COMPLETION PROCEDURES

- A. Submittals Prior to Final Completion: Before requesting final inspection for determining final completion, complete the following:
1. Submit a final Application for Payment according to Section 012900 "Payment Procedures."
 2. Certified List of Incomplete Items: Submit certified copy of Architect's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Architect. Certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
 3. Certificate of Insurance: Submit evidence of final, continuing insurance coverage complying with insurance requirements.
- B. Inspection: Submit a written request for final inspection to determine acceptance a minimum of 10 days prior to date the work will be completed and ready for final inspection and tests. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.
1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.

1.8 LIST OF INCOMPLETE ITEMS (PUNCH LIST)

- A. Organization of List: Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction.
1. Organize list of spaces in sequential order, starting with exterior areas first and proceeding from lowest floor to highest floor.
 2. Organize items applying to each space by major element, including categories for ceiling, individual walls, floors, equipment, and building systems.
 3. Include the following information at the top of each page:
 - a. Project name.
 - b. Date.
 - c. Name of Architect.
 - d. Name of Contractor.
 - e. Page number.
 4. Submit list of incomplete items in the following format:
 - a. Three paper copies. Architect will return two copies.

1.9 SUBMITTAL OF PROJECT WARRANTIES

- A. Time of Submittal: Submit written warranties on request of Architect for designated portions of the Work where commencement of warranties other than date of Substantial Completion is indicated, or when delay in submittal of warranties might limit Owner's rights under warranty.
- B. Partial Occupancy: Submit properly executed warranties within 15 days of completion of designated portions of the Work that are completed and occupied or used by Owner during construction period by separate agreement with Contractor.
- C. Organize warranty documents into an orderly sequence based on the table of contents of Project Manual.
 - 1. Bind warranties and bonds in heavy-duty, three-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch paper.
 - 2. Provide heavy paper dividers with plastic-covered tabs for each separate warranty. Mark tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product and the name, address, and telephone number of Installer.
 - 3. Identify each binder on the front and spine with the typed or printed title "WARRANTIES," Project name, and name of Contractor.
 - 4. Warranty Electronic File: Scan warranties and bonds and assemble complete warranty and bond submittal package into a single indexed electronic PDF file with links enabling navigation to each item. Provide bookmarked table of contents at beginning of document.
- D. Provide additional copies of each warranty to include in operation and maintenance manuals.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.
 - 1. Deliver Material Data Safety Information Sheets to Owner prior to delivery of products to site. Maintain copy in project office, main building office, and in the Superintendent's possession.
 - 2. Maintain a schedule of product uses and applications.

PART 3 - EXECUTION

3.1 FINAL CLEANING

- A. General: Perform final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.
- B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.
 - 1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a designated portion of Project:

- a. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.
 - b. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
 - c. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.
 - d. Remove tools, construction equipment, machinery, and surplus material from Project site.
 - e. Remove snow and ice to provide safe access to building.
 - f. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
 - g. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.
 - h. Sweep concrete floors broom clean in unoccupied spaces.
 - i. Vacuum carpet and similar soft surfaces, removing debris and excess nap; clean according to manufacturer's recommendations if visible soil or stains remain.
 - j. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other noticeable, vision-obscuring materials. Polish mirrors and glass, taking care not to scratch surfaces.
 - k. Remove labels that are not permanent.
 - l. Wipe surfaces of mechanical and electrical equipment, elevator equipment, and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
 - m. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.
 - n. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.
 - o. Clean ducts, blowers, and coils if units were operated without filters during construction or that display contamination with particulate matter on inspection.
 - 1) Clean HVAC system in compliance with NADCA Standard 1992-01. Provide written report on completion of cleaning.
 - p. Clean light fixtures, lamps, globes, and reflectors to function with full efficiency.
 - q. Leave Project clean and ready for occupancy.
- C. Construction Waste Disposal: Comply with waste disposal requirements in Section 015000 "Temporary Facilities and Controls."

3.2 REPAIR OF THE WORK

- A. Complete repair and restoration operations before requesting inspection for determination of Substantial Completion.
- B. Repair or remove and replace defective construction. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment. Where damaged or worn items cannot be repaired or restored, provide replacements. Remove and replace operating components that cannot be repaired. Restore damaged construction and permanent facilities used during construction to specified condition.
 1. Remove and replace chipped, scratched, and broken glass, reflective surfaces, and other damaged transparent materials.
 2. Touch up and otherwise repair and restore marred or exposed finishes and surfaces. Replace finishes and surfaces that already show evidence of repair or restoration.

- a. Do not paint over "UL" and other required labels and identification, including mechanical and electrical nameplates. Remove paint applied to required labels and identification.
3. Replace parts subject to operating conditions during construction that may impede operation or reduce longevity.
4. Replace burned-out bulbs, bulbs noticeably dimmed by hours of use, and defective and noisy starters in fluorescent and mercury vapor fixtures to comply with requirements for new fixtures.

END OF SECTION 017700

SECTION 017823 - OPERATION AND MAINTENANCE DATA

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for preparing operation and maintenance manuals, including the following:
 - 1. Operation and maintenance documentation directory.
 - 2. Operation manuals for systems, subsystems, and equipment.
 - 3. Product maintenance manuals.
 - 4. Systems and equipment maintenance manuals.
- B. Related Requirements:
 - 1. Section 013300 "Submittal Procedures" for submitting copies of submittals for operation and maintenance manuals.

1.3 DEFINITIONS

- A. System: An organized collection of parts, equipment, or subsystems united by regular interaction.
- B. Subsystem: A portion of a system with characteristics similar to a system.

1.4 CLOSEOUT SUBMITTALS

- A. Manual Content: Operations and maintenance manual content is specified in individual Specification Sections to be reviewed at the time of Section submittals. Submit reviewed manual content formatted and organized as required by this Section.
 - 1. Architect will comment on whether content of operations and maintenance submittals are acceptable.
 - 2. Where applicable, clarify and update reviewed manual content to correspond to revisions and field conditions.
- B. Format: Submit operations and maintenance manuals in the following format:
 - 1. PDF electronic file. Assemble each manual into a composite electronically indexed file. Submit on digital media (CD or USB Flashdrive) acceptable to Architect.
 - a. Name each indexed document file in composite electronic index with applicable item name. Include a complete electronically linked operation and maintenance directory.
 - b. Enable inserted reviewer Comments on draft submittals.

2. THREE paper copies for each school. Include a complete operation and maintenance directory. Enclose title pages and directories in clear plastic sleeves.
- C. Initial Manual Submittal: Submit draft copy of each manual at least 30 days before commencing demonstration and training. Architect will comment on whether general scope and content of manual are acceptable.
- D. Final Manual Submittal: Submit each manual in final form prior to requesting inspection for Substantial Completion and at least 7 days before commencing demonstration and training. Architect will return copy with comments.
 1. Correct or revise each manual to comply with Architect's comments. Submit copies of each corrected manual within 15 days of receipt of Architect's comments and prior to commencing demonstration and training.

PART 2 - PRODUCTS

2.1 OPERATION AND MAINTENANCE DOCUMENTATION DIRECTORY

- A. Directory: Prepare a single, comprehensive directory of emergency, operation, and maintenance data and materials, listing items and their location to facilitate ready access to desired information. Include a section in the directory for each of the following:
 1. List of documents.
 2. List of systems.
 3. List of equipment.
 4. Table of contents.
- B. List of Systems and Subsystems: List systems alphabetically. Include references to operation and maintenance manuals that contain information about each system.
- C. List of Equipment: List equipment for each system, organized alphabetically by system. For pieces of equipment not part of system, list alphabetically in separate list.
- D. Tables of Contents: Include a table of contents for each emergency, operation, and maintenance manual.
- E. Identification: In the documentation directory and in each operation and maintenance manual, identify each system, subsystem, and piece of equipment with same designation used in the Contract Documents. If no designation exists, assign a designation according to ASHRAE Guideline 4, "Preparation of Operating and Maintenance Documentation for Building Systems."

2.2 REQUIREMENTS FOR EMERGENCY, OPERATION, AND MAINTENANCE MANUALS

- A. Organization: Unless otherwise indicated, organize each manual into a separate section for each system and subsystem, and a separate section for each piece of equipment not part of a system. Each manual shall contain the following materials, in the order listed:
 1. Title page.
 2. Table of contents.
 3. Manual contents.

- B. Title Page: Include the following information:
1. Subject matter included in manual.
 2. Name and address of Project.
 3. Name and address of Owner.
 4. Date of submittal.
 5. Name and contact information for Contractor.
 6. Name and contact information for Construction Manager.
 7. Name and contact information for Architect.
 8. Name and contact information for Commissioning Authority.
 9. Names and contact information for major consultants to the Architect that designed the systems contained in the manuals.
 10. Cross-reference to related systems in other operation and maintenance manuals.
- C. Table of Contents: List each product included in manual, identified by product name, indexed to the content of the volume, and cross-referenced to Specification Section number in Project Manual.
1. If operation or maintenance documentation requires more than one volume to accommodate data, include comprehensive table of contents for all volumes in each volume of the set.
- D. Manual Contents: Organize into sets of manageable size. Arrange contents alphabetically by system, subsystem, and equipment. If possible, assemble instructions for subsystems, equipment, and components of one system into a single binder.
- E. Manuals, Electronic Files: Submit manuals in the form of a multiple file composite electronic PDF file for each manual type required.
1. Electronic Files: Use electronic files prepared by manufacturer where available. Where scanning of paper documents is required, configure scanned file for minimum readable file size.
 2. File Names and Bookmarks: Enable bookmarking of individual documents based on file names. Name document files to correspond to system, subsystem, and equipment names used in manual directory and table of contents. Group documents for each system and subsystem into individual composite bookmarked files, then create composite manual, so that resulting bookmarks reflect the system, subsystem, and equipment names in a readily navigated file tree. Configure electronic manual to display bookmark panel on opening file.
- F. Manuals, Paper Copy: Submit manuals in the form of hard copy, bound and labeled volumes.
1. Binders: Heavy-duty, three-ring, vinyl-covered, post-type binders, in thickness necessary to accommodate contents, sized to hold 8-1/2-by-11-inch paper; with clear plastic sleeve on spine to hold label describing contents and with pockets inside covers to hold folded oversize sheets.
 - a. If two or more binders are necessary to accommodate data of a system, organize data in each binder into groupings by subsystem and related components. Cross-reference other binders if necessary to provide essential information for proper operation or maintenance of equipment or system.
 - b. Identify each binder on front and spine, with printed title "OPERATION AND MAINTENANCE MANUAL," Project title or name, and subject matter of contents, and indicate Specification Section number on bottom of spine. Indicate volume number for multiple-volume sets.
 2. Dividers: Heavy-paper dividers with plastic-covered tabs for each section of the manual. Mark each tab to indicate contents. Include typed list of products and major components of equipment included in the section on each divider, cross-referenced to Specification Section number and title of Project Manual.

3. Protective Plastic Sleeves: Transparent plastic sleeves designed to enclose diagnostic software storage media for computerized electronic equipment.
4. Supplementary Text: Prepared on 8-1/2-by-11-inch white bond paper.
5. Drawings: Attach reinforced, punched binder tabs on drawings and bind with text.
 - a. If oversize drawings are necessary, fold drawings to same size as text pages and use as foldouts.
 - b. If drawings are too large to be used as foldouts, fold and place drawings in labeled envelopes and bind envelopes in rear of manual. At appropriate locations in manual, insert typewritten pages indicating drawing titles, descriptions of contents, and drawing locations.

2.3 OPERATION MANUALS

- A. Content: In addition to requirements in this Section, include operation data required in individual Specification Sections and the following information:
 1. System, subsystem, and equipment descriptions. Use designations for systems and equipment indicated on Contract Documents.
 2. Performance and design criteria if Contractor has delegated design responsibility.
 3. Operating standards.
 4. Operating procedures.
 5. Operating logs.
 6. Wiring diagrams.
 7. Control diagrams.
 8. Piped system diagrams.
 9. Precautions against improper use.
 10. License requirements including inspection and renewal dates.
- B. Descriptions: Include the following:
 1. Product name and model number. Use designations for products indicated on Contract Documents.
 2. Manufacturer's name.
 3. Equipment identification with serial number of each component.
 4. Equipment function.
 5. Operating characteristics.
 6. Limiting conditions.
 7. Performance curves.
 8. Engineering data and tests.
 9. Complete nomenclature and number of replacement parts.
- C. Operating Procedures: Include the following, as applicable:
 1. Startup procedures.
 2. Equipment or system break-in procedures.
 3. Routine and normal operating instructions.
 4. Regulation and control procedures.
 5. Instructions on stopping.
 6. Normal shutdown instructions.
 7. Seasonal and weekend operating instructions.
 8. Required sequences for electric or electronic systems.
 9. Special operating instructions and procedures.
- D. Systems and Equipment Controls: Describe the sequence of operation, and diagram controls as installed.

- E. Piped Systems: Diagram piping as installed, and identify color-coding where required for identification.

2.4 PRODUCT MAINTENANCE MANUALS

- A. Content: Organize manual into a separate section for each product, material, and finish. Include source information, product information, maintenance procedures, repair materials and sources, and warranties and bonds, as described below.
- B. Source Information: List each product included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual and drawing or schedule designation or identifier where applicable.
- C. Product Information: Include the following, as applicable:
 - 1. Product name and model number.
 - 2. Manufacturer's name.
 - 3. Color, pattern, and texture.
 - 4. Material and chemical composition.
 - 5. Reordering information for specially manufactured products.
- D. Maintenance Procedures: Include manufacturer's written recommendations and the following:
 - 1. Inspection procedures.
 - 2. Types of cleaning agents to be used and methods of cleaning.
 - 3. List of cleaning agents and methods of cleaning detrimental to product.
 - 4. Schedule for routine cleaning and maintenance.
 - 5. Repair instructions.
- E. Repair Materials and Sources: Include lists of materials and local sources of materials and related services.
- F. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.
 - 1. Include procedures to follow and required notifications for warranty claims.

2.5 SYSTEMS AND EQUIPMENT MAINTENANCE MANUALS

- A. Content: For each system, subsystem, and piece of equipment not part of a system, include source information, manufacturers' maintenance documentation, maintenance procedures, maintenance and service schedules, spare parts list and source information, maintenance service contracts, and warranty and bond information, as described below.
- B. Source Information: List each system, subsystem, and piece of equipment included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual and drawing or schedule designation or identifier where applicable.
- C. Manufacturers' Maintenance Documentation: Manufacturers' maintenance documentation including the following information for each component part or piece of equipment:

1. Standard maintenance instructions and bulletins.
 2. Drawings, diagrams, and instructions required for maintenance, including disassembly and component removal, replacement, and assembly.
 3. Identification and nomenclature of parts and components.
 4. List of items recommended to be stocked as spare parts.
- D. Maintenance Procedures: Include the following information and items that detail essential maintenance procedures:
1. Test and inspection instructions.
 2. Troubleshooting guide.
 3. Precautions against improper maintenance.
 4. Disassembly; component removal, repair, and replacement; and reassembly instructions.
 5. Aligning, adjusting, and checking instructions.
 6. Demonstration and training video recording, if available.
- E. Maintenance and Service Schedules: Include service and lubrication requirements, list of required lubricants for equipment, and separate schedules for preventive and routine maintenance and service with standard time allotment.
1. Scheduled Maintenance and Service: Tabulate actions for daily, weekly, monthly, quarterly, semiannual, and annual frequencies.
 2. Maintenance and Service Record: Include manufacturers' forms for recording maintenance.
- F. Spare Parts List and Source Information: Include lists of replacement and repair parts, with parts identified and cross-referenced to manufacturers' maintenance documentation and local sources of maintenance materials and related services.
- G. Maintenance Service Contracts: Include copies of maintenance agreements with name and telephone number of service agent.
- H. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.
1. Include procedures to follow and required notifications for warranty claims.

PART 3 - EXECUTION

3.1 MANUAL PREPARATION

- A. Operation and Maintenance Documentation Directory: Prepare a separate manual that provides an organized reference to emergency, operation, and maintenance manuals.
- B. Product Maintenance Manual: Assemble a complete set of maintenance data indicating care and maintenance of each product, material, and finish incorporated into the Work.
- C. Operation and Maintenance Manuals: Assemble a complete set of operation and maintenance data indicating operation and maintenance of each system, subsystem, and piece of equipment not part of a system.
 1. Engage a factory-authorized service representative to assemble and prepare information for each system, subsystem, and piece of equipment not part of a system.

2. Prepare a separate manual for each system and subsystem, in the form of an instructional manual for use by Owner's operating personnel.
- D. Manufacturers' Data: Where manuals contain manufacturers' standard printed data, include only sheets pertinent to product or component installed. Mark each sheet to identify each product or component incorporated into the Work. If data include more than one item in a tabular format, identify each item using appropriate references from the Contract Documents. Identify data applicable to the Work and delete references to information not applicable.
1. Prepare supplementary text if manufacturers' standard printed data are not available and where the information is necessary for proper operation and maintenance of equipment or systems.
- E. Drawings: Prepare drawings supplementing manufacturers' printed data to illustrate the relationship of component parts of equipment and systems and to illustrate control sequence and flow diagrams. Coordinate these drawings with information contained in record Drawings to ensure correct illustration of completed installation.
1. Do not use original project record documents as part of operation and maintenance manuals.
 2. Comply with requirements of newly prepared record Drawings in Section 017839 "Project Record Documents."
- F. Comply with Section 017700 "Closeout Procedures" for schedule for submitting operation and maintenance documentation.

END OF SECTION 017823

SECTION 017839 - PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for project record documents, including the following:
 - 1. Record Drawings.
 - 2. Record Specifications.
 - 3. Record Product Data.
 - 4. Miscellaneous record submittals.
- B. Related Requirements:
 - 1. Section 017300 "Execution" for final property survey.
 - 2. Section 017700 "Closeout Procedures" for general closeout procedures.
 - 3. Section 017823 "Operation and Maintenance Data" for operation and maintenance manual requirements.

1.3 CLOSEOUT SUBMITTALS

- A. Record Drawings: Comply with the following:
 - 1. Number of Copies: Submit three (3) set(s) of marked-up record prints for each school.
 - 2. Number of Copies: Submit copies of record Drawings as follows:
 - a. Initial Submittal:
 - 1) Submit one paper-copy set of marked-up record prints.
 - 2) Architect will indicate whether general scope of changes, additional information recorded, and quality of drafting are acceptable.
 - b. Final Submittal:
 - 1) Submit PDF electronic files of scanned record prints and three set(s) of prints.
 - 2) Print each drawing, whether or not changes and additional information were recorded.
- B. Record Specifications: Submit three paper copies and an annotated PDF electronic files of Project's Specifications, including addenda and contract modifications.
- C. Record Product Data: Submit three paper copies and an annotated PDF electronic files and directories of each submittal.

1. Where record Product Data are required as part of operation and maintenance manuals, submit duplicate marked-up Product Data as a component of manual.
- D. Miscellaneous Record Submittals: See other Specification Sections for miscellaneous record-keeping requirements and submittals in connection with various construction activities. Submit three paper copies and an annotated PDF electronic files and directories of each submittal.
- E. Reports: Submit written report weekly indicating items incorporated into project record documents concurrent with progress of the Work, including revisions, concealed conditions, field changes, product selections, and other notations incorporated.

PART 2 - PRODUCTS

2.1 RECORD DRAWINGS

- A. Record Prints: Maintain one set of marked-up paper copies of the Contract Drawings and Shop Drawings, incorporating new and revised drawings as modifications are issued.
 1. Preparation: Mark record prints to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to provide information for preparation of corresponding marked-up record prints.
 - a. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.
 - b. Accurately record information in an acceptable drawing technique.
 - c. Record data as soon as possible after obtaining it.
 - d. Record and check the markup before enclosing concealed installations.
 - e. Cross-reference record prints to corresponding archive photographic documentation.
 2. Content: Types of items requiring marking include, but are not limited to, the following:
 - a. Dimensional changes to Drawings.
 - b. Revisions to details shown on Drawings.
 - c. Depths of foundations below first floor.
 - d. Locations and depths of underground utilities.
 - e. Revisions to routing of piping and conduits.
 - f. Revisions to electrical circuitry.
 - g. Actual equipment locations.
 - h. Duct size and routing.
 - i. Locations of concealed internal utilities.
 - j. Changes made by Change Order or [**Construction**] Change Directive.
 - k. Changes made following Architect's written orders.
 - l. Details not on the original Contract Drawings.
 - m. Field records for variable and concealed conditions.
 - n. Record information on the Work that is shown only schematically.
 3. Mark the Contract Drawings and Shop Drawings completely and accurately. Use personnel proficient at recording graphic information in production of marked-up record prints.
 4. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.

5. Mark important additional information that was either shown schematically or omitted from original Drawings.
 6. Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.
- B. Newly Prepared Record Drawings: Prepare new Drawings instead of preparing record Drawings where Architect determines that neither the original Contract Drawings nor Shop Drawings are suitable to show actual installation.
1. New Drawings may be required when a Change Order is issued as a result of accepting an alternate, substitution, or other modification.
 2. Consult Architect for proper scale and scope of detailing and notations required to record the actual physical installation and its relation to other construction. Integrate newly prepared record Drawings into record Drawing sets; comply with procedures for formatting, organizing, copying, binding, and submitting.
- C. Format: Identify and date each record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location.
1. Record Prints: Organize record prints and newly prepared record Drawings into manageable sets. Bind each set with durable paper cover sheets. Include identification on cover sheets.
 2. Format: Annotated PDF electronic file with comment function enabled.
 3. Identification: As follows:
 - a. Project name.
 - b. Date.
 - c. Designation "PROJECT RECORD DRAWINGS."
 - d. Name of Architect.
 - e. Name of Contractor.

2.2 RECORD SPECIFICATIONS

- A. Preparation: Mark Specifications to indicate the actual product installation where installation varies from that indicated in Specifications, addenda, and contract modifications.
1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
 2. Record the name of manufacturer, supplier, Installer, and other information necessary to provide a record of selections made.
 3. For each principal product, indicate whether record Product Data has been submitted in operation and maintenance manuals instead of submitted as record Product Data.
 4. Note related Change Orders, record Product Data, and record Drawings where applicable.
- B. Format: Submit record Specifications as scanned PDF electronic file(s) of marked-up paper copy of Specifications.

2.3 RECORD PRODUCT DATA

- A. Preparation: Mark Product Data to indicate the actual product installation where installation varies substantially from that indicated in Product Data submittal.

1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
 2. Include significant changes in the product delivered to Project site and changes in manufacturer's written instructions for installation.
 3. Note related Change Orders, record Specifications, and record Drawings where applicable.
- B. Format: Submit record Product Data as scanned PDF electronic file(s) of marked-up paper copy of Product Data.
1. Include record Product Data directory organized by Specification Section number and title, electronically linked to each item of record Product Data.

2.4 MISCELLANEOUS RECORD SUBMITTALS

- A. Assemble miscellaneous records required by other Specification Sections for miscellaneous record keeping and submittal in connection with actual performance of the Work. Bind or file miscellaneous records and identify each, ready for continued use and reference.
- B. Format: Submit miscellaneous record submittals as scanned PDF electronic file(s) of marked-up miscellaneous record submittals.
1. Include miscellaneous record submittals directory organized by Specification Section number and title, electronically linked to each item of miscellaneous record submittals.

PART 3 - EXECUTION

3.1 RECORDING AND MAINTENANCE

- A. Recording: Maintain one copy of each submittal during the construction period for project record document purposes. Post changes and revisions to project record documents as they occur; do not wait until end of Project.
- B. Maintenance of Record Documents and Samples: Store record documents and Samples in the field office apart from the Contract Documents used for construction. Do not use project record documents for construction purposes. Maintain record documents in good order and in a clean, dry, legible condition, protected from deterioration and loss. Provide access to project record documents for Architect's reference during normal working hours.

END OF SECTION 017839

SECTION 017900 - DEMONSTRATION AND TRAINING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for instructing Owner's personnel, including the following:
 - 1. Demonstration of operation of systems, subsystems, and equipment.
 - 2. Training in operation and maintenance of systems, subsystems, and equipment.

1.3 QUALITY ASSURANCE

- A. Instructor Qualifications: A factory-authorized service representative, complying with requirements in Section 014000 "Quality Requirements," experienced in operation and maintenance procedures and training.

1.4 COORDINATION

- A. Coordinate instruction schedule with Owner's operations. Adjust schedule as required to minimize disrupting Owner's operations and to ensure availability of Owner's personnel.
- B. Coordinate instructors, including providing notification of dates, times, length of instruction time, and course content.
- C. Coordinate content of training modules with content of approved emergency, operation, and maintenance manuals. Do not submit instruction program until operation and maintenance data has been reviewed and approved by Architect.

PART 2 - PRODUCTS

2.1 INSTRUCTION PROGRAM

- A. Program Structure: Develop an instruction program that includes individual training modules for each system and for equipment not part of a system, as required by individual Specification Sections.
- B. Training Modules: Develop a learning objective and teaching outline for each module. Include a description of specific skills and knowledge that participant is expected to master. For each module, include instruction for the following as applicable to the system, equipment, or component:

1. Basis of System Design, Operational Requirements, and Criteria: Include the following:
 - a. System, subsystem, and equipment descriptions.
 - b. Performance and design criteria if Contractor is delegated design responsibility.
 - c. Operating standards.
 - d. Regulatory requirements.
 - e. Equipment function.
 - f. Operating characteristics.
 - g. Limiting conditions.
 - h. Performance curves.

2. Documentation: Review the following items in detail:
 - a. Emergency manuals.
 - b. Operations manuals.
 - c. Maintenance manuals.
 - d. Project record documents.
 - e. Identification systems.
 - f. Warranties and bonds.
 - g. Maintenance service agreements and similar continuing commitments.

3. Emergencies: Include the following, as applicable:
 - a. Instructions on meaning of warnings, trouble indications, and error messages.
 - b. Instructions on stopping.
 - c. Shutdown instructions for each type of emergency.
 - d. Operating instructions for conditions outside of normal operating limits.
 - e. Sequences for electric or electronic systems.
 - f. Special operating instructions and procedures.

4. Operations: Include the following, as applicable:
 - a. Startup procedures.
 - b. Equipment or system break-in procedures.
 - c. Routine and normal operating instructions.
 - d. Regulation and control procedures.
 - e. Control sequences.
 - f. Safety procedures.
 - g. Instructions on stopping.
 - h. Normal shutdown instructions.
 - i. Operating procedures for emergencies.
 - j. Operating procedures for system, subsystem, or equipment failure.
 - k. Seasonal and weekend operating instructions.
 - l. Required sequences for electric or electronic systems.
 - m. Special operating instructions and procedures.

5. Adjustments: Include the following:
 - a. Alignments.
 - b. Checking adjustments.
 - c. Noise and vibration adjustments.
 - d. Economy and efficiency adjustments.

6. Troubleshooting: Include the following:
 - a. Diagnostic instructions.
 - b. Test and inspection procedures.

7. Maintenance: Include the following:
 - a. Inspection procedures.
 - b. Types of cleaning agents to be used and methods of cleaning.
 - c. List of cleaning agents and methods of cleaning detrimental to product.
 - d. Procedures for routine cleaning
 - e. Procedures for preventive maintenance.
 - f. Procedures for routine maintenance.
 - g. Instruction on use of special tools.

8. Repairs: Include the following:
 - a. Diagnosis instructions.
 - b. Repair instructions.
 - c. Disassembly; component removal, repair, and replacement; and reassembly instructions.
 - d. Instructions for identifying parts and components.
 - e. Review of spare parts needed for operation and maintenance.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Assemble educational materials necessary for instruction, including documentation and training module. Assemble training modules into a training manual organized in coordination with requirements in Section 017823 "Operation and Maintenance Data."
- B. Set up instructional equipment at instruction location.

3.2 INSTRUCTION

- A. Engage qualified instructors to instruct Owner's personnel to adjust, operate, and maintain systems, subsystems, and equipment not part of a system.
- B. Scheduling: Provide instruction at mutually agreed on times. For equipment that requires seasonal operation, provide similar instruction at start of each season.
 1. Schedule training with Owner through Architect, with at least seven days' advance notice.
- C. Training Location and Reference Material: Conduct training on-site in the completed and fully operational facility using the actual equipment in-place. Conduct training using final operation and maintenance data submittals.
- D. Cleanup: Collect used and leftover educational materials and give to Owner. Remove instructional equipment. Restore systems and equipment to condition existing before initial training use.

END OF SECTION 017900

SECTION 024119- SELECTIVE DEMOLITION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 1. Demolition and removal of selected portions of building or structure.
 2. Demolition and removal of selected site elements.
 3. Removing below-grade construction.
 4. Disconnecting, capping or sealing, and removing site utilities.
 5. Salvage of existing items to be reused by Owner.

1.3 DEFINITIONS

- A. Remove: Detach items from existing construction and legally dispose of them off-site unless indicated to be removed and salvaged or removed and reinstalled.
- B. Remove and Salvage: Carefully detach from existing construction, in a manner to prevent damage, and deliver to Owner.
- C. Remove and Reinstall: Detach items from existing construction, prepare for reuse, and reinstall where indicated.
- D. Existing to Remain: Existing items of construction that are not to be permanently removed and that are not otherwise indicated to be removed, removed and salvaged, or removed and reinstalled.

1.4 MATERIALS OWNERSHIP

- A. Unless otherwise indicated, demolition waste becomes property of Contractor.

1.5 PREINSTALLATION MEETINGS

- A. Predemolition Conference: Conduct conference at Project site.
 1. Inspect and discuss condition of construction to be selectively demolished.
 2. Review structural load limitations of existing structure.
 3. Review and finalize selective demolition schedule and verify availability of materials, demolition personnel, equipment, and facilities needed to make progress and avoid delays.
 4. Review requirements of work performed by other trades that rely on substrates exposed by selective demolition operations.
 5. Review areas where existing construction is to remain and requires protection.

6. Review locations and requirements for delivery of salvaged items to Owner.
7. Review locations and requirements for asbestos containing materials or other hazardous materials.
8. Review locations and requirements for existing utilities (electrical, plumbing, gas, telecommunications, data/tech, etc.)
9. Review dust control requirements.
10. Review requirements for protection of smoke detectors and for placing system in test mode when applicable.
11. Review dumpster locations and pathways for removal of demolished debris.
12. Review temporary protection measures, including but not limited to, fire extinguishers and fire watch procedures.

1.6 INFORMATIONAL SUBMITTALS

- A. Proposed Protection Measures: Submit report, including drawings, that indicates the measures proposed for protecting individuals and property, for environmental protection, for dust control, for noise control. Indicate proposed locations and construction of barriers.
 1. Adjacent Buildings: Detail special measures proposed to protect adjacent buildings to remain including means of egress from those buildings or spaces.
- B. Schedule of Selective Demolition Activities: Indicate the following:
 1. Detailed sequence of selective demolition and removal work, with starting and ending dates for each activity. Ensure Owner's building manager's and other on-site operations are uninterrupted.
 2. Temporary interruption of utility services. Indicate how long utility services will be interrupted.
 3. Coordination for shutoff, capping, re-routing, and continuation of utility services.
 4. Use of elevator and stairs.
 5. Coordination of Owner's continuing occupancy of portions of existing building and of Owner's partial occupancy of completed Work.
- C. Inventory: Submit a list of items to be removed and salvaged and deliver to Owner prior to start of demolition.
- D. Predemolition Photographs or Video: Show existing conditions of adjoining construction and site improvements, including finish surfaces, that might be misconstrued as damage caused by demolition operations. Submit Photographic Documentation before the Work begins.
- E. Landfill Records: Indicate receipt and acceptance of all categories and types of wastes by a landfill facility licensed to accept the wastes.
- F. Warranties: Documentation indicated that existing warranties are still in effect after completion of selective demolition.

1.7 CLOSEOUT SUBMITTALS

- A. Inventory: Submit a list of items that have been removed and salvaged.
- B. Landfill Records: Indicate receipt and acceptance of wastes by a landfill facility licensed to accept wastes.

1.8 QUALITY ASSURANCE

- A. Regulatory Requirements: Comply with governing EPA notification regulations before beginning demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.
- B. Standards: Comply with ANSI/ASSE A10.6 and NFPA 241.

1.9 PROJECT CONDITIONS

- A. Buildings immediately adjacent to demolition area will be occupied. Conduct building demolition so operations of occupied buildings will not be disrupted.
 - 1. Provide not less than 72 hours' notice of activities that will affect operations of adjacent occupied buildings.
 - 2. Maintain access to existing walkways, exits, and other facilities used by occupants of adjacent buildings.
 - a. Do not close or obstruct walkways, exits, or other facilities used by occupants of adjacent buildings without written permission from authorities having jurisdiction.
- B. Owner assumes no responsibility for buildings and structures to be demolished.
 - 1. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.
- C. Notify Architect of discrepancies between existing conditions and Drawings before proceeding with selective demolition.
- D. Hazardous Materials: It is expected that hazardous materials will be encountered in the Work.
 - 1. Refer to Section 028213 Asbestos Abatement and construction documents for scope of work.
 - 2. If additional suspected hazardous materials are encountered, do not disturb; immediately notify Architect and Owner.
- E. Lead in Construction and Lead Safe Work Practice Activities
 - 1. Prior to the commencement of work, the contractor shall review the existing lead inspection report to familiarize themselves with the locations of the various confirmed lead based painted surfaces distributed throughout the building.
 - 2. If a painted surface is identified that was not previously assessed, then that painted surface shall be assumed lead containing until further testing confirms otherwise.
 - 3. All construction/renovation activities that will impact confirmed and/or assumed lead painted surfaces shall comply with all applicable "Lead in Construction" and "Lead Safe
 - 4. Work Practice" standards. Any such activities shall conform to all applicable, local, state and federal regulations and be performed by qualified and properly trained individuals/contractors knowledgeable of the required work practices and associated engineering controls. It should be noted that Occupational Safety and Health Administration (OSHA) regulations apply to any detectable concentrations of lead in paint.

5. This section (29 CFR 1926.62 Lead in Construction Standard), applies to all construction work where an employee may be occupationally exposed to lead. All construction work excluded from coverage in the general industry standard for lead by 29 CFR 1910.1025(a)(2) is covered by this standard. Construction work is defined as work for construction, alteration and/or repair, including painting and decorating. It includes but is not limited to the following:
 - a. Removal / Removal and Salvage of items where lead or materials containing lead are present;
 - b. Removal or encapsulation of materials containing lead;
 - c. New construction, alteration, repair, or renovation of buildings, substrates, or portions thereof, that contain lead, or materials containing lead;
 - d. Installation of products containing lead;
 - e. Lead contamination/emergency cleanup;
 - f. Transportation, disposal, storage, or containment of lead or materials containing lead on the site or location at which construction activities are performed, and maintenance operations associated with the construction activities described in this paragraph.
- F. Storage or sale of removed items or materials on-site is not permitted.
- G. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.
 1. Maintain fire-protection facilities in service during selective demolition operations. Provide and maintain fire watch during service interruptions.

1.10 WARRANTY

- A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during selective demolition, by methods and with materials so as not to void existing warranties. Notify warrantor before proceeding. Existing warranties include the following. Refer to drawings for areas of the work:
- B. Notify warrantor on completion of selective demolition, and obtain documentation verifying that existing system has been inspected and warranty remains in effect. Submit documentation at Project closeout.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.
- B. Standards: Comply with ANSI/ASSE A10.6 and NFPA 241.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that utilities have been disconnected and capped before starting selective demolition operations.
- B. Review record documents of existing construction provided by Owner. Owner does not guarantee that existing conditions are same as those indicated in record documents.
- C. Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.
- D. When unanticipated mechanical, electrical, or structural elements that conflict with intended function or design are encountered, investigate and measure the nature and extent of conflict. Promptly submit a written report to Architect.
- E. Engage a professional engineer to perform licensed in the State of New Jersey to design a complete structural shoring system for each work area. An engineering survey of conditions of buildings to determine whether removing any element might result in structural deficiency or unplanned collapse of any portion of structure or adjacent structures shall be performed during building demolition operations.
- F. Survey of Existing Conditions: Record existing conditions by use of preconstruction photographs and/or videotape.
 - 1. Inventory and record the condition of items to be removed and salvaged. Provide photographs of conditions that might be misconstrued as damage caused by salvage operations.
 - 2. Before selective demolition or removal of existing building elements that will be reproduced or duplicated in final Work, make permanent record of measurements, materials, and construction details required to make exact reproduction.

3.2 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

- A. Existing Services/Systems/Utilities to Remain: Maintain services/systems indicated to remain and protect them against damage.
- B. Existing Services/Systems/Utilities to Be Removed, Relocated, or Abandoned: Locate, identify, disconnect, and seal or cap off indicated utility services and mechanical/electrical systems serving areas to be selectively demolished.
 - 1. Arrange to shut off indicated utilities with utility companies.
 - 2. If services/systems are required to be removed, relocated, or abandoned, provide temporary services/systems that bypass area of selective demolition and that maintain continuity of services/systems to other parts of building and structures.
 - 3. Disconnect, demolish, and remove fire-suppression systems, plumbing, and HVAC systems, equipment, and components indicated to be removed.
 - a. Existing Utilities: Do not start demolition work until utility disconnecting and sealing have been completed and verified in writing.
 - b. Piping to Be Removed: Remove portion of piping indicated to be removed and cap or plug remaining piping with same or compatible piping material.
 - c. Equipment to Be Removed: Disconnect and cap services and remove equipment.

- d. Equipment to Be Removed and Reinstalled: Disconnect and cap services and remove, clean, and store equipment; when appropriate, reinstall, reconnect, and make equipment operational.
 - e. Ducts to Be Removed: Remove portion of ducts indicated to be removed and plug remaining ducts with same or compatible ductwork material.
- C. Temporary Shoring: Provide and maintain interior and exterior shoring, bracing, or structural support to preserve stability and prevent unexpected movement or collapse of construction being demolished.
- 1. Strengthen or add new supports when required during progress of demolition.
- D. Salvaged Items: Comply with the following:
- 1. Clean salvaged items of dirt and demolition debris.
 - 2. Pack or crate items after cleaning. Identify contents of containers.
 - 3. Store items in a secure area until delivery to Owner.
 - 4. Transport items to storage area designated by Owner.
 - 5. Protect items from damage during transport and storage.
- E. Contractor shall remove the following and return to the Owner:
- 1. Removable door cores.
 - 2. Window air conditioning units.
 - 3. Items that have been indicated on the contract documents.
 - 4. Items identified by the Owner.
- F. Owner shall remove and reinstall the following:
- 1. Cafeteria 1: Blue lights, monitors, cameras, and speakers.
 - 2. Link L-1: Cameras and wifi.
 - 3. Link L-2: Cameras, blue lights, and wifi.
 - 4. Items that have been indicated on the contract documents.
 - 5. Items identified by Owner.

3.3 PREPARATION AND PROTECTION

- A. Existing Facilities: Protect adjacent walkways, loading docks, building entries, and other building facilities during demolition operations. Maintain exits from existing buildings.
- B. Site Access and Temporary Controls: Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
- C. Existing Utilities: Maintain utility services to remain and protect from damage during demolition operations.
- 1. Do not interrupt existing utilities serving adjacent occupied or operating facilities unless authorized in writing by Owner and authorities having jurisdiction.
 - 2. Provide temporary services during interruptions to existing utilities, as acceptable to Owner and authorities having jurisdiction.
 - a. Provide at least 72 hours' notice to occupants of affected buildings if shutdown of service is required during changeover.

- D. Temporary Protection: Erect temporary protection, such as walks, fences, railings, canopies, and covered passageways, where required by authorities having jurisdiction and as indicated, to prevent injury to people and damage to adjacent buildings and facilities to remain.
 - 1. Provide protection to ensure safe passage of people around selective demolition area and to and from occupied portions of building.
 - 2. Provide temporary weather protection, during interval between selective demolition of existing construction on exterior surfaces and new construction, to prevent water leakage and damage to structure and interior areas.
 - 3. Protect walls, ceilings, floors, and other existing finish work that are to remain or that are exposed during selective demolition operations.
 - 4. Cover and protect furniture, furnishings, and equipment that have not been removed.
- E. Temporary Shoring: Provide and maintain shoring, bracing, and structural supports as required to preserve stability and prevent movement, settlement, or collapse of construction and finishes to remain, and to prevent unexpected or uncontrolled movement or collapse of construction being demolished.
 - 1. Strengthen or add new supports when required during progress of selective demolition.
- F. Remove temporary barriers and protections where hazards no longer exist. Where open excavations or other hazardous conditions remain, leave temporary barriers and protections in place.
- G. Saw cutting, grinding, and drilling, using equipment that is either water cooled or shrouded at the blade/bit with a vacuum HEPA filtered dust collection system (typical for all saw cutting, grinding, and drilling used throughout the Work), shall be used to segregate a demolished zone from a zone of demolition to proceed at a later time or at locations where interface between existing and new are to occur.
- H. The extent of demolition shall be limited to the amount of work the Contractor can reinstall and complete the wall assembly with maximum one month exposure to the elements. Contractor is to provide all protection necessary to maintain the building components and interiors free of dust and moisture, as well as to secure against entry.
- I. Substrate preparation for coatings using power tools, blast cleaning, etc., shall be performed under dust control conditions using shrouded hand tools with a vacuum HEPA filtered dust collection system and/or enclosing the work area with a dust tight enclosure and circulating HEPA filtered air within it during the Work to eliminate dust migrating beyond the work area.

3.4 SELECTIVE DEMOLITION, GENERAL

- A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:
 - 1. Proceed with selective demolition systematically, from higher to lower level. Complete selective demolition operations above each floor or tier before disturbing supporting members on the next lower level.
 - 2. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping, to minimize disturbance of adjacent surfaces. Temporarily cover openings to remain.
 - 3. Generally, Cut or drill from the exterior side.
 - 4. Do not damage existing finished surfaces.

5. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain fire watch and portable fire-suppression devices during flame-cutting operations.
 6. Maintain fire watch during and for at least one and one-half (1-1/2) hours after flame cutting operations.
 7. Maintain adequate ventilation when using cutting torches.
 8. Remove decayed, vermin-infested, or otherwise dangerous or unsuitable materials and promptly dispose of off-site.
 9. Remove structural framing members and lower to ground by method suitable to avoid free fall and to prevent ground impact or dust generation.
 10. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
- B. Engineering Surveys: During demolition, perform surveys to detect hazards that may result from building demolition activities.
- C. Site Access and Temporary Controls: Conduct building demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
1. Do not close or obstruct streets, walks, walkways, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by authorities having jurisdiction.
 2. Use water mist and other suitable methods to limit spread of dust and dirt. Comply with governing environmental-protection regulations. Do not use water when it may damage adjacent construction or create hazardous or objectionable conditions, such as ice, flooding, and pollution.
- D. Explosives: Use of explosives is not permitted.
- E. Reuse of Building Elements: Project has been designed to result in end-of-Project rates for reuse of building elements as follows. Do not demolish building elements beyond what is indicated on Drawings without Architect's approval.
- F. Removed and Salvaged Items:
1. Clean salvaged items.
 2. Store items in a secure area until delivery to Owner.
 3. Transport items to Owner's storage area on-site as designated by Owner.
 4. Protect items from damage during transport and storage.
- G. Removed and Reinstalled Items:
1. Clean and repair items to functional condition adequate for intended reuse.
 2. Pack or crate items after cleaning and repairing. Identify contents of containers.
 3. Protect items from damage during transport and storage.
 4. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated.
- H. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by Architect, items may be removed to a suitable, protected storage location during selective demolition and cleaned and reinstalled in their original locations after selective demolition operations are complete.

3.5 DEMOLITION BY MECHANICAL MEANS

- A. Proceed with demolition of structural framing members systematically, from higher to lower level. Complete building demolition operations above each floor or tier before disturbing supporting members on the next lower level.
- B. Remove debris from elevated portions of the building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.
 - 1. Remove structural framing members and lower to ground by method suitable to minimize ground impact and dust generation.
- C. Salvage: Owner reserves the right to review salvaged items.
- D. Below-Grade Construction: Demolish foundation walls and other below-grade construction.
 - 1. Remove below-grade construction, including basements, foundation walls, and footings, completely.
- E. Existing Utilities: Abandon existing utilities and below-grade utility structures. Cut utilities flush with grade.
- F. Existing Utilities: Demolish existing utilities and below-grade utility structures that are within ten (10) feet outside footprint indicated for new construction. Abandon utilities outside this area.
 - 1. Fill abandoned utility structures with soil materials to the Architect.
 - 2. Piping: Disconnect piping at unions, flanges, valves, or fittings.
 - 3. Wiring Ducts: Disassemble into unit lengths and remove plug-in and disconnecting devices.
- G. Existing Utilities: Demolish and remove existing utilities and below-grade utility structures.
 - 1. Piping: Disconnect piping at unions, flanges, valves, or fittings.
 - 2. Wiring Ducts: Disassemble into unit lengths and remove plug-in and disconnecting devices.

3.6 SELECTIVE DEMOLITION PROCEDURES FOR SPECIFIC MATERIALS

- A. Concrete: Demolish in small sections. Using power-driven saw, cut concrete to a depth of at least 3/4 inch at junctures with construction to remain. Dislodge concrete from reinforcement at perimeter of areas being demolished, cut reinforcement, and then remove remainder of concrete. Neatly trim openings to dimensions indicated.
- B. Concrete: Demolish in sections. Cut concrete full depth at junctures with construction to remain and at regular intervals using power-driven saw, then remove concrete between saw cuts.
- C. Masonry: Demolish in small sections. Cut masonry at junctures with construction to remain, using power-driven saw, then remove masonry between saw cuts.
- D. Concrete Slabs-on-Grade: Saw-cut perimeter of area to be demolished, then break up and remove.
- E. Resilient Floor Coverings: Remove floor coverings and adhesive according to recommendations in RFCI's "Recommended Work Practices for the Removal of Resilient Floor Coverings." Do not use methods requiring solvent-based adhesive strippers.

- F. Roofing: Remove no more existing roofing than what can be covered in one day by new roofing and so that building interior remains watertight and weathertight.
 - 1. Remove existing roof membrane, flashings, copings, and roof accessories.
 - 2. Remove existing roofing system down to substrate.
- G. Utilize the lightest possible pneumatic percussion demolition equipment, electric percussion demolition equipment and hand tools possible to remove concrete and masonry materials to prevent damage to adjacent materials that are indicated to remain.

3.7 SITE RESTORATION

- A. Below-Grade Areas: Rough grade below-grade areas ready for further excavation or new construction.
- B. Site Grading: Uniformly rough grade area of demolished construction to a smooth surface, free from irregular surface changes. Provide a smooth transition between adjacent existing grades and new grades.

3.8 REPAIRS

- A. Promptly repair damage to adjacent buildings caused by demolition operations.

3.9 DISPOSAL OF DEMOLISHED MATERIALS

- A. General: Except for items or materials indicated to be reused, salvaged, reinstalled, or otherwise indicated to remain Owner's property, remove demolished materials from Project site and legally dispose of them in an EPA-approved landfill.
 - 1. Do not allow demolished materials to accumulate on-site.
 - 2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
 - 3. Remove debris from elevated portions of building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.
- B. Burning: Do not burn demolished materials.
- C. Disposal: Transport demolished materials off Owner's property and legally dispose of them.

3.10 CLEANING

- A. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.
 - 1. Clean roadways of debris caused by debris transport.

END OF SECTION 024119

SECTION 028213 - ASBESTOS ABATEMENT

Cherry Hill High School East

Work procedures conducted at the **Cherry Hill High School East** shall commence on April 3, 2020 and shall be completed by April 10, 2020. There shall be no exceptions. **TIME IS OF THE ESSENCE.**

The following asbestos-containing material is known to be present in the work facilities. If other materials are found which are suspected of containing asbestos, notify the Project Manager immediately.

<u>Item</u>	<u>Asbestos Content</u>
Exterior Window Glazing	3% Chrysotile
Exterior Window Caulk	3% Chrysotile
Exterior Door Caulk	2 % Chrysotile
Interior Window Caulk	4% Chrysotile
Interior Window Glazing	2% Chrysotile
Interior Door Caulk	4% Chrysotile
Cove Base Mastic	3% Chrysotile
Interior Window Stool	4% Chrysotile
9" Floor Tile and Mastic	4% Chrysotile
12" Floor Tile and Mastic	2% Chrysotile
Pipe Fitting Insulation	4% Chrysotile
2 nd Layer of Floor Tile	3% Chrysotile
Carpet Mastic	2% Chrysotile
Linoleum	2% Chrysotile
White Exterior Wall Caulk	4% Chrysotile
Black Exterior Wall Caulk	3% Chrysotile

The Contractor Shall:

- a. Prior to commencement of any work, make a complete inspection of the work areas and issue in writing a complete report of the existence of any damages to the "Project Managers" upon the date of the contract origin. The Contractor shall be responsible for all damages not identified in his/her initial report.
- b. Prior to any work, disable the ventilating systems or any other system bringing air into or out of the work area by lockable switch, or other positive means that shall prevent accidental premature restarting of equipment.
- c. As part of the asbestos abatement work, remove and dispose of asbestos-containing materials the following:

Table 1.0: Asbestos Testing Results Summary			
Location	Material	Approximate Amount	Results
Link L-1 South Wall	Interior Window Glazing	360 LF	2% Chrysotile
Storage F062		32 LF	
F070		120 LF	
F072		96 LF	
F074		96 LF	
F076		112 LF	
F078		120 LF	
Link L-2 North Wall		360 LF	
Link L-1 South Wall	Interior Window Caulk	270 LF	4% Chrysotile
Storage F062		24 LF	
F072		72 LF	
F074		72 LF	
F076		84 LF	
F078		90 LF	
Link L-2 North Wall	270 LF		
Link L-1 South Wall	Interior Door Caulk	40 LF	5% Chrysotile
Kiln Room		20 LF	
Link L-2 North Wall		40 LF	
Storage F062	Cove Base Mastic	8 LF	4% Chrysotile
F070		30 LF	
F072		24 LF	
F074		140 LF (All CBM)	
F076		28 LF	
Kiln Room		12 LF	
F078		30 LF	
Storage F062	Tan 9"x9" Floor Tile	8 LF	2% Chrysotile
Storage F062	Mastic Assoc. w/Tan 9"x9" Floor Tile	8 LF	1.9% Chrysotile
F072	Mastic Assoc. w/White 12x12 Floor Tile	24 sf	1.6% Chrysotile
F074		24 sf	

Table 1.0: Asbestos Testing Results Summary			
Location	Material	Approximate Amount	Results
Kiln Room	Hard fittings associated with Fiberglass Pipe Insulation	1 fitting	4% Chrysotile
Cafeteria Office		1 fitting	
F070	Tan Floor Tile and Mastic (below visible Floor Tile layer)	30 LF	3% Chrysotile
F072		24 LF	
F074		1080 LF (Entire Room)	
F076		28 LF	
F078		30 LF	
Link L4 2 nd Floor South Wall	Interior Window Caulk	280 LF	2% Chrysotile
Link L-1 North Wall	Interior Window Caulk	280 LF	3% Chrysotile
Link L-1 North Wall	Interior Window Glazing	370 LF	2% Chrysotile
Link L-1 North Wall	Interior Door Caulk	40 LF	4% Chrysotile
Teacher's Dining Area	Carpet Square Glue	50 LF	2% Chrysotile
Teacher's Dining Area	Linoleum/Floor Tile under Carpet Squares	50 LF	2% Chrysotile
Cafeteria Office A-018	Mastic Associated with Brown Carpet	15 LF	1.2% Chrysotile
Teacher's Dining Area Exterior Wall	White Exterior Wall Caulk	10 LF	4% Chrysotile
Cafeteria Office Exterior Wall		10 LF	
Cafeteria Exterior Walls		20 LF	
Teachers Dining Area Exterior		80 LF	
Link L-1 North Wall Exterior		120 LF	
Teachers Dining Room Exterior	Black Exterior Caulk	40 LF	3% Chrysotile
Link L-1 North Wall Exterior	Exterior Door Caulk	40 LF	3% Chrysotile
Link L-2 North Wall Exterior	Exterior Door Caulk	40 LF	2% Chrysotile
Kiln Room Exterior		20 LF	
Link L-1 South Wall Exterior		40 LF	
Link L-2 North Wall Exterior		360 LF	
F-Wing Classrooms Exterior	Exterior Window Glazing	580 LF	3% Chrysotile
Link L-1 South Wall Exterior		360 LF	
Link L-2 North Wall Exterior	Grey Exterior Window Caulk	280 LF	3% Chrysotile
Cafeteria Office	Tan Floor Tile under brown carpet	15 LF	3% Chrysotile

Table 1.0: Asbestos Testing Results Summary			
Location	Material	Approximate Amount	Results
Storage F062, F070,F072,F076,Kiln Room, Link L-4	Transite Window Stool and Associated Mastic	200 SF	4% Chrysotile
Link L-4, Second Floor	Exterior Window Glazing	370 LF	2% Chrysotile
	Exterior Window Caulk	280 LF	3% Chrysotile
Kiln Room	Floor mastic	300 SF	<1% asbestos
Link L-1	Display Board Mastic	100 SF	Assumed

- d. A New Jersey Department of Labor Licensed Asbestos Abatement Contractor shall perform all asbestos work. All workers shall hold a valid permit issued by the New Jersey Department of Labor and Workforce Development (DLWD). The Contractor is advised that work under this contract shall be performed in accordance with the requirements of the Asbestos Hazard Emergency Response Act (AHERA) and any additional requirements that may be imposed by the New Jersey Department of Community Affairs (DCA.), New Jersey Department of Health and Senior Services (DHSS), DLWD, New Jersey Department of Environmental Protection (DEP.), New Jersey Department of Education, United States Department of Labor, and the United States Environmental Protection Agency (EPA).
- e. All work, both interior and exterior shall be performed via non-friable methods. All interior non-friable abatement work area preparations shall include two (2) layers of 6 mil polyethylene sheeting on all critical barriers, two (2) layers of 6 mil polyethylene containment around each work area and a negative pressure system. All air filtration devices shall be exhausted to the outside of the facility. A remote decontamination chamber shall be constructed prior to all abatement work.
- f. All exterior caulking removal work shall be performed by accessing the windows units and building caulking from the exterior of the building. All required scaffolding, portable scaffolding, ladders, man lifts, etc. shall be provided by the Abatement Contractor. The Contractor shall supply and maintain all OSHA required fall protection equipment as necessary to access and safely remove all asbestos containing materials indicated above from the exterior of the building.
- g. Contractor shall install critical barriers consisting of two (2) individual layers of 6 mil polyethylene sheeting on the inside of each window unit prior to commencement of window caulking removal activities. The Contractor shall install at a minimum a single layer of 6 mil polyethylene sheeting attached to the exterior window sill or building caulking limit and extending down and over the scaffolding platform and/or man lift floor or ground. The Contractor shall also install a layer reinforced polyethylene sheeting/trapping on the ground directly below all caulking removal operations extending a minimum of 10 feet in all directions as a drop cloth secured in place. Scaffolding and ground cover drop cloths shall be pickup at the completion of removal activities each day. Demarcate the work area by installing asbestos warning signs meeting the requirements of OSHA 29 CFR 1926.1101 (k) (6).

- h.** Window caulking removal shall include, but is not limited to, existing exterior caulking between window frame and existing building facade or finish on the exterior of the building. Window frames and exterior trim to remain. Window and building caulking shall be removed by hand scraping and HEPA vacuuming techniques. Contractor shall exercise extreme care throughout window and building caulking removal activities in order to prevent damage to the surrounding building surfaces and materials. Contractor shall decontaminate via HEPA vacuuming and wet wiping all surfaces on the exterior of the building within 10 feet in all directions impacted by the window and/or building caulking removal activities at the completion of each day and project.
- i.** All associated window and building caulking removal activities shall be coordinated with the General Contractor and the Window Replacement Contractor prior to the commencement of any removal activities. Any necessary building securing from weather and/or unauthorized building access after completion of abatement activities shall be the responsibility of the General Contractor.
- j.** Window glazing also contains asbestos. Once the window caulk is abated from the exterior, the general contractor may remove the windows and set aside for the asbestos abatement contractor to properly package and dispose of the windows as asbestos-containing waste. A critical barrier shall be constructed on the inside wall of each window being removed to isolate the interior of the building from the abatement activities. A temporary plywood barrier shall be constructed and installed over each window opening once the existing window structure has been extracted from the building.
- k.** Removal of asbestos-containing floor tile shall be accomplished utilizing ONLY EPA approved non-friable removal methods consisting of heat from infrared machines, building a dyke and flooding with water, dry ice and liquid nitrogen. Removal of floor tile shall include the complete removal and disposal as asbestos contaminated waste.
- l.** Removal of the asbestos-containing floor tile mastics shall be accomplished utilizing NO ODOR type chemical mastic solvents. All areas treaded with the chemical mastic solvent shall be thoroughly cleaned and neutralized with a TSP solution or approved equal to the satisfaction of the Owner and Consultant. Any issues arising with the adhesion of the new floor tile mastic as a result of the uses of chemical mastic solvents shall be remedied by the Contactor at no additional cost to the Owner.
- m.** The above referenced quantities of asbestos containing materials are provided for use as general guidance and may not be all inclusive of actual conditions. The Contractor is required to visit the site to determine the exact locations, quantities and conditions of materials in order to ensure complete removal of all asbestos containing and/or asbestos contaminated materials that exists within these areas. Any discrepancies between the Contractors estimated quantities and the quantities indicated in the contract documents shall be immediately reported to the Consultant and Owner. No additional compensation shall be permitted during the course of or at the completion of the project for failure to report any such discrepancies prior to submission of bids.
- n.** The Contractor is responsible to make applications for and secure all necessary permits, approvals, and inspections and pay all required fees. The Contractor is responsible for posting all such permits at the work site and has copies available in the business office.
- o.** The Contractor is required to guarantee that all work is in full compliance with the intent of the specifications for a period of two years following the completion and final acceptance of

the work. If any work is found to be incomplete or unsuitable, the Contractor will be required to correct the situation in a timely fashion at no additional expense to the Owner. If the Contractor does not act sufficiently or in a timely fashion, The Owner reserves the right to correct the situation using another Contractor and back charge the Contractor's account for these expenses.

- p. The contractor shall request that the Facility Manager deactivate the HVAC system, any fire or heat detection system and electrical system in the work area and the confirmation of the same before the start of work.
- q. Completely isolate the work area from other parts of the building to prevent asbestos-containing dust or debris from passing beyond the isolated area. Should the area beyond the work area(s) become contaminated with asbestos-containing dust or debris as a consequence of the work, clean those areas in accordance with the all regulations. Perform all such required cleaning or decontamination at no additional cost to the owner.

All asbestos removal and decontamination shall be performed in accordance with the guidelines and regulations of the responsible state agencies: Occupational Safety and Health Administration (OSHA), New Jersey Department of Health and Senior Services (DHSS), New Jersey Department of Labor and Workforce Development (DLWD) and the New Jersey Department of Environmental Protection (DEP).

Assume full responsibility and liability for the compliance with all applicable Federal, State, and Local regulations pertaining to work practices, hauling, and disposal. The Contractor is responsible for providing medical examinations and maintaining medical records of personnel as required by the applicable Federal, State, and Local regulations. The Contractor shall hold the Owner and the Owner's Representative harmless for failure to comply with any applicable work, hauling, disposal, safety, health or other regulation on the part of himself/herself, his/her employees, or his/her subcontractors.

Neither Building owner/representative nor its representatives will be responsible for informing the Contractor of his/her legal responsibilities. All references to codes and standards within this specification are made for informational purposes only. They are not intended nor shall they be interpreted as being all-inclusive. Building owner/representative and its representatives shall not be liable for the Contractor's negligence in compliance with any applicable code, law, or regulation not cited in this specification. In cases of conflict between this specification and any applicable code, law, and/or regulation the stricter wording shall apply and shall be enforced.

Except to the extent that more explicit or more stringent requirements are written directly into the contract documents, all applicable codes, regulations, and standards have the same force and effect (as if copied directly into the contract documents, or as if published copies are bound herewith).

Strictly adhere to all precautions necessary for the safety and health of the work person in accordance with provisions of OSHA Standards, 26 Code of Federal Registers C.F.R., Part 1926.1101 Constructions Standards, and Section 1910.1001, Industry Standards.

Properly contain, transport, and dispose of all contaminated wastes and materials at a site approved for asbestos disposal. The dumpster may be stored on-site as per the Building Owner/Owner's Representative. The dumpster shall be completely enclosed and locked.

Affidavit of insurance in force to include complete operative and products liability for asbestos removal. The amount of coverage shall be \$1,000,000.00.

Clean, dismantle, remove, and replace all items and equipment which should be moved prior to asbestos cleanup.

Dismount all fire, electrical, and mechanical fixtures and appurtenances required for proper execution of this contract. A licensed electrician is required and shall be trained on use of a respirator and handling asbestos materials.

Building owner/representative reserves the right to require the Contractor to discontinue the service of any worker or employee on the site who may be deemed unskilled or otherwise objectionable.

Required pre-abatement documentation shall include **all** of the following:

- a. Furnish documentation that the firm and its employees are familiar with the following regulations of the United States Department of Labor (D.O.L.), Occupational Safety and Health Administration (OSHA) and the United States Environmental Protection Agency (E.P.A.) relating to the application, removal, disposal and treatment of asbestos:
 1. United States Environmental Protection Agency Regulations for Asbestos (C.F.R., Title 40, Part 61, Subparts A and M. National Emissions Standards for Hazardous Air Pollutants (N.E.S.H.A.P.S.).
 2. United States Department of Labor (D.O.L.), Occupational Safety and Health Administration (OSHA) Asbestos Regulations (C.F.R., Title 29, Part Section 1910 and 1926).
 3. American National Standard Practices for Respiratory Protection (A.N.S.I.) Z88.2-1980.
 4. Any other applicable Federal, State, County or Local rules or regulations.
- b. Furnish proof that all workers on the job (supervisors and asbestos workers) have been given medical examinations within the past year as required by OSHA regulations, 29 C.F.R. 1926.1101. **As a minimum**, the examination should include a chest X-ray interpreted by a B-reader, a medical history with specific reference to respiratory disease and pulmonary function tests.

The Contractor shall notify the proper agencies in writing prior to the start of an asbestos removal project.

Documentation to be available at the job site shall include:

- a. A sign in black letters greater than four inches (4") in height stating the following:

**"LICENSED BY THE STATE OF NEW JERSEY
FOR ASBESTOS WORK"**

The sign shall be readily visible to the outdoors at the work site.

- b. An official copy of the Contractor's license obtained from the New Jersey Department of Labor and Workforce Development.
- c. List of emergency telephone numbers to include: the monitoring firm employed by the Building Owner, E.P.A., O.S.H.A., D.H.S.S., D.C.A., fire, police, local hospital, and emergency squad.

- d. The Contractor shall establish work area emergency procedures and shall have such a plan posted in view. In case of an emergency, decontamination procedures shall not impede emergency procedures.
- e. List of personnel including all new employees.

The Owner, Owner's Representatives, Project Manager, and the representatives of agencies having lawful jurisdiction shall at all times have access to the work area whether work is in preparation or progress.

Throughout the removal and cleaning operations, monitoring for airborne asbestos fibers shall be conducted (**on behalf of the Owner**) to ensure that the Contractor is complying with all codes, regulations, ordinances, and requirements of this specification.

Listed below are materials, equipment, and tools generally used in asbestos removal operations. It is not inferred, however, that all materials listed are necessarily required in every asbestos removal project and, in some instances, materials required to complete the work may not be listed.

- a. **Protective clothing:** Shall be fire retardant manufactured of "Tyvek" by DuPont (or approved equal) consist of disposable full body coveralls, head-covers, and boots as required by the most stringent OSHA standards applicable to the work.
- b. **Plastic Film:** All plastic film used on this project shall be fire retardant. Provide a minimum, clear six (6) mil in thickness polyethylene. The plastic sheeting shall be taped securely in place or stapled or fastened by spray-on adhesives, glue beads, horizontal wood battens, or the equivalent. Where work procedures are in view to the public, black or opaque six (6) mil polyethylene shall be utilized.
- c. **Adhesives:** Tape shall be high quality tape (Asbestostape, duct tape, or approved equal) in 2" or 3" widths with an adhesive formulated to aggressively stick.
- d. **Disposal bags** shall be six (6) mil polyethylene bags of a sufficient size for the application. The bags shall be printed with letters of sufficient size and contrast to be readily visible and legible. Each bag shall contain the U.S. DOT Class 9 (miscellaneous) hazardous material label. The label shall state as a minimum:

DANGER
Contains Asbestos Fibers
Avoid Creating Dust
Cancer and Lung Disease Hazard
Avoid Breathing Airborne Asbestos Fibers
And
Asbestos NA 2212, RQ

- e. **Signs:** Provide caution signs (14" x 20") red background, lettered in black. It shall be displayed at all routes of access and all visual and physical barriers as follows as a minimum:

LEGEND

NOTATION

Danger	1" Sans Serif Gothic or Block
Asbestos	1" Sans Serif Gothic or Block
Cancer and Lung Disease Hazard	3/4" Sans Serif Gothic or Block
Authorized Personnel Only	1/2" Gothic
Respirators and Protective Clothing are Required in this Area	1/4" Gothic

The sign shall meet OSHA Standards 29 C.F.R. 1926.1101.

It is the Contractor's responsibility to verify the detailed requirements of all codes, standards, and regulations to verify that the items procured for use in this work meet or exceed the specified requirements.

New Jersey Post-Removal Sampling. The release criteria for each work area shall comply with NIOSH 7400 analysis method protocols. A total of five (5) air samples shall be collected within each work area and analyzed by the Phase Contrast Microscopy (PCM) Method. All samples must be below the standard of 0.010 f/cc.

If the post-removal air tests or final inspections fail to meet the evaluation criteria, the Contractor shall be liable for the cost of additional air tests and inspections conducted by the asbestos safety technician to verify compliance.

Asbestos abatement work is complete upon meeting the work area clearance criteria and fulfilling the following:

- a. Remove all equipment, materials, and debris from the work site.
- b. Dispose of all asbestos-containing waste material.
- c. Repair or replace all interior finishes damaged during the course of the asbestos abatement.
- d. Fulfill project closeout requirements.

The Contractor shall submit a report to the Owner upon completion of the removal project. The report shall contain:

- a. All Daily Logs
- b. Operational Data
- c. Summary of all daily OSHA compliance test results
- d. Any updated medical reports
- e. Proof that employee was notified if exposure levels exceeded current standards.
- f. Documented proof (receipts) that all asbestos materials have been properly disposed of in a legal, regulated landfill.

Request for payment shall be withheld if all reports are not complete.
The report shall be signed by an authorized representative of the Contractor.



EXTERIOR WALL/WINDOWS

- ① EXTERIOR WALL CAULK
- ② EXTERIOR BLACK WALL CAULK
- ③ EXTERIOR DOOR CAULK

INTERIOR WALL/WINDOWS

- ⑥ INTERIOR WINDOW GLAZING
- ⑦ INTERIOR WINDOW CAULK
- ⑧ INTERIOR DOOR CAULK
- ⑩ HARD FITTING ON PIPE INSULATION

INTERIOR MISC.

- ⑫ FLOOR TILE (LOWER LAYER)
- ⑬ FLOOR TILE (UPPER LAYER)
- ⑭ CARPET MASTIC
- ⑮ CARPET GLUE
- ⑯ TRANSITE WINDOW STOOL & MASTIC
- ⑰ DISPLAY BOARD MASTIC

DRAWING TITLE:

ASB 1.0: SAMPLE LOCATION DIAGRAM

PROJECT LOCATION:

**CHERRY HILL PUBLIC SCHOOLS
CHERRY HILL EAST HIGH SCHOOL**
1750 Kresson Road, Cherry Hill, New Jersey

DATE: 12/23/19

TTI PROJECT NO: 19-1356

DRAWN BY: DC

INSPECTION DATES:

FILE:

SCALE: NTS

INSPECTOR:

REVIEWED BY: JG

NOTES:



1253 North Church Street
Moorestown, NJ 08057
(856) 840-8800
(856) 840-8815 Fax
www.ttienv.com



- EXTERIOR WALL/WINDOWS**
- ③ EXTERIOR DOOR CAULK
 - ④ EXTERIOR WINDOW GLAZING
 - ⑤ EXTERIOR WINDOW CAULK
- INTERIOR WALL/WINDOWS**
- ⑥ INTERIOR WINDOW GLAZING
 - ⑦ INTERIOR WINDOW CAULK
 - ⑧ INTERIOR DOOR CAULK
 - ⑨ COVE BASE MASTIC
 - ⑩ HARD FITTING ON PIPE INSULATION
- INTERIOR MISC.**
- ⑪ FLOOR TILE (9X9)
 - ⑫ FLOOR TILE (LOWER LAYER)
 - ⑬ FLOOR TILE (UPPER LAYER)
 - ⑭ TRANSITE WINDOW STOOL & MASTIC
 - ⑮ DISPLAY BOARD MASTIC



EXTERIOR WALL/WINDOWS

- ④ EXTERIOR WINDOW GLAZING
- ⑤ EXTERIOR WINDOW CAULK

INTERIOR WALL/WINDOWS

- ⑦ INTERIOR WINDOW CAULK

INTERIOR MISC.

- ⑩ TRANSITE WINDOW STOOL & MASTIC
- ⑰ DISPLAY BOARD MASTIC



1253 North Church Street
 Moorestown, NJ 08057
 (856) 840-8800
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DRAWING TITLE:
ASB 3.0: SAMPLE LOCATION DIAGRAM

PROJECT LOCATION:
**CHERRY HILL PUBLIC SCHOOLS
 CHERRY HILL EAST HIGH SCHOOL**
 1750 Kresson Road, Cherry Hill, New Jersey

DATE:	12/23/19	SCALE:	NTS
TTI PROJECT NO:	19-1356	INSPECTOR:	
DRAWN BY:	DC	REVIEWED BY:	JG
INSPECTION DATES:			
FILE:			

NOTES:

SECTION 042000 - UNIT MASONRY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Concrete masonry units.
2. Concrete building brick.
3. Decorative concrete masonry units.
4. Clay face brick.
5. Mortar and grout.
6. Steel reinforcing bars.
7. Masonry-joint reinforcement.
8. Ties and anchors.
9. Embedded flashing.
10. Miscellaneous masonry accessories.

B. Products Installed but not Furnished under This Section:

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

C. Related Requirements:

1. Section 014001 "Statement of Special Inspections".
2. Section 072726 "Fluid-Applied Membrane Air Barriers".
3. Section 047200 "Cast Stone Masonry".
4. Section 071900 "Water Repellents" for water repellents applied to unit masonry assemblies.
5. Section 072110 "Thermal Insulation" for cavity wall insulation.
6. Section 076200 "Sheet Metal Flashing and Trim" for sheet metal flashing and for furnishing manufactured reglets installed in masonry joints.

1.3 DEFINITIONS

- A. CMU(s): Concrete masonry unit(s).
- B. Reinforced Masonry: Masonry containing reinforcing steel in grouted cells.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: For the following:
 - 1. Masonry Units: Show sizes, profiles, coursing, and locations of special shapes.
 - 2. Reinforcing Steel: Detail bending, lap lengths, and placement of unit masonry reinforcing bars. Comply with ACI 315. Show elevations of reinforced walls.
 - 3. Fabricated Flashing: Detail corner units, end-dam units, and other special applications.
- C. Samples for Initial Selection:
 - 1. Decorative CMUs, in the form of small-scale units.
 - 2. Colored mortar.
 - 3. Weep holes/cavity vents.
- D. Samples for Verification: For each type and color of the following:
 - 1. Exposed, decorative CMUs.
 - 2. Clay face brick, in the form of straps of five or more bricks.
 - 3. Special brick shapes.
 - 4. Pigmented and colored-aggregate mortar. Make Samples using same sand and mortar ingredients to be used on Project.
 - 5. Accessories embedded in masonry.

1.5 INFORMATIONAL SUBMITTALS

- A. List of Materials Used in Constructing Mockups: List generic product names together with manufacturers, manufacturers' product names, model numbers, lot numbers, batch numbers, source of supply, and other information as required to identify materials used. Include mix proportions for mortar and grout and source of aggregates.
 - 1. Submittal is for information only. Receipt of list does not constitute approval of deviations from the Contract Documents unless such deviations are specifically brought to the attention of Architect and approved in writing.
- B. Qualification Data: For testing agency.
- C. Material Certificates: For each type and size of the following:
 - 1. Masonry units.
 - a. Include material test reports substantiating compliance with requirements.
 - b. For brick, include size-variation data verifying that actual range of sizes falls within specified tolerances.
 - c. For exposed brick, include test report for efflorescence according to ASTM C67.
 - d. For masonry units, include data and calculations establishing average net-area compressive strength of units.
 - 2. Integral water repellent used in CMUs.
 - 3. Cementitious materials. Include name of manufacturer, brand name, and type.
 - 4. Mortar admixtures.

5. Preblended, dry mortar mixes. Include description of type and proportions of ingredients.
 6. Grout mixes. Include description of type and proportions of ingredients.
 7. Reinforcing bars.
 8. Joint reinforcement.
 9. Anchors, ties, and metal accessories.
- D. Mix Designs: For each type of mortar and grout. Include description of type and proportions of ingredients.
- E. Statement of Compressive Strength of Masonry: For each combination of masonry unit type and mortar type, provide statement of average net-area compressive strength of masonry units, mortar type, and resulting net-area compressive strength of masonry determined according to TMS 602/ACI 530.1/ASCE 6.
- F. Cold-Weather and Hot-Weather Procedures: Detailed description of methods, materials, and equipment to be used to comply with requirements.

1.6 QUALITY ASSURANCE

- A. Testing Agency Qualifications: Qualified according to ASTM C1093 for testing indicated.
- B. Mockups: Build mockup to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for materials and execution.
1. Build mockup of typical wall area as indicated in Drawings.
 2. Build mockups for each type of exposed unit masonry construction in sizes approximately 48 inches (1200 mm) long by 60 inches (1500 mm) high by full thickness, including face and backup wythes and accessories.
 - a. Include a sealant-filled joint at least 16 inches (400 mm) long in each mockup.
 - b. Include lower corner of window opening at upper corner of exterior wall mockup. Make opening approximately 12 inches (300 mm) wide by 16 inches (400 mm) high.
 - c. Include through-wall flashing installed for a 24-inch (600-mm) length in corner of exterior wall mockup approximately 16 inches (400 mm) down from top of mockup, with a 12-inch (300-mm) length of flashing left exposed to view (omit masonry above half of flashing).
 - d. Include air barrier, veneer anchors, flashing, cavity drainage material, and weep holes in exterior masonry-veneer wall mockup.
 3. Where masonry is to match existing, erect mockups adjacent and parallel to existing surface.
 4. Clean one-half of exposed faces of mockups with masonry cleaner as indicated.
 5. Install water repellent at one-half of exposed faces of mockups.
 6. Protect accepted mockups from the elements with weather-resistant membrane.
 7. Mixing and placement of reinforcing and mortar and grout materials shall be done in the presence of the Owner's Special Inspector who will visually verify compliance with the Statement Special Inspections including but not limited to conditions of CMU grout cells before grouting operations, installation of grout stops, and other preparations prior to grout placement, to verify grout proportioning, flow, method of placement, and grout consolidation. Special Inspector shall mark out all areas where deficiencies are noted.
 8. Approval of mockups is for color, texture, and blending of masonry units; relationship of mortar and sealant colors to masonry unit colors; tooling of joints; and aesthetic qualities of workmanship.
 - a. Approval of mockups is also for other material and construction qualities specifically approved by Architect in writing.

- b. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
- 9. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.7 MANUFACTURER'S QUALIFICATIONS/ALTERNATE MANUFACTURERS:

- A. The materials outlined are the type of materials to be used on this project. Please refer to Specification Section 013300, "Submittal Procedures." "Or Equal" substitutions are permitted so long as they are equal to or superior to the basis of design and the Contractor takes full responsibility for all coordination and costs associated with collateral issues related to the substitution. No Substitutions will be reviewed during the bidding process. The Contractor takes full responsibility for all substitutions. Substitution submittals shall be made no later than 30 days after Notice to Proceed in order to provide time for comparison review. All submittals after 30 days shall be in strict accordance with the basis of design / specified products. No Substitutions will be considered after 30 days. The following manufacturer criteria must be submitted with the substitution request.

1.8 DELIVERY, STORAGE, AND HANDLING

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

1.9 FIELD CONDITIONS

- A. Protection of Masonry: During construction, cover tops of walls, projections, and sills with waterproof sheeting at end of each day's work. Cover partially completed masonry when construction is not in progress.
 - 1. Extend cover a minimum of 24 inches (600 mm) down both sides of walls, and hold cover securely in place.
 - 2. Where one wythe of multiwythe masonry walls is completed in advance of other wythes, secure cover a minimum of 24 inches (600 mm) down face next to unconstructed wythe and hold cover in place.
- B. Do not apply uniform floor or roof loads for at least 12 hours and concentrated loads for at least three days after building masonry walls or columns.

- C. Stain Prevention: Prevent grout, mortar, and soil from staining the face of masonry to be left exposed or painted. Immediately remove grout, mortar, and soil that come in contact with such masonry.
 - 1. Protect base of walls from rain-splashed mud and from mortar splatter by spreading coverings on ground and over wall surface.
 - 2. Protect sills, ledges, and projections from mortar droppings.
 - 3. Protect surfaces of window and door frames, as well as similar products with painted and integral finishes, from mortar droppings.
 - 4. Turn scaffold boards near the wall on edge at the end of each day to prevent rain from splashing mortar and dirt onto completed masonry.

- D. Cold-Weather Requirements: Do not use frozen materials or materials mixed or coated with ice or frost. Do not build on frozen substrates. Remove and replace unit masonry damaged by frost or by freezing conditions. Comply with cold-weather construction requirements contained in TMS 602/ACI 530.1/ASCE 6.
 - 1. Cold-Weather Cleaning: Use liquid cleaning methods only when air temperature is 40 deg F (4 deg C) and higher and will remain so until masonry has dried, but not less than seven days after completing cleaning.

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

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Source Limitations for Masonry Units: Obtain exposed masonry units of a uniform texture and color, or a uniform blend within the ranges accepted for these characteristics, from single source from single manufacturer for each product required.

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

2.2 PERFORMANCE REQUIREMENTS

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

2.3 UNIT MASONRY, GENERAL

- A. Masonry Standard: Comply with TMS 602/ACI 530.1/ASCE 6, except as modified by requirements in the Contract Documents.

- B. Fire-Resistance Ratings: Comply with requirements for fire-resistance-rated assembly designs indicated.

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

2.4 CONCRETE MASONRY UNITS

- A. Shapes: Provide shapes indicated and as follows, with exposed surfaces matching exposed faces of adjacent units unless otherwise indicated.
 1. Provide special shapes for lintels, corners, jambs, sashes, movement joints, headers, bonding, and other special conditions.
 2. Provide bullnose units for outside corners unless otherwise indicated.
- B. Integral Water Repellent: Provide units made with integral water repellent for exposed units.
 1. Integral Water Repellent: Liquid polymeric, integral water-repellent admixture that does not reduce flexural bond strength. Units made with integral water repellent, when tested according to ASTM E514/E514M as a wall assembly made with mortar containing integral water-repellent manufacturer's mortar additive, with test period extended to 24 hours, shall show no visible water or leaks on the back of test specimen.
- C. CMUs: ASTM C90.
 1. Unit Compressive Strength: Provide units with minimum average net-area compressive strength of 1900 psi.
 2. Density Classification: Medium weight.
 3. Size (Width): Manufactured to dimensions 3/8 inch (10 mm) less than nominal dimensions.
 4. Exposed Faces: Provide color and texture matching the range represented by Architect's sample.
 5. Faces to Receive Plaster: Where units are indicated to receive a direct application of plaster, provide textured-face units made with gap-graded aggregates.
- D. Concrete Building Brick: ASTM C55.
 1. Unit Compressive Strength: Provide units with minimum average net-area compressive strength of 2800 psi (19.3 MPa).
 2. Density Classification: Medium weight.
 3. Size (Actual Dimensions): 3-5/8 inches (92 mm) wide by 2-1/4 inches or 3-5/8 inches high by 7-5/8 inches (194 mm) long.
- E. Decorative CMUs: ASTM C90.
 1. All 4" wide (nominal) CMU veneer units shall be 100% solid.
 2. Unit Compressive Strength: Provide units with minimum average net-area compressive strength of 2800 psi (19.3 MPa).
 3. Density Classification: Normal weight.
 4. Size (Width): Manufactured to dimensions specified in "CMUs" Paragraph.
 5. Pattern and Texture:
 - a. Standard pattern, ground-face finish. Basis of design: Architectural ground face CMU as manufactured by Nitterhouse or approved equal.
 6. Colors: Match Architect's samples.
 7. Special Aggregate: Provide units made with aggregate matching aggregate in Architect's sample.

2.5 CONCRETE AND MASONRY LINTELS

- A. General: Provide one of the following:
- B. Concrete Lintels: Precast or formed-in-place concrete lintels complying with requirements in Section 033000 "Cast-in-Place Concrete," and with reinforcing bars indicated. Only for use where specifically indicated in drawings.
- C. Masonry Lintels: Prefabricated or built-in-place masonry lintels made from bond beam CMUs matching adjacent CMUs in color, texture, and density classification, with reinforcing bars placed as indicated and filled with coarse grout. Cure precast lintels before handling and installing. Temporarily support built-in-place lintels until cured. Provide solid bottom bond beam block at heads of masonry openings.

2.6 BRICK

- A. General: Provide shapes indicated and as follows, with exposed surfaces matching finish and color of exposed faces of adjacent units:
 - 1. For ends of sills and caps and for similar applications that would otherwise expose unfinished brick surfaces, provide units without cores or frogs and with exposed surfaces finished.
 - 2. Provide special shapes for applications where stretcher units cannot accommodate special conditions, including those at corners, movement joints, bond beams, sashes, and lintels.
 - 3. Provide special shapes for applications requiring brick of size, form, color, and texture on exposed surfaces that cannot be produced by sawing.
 - 4. Provide special shapes for applications where shapes produced by sawing would result in sawed surfaces being exposed to view.
- B. Clay Face Brick: Facing brick complying with ASTM C216.
 - 1. Grade: SW.
 - 2. Type: FBX
 - 3. Unit Compressive Strength: Provide units with minimum average net-area compressive strength of 4950 psi (34.13 MPa).
 - 4. Initial Rate of Absorption: Less than 30 g/30 sq. in. (30 g/194 sq. cm) per minute when tested according to ASTM C67.
 - 5. Efflorescence: Provide brick that has been tested according to ASTM C67 and is rated "not effloresced."
 - 6. Surface Coating: Brick with colors or textures produced by application of coatings shall withstand 50 cycles of freezing and thawing according to ASTM C67 with no observable difference in the applied finish when viewed from 10 feet (3 m) or shall have a history of successful use in Project's area.
 - 7. Size (Actual Dimensions): 3-5/8 inches (92 mm) wide by 2-1/4 inches (57 mm) high by 7-5/8 inches (194 mm) long.
 - 8. Application: Use where brick is exposed unless otherwise indicated.
 - 9. Provide face brick matching color range, texture, and size of existing adjacent brickwork.
 - a. Taylor Clay Products, Inc. Blend 40% of each: #301 (Buff) and #306, and 20%: #309.
 - 10. Color and Texture: Match Architect's samples.

2.7 MORTAR AND GROUT MATERIALS

- A. Portland Cement: ASTM C150/C150M, Type I or II, except Type III may be used for cold-weather construction. Provide natural color or white cement as required to produce mortar color indicated.
 - 1. Alkali content shall not be more than 0.1 percent when tested according to ASTM C114.
- B. Hydrated Lime: ASTM C207, Type S.
- C. Portland Cement-Lime Mix: Packaged blend of portland cement and hydrated lime containing no other ingredients.
- D. Mortar Pigments: Natural and synthetic iron oxides and chromium oxides, compounded for use in mortar mixes and complying with ASTM C979/C979M. Use only pigments with a record of satisfactory performance in masonry mortar.
- E. Colored Cement Products: Packaged blend made from portland cement and hydrated lime and mortar pigments, all complying with specified requirements, and containing no other ingredients.
 - 1. Formulate blend as required to produce color indicated or, if not indicated, as selected from manufacturer's standard colors.
- F. Aggregate for Mortar: ASTM C144.
 - 1. For mortar that is exposed to view, use washed aggregate consisting of natural sand or crushed stone.
 - 2. For joints less than 1/4 inch (6 mm) thick, use aggregate graded with 100 percent passing the No. 16 (1.18-mm) sieve.
 - 3. White-Mortar Aggregates: Natural white sand or crushed white stone.
 - 4. Colored-Mortar Aggregates: Natural sand or crushed stone of color necessary to produce required mortar color.
- G. Aggregate for Grout: ASTM C404.
- H. Water-Repellent Admixture: Liquid water-repellent mortar admixture intended for use with CMUs containing integral water repellent from same manufacturer.
- I. Water: Potable.

2.8 REINFORCEMENT

- A. Uncoated-Steel Reinforcing Bars: ASTM A615/A615M or ASTM A996/A996M, Grade 60 (Grade 420).
- B. Reinforcing Bar Positioners: Wire units designed to fit into mortar bed joints spanning masonry unit cells and to hold reinforcing bars in center of cells. Units are formed from 0.148-inch (3.77-mm) steel wire, hot-dip galvanized after fabrication. Provide units designed for number of bars indicated.
- C. Masonry-Joint Reinforcement, General: ASTM A951/A951M.
 - 1. Interior Walls: Mill- galvanized carbon steel.
 - 2. Exterior Walls: Stainless steel, Type 304 or Type 316.
 - 3. Wire Size for Side Rods: 0.148-inch (3.77-mm).
 - 4. Wire Size for Cross Rods: 0.148-inch (3.77-mm).

5. Wire Size for Veneer Ties: 0.187-inch (4.76-mm) diameter.
 6. Spacing of Cross Rods, Tabs, and Cross Ties: Not more than 16 inches (407 mm) o.c.
 7. Provide in lengths of not less than 10 feet (3 m), with prefabricated corner and tee units.
- D. Masonry-Joint Reinforcement for Single-Wythe Masonry: Ladder type with single pair of side rods. Basis of Design: Hohmann & Barnard #220 Ladder Mesh, Type 304 stainless steel or approved equal.
- E. Masonry-Joint Reinforcement for Multiwythe Masonry:
1. Adjustable (two-piece) type, either ladder or truss design, with one side rod at each face shell of backing wythe and with separate adjustable ties with pintle-and-eye connections having a maximum horizontal play of 1/16 inch (1.5 mm) and maximum vertical adjustment of 1-1/4 inches (32 mm). Size ties to extend at least halfway through facing wythe but with at least 5/8-inch (16-mm) cover on outside face.
 2. Basis of Design: Hohman & Barnard #265 adjustable ladder joint reinforcement with 2X-Hook, standard weight, with hook spacing of 16 inches on center. Provide pre-fabricated tees and corners.
 3. Provide H&B stainless steel adjustable wall ties, 3/16-inch diameter pintles and 3/16-inch diameter eyes with 2X-Hooks. Locate where additional ties are required at masonry openings and veneer movement joints.
- F. Masonry-Joint Reinforcement for Brick and CMU veneer: where indicated.
1. Stainless steel, truss type, with two side rods, one at each face of brick, with at least 5/8" cover on outside face.

2.9 TIES AND ANCHORS

- A. General: Ties and anchors shall extend at least 1-1/2 inches (38 mm) into veneer but with at least a 5/8-inch (16-mm) cover on outside face.
- B. Materials: Provide ties and anchors specified in this article that are made from materials that comply with the following unless otherwise indicated:
1. Mill-Galvanized, Carbon-Steel Wire: ASTM A82/A82M, with ASTM A641/A641M, Class 1 coating.
 2. Hot-Dip Galvanized, Carbon-Steel Wire: ASTM A82/A82M, with ASTM A153/A153M, Class B-2 coating.
 3. Stainless Steel Wire: ASTM A580/A580M, Type 304.
 4. Galvanized-Steel Sheet: ASTM A653/A653M, Commercial Steel, G60 (Z180) zinc coating.
 5. Steel Sheet, Galvanized after Fabrication: ASTM A1008/A1008M, Commercial Steel, with ASTM A153/A153M, Class B coating.
 6. Stainless Steel Sheet: ASTM A240/A240M or ASTM A666, Type 304.
 7. Steel Plates, Shapes, and Bars: ASTM A36/A36M.
 8. Stainless Steel Bars: ASTM A276 or ASTM A666, Type 304.
- C. Rigid Anchors: Rigid anchors can be used to connect T-intersections of CMU shear walls in lieu of masonry bonding or bond beams. They are also often used at T-intersections of other CMU walls, although masonry bonding and T-shaped masonry-joint reinforcement may be used.
1. Fabricate from steel bars 1-1/2 inches (38 mm) wide by 1/4 inch (6.35 mm) thick by 24 inches (610 mm) long, with ends turned up 2 inches (51 mm) or with cross pins unless otherwise indicated.

2. Corrosion Protection: Hot-dip galvanized to comply with ASTM A 153/A 153M.

D. Adjustable Masonry-Veneer Anchors:

1. General: Provide anchors that allow vertical adjustment but resist a minimum of 100-lbf (445-N) load in both tension and compression perpendicular to plane of wall without deforming or developing play in excess of 1/16 inch (1.5 mm).
2. Fabricate sheet metal anchor sections and other sheet metal parts from minimum 0.078-inch- (1.98-mm-) thick, stainless-steel sheet.
3. Fabricate wire ties from 0.187-inch- (4.76-mm-) diameter, stainless-steel wire unless otherwise indicated.
4. Screw or and post installed anchor attached, Masonry-Veneer Anchors: Wire tie and a rib-stiffened, sheet metal anchor section with screw holes top and bottom, with a projecting vertical tab having a slotted hole for inserting wire tie.
 - a. Attached to structural steel and cold formed metal framing, where indicated:
 - 1) Unless noted otherwise, Basis of Design: Hohmann & Barnard HB-213 adjustable veneer anchor, 2X hooks and insulation retaining washer.
 - 2) Where indicated: Hohmann & Barnard 359-FH Hot-Dip Galvanized with Vee Byna-Tie, 3/16" wire tie diameter.
 - 3) Fasten to structural steel with two ¼-20 self-drilling screw fasteners with hex-head and bonded neoprene washer. Basis of Design: Hilti Bi-Metal Kwik-Flex.
 - 4) Other acceptable products:
 - a) CTP-16 with fasteners noted above and insulation retaining washer.
www.ctpanchors.com
 - b. Welded adjustable anchors for Connecting to Structural Steel Framing: Where indicated, provide anchors that allow vertical or horizontal adjustment but resist tension and compression forces perpendicular to plane of wall.
 - 1) Anchor Section for Welding to Steel Frame: Crimped 1/4-inch- (6.35-mm-) diameter, hot-dip galvanized steel wire.
 - 2) Tie Section: Triangular-shaped wire tie made from 0.25-inch- (6.35-mm-) diameter, hot-dip galvanized steel wire.
 - 3) Basis of design: Hohman & Barnard #359-C weld-on ties, with 8-inch offsets, ¼-inch wire, Vee-Byna tie, wire diameter to match net tie space between structural steel and inside of weld-on ties plus or minus 1/16 inch clearance max, hot dip galvanized, shop welded to steel.
 - 4) Touch up welds with zinc-rich coating per approved shop paint manufacturer's recommendations.
 - c. Attached to CMU backing wythe, where specifically indicated:
 - 1) Unless noted otherwise, Basis of Design: Hohmann & Barnard HB-5213 adjustable veneer anchor, 2X hooks and insulation retaining washer.
 - 2) Where indicated: Hohmann & Barnard 359-FH Hot-Dip Galvanized with Vee Byna-Tie, 3/16" wire tie diameter.
 - 3) H&B 523 brass expansion anchor or approved equal.
5. Polymer-Coated, Steel Drill Screws for Steel Studs: ASTM C954 except manufactured with hex washer head and neoprene or EPDM washer, No. 10 (4.83-mm) diameter by length required to penetrate steel stud flange with not less than three exposed threads, and with organic polymer coating with salt-spray resistance to red rust of more than 800 hours according to ASTM B117.

6. Stainless Steel Drill Screws for Steel Studs: ASTM C954 except manufactured with hex washer head and neoprene or EPDM washer, No. 10 (4.83-mm) diameter by length required to penetrate steel stud flange with not less than three exposed threads; either made from Type 410 stainless steel or made with a carbon-steel drill point and 300 Series stainless steel shank.

2.10 EMBEDDED FLASHING MATERIALS

- A. Metal Flashing: Provide metal flashing complying with SMACNA's "Architectural Sheet Metal Manual" and as follows:
 1. Stainless Steel: ASTM A 240/A 240M or ASTM A 666, Type 316, 0.016 inch (0.40 mm) thick.
 2. Fabricate continuous flashings in sections 96 inches (2400 mm) long minimum, but not exceeding 12 feet (3.7 m). Provide splice plates at joints of formed, smooth metal flashing.
 3. Fabricate metal drip plates from stainless steel. Extend at least 3½ inch (76 mm) into wall and 1/2 inch (13 mm) out from wall, with outer edge bent down 30 degrees and hemmed. Provide pre-manufactured, water tight, mitered and welded corners, splice plates, and end dams.
 4. Fabricate metal sealant stops from stainless steel. Extend at least 3 inches (76 mm) into wall and out to exterior face of wall. At exterior face of wall, bend metal back on itself for 3/4 inch (19 mm) and down into joint 1/4 inch (6 mm) to form a stop for retaining sealant backer rod.
 5. Solder metal items at corners.
- B. Flexible Through Wall Flashing: Comply with Fluid Applied Air Barrier specification.
- C. Bottom of wall waterproofing:
 1. Continuous rolled, self-adhering waterproofing membrane at foundation wall around entire perimeter of the brick masonry replacement work.
 2. Provide 56 mil thick polymeric waterproofing membrane on a 4 mil cross laminated polyethylene carrier film with pull-off release strips.
 3. Application: Unless otherwise indicated, use the following:
 4. Where flashing is indicated to receive counterflashing, use metal flashing.
 5. Where flashing is indicated to be turned down at or beyond the wall face, use metal flashing.
 6. Where flashing is partly exposed and is indicated to terminate at the wall face, use flexible flashing with a metal drip plate or flexible flashing with a metal sealant stop as indicated.
 7. Where flashing is fully concealed, use flexible flashing.
- D. Solder and Sealants for Sheet Metal Flashings:
 1. Solder for Stainless Steel: ASTM B 32, Grade Sn60, with acid flux of type recommended by stainless-steel sheet manufacturer.
 2. Elastomeric Sealant: ASTM C 920, chemically curing silicone sealant; of type, grade, class, and use classifications required to seal joints in sheet metal flashing and remain watertight.
 3. Butyl sealant where indicated.
- E. Adhesives, Primers, and Seam Tapes for Flashings: Flashing manufacturer's standard products or products recommended by flashing manufacturer for bonding flashing sheets to each other and to substrates.
- F. Termination Bars for Flexible Flashing: Stainless-steel sheet 0.019 inch by 1-1/2 inches (0.48 mm by 38 mm) with a 3/8-inch (10-mm) sealant flange at top.

2.11 MISCELLANEOUS MASONRY ACCESSORIES

- A. Compressible Filler: Premolded filler strips complying with ASTM D1056, Grade 2A1; compressible up to 35 percent; of width and thickness indicated; formulated from neoprene, urethane, or PVC.

- B. Preformed Control-Joint Gaskets: Made from styrene-butadiene-rubber compound, complying with ASTM D 2000, Designation M2AA-805 or PVC, complying with ASTM D 2287, Type PVC-65406J and designed to fit standard sash block and to maintain lateral stability in masonry wall; size and configuration as indicated.
- C. Bond-Breaker Strips: Asphalt-saturated felt complying with ASTM D226/D226M, Type I (No. 15 asphalt felt).
- D. EPDM Flashing: Sheet flashing product made from ethylene-propylene-diene terpolymer, complying with ASTM D4637/D4637M, 0.040 inch (1.02 mm) thick and compatible with air-barrier system.
- E. Closed Cell Spray Polyurethane Foam grout stop: Injection-applied materials as specified. Subject to compliance with ASTM C1029, Type I or II and the following properties:
 - 1. Properties
 - a. Density: Nominal 2.0 lbs/cf per ASTM D1622
 - b. Closed-cell content: 90% (min.) per ASTM D6226
 - c. Design R-Value: R-6.7 per inch thickness per ASTM C518
 - d. Design R-Value: R-28 @ 4 inch thickness per ASTM C518
 - e. Flame spread: 25 or less per ASTM E 84
 - f. Smoke developed: 350 or less per ASTM E 84
 - g. Compressive strength: 26 psi (min.) per ASTM D1621
 - h. Tensile strength: 62.4 psi (min.) per ASTM D1623, Type C
 - i. Incorporating a zero ozone depleting blowing agent
 - j. Water vapor transmission: 1.39 perm-inch at 1" thickness per ASTM E96
- F. Weep/Cavity Vent Products:
 - 1. Cellular Plastic Weep/Vent: One-piece, flexible extrusion made from UV-resistant polypropylene copolymer, full height and width of head joint and depth 1/8 inch (3 mm) less than depth of outer wythe, in color selected from manufacturer's standard.
 - 2. Products
 - a. Basis of Design: Hohmann & Barnard QV Quadro Vent full mortar joint height. Color to match mortar.
 - b. Approved equal.
- G. Cavity Drainage Material: Free-draining mesh, made from polymer strands that will not degrade within the wall cavity.
 - 1. Configuration: Provide one of the following:
 - a. Sheets or strips, full depth of cavity and installed to full height of cavity.
- H. Insulation Fastening System: insulation retaining clip for fastening continuous insulation at cavity wall with masonry veneer.
 - 1. Basis of Design: Thermafiber Rainbarrier Clip, as Manufactured by Thermafiber, or approved equal.

2.12 MASONRY CLEANERS

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

2.13 MORTAR AND GROUT MIXES

- A. General: Do not use admixtures, including pigments, air-entraining agents, accelerators, retarders, water-repellent agents, antifreeze compounds, or other admixtures unless otherwise indicated.
1. Do not use calcium chloride in mortar or grout.
 2. Use portland cement-lime mortar unless otherwise indicated.
 3. For exterior masonry, use portland cement-lime.
 4. For reinforced masonry, use portland cement-lime mortar.
 5. Add cold-weather admixture (if used) at same rate for all mortar that will be exposed to view, regardless of weather conditions, to ensure that mortar color is consistent.
- B. Preblended, Dry Mortar Mix: Furnish dry mortar ingredients in form of a preblended mix. Measure quantities by weight to ensure accurate proportions, and thoroughly blend ingredients before delivering to Project site.
- C. Mortar for Unit Masonry: Comply with ASTM C270, Proportion Specification. Provide the following types of mortar for applications stated unless another type is indicated.
1. For masonry below grade or in contact with earth, use Type M.
 2. For reinforced masonry, use Type S.
 3. For mortar parge coats, use Type S.
 4. For exterior, above-grade, load-bearing and nonload-bearing walls and parapet walls; for interior load-bearing walls; for interior nonload-bearing partitions; and for other applications where another type is not indicated, use Type N.
 5. For interior nonload-bearing partitions, Type O may be used instead of Type N.
- D. Pigmented Mortar: Use colored cement product or select and proportion pigments with other ingredients to produce color required. Do not add pigments to colored cement products.
1. Pigments shall not exceed 10 percent of portland cement by weight.
 2. Mix to match Architect's sample.
 3. Application: Use pigmented mortar for exposed mortar joints with the following units:
 - a. Decorative CMUs.
 - b. Clay face brick.
 - c. Cast-stone trim units.
- E. Colored-Aggregate Mortar: Produce required mortar color by using colored aggregates and natural color or white cement as necessary to produce required mortar color.
1. Mix to match Architect's sample.
 2. Application: Use colored-aggregate mortar for exposed mortar joints with the following units:
 - a. Decorative CMUs.
 - b. Clay face brick.
 - c. Cast-stone trim units.
- F. Grout for Unit Masonry: Comply with ASTM C476.
1. Use grout of type indicated or, if not otherwise indicated, of type fine that will comply with TMS 602/ACI 530.1/ASCE 6 for dimensions of grout spaces and pour height.

2. Self-consolidating grout where indicated (SCG): ASTM C476 fine grout, pre-batched, pre-bagged, dry ingredients ready for hydration at the project site. Site proportioned grout will be rejected.
 - a. Specified minimum 28 day compressive strength is 3000 psi (ASTM C1019);
 - b. Slump flow (ASTM C1611) 24 inches to 28 inches;
 - c. T50 = 2 to 5 seconds;
 - d. Visual Stability Index (VSI) = 0;
 - e. Basis of Design: SPEC MIX SCG, or approved equal.
3. Self-consolidating grout (SCG) as a ready mixed grout: provide mix design for review. Use NCMA TEK 9-2B as a guide. Site proportioned grout will be rejected.
 - a. Specified minimum 28 day compressive strength is 3000 psi (ASTM C1019);
 - b. Slump flow (ASTM C1611) 24 inches to 30 inches;
 - c. T50 = 2 to 5 seconds;
 - d. Visual Stability Index (VSI) = 0;

PART 3 - EXECUTION

3.1 EXAMINATION

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

3.2 INSTALLATION, GENERAL

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

- F. Matching Existing Masonry: Match coursing, bonding, color, and texture of existing masonry.
- G. Wetting of Brick: Wet brick before laying if initial rate of absorption exceeds 30 g/30 sq. in. (30 g/194 sq. cm) per minute when tested according to ASTM C67. Allow units to absorb water so they are damp but not wet at time of laying.

3.3 TOLERANCES

A. Dimensions and Locations of Elements:

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

B. Lines and Levels:

1. For bed joints and top surfaces of bearing walls, do not vary from level by more than 1/4 inch in 10 feet (6 mm in 3 m), or 1/2-inch (12-mm) maximum.
2. For conspicuous horizontal lines, such as lintels, sills, parapets, and reveals, do not vary from level by more than 1/8 inch in 10 feet (3 mm in 3 m), 1/4 inch in 20 feet (6 mm in 6 m), or 1/2-inch (12-mm) maximum.
3. For vertical lines and surfaces, do not vary from plumb by more than 1/4 inch in 10 feet (6 mm in 3 m), 3/8 inch in 20 feet (9 mm in 6 m), or 1/2-inch (12-mm) maximum.
4. For conspicuous vertical lines, such as external corners, door jambs, reveals, and expansion and control joints, do not vary from plumb by more than 1/8 inch in 10 feet (3 mm in 3 m), 1/4 inch in 20 feet (6 mm in 6 m), or 1/2-inch (12-mm) maximum.
5. For lines and surfaces, do not vary from straight by more than 1/4 inch in 10 feet (6 mm in 3 m), 3/8 inch in 20 feet (9 mm in 6 m), or 1/2-inch (12-mm) maximum.
6. For vertical alignment of exposed head joints, do not vary from plumb by more than 1/4 inch in 10 feet (6 mm in 3 m), or 1/2-inch (12-mm) maximum.
7. For faces of adjacent exposed masonry units, do not vary from flush alignment by more than 1/16 inch (1.5 mm) except due to warpage of masonry units within tolerances specified for warpage of units.

C. Joints:

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

3.4 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: Unless otherwise indicated, lay exposed masonry in running bond; do not use units with less-than-nominal 4-inch (100-mm) horizontal face dimensions at corners or jambs.
- C. Lay concealed masonry with all units in a wythe in running bond or bonded by lapping not less than 2 inches (50 mm). Bond and interlock each course of each wythe at corners. Do not use units with less-than-nominal 4-inch (100-mm) horizontal face dimensions at corners or jambs.
- D. Stopping and Resuming Work: Stop work by stepping back units in each course from those in course below; do not tooth. When resuming work, clean masonry surfaces that are to receive mortar, remove loose masonry units and mortar, and wet brick if required before laying fresh masonry.
- E. Built-in Work: As construction progresses, build in items specified in this and other Sections. Fill in solidly with masonry around built-in items.
- F. Fill space between steel 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, wire mesh, or plastic mesh in the joint below, and rod mortar or grout into core.
- H. Fill cores in hollow CMUs with grout 24 inches (600 mm) under bearing plates, beams, lintels, posts, and similar items unless otherwise indicated.
- I. Build nonload-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.
 - 2. Fasten partition top anchors to structure above as shown in drawings.
 - 3. At fire-rated partitions, treat joint between top of partition and underside of structure above.

3.5 MORTAR BEDDING AND JOINTING

- A. Lay CMUs as follows:
 - 1. Bed face shells in mortar and make head joints of depth equal to bed joints.
 - 2. Bed webs in mortar in all courses of piers, columns, and pilasters.
 - 3. Bed webs in mortar in grouted masonry, including starting course on footings.
 - 4. Fully bed entire units, including areas under cells, at starting course on footings where cells are not grouted.
 - 5. Fully bed units and fill cells with mortar at anchors and ties as needed to fully embed anchors and ties in mortar.
- B. Lay solid 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.
- C. Set cast-stone trim units in full bed of mortar with full vertical joints. Fill dowel, anchor, and similar holes.

1. Clean soiled surfaces with fiber brush and soap powder and rinse thoroughly with clear water.
2. Allow cleaned surfaces to dry before setting.
3. Wet joint surfaces thoroughly before applying mortar.
4. Rake out mortar joints for pointing with sealant.

- D. Tool exposed joints slightly concave when thumbprint hard, using a jointer larger than joint thickness unless otherwise indicated.
- E. Cut joints flush for masonry walls to receive plaster or other direct-applied finishes (other than paint) unless otherwise indicated.
- F. Cut joints flush where indicated to receive waterproofing, cavity wall insulation, and air barriers unless otherwise indicated.

3.6 CAVITY WALLS

- A. Bond wythes of cavity walls together as follows:

1. Individual Metal Ties as indicated on drawings: Provide ties as shown installed in horizontal joints, but not less than one metal tie for 1.77 sq. ft. of wall area spaced not to exceed 24 inches o.c. horizontally and 16 inches o.c. vertically. Stagger ties in alternate courses. Provide additional ties around openings and space as indicated around perimeter of openings. At intersecting and abutting walls, provide ties at no more than 24 inches o.c. vertically.
 - a. Where bed joints of wythes do not align, use adjustable-type (two-piece-type) ties.
 - b. Where one wythe is of clay masonry and the other of concrete masonry, use adjustable-type (two-piece-type) ties to allow for differential movement regardless of whether bed joints align.
2. Masonry-Joint Reinforcement: Installed in horizontal mortar joints.
 - a. Where bed joints of wythes do not align, use adjustable-type (two-piece-type) reinforcement.
 - b. Where one wythe is of clay masonry and the other of concrete masonry, use adjustable-type (two-piece-type) reinforcement to allow for differential movement regardless of whether bed joints align.
3. Masonry-Veneer Anchors: Comply with requirements for anchoring masonry veneers.

- B. Bond wythes of cavity walls together using bonding system indicated on Drawings.

- C. Keep cavities clean of mortar droppings and other materials during construction. Bevel beds away from cavity, to minimize mortar protrusions into cavity. Do not attempt to trowel or remove mortar fins protruding into cavity. Provide clean out units (CMU or clay facing) every other unit for the length of the work. Remove accumulated mortar at completion of each lift of work. Install cleanout unit after top of masonry is completed.

3.7 ANCHORED MASONRY VENEERS

- A. Anchor masonry veneers to wall framing and structural steel and masonry backup with masonry-veneer anchors to comply with the following requirements:

1. Fasten fastener-attached anchors through sheathing to wall framing and to masonry backup with metal fasteners of type indicated. Use two fasteners unless anchor design only uses one fastener.
2. Embed tie sections in masonry joints.
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 16 inches o.c. horizontally, with not less than one anchor for each 1.77 sq. ft. of wall area. Install additional anchors around openings and at intervals, not exceeding 8 inches (203 mm), around perimeter and as indicated.

B. Provide not less than 1 inch (25 mm) of airspace between back of masonry veneer and face of insulation.

1. Keep air space clean of mortar droppings and other materials during construction. Bevel beds away from airspace, to minimize mortar protrusions into airspace. Do not attempt to trowel or remove mortar fins protruding into airspace. Provide clean out units (CMU or clay facing) every other unit for the length of the work. Remove accumulated mortar at completion of each lift of work. Install cleanout unit after top of masonry is completed.

3.8 MASONRY-JOINT REINFORCEMENT

A. General: Install entire length of longitudinal side rods in mortar with a minimum cover of 5/8 inch (16 mm) on exterior side of walls, 1/2 inch (13 mm) elsewhere. Lap reinforcement a minimum of 6 inches (150 mm).

1. Space reinforcement not more than 16 inches (406 mm) o.c.
2. Space reinforcement not more than 8 inches (203 mm) o.c. in foundation walls and parapet walls.
3. Provide reinforcement not more than 8 inches (203 mm) above and below wall openings and extending 12 inches (305 mm) beyond openings in addition to continuous reinforcement.

B. Interrupt joint reinforcement at control and expansion joints unless otherwise indicated.

C. Provide continuity at wall intersections by using prefabricated T-shaped units.

D. Provide continuity at corners by using prefabricated L-shaped units.

E. Install brick masonry joint reinforcement at heads and sills of openings in brick veneer as indicated. Coordinate bed joint locations with adjustable anchor/ties. Do not install joint reinforcement in the same bed joint as the anchor/ties.

3.9 ANCHORING MASONRY TO STRUCTURAL STEEL AND CONCRETE

A. Anchor masonry to structural steel, where masonry abuts or faces structural steel or concrete, to comply with the following:

1. Provide an open space not less than 1 inch (25 mm) wide between masonry and structural steel unless otherwise indicated. Keep open space free of mortar and other rigid materials.
2. Anchor masonry with anchors embedded in masonry joints and attached to structure.
3. Space anchors as indicated.

3.10 CONTROL AND EXPANSION JOINTS

- A. General: Install control- and expansion-joint materials in unit masonry as masonry progresses. Do not allow materials to span control and expansion joints without provision to allow for in-plane wall or partition movement.
- B. Form control joints in concrete masonry using one of the following methods:
 - 1. Fit bond-breaker strips into hollow contour in ends of CMUs on one side of control joint. Fill resultant core with grout and rake out joints in exposed faces for application of sealant.
 - 2. Install preformed control-joint gaskets designed to fit standard sash block.
 - 3. Install interlocking units designed for control joints. Install bond-breaker strips at joint. Keep head joints free and clear of mortar or rake out joint for application of sealant.
 - 4. Install temporary foam-plastic filler in head joints and remove filler when unit masonry is complete for application of sealant.
- C. Form expansion joints in brick as follows:
 - 1. Build flanges of metal expansion strips into masonry. Lap each joint 4 inches (100 mm) in direction of water flow. Seal joints below grade and at junctures with horizontal expansion joints if any.
 - 2. Build flanges of factory-fabricated, expansion-joint units into masonry.
 - 3. Build in compressible joint fillers where indicated.
 - 4. Form open joint full depth of brick wythe and of width indicated, but not less than 1/2 inch (13 mm) for installation of sealant and backer rod.
- D. Provide horizontal, pressure-relieving joints by either leaving an airspace or inserting a compressible filler of width required for installing sealant and backer rod but not less than 1/2 inch (10 mm).
 - 1. Locate horizontal, pressure-relieving joints beneath shelf angles supporting masonry.

3.11 LINTELS

- A. Install steel lintels where indicated.
- B. Provide concrete or masonry lintels where shown and where openings of more than 12 inches (305 mm) for brick-size units and 24 inches (610 mm) for block-size units are shown without structural steel or other supporting lintels.
- C. Provide minimum bearing of 8 inches (200 mm) at each jamb unless otherwise indicated.

3.12 FLASHING, WEEP HOLES, AND CAVITY VENTS

- A. General: Install embedded flashing and weep holes in masonry at shelf angles, lintels, ledges, other obstructions to downward flow of water in wall, and where indicated.
- B. Install flashing as follows unless otherwise indicated:
 - 1. Prepare masonry surfaces so they are smooth and free from projections that could puncture flashing. Where flashing is within mortar joint, place through-wall flashing on sloping bed of mortar and cover with mortar. Before covering with mortar, seal penetrations in flashing with adhesive, sealant, or tape as recommended by flashing manufacturer.

2. At masonry-veneer walls, extend flashing through veneer, across airspace behind veneer, and up face of sheathing or masonry backup in accordance with barrier system manufacturer requirements at least 8 inches (200 mm); with upper edge tied into water-resistive barrier, lapping at least 4 inches (100 mm). Fasten upper edge of flexible flashing to sheathing through termination bar. Provide cut off sealant above termination bar to CMU.
 3. At lintels and shelf angles, extend flashing a minimum of 6 inches (150 mm) into masonry at each end. At heads and sills, extend flashing a minimum of 6 inches (150 mm) at ends and turn up not less than 2 inches (50 mm) to form end dams at nearest head joint.
 4. Install metal drip plates beneath flexible flashing at exterior face of wall. Stop flexible flashing 1/2 inch (13 mm) back from outside face of wall and adhere flexible flashing to top of metal drip plate.
 5. Install metal flashing termination beneath flexible flashing at exterior face of wall. Stop flexible flashing 1/2 inch (13 mm) back from outside face of wall and adhere flexible flashing to top of metal flashing termination.
 6. Provide minimum of 3 inches lap onto drip plate. Set drip plate in continuous bed of butyl sealant. Set butyl on grouted solid brick course.
 7. Install continuous self-adhering base of wall waterproofing flush to exterior surface of trench foundation wall, extend horizontally inward to intersecting masonry wall and rise to the underside of through wall flashing location, terminate with termination bar to CMU wall, prime surfaces as required by approved manufacturer to provide complete adhesion.
- C. Install reglets and nailers for flashing and other related construction where they are shown to be built into masonry.
- D. Install weep holes in exterior wythes and veneers in head joints of first course of masonry immediately above embedded flashing.
1. Use specified weep/cavity vent products to form weep holes.

3.13 REINFORCED UNIT MASONRY

- A. Temporary Formwork and Shores: Construct formwork and shores as needed to support reinforced masonry elements during construction.
1. Construct formwork to provide shape, line, and dimensions of completed masonry as indicated. Make forms sufficiently tight to prevent leakage of mortar and grout. Brace, tie, and support forms to maintain position and shape during construction and curing of reinforced masonry.
 2. Do not remove forms and shores until reinforced masonry members have hardened sufficiently to carry their own weight and that of other loads that may be placed on them during construction.
- B. Placing Reinforcement: Comply with requirements in TMS 602/ACI 530.1/ASCE 6.
- C. Grouting: Do not place grout until entire height of masonry to be grouted has attained enough strength to resist grout pressure.
1. Comply with requirements in TMS 602/ACI 530.1/ASCE 6 for cleanouts and for grout placement, including minimum grout space and maximum pour height.
 2. Limit height of vertical grout pours to not more than 60 inches (1520 mm).

3.14 FIELD QUALITY CONTROL

- A. Testing and Inspecting: Owner will engage special inspectors to perform tests and inspections and prepare reports. Allow inspectors access to scaffolding and work areas as needed to perform tests and inspections. Retesting of materials that fail to comply with specified requirements shall be done at Contractor's expense.

- B. Inspections: Special inspections according to Level B in TMS 402/ACI 530/ASCE 5.
 - 1. Begin masonry construction only after inspectors have verified proportions of site-prepared mortar.
 - 2. Place grout only after inspectors have verified compliance of grout spaces and of grades, sizes, and locations of reinforcement.
 - 3. Place grout only after inspectors have verified proportions of site-prepared grout.
- C. Testing Prior to Construction: One set of tests.
- D. Testing Frequency: One set of tests for each 5000 sq. ft. (464 sq. m) of wall area or portion thereof.
- E. Clay Masonry Unit Test: For each type of unit provided, according to ASTM C67 for compressive strength.
- F. Concrete Masonry Unit Test: For each type of unit provided, according to ASTM C140 for compressive strength.
- G. Mortar Aggregate Ratio Test (Proportion Specification): For each mix provided, according to ASTM C780.
- H. Grout Test (Compressive Strength): For each mix provided, according to ASTM C1019.
 - 1. Additional requirements for self-consolidating grout (SCG):
 - a. Slump flow (ASTM C1611).
 - b. T50.
 - c. Visual Stability Index (VSI).

3.15 PARGING

- A. Parge exterior faces of below-grade masonry walls, where indicated, in two uniform coats to a total thickness of 3/4 inch (19 mm). Dampen wall before applying first coat and scarify first 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 (3 mm per 300 mm). Form a wash at top of parging and a cove at bottom.
- C. Damp-cure parging for at least 24 hours and protect parging until cured.

3.16 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, where indicated.
- C. In-Progress Cleaning: Clean unit masonry as work progresses by dry brushing to remove mortar fins and smears before tooling joints.

- D. Final Cleaning: After mortar is thoroughly set and cured, clean exposed masonry as follows:
1. Remove large mortar particles by hand with wooden paddles and nonmetallic scrape hoes or chisels.
 2. Test cleaning methods on sample wall panel; leave one-half of panel uncleaned for comparison purposes. Obtain Architect's approval of sample cleaning before proceeding with cleaning of masonry.
 3. Protect adjacent stone and nonmasonry surfaces from contact with cleaner by covering them with liquid strippable masking agent or polyethylene film and waterproof masking tape.
 4. Wet wall surfaces with water before applying cleaners; remove cleaners promptly by rinsing surfaces thoroughly with clear water.
 5. Clean brick by bucket-and-brush hand-cleaning method described in BIA Technical Notes 20.
 6. Clean concrete masonry by applicable cleaning methods indicated in NCMA TEK 8-4A.
 7. Clean masonry with a proprietary acidic cleaner applied according to manufacturer's written instructions.

3.17 MASONRY WASTE DISPOSAL

- A. Salvageable Materials: Unless otherwise indicated, excess masonry materials are Contractor's property. At completion of unit masonry work, remove from Project site.
- B. Masonry Waste Recycling: Return broken CMUs not used as fill to manufacturer for recycling.
- C. Excess Masonry Waste: Remove excess clean masonry waste that cannot be used as fill, as described above or recycled, and other masonry waste, and legally dispose of off Owner's property.

END OF SECTION 042000

SECTION 047200 - CAST STONE MASONRY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Cast-stone trim including the following:

- a. Window sills.
- b. Lintels.
- c. Surrounds.
- d. Coping.
- e. Cornices
- f. Wall caps.
- g. Belt courses.
- h. Water tables.

B. Related Sections:

- 1. Section 042000 "Unit Masonry" for installing cast-stone units in unit masonry.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

- 1. For cast-stone units, include construction details, material descriptions, dimensions of individual components and profiles, and finishes.

B. Shop Drawings: Show fabrication and installation details for cast-stone units. Include dimensions, details of reinforcement and anchorages if any, and indication of finished faces.

- 1. Include building elevations showing layout of units and locations of joints and anchors.

C. Samples for Initial Selection: For colored mortar.

D. Samples for Verification:

- 1. For each color and texture of cast stone required, 10 inches (250 mm) square in size.
- 2. For each trim shape required, 10 inches (250 mm) in length.
- 3. For colored mortar, make Samples using same sand and mortar ingredients to be used on Project. Label Samples to indicate types and amounts of pigments used.

1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For manufacturer.
 - 1. Include copies of material test reports for completed projects, indicating compliance of cast stone with ASTM C 1364.
- B. Material Test Reports: For each mix required to produce cast stone, based on testing according to ASTM C 1364, including test for resistance to freezing and thawing.
 - 1. Provide test reports based on testing within previous two years.
- C. Delegated Design: Provide services of a Specialty Structural Engineer (SSE) to design cast stone component which are not continuously supported over their entire horizontal surface for gravity loads and all anchors required to secure to cast stone elements in place. SSE shall be licensed to practice engineering in the state of New Jersey.

1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: A qualified manufacturer of cast-stone units similar to those indicated for this Project, that has sufficient production capacity to manufacture required units, and is a plant certified by the Cast Stone Institute, the Architectural Precast Association, or the Precast/Prestressed Concrete Institute for Group A, Category AT.
- B. Testing Agency Qualifications: Qualified according to ASTM E 329 for testing indicated.
- C. Mockups: Furnish cast stone for installation in mockups specified in Section 042000 "Unit Masonry."
- D. Mockups: Build mockups to verify selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
 - 1. Build mockup of typical wall area as shown on Drawings.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Coordinate delivery of cast stone with unit masonry work to avoid delaying the Work and to minimize the need for on-site storage.
- B. Pack, handle, and ship cast-stone units in suitable packs or pallets.
 - 1. Lift with wide-belt slings; do not use wire rope or ropes that might cause staining. Move cast-stone units if required, using dollies with wood supports.
 - 2. Store cast-stone units on wood skids or pallets with nonstaining, waterproof covers, securely tied. Arrange to distribute weight evenly and to prevent damage to units. Ventilate under covers to prevent condensation.
- C. Store cementitious materials on elevated platforms, under cover, and in a dry location. Do not use cementitious materials that have become damp.
- D. Store mortar aggregates where grading and other required characteristics can be maintained and contamination can be avoided.

1.7 PROJECT CONDITIONS

- A. Cold-Weather Requirements: Do not use frozen materials or materials mixed or coated with ice or frost. Do not build on frozen substrates. Comply with cold-weather construction requirements in TMS 602/ACI 530.1/ASCE 6.
 - 1. Cold-Weather Cleaning: Use liquid cleaning methods only when air temperature is 40 deg F (4 deg C) and above and will remain so until cast stone has dried, but no fewer than seven days after completing cleaning.
- B. Hot-Weather Requirements: Comply with hot-weather construction requirements in TMS 602/ACI 530.1/ASCE 6.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Source Limitations for Cast Stone: Obtain cast-stone units from single source from single manufacturer.
- B. Source Limitations for Mortar Materials: Obtain mortar ingredients of a uniform quality, including color, from one manufacturer for each cementitious component and from one source or producer for each aggregate.

2.2 CAST-STONE MATERIALS

- A. General: Comply with ASTM C 1364.
- B. Portland Cement: ASTM C 150/C 150M, Type I or Type III, containing not more than 0.60 percent total alkali when tested according to ASTM C 114. Provide natural color or white cement as required to produce cast-stone color indicated.
- C. Coarse Aggregates: Granite, quartz, or limestone complying with ASTM C 33/C 33M; gradation and colors as needed to produce required cast-stone textures and colors.
- D. Fine Aggregates: Natural sand or crushed stone complying with ASTM C 33/C 33M, gradation and colors as needed to produce required cast-stone textures and colors.
- E. Color Pigment: ASTM C 979/C 979M, synthetic mineral-oxide pigments or colored water-reducing admixtures; color stable, free of carbon black, nonfading, and resistant to lime and other alkalis.
- F. Admixtures: Use only admixtures specified or approved in writing by Architect.
 - 1. Do not use admixtures that contain more than 0.1 percent water-soluble chloride ions by mass of cementitious materials. Do not use admixtures containing calcium chloride.
 - 2. Use only admixtures that are certified by manufacturer to be compatible with cement and other admixtures used.
 - 3. Air-Entraining Admixture: ASTM C 260/C 260M. Add to mixes for units exposed to the exterior at manufacturer's prescribed rate to result in an air content of 4 to 6 percent, except do not add to zero-slump concrete mixes.
 - 4. Water-Reducing Admixture: ASTM C 494/C 494M, Type A.
 - 5. Water-Reducing, Retarding Admixture: ASTM C 494/C 494M, Type D.

6. Water-Reducing, Accelerating Admixture: ASTM C 494/C 494M, Type E.
- G. Reinforcement: Deformed steel bars complying with ASTM A 615/A 615M, Grade 60 (Grade 420). Use galvanized or epoxy-coated reinforcement when covered with less than 1-1/2 inches (38 mm) of cast-stone material.
 1. Epoxy Coating: ASTM A 775/A 775M.
 2. Galvanized Coating: ASTM A 767/A 767M.
- H. Embedded Anchors and Other Inserts: Fabricated from stainless steel complying with ASTM A 240/A 240M, ASTM A 276, or ASTM A 666, Type 304.

2.3 CAST-STONE UNITS

- A. Cast-Stone Units: Comply with ASTM C 1364.
 1. Units shall be manufactured using the wet-cast method.
 2. Units shall be resistant to freezing and thawing as determined by laboratory testing according to ASTM C 666/C 666M, Procedure A, as modified by ASTM C 1364.
- B. Fabricate units with sharp arris and accurately reproduced details, with indicated texture on all exposed surfaces unless otherwise indicated.
 1. Slope exposed horizontal surfaces 1:12 to drain unless otherwise indicated.
 2. Provide raised fillets at backs of sills and at ends indicated to be built into jambs.
 3. Provide drips on projecting elements unless otherwise indicated.
- C. Fabrication Tolerances:
 1. Variation in Cross Section: Do not vary from indicated dimensions by more than 1/8 inch (3 mm).
 2. Variation in Length: Do not vary from indicated dimensions by more than 1/360 of the length of unit or 1/8 inch (3 mm), whichever is greater, but in no case by more than 1/4 inch (6 mm).
 3. Warp, Bow, and Twist: Not to exceed 1/360 of the length of unit or 1/8 inch (3 mm), whichever is greater.
 4. Location of Grooves, False Joints, Holes, Anchorages, and Similar Features: Do not vary from indicated position by more than 1/8 inch (3 mm) on formed surfaces of units and 3/8 inch (10 mm) on unformed surfaces.
- D. Cure Units as Follows:
 1. Cure units in enclosed, moist curing room at 95 to 100 percent relative humidity and temperature of 100 deg F (38 deg C) for 12 hours or 70 deg F (21 deg C) for 16 hours.
 2. Keep units damp and continue curing to comply with one of the following:
 - a. No fewer than five days at mean daily temperature of 70 deg F (21 deg C) or above.
 - b. No fewer than six days at mean daily temperature of 60 deg F (16 deg C) or above.
 - c. No fewer than seven days at mean daily temperature of 50 deg F (10 deg C) or above.
 - d. No fewer than eight days at mean daily temperature of 45 deg F (7 deg C) or above.
- E. Acid etch units after curing to remove cement film from surfaces to be exposed to view.
- F. Colors and Textures: As selected by Architect from manufacturer's full range.

- G. Colors and Textures: Provide units with fine-grained texture and buff color resembling smooth-finished Indiana limestone.
- H. Colors and Textures: Provide units with fine texture and red-brown color resembling brownstone on adjacent buildings.

2.4 MORTAR MATERIALS

- A. Provide mortar materials that comply with Section 042000 "Unit Masonry."
- B. Portland Cement: ASTM C 150/C 150M, Type I or II, except Type III may be used for cold-weather construction. Provide natural color or white cement as required to produce mortar color indicated.
- C. Hydrated Lime: ASTM C 207, Type S.
- D. Portland Cement-Lime Mix: Packaged blend of portland cement and hydrated lime containing no other ingredients.
- E. Mortar Pigments: Natural and synthetic iron oxides and chromium oxides, compounded for use in mortar mixes and complying with ASTM C 979/C 979M. Use only pigments with a record of satisfactory performance in masonry mortar.
- F. Colored Cement Product: Packaged blend made from portland cement and hydrated lime and mortar pigments, all complying with specified requirements, and containing no other ingredients.
 - 1. Formulate blend as required to produce color indicated or, if not indicated, as selected from manufacturer's standard colors.
 - 2. Pigments shall not exceed 10 percent of portland cement by weight.
- G. Aggregate for Mortar: ASTM C 144.
 - 1. For mortar that is exposed to view, use washed aggregate consisting of natural sand or crushed stone.
 - 2. For joints less than 1/4 inch (6 mm) thick, use aggregate graded with 100 percent passing the No. 16 (1.18-mm) sieve.
 - 3. White-Mortar Aggregates: Natural white sand or crushed white stone.
 - 4. Colored Aggregates: Natural sand or crushed stone of color necessary to produce required mortar color.
- H. Water: Potable.

2.5 ACCESSORIES

- A. Anchors: Type and size indicated, fabricated from Type 304 stainless steel complying with ASTM A 240/A 240M, ASTM A 276, or ASTM A 666.
- B. Dowels: 1/2-inch- (12-mm-) diameter round bars, fabricated from Type 304 stainless steel complying with ASTM A 240/A 240M, ASTM A 276, or ASTM A 666.
- C. Proprietary Acidic Cleaner: Manufacturer's standard-strength cleaner designed for removing mortar/grout stains, efflorescence, and other new construction stains from new masonry without discoloring or

damaging masonry surfaces. Use product expressly approved for intended use by cast-stone manufacturer and expressly approved by cleaner manufacturer for use on cast stone and adjacent masonry materials.

- D. Provide deligate design by the SSE all anchors.

2.6 MORTAR MIXES

- A. Comply with requirements in Section 042000 "Unit Masonry" for mortar mixes.
- B. Do not use admixtures including pigments, air-entraining agents, accelerators, retarders, water-repellent agents, antifreeze compounds, or other admixtures unless otherwise indicated.
 - 1. Do not use calcium chloride in mortar or grout.
 - 2. Use portland cement-lime mortar unless otherwise indicated.
- C. Comply with ASTM C 270, Proportion Specification.
 - 1. For setting mortar, use Type S.
 - 2. For pointing mortar, use Type N.
- D. Pigmented Mortar: Use colored cement product or select and proportion pigments with other ingredients to produce color required. Do not add pigments to colored cement products.
 - 1. Pigments shall not exceed 10 percent of portland cement by weight.
 - 2. Mix to match Architect's sample.
 - 3. Application: Use pigmented mortar for exposed mortar joints.
- E. Colored-Aggregate Mortar: Produce required mortar color by using colored aggregates and natural color or white cement as necessary to produce required mortar color.
 - 1. Mix to match Architect's sample.
 - 2. Application: Use colored-aggregate mortar for exposed mortar joints.

2.7 SOURCE QUALITY CONTROL

- A. Engage a qualified independent testing agency to sample and test cast-stone units according to ASTM C 1364.
 - 1. Include one test for resistance to freezing and thawing.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 SETTING CAST STONE IN MORTAR

- A. Install cast-stone units to comply with requirements in Section 042000 "Unit Masonry."
- B. Set cast stone as indicated on Drawings. Set units accurately in locations indicated, with edges and faces aligned according to established relationships and indicated tolerances.
 - 1. Install anchors, supports, fasteners, and other attachments indicated or necessary to secure units in place.
 - 2. Coordinate installation of cast stone with installation of flashing specified in other Sections.
- C. Wet joint surfaces thoroughly before applying mortar or setting in mortar.
- D. Set units in full bed of mortar with full head joints unless otherwise indicated.
 - 1. Set units with joints 3/8 to 1/2 inch (10 to 13 mm) wide unless otherwise indicated.
 - 2. Build anchors and ties into mortar joints as units are set.
 - 3. Fill dowel holes and anchor slots with mortar.
 - 4. Fill collar joints solid as units are set.
 - 5. Build concealed flashing into mortar joints as units are set.
 - 6. Keep head joints in copings and between other units with exposed horizontal surfaces open to receive sealant.
 - 7. Keep joints at shelf angles open to receive sealant.
- E. Rake out joints for pointing with mortar to depths of not less than 3/4 inch (19 mm). Rake joints to uniform depths with square bottoms and clean sides. Scrub faces of units to remove excess mortar as joints are raked.
- F. Point mortar joints by placing and compacting mortar in layers not greater than 3/8 inch (10 mm). Compact each layer thoroughly and allow it to become thumbprint hard before applying next layer.
- G. Tool exposed joints slightly concave when thumbprint hard. Use a smooth plastic jointer larger than joint thickness.
- H. Rake out joints for pointing with sealant to depths of not less than 3/4 inch (19 mm). Scrub faces of units to remove excess mortar as joints are raked.
- I. Point joints with sealant to comply with applicable requirements in Section 079200 "Joint Sealants."
 - 1. Prime cast-stone surfaces to receive sealant and install compressible backer rod in joints before applying sealant unless otherwise indicated.
- J. Provide sealant joints at head joints of copings and other horizontal surfaces; at expansion, control, and pressure-relieving joints; and at locations indicated.
 - 1. Keep joints free of mortar and other rigid materials.
 - 2. Build in compressible foam-plastic joint fillers where indicated.
 - 3. Form joint of width indicated, but not less than 1/2 inch (13 mm)
 - 4. Prime cast-stone surfaces to receive sealant and install compressible backer rod in joints before applying sealant unless otherwise indicated.
 - 5. Prepare and apply sealant of type and at locations indicated to comply with applicable requirements in Section 079200 "Joint Sealants."

3.3 SETTING ANCHORED CAST STONE WITH SEALANT-FILLED JOINTS

- A. Set cast stone as indicated on Drawings. Set units accurately in locations indicated, with edges and faces aligned according to established relationships and indicated tolerances.
 - 1. Install anchors, supports, fasteners, and other attachments indicated or necessary to secure units in place.
 - 2. Shim and adjust anchors, supports, and accessories to set cast stone in locations indicated with uniform joints.
- B. Keep cavities open where unfilled space is indicated between back of cast-stone units and backup wall; do not fill cavities with mortar or grout.
- C. Fill anchor holes with sealant.
 - 1. Where dowel holes occur at pressure-relieving joints, provide compressible material at ends of dowels.
- D. Set cast stone supported on clip or continuous angles on resilient setting shims. Use material of thickness required to maintain uniform joint widths. Hold shims back from face of cast stone a distance at least equal to width of joint.
- E. Keep joints free of mortar and other rigid materials. Remove temporary shims and spacers from joints after anchors and supports are secured in place and cast-stone units are anchored. Do not begin sealant installation until temporary shims and spacers are removed.
 - 1. Form open joint of width indicated, but not less than 1/2 inch (13 mm).
- F. Prime cast-stone surfaces to receive sealant and install compressible backer rod in joints before applying sealant unless otherwise indicated.
- G. Prepare and apply sealant of type and at locations indicated to comply with applicable requirements in Section 079200 "Joint Sealants."

3.4 INSTALLATION TOLERANCES

- A. Variation from Plumb: Do not exceed 1/8 inch in 10 feet (3 mm in 3 m), 1/4 inch in 20 feet (6 mm in 6 m), or 1/2 inch (12 mm) maximum.
- B. Variation from Level: Do not exceed 1/8 inch in 10 feet (3 mm in 3 m), 1/4 inch in 20 feet (6 mm in 6 m), or 1/2 inch (12 mm) maximum.
- C. Variation in Joint Width: Do not vary joint thickness more than 1/8 inch in 36 inches (3 mm in 900 mm) or one-fourth of nominal joint width, whichever is less.
- D. Variation in Plane between Adjacent Surfaces (Lipping): Do not vary from flush alignment with adjacent units or adjacent surfaces indicated to be flush with units by more than 1/16 inch (1.5 mm), except where variation is due to warpage of units within tolerances specified.

3.5 ADJUSTING AND CLEANING

- A. Remove and replace stained and otherwise damaged units and units not matching approved Samples. Cast stone may be repaired if methods and results are approved by Architect.
- B. Replace units in a manner that results in cast stone matching approved Samples, complying with other requirements, and showing no evidence of replacement.
- C. In-Progress Cleaning: Clean cast stone as work progresses.
 - 1. Remove mortar fins and smears before tooling joints.
 - 2. Remove excess sealant immediately, including spills, smears, and spatter.
- D. Final Cleaning: After mortar is thoroughly set and cured, clean exposed cast stone as follows:
 - 1. Remove large mortar particles by hand with wooden paddles and nonmetallic scrape hoes or chisels.
 - 2. Test cleaning methods on sample; leave one sample uncleaned for comparison purposes. Obtain Architect's approval of sample cleaning before proceeding with cleaning of cast stone.
 - 3. Protect adjacent surfaces from contact with cleaner by covering them with liquid strippable masking agent or polyethylene film and waterproof masking tape.
 - 4. Wet surfaces with water before applying cleaners; remove cleaners promptly by rinsing thoroughly with clear water.
 - 5. Clean cast stone by bucket-and-brush hand-cleaning method described in BIA Technical Notes 20.
 - 6. Clean cast stone with proprietary acidic cleaner applied according to manufacturer's written instructions.

END OF SECTION 047200

SECTION 051200 - STRUCTURAL STEEL FRAMING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Structural steel.

1.2 DEFINITIONS

- A. Structural Steel: Elements of the structural frame indicated on Drawings and as described in AISC 303, "Code of Standard Practice for Steel Buildings and Bridges."

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: Show fabrication of structural-steel components.

1.4 INFORMATIONAL SUBMITTALS

- A. Welding certificates.
- B. Mill test reports for structural steel, including chemical and physical properties.
- C. Source quality-control reports.
- D. Field quality-control reports.

1.5 QUALITY ASSURANCE

- A. Fabricator Qualifications: A qualified fabricator that participates in the AISC Quality Certification Program and is designated an AISC-Certified Plant, Category STD. Fabricator not designated as AISC-Certified Plant shall follow AISC QA/QC procedures and is subject to in-plant inspections by the Owner's Special inspector. All cost of in-plant inspections will be paid by the Contractor.
- B. Installer Qualifications: A qualified installer who participates in the AISC Quality Certification Program and is designated an AISC-Certified Erector, Category CSE. Installers not designated as AISC-Certified Erector shall follow AISC QA/QC procedures and is subject to inspections by the Owners special inspector.
- C. Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."

- D. Comply with applicable provisions of the following specifications and documents:
1. AISC 303.
 2. AISC 360.
 3. RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."

1.6 MANUFACTURERS' QUALIFICATIONS/ALTERNATE MANUFACTURERS:

- A. The materials outlined are the type of materials to be used on this project. Please refer to Specification Section "Substitution Procedures" and "Submittal Procedures". "Or Equal" substitutions are permitted so long as they are equal to or superior to the basis of design and the Contractor takes full responsibility for all coordination and costs associated with collateral issues related to the substitution. No Substitutions will be reviewed during the bidding process. The Contractor takes full responsibility for all substitutions. Substitution submittals shall be made no later than 30 days after Notice to Proceed in order to provide time for comparison review. All submittals after 30 days shall be in strict accordance with the basis of design / specified products. No Substitutions will be considered after 30 days. The following manufacturer criteria must be submitted with the substitution request.

PART 2 - PRODUCTS

2.1 STRUCTURAL-STEEL MATERIALS

- A. W-Shapes: ASTM A 992/A 992M.
- B. Channels, Angles: ASTM A 36/A 36M
- C. Plate and Bar: ASTM A 36/A 36M.
- D. Cold-Formed Hollow Structural Sections: ASTM A 500/A 500M, Grade B , structural tubing.
- E. Steel Pipe: ASTM A 53/A 53M, Type E or Type S, Grade B.
- F. Welding Electrodes: Comply with AWS requirements.

2.2 BOLTS, CONNECTORS, AND ANCHORS

- A. High-Strength Bolts, Nuts, and Washers: ASTM A 325 , Type 1, heavy-hex steel structural bolts; ASTM A 563, Grade C, heavy-hex carbon-steel nuts; and ASTM F 436 , Type 1, hardened carbon-steel washers; all with plain finish.
 1. Direct-Tension Indicators: ASTM F 959, Type 325 , compressible-washer type with plain finish.
- B. High-Strength Bolts, Nuts, and Washers: ASTM A 490 Type 1, heavy-hex steel structural bolts or tension-control, bolt-nut-washer assemblies with splined ends; ASTM A 563, Grade DH, heavy-hex carbon-steel nuts; and ASTM F 436 , Type 1, hardened carbon-steel washers with plain finish.
 1. Direct-Tension Indicators: ASTM F 959, Type 490 , compressible-washer type with plain finish.

- C. Zinc-Coated High-Strength Bolts, Nuts, and Washers: ASTM A 325, Type 1, heavy-hex steel structural bolts; ASTM A 563, Grade DH heavy-hex carbon-steel nuts; and ASTM F 436 , Type 1, hardened carbon-steel washers.
 - 1. Finish: Hot-dip zinc coating .
 - 2. Direct-Tension Indicators: ASTM F 959, Type 325 , compressible-washer type with mechanically deposited zinc coating finish.
- D. Tension-Control, High-Strength Bolt-Nut-Washer Assemblies: ASTM F 1852, Type 1, heavy-hex head assemblies consisting of steel structural bolts with splined ends, heavy-hex carbon-steel nuts, and hardened carbon-steel washers.
 - 1. Finish: Plain.
- E. Shear Connectors: ASTM A 108, Grades 1015 through 1020, headed-stud type, cold-finished carbon steel; AWS D1.1/D1.1M, Type B.
- F. Unheaded Anchor Rods: ASTM F 1554, Grade 36.
 - 1. Configuration: Hooked.
 - 2. Finish: Plain or Hot-dip zinc coating, ASTM A 153/A 153M, Class C as indicated.
- G. Headed Anchor Rods: ASTM F 1554, Grade 36 straight.
 - 1. Finish: Plain or Hot-dip zinc coating, ASTM A 153/A 153M, Class C as indicated.
- H. Threaded Rods: ASTM A 36/A 36M.
- I. Finish: Plain or Hot-dip zinc coating, ASTM A 153/A 153M, Class C as indicated.

2.3 PRIMER

- A. Primer: Fabricator's standard lead- and chromate-free, non-asphaltic, rust-inhibiting primer complying with MPI#79 and compatible with topcoat. Primer shall be applied to a minimum thickness of 1 mil., with surface preparation minimum SSPC-SP2.

2.4 GROUT

- A. Nonmetallic, Shrinkage-Resistant Grout: ASTM C 1107/C 1107M, factory-packaged, nonmetallic aggregate grout, noncorrosive and nonstaining, mixed with water to consistency suitable for application and a 30-minute working time.

2.5 FABRICATION

- A. Structural Steel: Fabricate and assemble in shop to greatest extent possible. Fabricate according to AISC 303, "Code of Standard Practice for Steel Buildings and Bridges," and to AISC 360.

2.6 SHOP CONNECTIONS

- A. High-Strength Bolts: Shop install high-strength bolts according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts" for type of bolt and type of joint specified.
 - 1. Joint Type: Snug tightened unless otherwise indicated.
- B. Weld Connections: Comply with AWS D1.1/D1.1M for tolerances, appearances, welding procedure specifications, weld quality, and methods used in correcting welding work.

2.7 SHOP PRIMING

- A. Shop prime steel surfaces except the following:
 - 1. Surfaces embedded in concrete or mortar. Extend priming of partially embedded members to a depth of 2 inches (50 mm).
 - 2. Surfaces to be field welded.
 - 3. Surfaces of high-strength bolted, slip-critical connections.
 - 4. Surfaces to receive sprayed fire-resistive materials (applied fireproofing).
 - 5. Galvanized surfaces.
- B. Surface Preparation: Clean surfaces to be painted. Remove loose rust and mill scale and spatter, slag, or flux deposits. Prepare surfaces according to the following specifications and standards:
 - 1. SSPC-SP 2, "Hand Tool Cleaning."
 - 2. SSPC-SP 3, "Power Tool Cleaning."
 - 3. SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning" for SSPC Paint 20.
- C. Priming: Immediately after surface preparation, apply primer according to manufacturer's written instructions and at rate recommended by SSPC to provide a minimum dry film thickness of 1.5 mils (0.038 mm). Use priming methods that result in full coverage of joints, corners, edges, and exposed surfaces.

2.8 SOURCE QUALITY CONTROL

- A. Testing Agency: Owner will engage a qualified testing agency to perform shop tests and inspections.
 - 1. Provide testing agency with access to places where structural-steel work is being fabricated or produced to perform tests and inspections.
- B. Bolted Connections: Inspect and test shop-bolted connections according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."
- C. Welded Connections: Visually inspect shop-welded connections according to AWS D1.1/D1.1M and the following inspection procedures, at testing agency's option:
 - 1. Liquid Penetrant Inspection: ASTM E 165.
 - 2. Magnetic Particle Inspection: ASTM E 709; performed on root pass and on finished weld. Cracks or zones of incomplete fusion or penetration are not accepted.
 - 3. Ultrasonic Inspection: ASTM E 164.
 - 4. Radiographic Inspection: ASTM E 94.

- D. Prepare test and inspection reports.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify, with certified steel erector present, elevations of concrete- and masonry-bearing surfaces and locations of anchor rods, bearing plates, and other embedments for compliance with requirements.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 ERECTION

- A. Set structural steel accurately in locations and to elevations indicated and according to AISC 303 and AISC 360.
- B. Baseplates Bearing Plates and Leveling Plates: Clean concrete- and masonry-bearing surfaces of bond-reducing materials, and roughen surfaces prior to setting plates. Clean bottom surface of plates.
 - 1. Set plates for structural members on wedges, shims, or setting nuts as required.
 - 2. Weld plate washers to top of baseplate.
 - 3. Snug-tighten anchor rods after supported members have been positioned and plumbed. Do not remove wedges or shims but, if protruding, cut off flush with edge of plate before packing with grout.
 - 4. Promptly pack grout solidly between bearing surfaces and plates so no voids remain. Neatly finish exposed surfaces; protect grout and allow to cure. Comply with manufacturer's written installation instructions for shrinkage-resistant grouts.
- C. Maintain erection tolerances of structural steel within AISC 303, "Code of Standard Practice for Steel Buildings and Bridges."

3.3 FIELD CONNECTIONS

- A. High-Strength Bolts: Install high-strength bolts according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts" for type of bolt and type of joint specified.
 - 1. Joint Type: Snug tightened unless otherwise indicated.
- B. Weld Connections: Comply with AWS D1.1/D1.1M for tolerances, appearances, welding procedure specifications, weld quality, and methods used in correcting welding work.
 - 1. Comply with AISC 303 and AISC 360 for bearing, alignment, adequacy of temporary connections, and removal of paint on surfaces adjacent to field welds.
 - 2. Remove backing bars or runoff tabs, back gouge, and grind steel smooth.
 - 3. Assemble and weld built-up sections by methods that maintain true alignment of axes without exceeding tolerances in AISC 303, "Code of Standard Practice for Steel Buildings and Bridges," for mill material.
 - 4. All field welding shall be done in the presence of "smoke eaters" to prevent combustion by-products of the welding process from migrating beyond the work area.
 - 5. All welding shall be done in the presents of a fire watch independent of the welding crew.

3.4 FIELD QUALITY CONTROL

- A. Special Inspections: Owner will engage a qualified special inspector to perform the following special inspections:
 - 1. Verify structural-steel materials and inspect steel frame joint details.
 - 2. Verify weld materials and inspect welds.
 - 3. Verify connection materials and inspect high-strength bolted connections.
- B. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections.
- C. Bolted Connections: Inspect and test] bolted connections according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."
- D. Welded Connections: Visually inspect field welds according to AWS D1.1/D1.1M.
 - 1. In addition to visual inspection, test and inspect field welds according to AWS D1.1/D1.1M and the following inspection procedures, at testing agency's option:
 - a. Liquid Penetrant Inspection: ASTM E 165.
 - b. Magnetic Particle Inspection: ASTM E 709; performed on root pass and on finished weld. Cracks or zones of incomplete fusion or penetration are not accepted.
 - c. Ultrasonic Inspection: ASTM E 164.
 - d. Radiographic Inspection: ASTM E 94.

END OF SECTION 051200

SECTION 054000 - COLD-FORMED METAL FRAMING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Exterior load-bearing wall framing.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings:
 - 1. Include layout, spacings, sizes, thicknesses, and types of cold-formed steel framing; fabrication; and fastening and anchorage details, including mechanical fasteners.
 - 2. Indicate reinforcing channels, opening framing, supplemental framing, strapping, bracing, bridging, splices, accessories, connection details, and attachment to adjoining work.

1.3 INFORMATIONAL SUBMITTALS

- A. Welding certificates.
- B. Product certificates.
- C. Product test reports.
- D. Evaluation Reports: For post-installed anchors and power-actuated fasteners, from ICC-ES or other qualified testing agency acceptable to authorities having jurisdiction.

1.4 QUALITY ASSURANCE

- A. Testing Agency Qualifications: Qualified according to ASTM E 329 for testing indicated.
- B. Special Inspections will be provided by the Owner.
- C. Product Tests: Mill certificates or data from a qualified independent testing agency.
- D. Welding Qualifications: Qualify procedures and personnel according to the following:
 - 1. AWS D1.1/D1.1M, "Structural Welding Code - Steel."
 - 2. AWS D1.3/D1.3M, "Structural Welding Code - Sheet Steel."

1.5 MANUFACTURER'S QUALIFICATIONS / ALTERNATE MANUFACTURERS:

- A. The materials outlined are the type of materials to be used on this project. Please refer to Specification Section "Substitution Procedures" and "Submittal Procedures". "Or Equal" substitutions are permitted so long as they are equal to or superior to the basis of design and the Contractor takes full responsibility for all coordination and costs associated with collateral issues related to the substitution. No Substitutions will be reviewed during the bidding process. The Contractor takes full responsibility for all substitutions. Substitution submittals shall be made no later than 30 days after Notice to Proceed in order to provide time for comparison review. All submittals after 30 days shall be in strict accordance with the basis of design / specified products. No Substitutions will be considered after 30 days. The following manufacturer criteria must be submitted with the substitution request.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Cold-Formed Steel Framing Standards: Unless more stringent requirements are indicated, framing shall comply with AISI S100, AISI S200, and the following:
1. Wall Studs: AISI S211.
 2. Headers: AISI S212.
 3. Lateral Design: AISI S213.
- B. Fire-Resistance Ratings: Comply with ASTM E 119; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

2.2 COLD-FORMED STEEL FRAMING MATERIALS

- A. Steel Sheet: ASTM A 1003/A 1003M, Structural Grade, Type H, metallic coated, of grade and coating designation as follows:
1. Grade: ST33H (ST230H) ST50H (ST340H) unless otherwise indicated by structural performance or in drawings.
 2. Coating: G90, min. and as indicated on drawings.
- B. Steel Sheet for Vertical Deflection Clips and Drift Clips: ASTM A 653/A 653M, structural steel, zinc coated, of grade and coating as follows:
1. Grade: 50 (340), Class 1.
 2. Coating: G90 (Z275).

2.3 LOAD-BEARING (LATERAL AND GRAVITY) WALL FRAMING

- A. Steel Studs: Manufacturer's standard C-shaped steel studs, of web depths indicated, punched, with stiffened flanges, and as follows:
1. Minimum Base-Metal Thickness: 0.0428 inch (1.09 mm) unless otherwise indicated by structural performance or in drawings.

2. Flange Width: 1-5/8 inches (41 mm) unless otherwise indicated by structural performance or in drawings.
- B. Steel Track: Manufacturer's standard U-shaped steel track, of web depths indicated, unpunched, with straight flanges, and matching minimum base-metal thickness of steel studs.
- C. Steel Box or Back-to-Back Headers: Manufacturer's standard C-shapes used to form header beams, of web depths indicated, unpunched, with stiffened flanges, and as follows:
 1. Minimum Base-Metal Thickness: 0.0428 inch (1.09 mm) unless otherwise indicated by structural performance or in drawings.
 2. Flange Width: 1-5/8 inches (41 mm) unless otherwise indicated by structural performance or in drawings.

2.4 EXTERIOR NON-LOAD-BEARING WALL FRAMING

- A. Steel Studs: Manufacturer's standard C-shaped steel studs, of web depths indicated, punched, with stiffened flanges, and as follows:
 1. Minimum Base-Metal Thickness: 0.0428 inch (1.09 mm) unless otherwise indicated by structural performance or in drawings.
 2. Flange Width: 1-5/8 inches (41 mm) unless otherwise indicated by structural performance or in drawings.
- B. Steel Track: Manufacturer's standard U-shaped steel track, of web depths indicated, unpunched, with unstiffened flanges, and matching minimum base-metal thickness of steel studs.
- C. Vertical Deflection Clips: Manufacturer's standard clips, capable of accommodating upward and downward vertical displacement of primary structure through positive mechanical attachment to stud web unless otherwise indicated by structural performance or in drawings.
- D. Single Deflection Track: Manufacturer's single, deep-leg, U-shaped steel track; unpunched, with unstiffened flanges, of web depth to contain studs while allowing free vertical movement, with flanges designed to support horizontal loads and transfer them to the primary structure.
- E. Double Deflection Tracks: Manufacturer's double, deep-leg, U-shaped steel tracks, consisting of nested inner and outer tracks; unpunched, with unstiffened flanges.
- F. Drift Clips: Manufacturer's standard bypass or head clips, capable of isolating wall stud from upward and downward vertical displacement and lateral drift of primary structure through positive mechanical attachment to stud web and structure.

2.5 INTERIOR NON-LOAD-BEARING WALL FRAMING

- A. Steel Studs: Manufacturer's standard C-shaped steel studs, of web depths indicated, punched, with stiffened flanges, and as follows:
 1. Minimum Base-Metal Thickness: 0.0428 inch (1.09 mm) unless otherwise indicated by structural performance or in drawings.
 2. Flange Width: 1-5/8 inches (41 mm) unless otherwise indicated by structural performance or in drawings.

- B. Steel Track: Manufacturer's standard U-shaped steel track, of web depths indicated, unpunched, with unstiffened flanges, and matching minimum base-metal thickness of steel studs.
- C. Vertical Deflection Clips: Manufacturer's standard clips, capable of accommodating upward and downward vertical displacement of primary structure through positive mechanical attachment to stud web unless otherwise indicated by structural performance or in drawings.
- D. Single Deflection Track: Manufacturer's single, deep-leg, U-shaped steel track; unpunched, with unstiffened flanges, of web depth to contain studs while allowing free vertical movement, with flanges designed to support horizontal loads and transfer them to the primary structure.
- E. Double Deflection Tracks: Manufacturer's double, deep-leg, U-shaped steel tracks, consisting of nested inner and outer tracks; unpunched, with unstiffened flanges.
- F. Drift Clips: Manufacturer's standard bypass or head clips, capable of isolating wall stud from upward and downward vertical displacement and lateral drift of primary structure through positive mechanical attachment to stud web and structure.

2.6 FRAMING ACCESSORIES

- A. Fabricate steel-framing accessories from ASTM A 1003/A 1003M, Structural Grade, Type H, metallic coated steel sheet, of same grade and coating designation used for framing members.
- B. Provide accessories of manufacturer's standard thickness and configuration, unless otherwise indicated.

2.7 ANCHORS, CLIPS, AND FASTENERS

- A. Steel Shapes and Clips: ASTM A 36/A 36M, zinc coated by hot-dip process according to ASTM A 123/A 123M.
- B. Anchor Bolts: ASTM F 1554, Grade 36, threaded carbon-steel carbon-steel nuts, and flat, hardened-steel washers; zinc coated by hot-dip process according to ASTM A 153/A 153M, Class C.
- C. Post-Installed Anchors: Fastener systems with bolts of same basic metal as fastened metal, if visible, unless otherwise indicated; with working capacity greater than or equal to the design load, according to an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC01 reports as appropriate for the substrate.
 - 1. Uses: Securing cold-formed steel framing to structure.
 - 2. Type: Torque-controlled expansion anchor, Torque-controlled adhesive anchor, Power actuated fasteners or adhesive anchor.
 - 3. Material for Interior Locations: Carbon-steel components zinc plated to comply with ASTM B 633 or ASTM F 1941 (ASTM F 1941M), Class Fe/Zn 5, unless otherwise indicated.
 - 4. Material for Exterior or Interior Locations and Where Stainless Steel Is Indicated: Alloy Group 1 (A1) stainless-steel bolts, ASTM F 593 (ASTM F 738M), and nuts, ASTM F 594 (ASTM F 836M).
- D. Power-Actuated Anchors: Fastener systems with working capacity greater than or equal to the design load, according to an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES reports as appropriate for the substrate.

- E. Mechanical Fasteners: ASTM C 1513, corrosion-resistant-coated, self-drilling, self-tapping, steel drill screws.
 - 1. Head Type: Low-profile head beneath sheathing; manufacturer's standard elsewhere.

2.8 MISCELLANEOUS MATERIALS

- A. Galvanizing Repair Paint: ASTM A 780/A 780M or SSPC-Paint 20.
- B. Cement Grout: Portland cement, ASTM C 150/C 150M, Type I; and clean, natural sand, ASTM C 404. Mix at ratio of 1 part cement to 2-1/2 parts sand, by volume, with minimum water required for placement and hydration.
- C. Nonmetallic, Nonshrink Grout: Factory-packaged, nonmetallic, noncorrosive, nonstaining grout, complying with ASTM C 1107/C 1107M, and with a fluid consistency and 30-minute working time.
- D. Shims: Load-bearing, high-density, multimonomer, nonleaching plastic; or cold-formed steel of same grade and metallic coating as framing members supported by shims.
- E. Sealer Gaskets: Closed-cell neoprene foam, 1/4 inch (6 mm) thick, selected from manufacturer's standard widths to match width of bottom track or rim track members as required.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Before sprayed fire-resistive materials are applied, attach continuous angles, supplementary framing, or tracks to structural members indicated to receive sprayed fire-resistive materials.
- B. After applying sprayed fire-resistive materials, remove only as much of these materials as needed to complete installation of cold-formed framing without reducing thickness of fire-resistive materials below that required to obtain fire-resistance ratings indicated. Protect remaining fire-resistive materials from damage.
- C. Install load-bearing shims or grout between the underside of load-bearing wall bottom track and the top of foundation wall or slab at locations with a gap larger than 1/4 inch (6 mm) to ensure a uniform bearing surface on supporting concrete or masonry construction.
- D. Install sealer gaskets at the underside of wall bottom track or rim track and at the top of foundation wall or slab at stud or joist locations.

3.2 INSTALLATION, GENERAL

- A. Cold-formed steel framing may be shop or field fabricated for installation, or it may be field assembled.
- B. Install cold-formed steel framing according to AISI S200, AISI S202, and manufacturer's written instructions unless more stringent requirements are indicated.
- C. Install cold-formed steel framing and accessories plumb, square, and true to line, and with connections securely fastened.

- D. Install framing members in one-piece lengths unless splice connections are indicated for track or tension members.
- E. Install temporary bracing and supports to secure framing and support loads equal to those for which structure was designed. Maintain braces and supports in place, undisturbed, until entire integrated supporting structure has been completed and permanent connections to framing are secured.
- F. Do not bridge building expansion joints with cold-formed steel framing. Independently frame both sides of joints.
- G. Install insulation, specified in "Thermal Insulation," in framing-assembly members, such as headers, sills, boxed joists, and multiple studs at openings, that are inaccessible on completion of framing work.
- H. Fasten hole-reinforcing plate over web penetrations that exceed size of manufacturer's approved or standard punched openings.
- I. All field welding shall be done in the presence of "smoke eaters" to prevent combustion by-products of the welding process from migrating beyond the work area.
- J. All welding shall be done in the presents of a fire watch independent of the welding crew.

3.3 LOAD-BEARING WALL INSTALLATION

- A. Install continuous top and bottom tracks sized to match studs. Align tracks accurately and securely anchor at corners and ends, and at spacings as follows:
 - 1. Anchor Spacing: To match stud spacing unless otherwise indicated by structural performance or in drawings.
- B. Squarely seat studs against top and bottom tracks, with gap not exceeding 1/8 inch (3 mm) between the end of wall-framing member and the web of track. Fasten both flanges of studs to top and bottom tracks. Space studs as follows:
 - 1. Stud Spacing: 12 inches (305 mm) unless otherwise indicated by structural performance or in drawings.
- C. Set studs plumb, except as needed for diagonal bracing or required for nonplumb walls or warped surfaces and similar configurations.
- D. Align studs vertically where floor framing interrupts wall-framing continuity. Where studs cannot be aligned, continuously reinforce track to transfer loads.
- E. Align floor and roof framing over studs according to AISI S200, Section C1. Where framing cannot be aligned, continuously reinforce track to transfer loads.
- F. Anchor studs abutting structural columns or walls, including masonry walls, to supporting structure.
- G. Install headers over wall openings wider than stud spacing. Locate headers above openings. Fabricate headers of compound shapes indicated or required to transfer load to supporting studs, complete with clip-angle connectors, web stiffeners, or gusset plates.
 - 1. Frame wall openings with not less than a double stud at each jamb of frame. Fasten jamb members together to uniformly distribute loads.

2. Install tracks and jack studs above and below wall openings. Anchor tracks to jamb studs with clip angles or by welding, and space jack studs same as full-height wall studs.
- H. Install supplementary framing, blocking, and bracing in stud framing indicated to support fixtures, equipment, services, casework, heavy trim, furnishings, and similar work requiring attachment to framing.
 1. If type of supplementary support is not indicated, comply with stud manufacturer's written recommendations and industry standards in each case, considering weight or load resulting from item supported.
- I. Install horizontal bridging in stud system, spaced vertically 48 inches (1220 mm) unless otherwise indicated by structural performance or in drawings. Fasten at each stud intersection.
 1. Channel Bridging: Cold-rolled steel channel, welded or mechanically fastened to webs of punched studs with a minimum of two screws into each flange of the clip angle for framing members up to 6 inches (150 mm) deep.
 2. Strap Bridging: Combination of flat, taut, steel sheet straps of width and thickness indicated and stud-track solid blocking of width and thickness to match studs. Fasten flat straps to stud flanges, and secure solid blocking to stud webs or flanges.
 3. Bar Bridging: Proprietary bridging bars installed according to manufacturer's written instructions.
- J. Install steel sheet diagonal bracing straps to both stud flanges; terminate at and fasten to reinforced top and bottom tracks. Fasten clip-angle connectors to multiple studs at ends of bracing and anchor to structure.
- K. Install miscellaneous framing and connections, including supplementary framing, web stiffeners, clip angles, continuous angles, anchors, and fasteners, to provide a complete and stable wall-framing system.

3.4 EXTERIOR NON-LOAD-BEARING WALL INSTALLATION

- A. Install continuous tracks sized to match studs. Align tracks accurately and securely anchor to supporting structure.
- B. Fasten both flanges of studs to top and bottom track unless otherwise indicated. Space studs as follows:
 1. Stud Spacing: 12 inches (305 mm) unless otherwise indicated by structural performance or in drawings.
- C. Set studs plumb, except as needed for diagonal bracing or required for nonplumb walls or warped surfaces and similar requirements.
- D. Isolate non-load-bearing steel framing from building structure to prevent transfer of vertical loads while providing lateral support.
 1. Install single deep-leg deflection tracks and anchor to building structure.
 2. Install double deep-leg deflection tracks and anchor outer track to building structure.
 3. Connect vertical deflection clips to studs and anchor to building structure.
 4. Connect drift clips to cold-formed steel framing and anchor to building structure.
- E. Install horizontal bridging in wall studs, spaced vertically in rows indicated but not more than 48 inches (1220 mm) apart. Fasten at each stud intersection.

1. Channel Bridging: Cold-rolled steel channel, welded or mechanically fastened to webs of punched studs.
 2. Strap Bridging: Combination of flat, taut, steel sheet straps of width and thickness indicated and stud-track solid blocking of width and thickness to match studs. Fasten flat straps to stud flanges and secure solid blocking to stud webs or flanges.
 3. Bar Bridging: Proprietary bridging bars installed according to manufacturer's written instructions.
- F. Top Bridging for Single Deflection Track: Install row of horizontal bridging within 12 inches (305 mm) of single deflection track. Install a combination of bridging and stud or stud-track solid blocking of width and thickness matching studs, secured to stud webs or flanges.
- G. Install miscellaneous framing and connections, including stud kickers, web stiffeners, clip angles, continuous angles, anchors, and fasteners, to provide a complete and stable wall-framing system.

3.5 INTERIOR NON-LOAD-BEARING WALL INSTALLATION

- A. Install continuous tracks sized to match studs. Align tracks accurately and securely anchor to supporting structure.
- B. Fasten both flanges of studs to top and bottom track unless otherwise indicated. Space studs as follows:
1. Stud Spacing: 12 inches (305 mm) unless otherwise indicated by structural performance or in drawings.
- C. Set studs plumb, except as needed for diagonal bracing or required for nonplumb walls or warped surfaces and similar requirements.
- D. Isolate non-load-bearing steel framing from building structure to prevent transfer of vertical loads while providing lateral support.
1. Install single deep-leg deflection tracks and anchor to building structure.
 2. Install double deep-leg deflection tracks and anchor outer track to building structure.
 3. Connect vertical deflection clips to studs and anchor to building structure.
 4. Connect drift clips to cold-formed steel metal framing and anchor to building structure.
- E. Install horizontal bridging in wall studs, spaced vertically in rows indicated but not more than 48 inches (1220 mm) apart. Fasten at each stud intersection.
1. Channel Bridging: Cold-rolled steel channel, welded or mechanically fastened to webs of punched studs.
 2. Strap Bridging: Combination of flat, taut, steel sheet straps of width and thickness indicated and stud-track solid blocking of width and thickness to match studs. Fasten flat straps to stud flanges and secure solid blocking to stud webs or flanges.
 3. Bar Bridging: Proprietary bridging bars installed according to manufacturer's written instructions.
- F. Top Bridging for Single Deflection Track: Install row of horizontal bridging within 12 inches (305 mm) of single deflection track. Install a combination of bridging and stud or stud-track solid blocking of width and thickness matching studs, secured to stud webs or flanges.
- G. Install miscellaneous framing and connections, including stud kickers, web stiffeners, clip angles, continuous angles, anchors, and fasteners, to provide a complete and stable wall-framing system.

3.6 ERECTION TOLERANCES

- A. Install cold-formed steel framing level, plumb, and true to line to a maximum allowable tolerance variation of 1/8 inch in 10 feet (1:960) and as follows:
 - 1. Space individual framing members no more than plus or minus 1/8 inch (3 mm) from plan location. Cumulative error shall not exceed minimum fastening requirements of sheathing or other finishing materials.

3.7 FIELD QUALITY CONTROL

- A. Testing: Owner will engage a qualified independent testing and inspecting agency to perform field tests and inspections and prepare test reports.
- B. Field and shop welds will be subject to testing and inspecting.
- C. Testing agency will report test results promptly and in writing to Contractor and Architect.
- D. Cold-formed steel framing will be considered defective if it does not pass tests and inspections.
- E. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

3.8 REPAIRS AND PROTECTION

- A. Galvanizing Repairs: Prepare and repair damaged galvanized coatings on fabricated and installed cold-formed steel framing with galvanized repair paint according to ASTM A 780/A 780M and manufacturer's written instructions.

END OF SECTION 054000

SECTION 055000 - METAL FABRICATIONS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Metal wall ladders.
2. Steel framing and supports for applications where framing and supports are not specified in other Sections.
3. Shelf angles.
4. Loose bearing and leveling plates for applications where they are not specified in other Sections.

B. Products furnished, but not installed, under this Section include the following:

1. Loose steel lintels.
2. 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.
3. Section 077200 "Roof Accessories" for manufactured metal roof walkways and metal roof stairs.

1.3 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.

1.4 ACTION SUBMITTALS

- A. Product Data: For the following:
 - 1. Ladder and ladder components.
 - 2. Fasteners.
 - 3. Shop primers.
 - 4. Shrinkage-resisting grout.
 - 5. Manufactured metal ladders.
 - 6. Shelf angles.
 - 7. Loose steel lintels.
- 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. Metal ladders.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For professional engineer's experience with providing delegated-design engineering services of the kind indicated, including documentation that engineer is licensed in the jurisdiction in which Project is located.
- B. Mill Certificates: Signed by stainless steel manufacturers, certifying that products furnished comply with requirements.
- C. Welding certificates.
- D. Paint Compatibility Certificates: From manufacturers of topcoats applied over shop primers, certifying that shop primers are compatible with topcoats.
- E. Research Reports: For post-installed anchors.

1.6 QUALITY ASSURANCE

- A. Welding Qualifications: Qualify procedures and personnel in accordance with the following:
 - 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."

1.7 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,**] shall withstand the effects of loads and stresses within limits and under conditions specified in ANSI A14.3.
- B. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes acting on exterior metal fabrications by preventing buckling, opening of joints, overstressing of components, failure of connections, and other detrimental effects.
 - 1. Temperature Change: [**120 deg F (67 deg C),** ambient.

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. 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.
- C. Steel Plates, Shapes, and Bars: ASTM A36/A36M.
- D. Stainless Steel Sheet, Strip, and Plate: ASTM A240/A240M or ASTM A666, **Type 304**
- E. Stainless Steel Bars and Shapes: ASTM A276/A276M, **Type 304**.
- F. Steel Tubing: ASTM A500/A500M, cold-formed steel tubing.
- G. Steel Pipe: ASTM A53/A53M, Standard Weight (Schedule 40) unless otherwise indicated.
- H. Aluminum Plate and Sheet: ASTM B209 (ASTM B209M), Alloy 6061-T6.
- I. Aluminum Extrusions: ASTM B221 (ASTM B 221M), Alloy 6063-T6.
- J. Aluminum-Alloy Rolled Tread Plate: ASTM B632/B632M, Alloy 6061-T6.
- K. Aluminum Castings: ASTM B26/B26M, Alloy 443.0-F.

2.3 FASTENERS

- A. General: Unless otherwise indicated, provide Type 304 or Type 316 stainless-steel fasteners, as recommended by the manufacturer, for exterior use and zinc-plated fasteners with coating complying with ASTM B 633 or ASTM F 1941 (ASTM F 1941M), Class Fe/Zn 5, at exterior walls. Select fasteners for type, grade, and class required.
 - 1. Provide stainless-steel fasteners for fastening aluminum or stainless steel.

- B. 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.
- C. Stainless Steel Bolts and Nuts: Regular hexagon-head annealed stainless steel bolts, **ASTM F593 (ASTM F738M)**; with hex nuts, **ASTM F594 (ASTM F836M)**; and, where indicated, flat washers; Alloy **[Group 1 (A1)] [Group 2 (A4)]**.
- D. 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.
- E. 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.
- F. Post-Installed Anchors: Torque-controlled expansion anchors or chemical anchors.
 - 1. Material for Exterior Locations and Where Stainless Steel Is Indicated: Alloy **[Group 1 (A1)] [Group 2 (A4)]** stainless steel bolts, **ASTM F593 (ASTM F738M)**, and nuts, **ASTM F594 (ASTM F836M)**.

2.4 MISCELLANEOUS MATERIALS

- A. Shop Primers: Provide primers that comply with **[Section 099113 "Exterior Painting," [Section 099123 "Interior Painting," [Section 099600 "High-Performance Coatings," [Section 099113 "Exterior Painting," Section 099123 "Interior Painting," and Section 099600 "High-Performance Coatings."]**
- B. Universal Shop Primer: Fast-curing, lead- and chromate-free, universal modified-alkyd primer complying with MPI#79 and compatible with topcoat.
 - 1. Use primer containing pigments that make it easily distinguishable from zinc-rich primer.
- C. Water-Based Primer: Emulsion type, anticorrosive primer for mildly corrosive environments that is resistant to flash rusting when applied to cleaned steel, complying with MPI#107 and compatible with topcoat.
- D. Epoxy Zinc-Rich Primer: Complying with MPI#20 and compatible with topcoat.
- E. Shop Primer for Galvanized Steel: Primer formulated for exterior use over zinc-coated metal and compatible with finish paint systems indicated.
- F. Galvanizing Repair Paint: High-zinc-dust-content paint complying with SSPC-Paint 20 and compatible with paints specified to be used over it.
- G. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D1187/D1187M.
- H. 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.

2.5 FABRICATION, GENERAL

- A. Provide complete metal ladder assembly, including metal framing, hangers, struts, railings, clips, brackets, and all other components necessary to support and anchor metal ladder on supporting structure.
 - 1. Join components by welding unless otherwise indicated.
 - 2. Use connections that maintain structural value of joined pieces.
- B. 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.
- C. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately **1/32 inch (1 mm)** unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.
- D. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.
- E. Form exposed work with accurate angles and surfaces and straight edges.
- F. Weld 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**].
- G. 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.
- H. Fabricate seams and other connections that are exposed to weather in a manner to exclude water. Provide weep holes where water may accumulate.
- I. Cut, reinforce, drill, and tap metal fabrications as indicated to receive finish hardware, screws, and similar items.
- J. 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.

2.6 MISCELLANEOUS FRAMING AND SUPPORTS

- A. General: Provide steel framing and supports not specified in other Sections as needed to complete the Work.

2.7 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 **and prime** shelf angles located in exterior walls.
- D. Prime shelf angles located in exterior walls with **[zinc-rich primer.] [primer specified in Section 099600 "High-Performance Coatings."]**

2.8 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.

2.9 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 1/12 of clear span, but not less than **8 inches (200 mm)** unless otherwise indicated.
- C. Galvanize[**and prime**] loose steel lintels located in exterior walls.
- D. Prime loose steel lintels located in exterior walls with **[zinc-rich primer.] [primer specified in Section 099600 "High-Performance Coatings."]**

2.10 METAL LADDERS

- A. General:
 - 1. Comply with ANSI A14.3.
- B. Aluminum Ladders: Interior Fixed Wall Ladder – access to crawlspace.
 - 1. Manufacturers: Subject to compliance with requirements, provide:
 - a. Basis of Design: Interior Fixed Wall Ladder – Elevator Pit Access, Model 561E: ALACO Ladder Co.
 - b. Or approved equal.

2. Ladder up safety post: Basis of Design: Bilco Lu-4 or approved equal.
 - a. Provide factory-fabricated ladder safety posts.
 - b. Manufacturers Quality System: Registered to ISO 9001 Quality Standards including in-house engineering for product design activities.
 - c. MANUFACTURER
 - 1) Basis-of-Design Manufacturer: Type LU Ladder Safety Post by The BILCO Company, P.O. Box 1203, New Haven, CT 06505, 1-800-366-6530, Fax: 1-203-535-1582, Web: www.bilco.com. Comply with the following:
 - d. LADDER SAFETY POST
 - 1) Furnish and install where indicated on plans ladder safety post Model [insert LU-1, LU-2, LU-3, or LU-4]. The ladder safety post shall be pre-assembled from the manufacturer.
 - 2) Performance characteristics:
 - 3) Tubular post shall lock automatically when fully extended.
 - 4) Safety post shall have controlled upward and downward movement.
 - 5) Release lever shall disengage the post to allow it to be returned to its lowered position.
 - 6) Post shall have adjustable mounting brackets to fit ladder rung spacing up to 14" (356mm) on center and clamp brackets to accommodate ladder rungs up to 1-3/4" (44mm) in diameter.
 - 7) Post: Shall be manufactured of high strength square tubing. A pull up loop shall be provided at the upper end of the post to facilitate raising the post.
 - 8) Material of construction: Shall be aluminum (Model LU-4).
 - 9) Hardware: All mounting hardware shall be Type 316 stainless steel.
 - e. INSTALLATION
 - 1) Install products in strict accordance with manufacturer's instructions and approved submittals. Locate units level, plumb, and in proper alignment with adjacent work.
3. Space siderails 20 inches minimum apart unless otherwise indicated.
4. Siderails: Continuous extruded-aluminum bars, 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 1 1/8" round rungs with serrated tread surfaces.
6. Fit rungs in centerline of siderails; fasten by welding or with stainless-steel fasteners or brackets and aluminum rivets.
7. Manufacturer's mounting brackets: Support each ladder at bottom and not more than 24 inches (1500 mm) o.c. with welded or bolted aluminum brackets.
8. Mount top of rung of ladder within 6" from top of hatch curb. Contractor to verify dimension between finish floor and top of roof hatch.
9. Standard Mill finish; requires no painting.

2.11 FINISHES, GENERAL

- 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.

2.12 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.
 1. Shop prime with [**universal shop primer**] [**primers specified in Section 099113 "Exterior Painting"**] [**primers specified in Section 099123 "Interior Painting"**] unless [**zinc-rich primer is**] [**primers specified in Section 099600 "High-Performance Coatings" are**] indicated.
- D. Preparation for Shop Priming: Prepare surfaces to comply with [**SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."**] [**SSPC-SP 3, "Power Tool Cleaning."**] [**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.

2.13 ALUMINUM FINISHES

- A. As-Fabricated Finish: AA-M12.

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.
- G. Install ladder as recommend by manufacturer.

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 anchors specified in drawings.

3.3 INSTALLATION OF 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.

3.4 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.
 2. Cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint are specified in [Section 099113 "Exterior Painting."] [Section 099123 "Interior Painting."]

- B. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A780/A780M.

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 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Framing with dimension lumber.
 - 2. Wood blocking and nailers.
 - 3. Wood furring.
- B. Related Requirements:
 - 1. Section 061600 "Sheathing" for sheathing, subflooring, and underlayment.

1.3 DEFINITIONS

- A. Dimension Lumber: Lumber of 2 inches nominal (38 mm actual) size or greater but less than 5 inches nominal (114 mm actual) size in least dimension.
- B. Exposed Framing: Framing not concealed by other construction.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.
 - 1. Include data for wood-preservative treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Indicate type of preservative used and net amount of preservative retained.
 - 2. For products receiving a waterborne treatment, include statement that moisture content of treated materials was reduced to levels specified before shipment to Project site.

1.5 INFORMATIONAL SUBMITTALS

- A. 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 ALSC Board of Review.
- B. Evaluation Reports: For the following, from ICC-ES:
 - 1. Wood-preservative-treated wood.
 - 2. Power-driven fasteners.

3. Post-installed anchors.
4. Metal framing anchors.

1.6 QUALITY ASSURANCE

- A. Testing Agency Qualifications: For testing agency providing classification marking for fire-retardant treated material, an inspection agency acceptable to authorities having jurisdiction that periodically performs inspections to verify that the material bearing the classification marking is representative of the material tested.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Stack wood products flat with spacers beneath and between each bundle to provide air circulation. Protect wood products from weather by covering with waterproof sheeting, securely anchored. Provide for air circulation around stacks and under coverings.

PART 2 - PRODUCTS

2.1 WOOD PRODUCTS, GENERAL

- A. Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, comply with the applicable rules of any rules-writing agency certified by the ALSC Board of Review. Grade lumber by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated.
 1. Factory mark each piece of lumber with grade stamp of grading agency.
 2. Dress lumber, S4S, unless otherwise indicated.
- B. Maximum Moisture Content of Lumber: **15 percent** .

2.2 WOOD-PRESERVATIVE-TREATED LUMBER

- A. Preservative Treatment by Pressure Process: AWP A U1; Use Category UC2 for interior construction not in contact with ground, Use Category UC3b for exterior construction not in contact with ground, and Use Category UC4a for items in contact with ground.
 1. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium.
 2. For exposed items indicated to receive a stained or natural finish, chemical formulations shall not require incising, contain colorants, bleed through, or otherwise adversely affect finishes.
- B. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. Do not use material that is warped or that does not comply with requirements for untreated material.
- C. Mark lumber with treatment quality mark of an inspection agency approved by the ALSC Board of Review.
- D. Application: Treat all rough carpentry unless otherwise indicated.

MISCELLANEOUS LUMBER

- A. General: Provide miscellaneous lumber indicated and lumber for support or attachment of other construction, including the following:
 - 1. Blocking.
 - 2. Nailers.
 - 3. Furring.
- B. Dimension Lumber Items: Construction or No. 2 grade lumber of any of the following species:
 - 1. Hem-fir (north); NLGA.
 - 2. Southern pine; SPIB.
 - 3. Hem-fir; WCLIB or WWP.
- C. For blocking and nailers used for attachment of other construction, select and cut lumber to eliminate knots and other defects that will interfere with attachment of other work.

2.4 FASTENERS

- A. General: Fasteners shall be of size and type indicated and shall comply with requirements specified in this article for material and manufacture.
 - 1. Where rough carpentry is exposed to weather, in ground contact, pressure-preservative treated, or in area of high relative humidity, provide Type 304 stainless steel fasteners.
- B. Nails, Brads, and Staples: ASTM F 1667.
- C. Power-Driven Fasteners: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC70.
- D. Post-Installed Anchors: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC01, ICC-ES AC58, ICC-ES AC193, or ICC-ES AC308 as appropriate for the substrate.
 - 1. Material: 1018 to 1022 Cold rolled steel hardened to HRC 45, zinc-rich with aluminum rich top coat, tapered flat head (recessed installation), 1/4 inch diameter, 1-3/4" minimum embedment in CMU.
 - a. Products:
 - 1) Basis of Design: Hilti Kwik-Con II Concrete-masonry screw with Kwik Cote finish. Install per manufactures requirement to achieve maximum rated tension capacity (310 pounds).
 - 2) Or approved equal.

Flexible Flashing: Composite, self-adhesive, flashing product consisting of a pliable, **rubberized-asphalt** compound, bonded to a high-density polyethylene film, aluminum foil, or spunbonded polyolefin to produce an overall thickness of not less than **0.025 inch (0.6 mm)**.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Framing Standard: Comply with AF&PA's WCD 1, "Details for Conventional Wood Frame Construction," unless otherwise indicated.
- B. Set rough carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit rough carpentry accurately to other construction. Locate nailers, blocking, and similar supports to comply with requirements for attaching other construction.
- C. Do not splice blocking members between unless otherwise indicated.
- D. Provide blocking and framing as indicated and as required to support facing materials, fixtures, specialty items, and trim.
- E. Sort and select lumber so that natural characteristics do not interfere with installation or with fastening other materials to lumber. Do not use materials with defects that interfere with function of member or pieces that are too small to use with minimum number of joints or optimum joint arrangement.
- F. Comply with AWWPA M4 for applying field treatment to cut surfaces of preservative-treated lumber.
 - 1. Use inorganic boron for items that are continuously protected from liquid water.
 - 2. Use copper naphthenate for items not continuously protected from liquid water.
- G. Where wood-preservative-treated lumber is installed adjacent to cold formed metal framing or masonry, install continuous flexible flashing separator between wood and cold formed metal framing or masonry.
 - 1. Securely attach rough carpentry work to substrate by anchoring and fastening as indicated.
- H. Use steel common nails unless otherwise indicated. Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting wood. Drive nails snug but do not countersink nail heads unless otherwise indicated.

3.2 WOOD BLOCKING, AND NAILER INSTALLATION

- A. Install where indicated and where required for attaching other work. Form to shapes indicated and cut as required for true line and level of attached work. Coordinate locations with other work involved.
- B. Attach items to substrates to support applied loading. Recess bolts and nuts flush with surfaces unless otherwise indicated.

END OF SECTION 061000

SECTION 061600 - SHEATHING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:

- 1. Parapet sheathing.
- 2. Sheathing joint and penetration treatment.

- B. Related Requirements:

- 1. Section 072720 "Fluid Applied Membrane Air Barriers" for air barrier assembly applied over sheathing.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.

- 1. Include data for wood-preservative treatment from chemical treatment manufacturer and certification by treating plant that treated plywood complies with requirements. Indicate type of preservative used and net amount of preservative retained.
- 2. For products receiving waterborne treatment, include statement that moisture content of treated materials was reduced to levels specified before shipment to Project site.

1.4 INFORMATIONAL SUBMITTALS

- A. Evaluation Reports: For the following, from ICC-ES:

- 1. Wood-preservative-treated plywood.

- B. Field quality-control reports.

1.5 QUALITY ASSURANCE

- A. Mockups: Build mockups to set quality standards for materials and execution.

- 1. Build integrated mockups of exterior wall assembly as indicated on Drawings, incorporating backup wall construction, window, storefront, door frame and sill, ties and other penetrations, and

flashing to demonstrate crack and joint treatment and sealing of gaps, terminations, and penetrations of air-barrier sheathing assembly.

- a. Coordinate construction of mockups to permit inspection and testing of sheathing before external insulation and cladding are installed.
 - b. Include junction with roofing membrane and building corner condition.
 - c. If Architect determines mockups do not comply with requirements, reconstruct mockups until mockups are approved.
2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
 3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.6 MANUFACTURERS' QUALIFICATIONS / ALTERNATE MANUFACTURERS:

- A. The materials outlined are the type of materials to be used on this project. Please refer to Specification Section "Substitution Procedures" and "Submittal Procedures". "Or Equal" substitutions are permitted so long as they are equal to or superior to the basis of design and the Contractor takes full responsibility for all coordination and costs associated with collateral issues related to the substitution. No Substitutions will be reviewed during the bidding process. The Contractor takes full responsibility for all substitutions. Substitution submittals shall be made no later than 30 days after Notice to Proceed in order to provide time for comparison review. All submittals after 30 days shall be in strict accordance with the basis of design/specified products. No Substitutions will be considered after 30 days. The following manufacturer criteria must be submitted with the substitution request.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Stack panels flat with spacers beneath and between each bundle to provide air circulation. Protect sheathing from weather by covering with waterproof sheeting, securely anchored. Provide for air circulation around stacks and under coverings.

PART 2 - PRODUCTS

2.1 WOOD PANEL PRODUCTS

- A. Thickness: As needed to comply with requirements specified, but not less than thickness indicated.
- B. Factory mark panels to indicate compliance with applicable standard.

2.2 PRESERVATIVE-TREATED PLYWOOD

- A. Preservative Treatment by Pressure Process: AWWA U1; Use Category UC2 **for interior construction not in contact with ground, Use Category UC3b for exterior construction not in contact with ground, and Use Category UC4a for items in contact with ground.**
 1. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium.

- B. Mark plywood with appropriate classification marking of an inspection agency acceptable to authorities having jurisdiction.
- C. Application: **Treat all plywood unless otherwise indicated.**
- D. Glass-Mat Gypsum Sheathing: ASTM C1177/C1177M.
 - 1. Type and Thickness: **Type X, 5/8 inch (15.9 mm)** thick.
 - 2. Size: **48 by 96 inches (1219 by 2438 mm)** for vertical installation.

2.3 PARAPET SHEATHING

- A. Plywood Sheathing: **Either DOC PS 1 or DOC PS 2, Exterior** sheathing.
 - 1. Span Rating: Not less than **32/16**.
 - 2. Nominal Thickness: Not less than **1/2 inch (13 mm)**.
- B. Glass-Mat Gypsum Sheathing: ASTM C1177/C1177M.
 - 1. Type and Thickness: **Type X, 5/8 inch (15.9 mm)** thick.
 - 2. Size: **48 by 96 inches (1219 by 2438 mm)** for vertical installation.

2.4 FASTENERS

- A. General: Provide fasteners of size and type indicated that comply with requirements specified in this article for material and manufacture.
 - 1. For **parapet** sheathing, provide fasteners **with hot-dip zinc coating complying with ASTM A153/A153M or of Type 304 stainless steel**.
 - 2. For **parapet** sheathing, provide fasteners with organic-polymer or other corrosion-protective coating having a salt-spray resistance of more than 800 hours according to ASTM B117.
- B. Nails, Brads, and Staples: ASTM F1667.
- C. Screws for Fastening Sheathing to Wood Framing: ASTM C1002.
- D. Screws for Fastening Wood Structural Panels to Cold-Formed Metal Framing: ASTM C954, except with wafer heads and reamer wings, length as recommended by screw manufacturer for material being fastened.
- E. Screws for Fastening Gypsum Sheathing to Cold-Formed Metal Framing: Steel drill screws, in length recommended by sheathing manufacturer for thickness of sheathing to be attached.
 - 1. For steel framing less than **0.0329 inch (0.835 mm)** thick, use screws that comply with ASTM C1002.
 - 2. For steel framing from **0.033 to 0.112 inch (0.84 to 2.84 mm)** thick, use screws that comply with ASTM C954.

2.5 SHEATHING JOINT-AND-PENETRATION TREATMENT MATERIALS

- A. Provide joint and penetration treatment unless specified in Section 072726 Fluid Applied Membrane Air Barriers.

- B. Sealant for **Glass-Mat** Gypsum Sheathing: Elastomeric, medium-modulus, neutral-curing silicone joint sealant compatible with joint substrates formed by gypsum sheathing and other materials, recommended by sheathing manufacturer for application indicated and complying with requirements for elastomeric sealants specified in Section 079200 "Joint Sealants."
- C. Sealant for Glass-Mat Gypsum Sheathing: Silicone emulsion sealant complying with ASTM C834, compatible with sheathing tape and sheathing and recommended by tape and sheathing manufacturers for use with glass-fiber sheathing tape and for covering exposed fasteners.
 - 1. Sheathing Tape: Self-adhering glass-fiber tape, minimum **2 inches (50 mm)** wide, **10 by 10 or 10 by 20 threads/inch (390 by 390 or 390 by 780 threads/m)**, of type recommended by sheathing and tape manufacturers for use with silicone emulsion sealant in sealing joints in glass-mat gypsum sheathing and with a history of successful in-service use.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Do not use materials with defects that impair quality of sheathing or pieces that are too small to use with minimum number of joints or optimum joint arrangement. Arrange joints so that pieces do not span between fewer than three support members.
- B. Cut panels at penetrations, edges, and other obstructions of work; fit tightly against abutting construction unless otherwise indicated.
- C. Securely attach to substrate by fastening as indicated, complying with the following:
 - 1. Table 2304.9.1, "Fastening Schedule," in the ICC's International Building Code.
 - 2. ICC-ES evaluation report for fastener.
- D. Use common wire nails unless otherwise indicated. Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections. Install fasteners without splitting wood.
- E. Coordinate **parapet** sheathing installation with flashing and joint-sealant installation with air barrier assembly, flashing, and joint sealant installation so these materials are installed in sequence and manner that prevent exterior moisture from passing through completed assembly.
- F. Do not bridge building expansion joints; cut and space edges of panels to match spacing of structural support elements.
- G. Coordinate sheathing installation with installation of materials installed over sheathing so sheathing is not exposed to precipitation or left exposed at end of the workday when rain is forecast.

3.2 WOOD STRUCTURAL PANEL INSTALLATION

- A. General: Comply with applicable recommendations in APA Form No. E30, "Engineered Wood Construction Guide," for types of structural-use panels and applications indicated.
- B. Fastening Methods: Fasten panels as indicated below:

1. Parapet Sheathing:
 - a. **Screw** to wood framing.
 - b. Screw to cold-formed metal framing.
 - c. Space panels **1/8 inch (3 mm)** apart at edges and ends.

3.3 GYPSUM SHEATHING INSTALLATION

- A. Comply with GA-253 and with manufacturer's written instructions.
 1. Fasten gypsum sheathing to wood framing with **screws**.
 2. Fasten gypsum sheathing to cold-formed metal framing with screws.
 3. Install panels with a **3/8-inch (9.5-mm)** gap where non-load-bearing construction abuts structural elements.
 4. Install panels with a **1/4-inch (6.4-mm)** gap where they abut masonry or similar materials that might retain moisture, to prevent wicking.
- B. Apply fasteners so heads bear tightly against face of sheathing, but do not cut into facing.
- C. Horizontal Installation: Install sheathing with V-grooved edge down and tongue edge up. Interlock tongue with groove to bring long edges in contact with edges of adjacent panels without forcing. Abut ends over centers of studs, and stagger end joints of adjacent panels not less than one stud spacing. Attach at perimeter and within field of panel to each stud.
 1. Space fasteners approximately **8 inches (200 mm)** o.c. and set back a minimum of **3/8 inch (9.5 mm)** from edges and ends of panels.
 2. For sheathing under stucco cladding, panels may be initially tacked in place with screws if overlying self-furring metal lath is screw-attached through sheathing to studs immediately after sheathing is installed.
- D. Vertical Installation: Install vertical edges centered over studs. Abut ends and edges with those of adjacent panels. Attach at perimeter and within field of panel to each stud.
 1. Space fasteners approximately **8 inches (200 mm)** o.c. and set back a minimum of **3/8 inch (9.5 mm)** from edges and ends of panels.
 2. For sheathing under stucco cladding, panels may be initially tacked in place with screws if overlying self-furring metal lath is screw-attached through sheathing to studs immediately after sheathing is installed.
- E. Seal sheathing joints according to sheathing manufacturer's written instructions.
 1. Apply elastomeric sealant to joints and fasteners and trowel flat. Apply sufficient amount of sealant to completely cover joints and fasteners after troweling. Seal other penetrations and openings.
 2. Apply glass-fiber sheathing tape to glass-mat gypsum sheathing joints and apply and trowel sealant to embed entire face of tape in sealant. Apply sealant to exposed fasteners with a trowel so fasteners are completely covered. Seal other penetrations and openings.

END OF SECTION 061600

SECTION 071900 - WATER REPELLENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes penetrating water-repellent treatments for the following vertical and horizontal surfaces:
 - 1. Cast stone.
 - 2. Decorative concrete unit masonry veneer.
 - 3. Clay brick masonry.
- B. Related Requirements:
 - 1. Section 042000 "Unit Masonry" for integral water-repellent admixture for unit masonry assemblies.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include manufacturer's printed statement of VOC content.
 - 2. Include manufacturer's standard colors.
 - 3. Include manufacturer's recommended number of coats for each type of substrate and spreading rate for each separate coat.
 - 4. Include printout of current "MPI Approved Products List" for each product category specified in Part 2 that specifies water repellents approved by MPI, with the proposed product highlighted.
- B. Samples: For each type of water repellent and substrate indicated, 12 by 12 inches (300 by 300 mm) in size, with specified water-repellent treatment applied to half of each Sample.

1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Applicator.
- B. Product Certificates: For each type of water repellent.
- C. Field quality-control reports.
- D. Sample Warranty: For special warranty.

1.5 QUALITY ASSURANCE

- A. Applicator Qualifications: An employer of workers trained and approved by manufacturer.
- B. MPI Standards: Comply with MPI standards indicated and provide water repellents listed in its "MPI Approved Products List."
- C. Mockups: Prepare mockups of each required water repellent on each type of substrate required to demonstrate aesthetic effects, and to set quality standards for materials and execution.
 - 1. Locate mockups on masonry sample panels and on existing surfaces where directed by Architect.
 - a. Size: 10 sq. ft. (9.3 sq. m) each.
 - 2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
 - 3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.6 FIELD CONDITIONS

- A. Limitations: Proceed with application only when the following existing and forecasted weather and substrate conditions permit water repellents to be applied according to manufacturers' written instructions and warranty requirements:
 - 1. Concrete surfaces and mortar have cured for not less than 28 days.
 - 2. Building has been closed in for not less than 30 days before treating wall assemblies.
 - 3. Ambient temperature is above 40 deg F (4.4 deg C) and below 100 deg F (37.8 deg C) and will remain so for 24 hours.
 - 4. Substrate is not frozen and substrate-surface temperature is above 40 deg F (4.4 deg C) and below 100 deg F (37.8 deg C).
 - 5. Rain or snow is not predicted within 24 hours.
 - 6. Not less than seven days have passed (or sooner as approved by manufacturer) since surfaces were last wet.
 - 7. Windy conditions do not exist that might cause water repellent to be blown onto vegetation or surfaces not intended to be treated.

1.7 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer and Applicator agree(s) to repair or replace materials that fail to maintain water repellency specified in "Performance Requirements" Article within specified warranty period.
 - 1. Warranty Period: Two years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Performance: Water repellents shall meet the following performance requirements as determined by testing on manufacturer's standard substrates representing those indicated for this Project.
- B. Water Absorption: Minimum 80 percent reduction of water absorption after 24 hours for treated compared to untreated specimens when tested according to the following:
 - 1. Cast Stone: ASTM C1195.
 - 2. Concrete Masonry Units: ASTM C140.
 - 3. Clay Brick: ASTM C67.
- C. Water-Vapor Transmission: Comply with one or both of the following:
 - 1. Maximum 10 percent reduction water-vapor transmission of treated compared to untreated specimens, according to ASTM E 96/E 96M.
- D. Water Penetration and Leakage through Masonry: Minimum 90 percent reduction in leakage rate of treated compared to untreated specimens, according to ASTM E 514/E 514M.
- E. Durability: Maximum 5 percent loss of water-repellent performance after 2500 hours of weathering according to ASTM G 154 compared to water-repellent-treated specimens before weathering.
- F. Compatible with decorative CMU and mortar integral water repellent admixture.

2.2 PENETRATING WATER REPELLENTS

- A. Silane/Siloxane-Blend, Penetrating Water Repellent: Clear, silane and siloxane blend with 400 g/L or less of VOCs,

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Applicator present, for compliance with requirements and conditions affecting performance of the Work.
 - 1. Verify that surfaces are clean and dry according to water-repellent manufacturer's requirements. Check moisture content in representative locations by method recommended by manufacturer.
 - 2. Verify that there is no efflorescence or other removable residues that would be trapped beneath the application of water repellent.
 - 3. Verify that required repairs are complete, cured, and dry before applying water repellent.
- B. Test pH level according to water-repellent manufacturer's written instructions to ensure chemical bond to silica-containing or siliceous minerals.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. New Construction and Repairs: Allow concrete and other cementitious materials to age before application of water repellent, according to repellent manufacturer's written instructions.
- B. Cleaning: Before application of water repellent, clean substrate of substances that could impair penetration or performance of product according to water-repellent manufacturer's written instructions and as follows:
 - 1. Cast Stone and Concrete Unit Masonry: Remove oil, curing compounds, laitance, and other substances that inhibit penetration or performance of water repellents according to ASTM E 1857.
 - 2. Clay Brick Masonry: ASTM D 5703.
- C. Protect adjoining work, including mortar and sealant bond surfaces, from spillage or blow-over of water repellent. Cover adjoining and nearby surfaces of aluminum and glass if there is the possibility of water repellent being deposited on surfaces. Cover live vegetation.
- D. Coordination with Mortar Joints: Do not apply water repellent until pointing mortar for joints adjacent to surfaces receiving water-repellent treatment has been installed and cured.
- E. Coordination with Sealant Joints: Do not apply water repellent until sealants for joints adjacent to surfaces receiving water-repellent treatment have been installed and cured.
 - 1. Water-repellent work may precede sealant application only if sealant adhesion and compatibility have been tested and verified using substrate, water repellent, and sealant materials identical to those required.

3.3 APPLICATION

- A. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect the substrate before application of water repellent and to instruct Applicator on the product and application method to be used.
- B. Apply coating of water repellent on surfaces to be treated using 15 psi- (103 kPa-) pressure spray with a fan-type spray nozzle, roller, or brush to the point of saturation. Apply coating in dual passes of uniform, overlapping strokes. Remove excess material; do not allow material to puddle beyond saturation. Comply with manufacturer's written instructions for application procedure unless otherwise indicated.
 - 1. Cast Stone: At Contractor's option, first application of water repellent may be completed before installing units. Mask mortar and sealant bond surfaces to prevent water repellent from migrating onto joint surfaces. Remove masking after repellent has cured.
- C. Apply a second saturation coating, repeating first application. Comply with manufacturer's written instructions for limitations on drying time between coats and after rainstorm wetting of surfaces between coats. Consult manufacturer's technical representative if written instructions are not applicable to Project conditions.

3.4 FIELD QUALITY CONTROL

- A. Testing of Water-Repellent Material: Owner reserves the right to invoke the following procedure at any time and as often as Owner deems necessary during the period when water repellent is being applied:
 - 1. Owner will engage the services of a qualified testing agency to sample water-repellent material being used. Samples of material delivered to Project site will be taken, identified, sealed, and certified in presence of Contractor.
 - 2. Testing agency will perform tests for compliance of water-repellent material with product requirements.
 - 3. Owner may direct Contractor to stop applying water repellents if test results show material being used does not comply with product requirements. Contractor shall remove noncomplying material from Project site, pay for testing, and correct deficiency of surfaces treated with rejected materials, as approved by Architect.

- B. Coverage Test: In the presence of Architect, hose down a dry, repellent-treated surface to verify complete and uniform product application. A change in surface color will indicate incomplete application.
 - 1. Notify Architect seven days in advance of the dates and times when surfaces will be tested.
 - 2. Reapply water repellent until coverage test indicates complete coverage.

3.5 CLEANING

- A. Immediately clean water repellent from adjoining surfaces and surfaces soiled or damaged by water-repellent application as work progresses. Correct damage to work of other trades caused by water-repellent application, as approved by Architect.

- B. Comply with manufacturer's written cleaning instructions.

END OF SECTION 071900

SECTION 072110 - THERMAL INSULATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Glass-fiber and mineral wool blankets.
 - 2. Mineral-wool board.
 - 3. Extruded polystyrene foam-plastic board.
- B. Product Data: For each type of product.

1.3 INFORMATIONAL SUBMITTALS

- A. Product Test Reports: For each product, for tests performed by a qualified testing agency.
- B. Evaluation Reports: For foam-plastic insulation, from ICC-ES.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Protect insulation materials from physical damage and from deterioration due to moisture, soiling, and other sources. Store inside and in a dry location. Comply with manufacturer's written instructions for handling, storing, and protecting during installation.

1.5 MANUFACTURERS' QUALIFICATIONS / ALTERNATE MANUFACTURERS:

- A. The materials outlined are the type of materials to be used on this project. Please refer to Specification Section "Substitution Procedures" and "Submittal Procedures". "Or Equal" substitutions are permitted so long as they are equal to or superior to the basis of design and the Contractor takes full responsibility for all coordination and costs associated with collateral issues related to the substitution. No Substitutions will be reviewed during the bidding process. The Contractor takes full responsibility for all substitutions. Substitution submittals shall be made no later than 30 days after Notice to Proceed in order to provide time for comparison review. All submittals after 30 days shall be in strict accordance with the basis of design/specified products. No Substitutions will be considered after 30 days. The following manufacturer criteria must be submitted with the substitution request.

PART 2 - PRODUCTS

2.1 GLASS-FIBER BLANKETS

- A. Sustainability Requirements: Provide glass-fiber blanket insulation as follows:
1. Free of Formaldehyde: Insulation manufactured with 100 percent acrylic binders and no formaldehyde.
 2. Low Emitting: Insulation tested according to ASTM D 5116 and shown to emit less than 0.05-ppm formaldehyde.
- B. Glass-Fiber Blanket, Polypropylene-Scrim-Kraft Faced: ASTM C 665, Type II (nonreflective faced), Class A (faced surface with a flame-spread index of 25 or less); Category 1 (membrane is a vapor barrier).
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. Dow Chemical Company
 - b. Owens Corning
 - c. Or Approved Equal

2.2 MINERAL WOOL BLANKETS

- A. Mineral-Wool Blanket, Unfaced: ASTM C 665, Type I (blankets without membrane facing); consisting of fibers; with maximum flame-spread and smoke-developed indexes of zero, respectively, per ASTM E 84; passing ASTM E 136 for non-combustible characteristics.
1. Products:
 - a. Basis of Design: ComfortBatt, Roxul Inc.
 - b. Or approved equal.

2.3 MINERAL-WOOL BOARD

- A. Mineral-Wool Board, Unfaced, low density for use where fasteners supporting building finishes do not penetrate insulation and in masonry cavity walls.: ASTM C612, Type IVB; with maximum flame-spread and smoke-developed indexes of zero, respectively, per ASTM 84; passing ASTM E 136 for Non-Combustible characteristics. Nominal density of 4.4-5.3 lb/cu. ft.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 2. Basis-of-Design Product: Subject to compliance with requirements, provide Roxul; CAVITYROCK or comparable product by one of the following:
 - a. Owens Corning
 - b. Or approved equal
- B. Mineral-Wool Board, Unfaced, high density for use where fasteners supporting building finishes penetrate insulation and as indicated.: ASTM C612, Type IVB; with maximum flame-spread and smoke-developed indexes of zero, respectively, per ASTM 84; passing ASTM E 136

for Non-Combustible characteristics. Non-corrosive to fasteners, compressive strength 28000psi. Nominal density of 11 lb/cu. ft. R value per inch at 75 degrees F 4hr.ft²/Btu

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
2. Basis-of-Design Product: Subject to compliance with requirements, provide Roxul; Comfortboard 110 or approved equal.

2.4 EXTRUDED POLYSTYRENE FOAM-PLASTIC BOARD

- A. Extruded polystyrene boards in this article are also called "XPS boards." Roman numeral designators in ASTM C 578 are assigned in a fixed random sequence, and their numeric order does not reflect increasing strength or other characteristics.
- B. Extruded Polystyrene Board, Type IV Wall, Parapet and Soffit Insulation: ASTM C 578, Type IV, 25-psi minimum compressive strength; unfaced; maximum flame-spread and smoke-developed indexes of 25 and 450, respectively, per ASTM E 84.
 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. Dow Chemical Company
 - b. Owens Corning
 - c. Or Approved Equal
 2. Fire Propagation Characteristics: Passes NFPA 285 testing as part of an approved assembly.
 3. Minimum R-Value per inch of thickness: 5.0

2.5 INSULATION FASTENERS

- A. Brick veneer with CMU back up with adjustable wall ties construction: mechanically attach mineral wool board to masonry with insulation retaining clip, Basis of Design Thermafiber Rainbarrier Clip. Install per insulation manufacturer requirements.
- B. Mechanically attach mineral wool board to masonry in the absence of adjustable wall ties with power actuated fastener, Basis of Design Ramset Insulfast. Install per insulation manufacturer requirements.
- C. Mechanically attach mineral wool board to steel, impaling pin and retaining washer, mechanically fastened to steel substrates with two self-drilling screws.
- D. Metal Panel with CMU backup and metal panel with gypsum sheathing and metal stud back up construction: mechanically attach mineral wool board using self-drilling fastener with 2-inch diameter composite insulation washer. Install per insulation manufacturer requirements appropriate for the substrate.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Clean substrates of substances that are harmful to insulation, including removing projections capable of puncturing insulation or vapor retarders, or that interfere with insulation attachment.

3.2 INSTALLATION, GENERAL

- A. Comply with insulation manufacturer's written instructions applicable to products and applications.
- B. Install insulation that is undamaged, dry, and unsoiled and that has not been left exposed to ice, rain, or snow at any time.

3.3 INSTALLATION OF FOUNDATION WALL/ BELOW-GRADE INSULATION

- A. Butt panels together for tight fit.
- B. Adhesive Installation: Install with adhesive or press into tacky waterproofing or dampproofing according to manufacturer's written instructions.
- C. Unless otherwise indicated extend insulation a minimum of 24 inches below exterior grade line.
- D. insulation. Remove projections that interfere with placement.
- E. Provide sizes to fit applications and selected from manufacturer's standard thicknesses, widths, and lengths. Apply single layer of insulation units unless multiple layers are otherwise shown or required to make up total thickness or to achieve R-value.

3.4 INSTALLATION OF INSULATION IN FRAMED CONSTRUCTION

- A. Blanket Insulation: Install in cavities formed by framing members according to the following requirements:
 - 1. Use insulation widths and lengths that fill the cavities formed by framing members. If more than one length is required to fill the cavities, provide lengths that will produce a snug fit between ends.
 - 2. Place insulation in cavities formed by framing members to produce a friction fit between edges of insulation and adjoining framing members.
 - 3. Maintain 3-inch (76-mm) clearance of insulation around recessed lighting fixtures not rated for or protected from contact with insulation.
 - 4. Attics: Install eave ventilation troughs between roof framing members in insulated attic spaces at vented eaves.
 - 5. For metal-framed wall cavities where cavity heights exceed 96 inches (2438 mm), support unfaced blankets mechanically and support faced blankets by taping flanges of insulation to flanges of metal studs.
 - 6. For wood-framed construction, install blankets according to ASTM C 1320 and as follows:
 - a. With faced blankets having stapling flanges, lap blanket flange over flange of adjacent blanket to maintain continuity of vapor retarder once finish material is installed over it.

7. Vapor-Retarder-Faced Blankets: Tape joints and ruptures in vapor-retarder facings, and seal each continuous area of insulation to ensure airtight installation.
 - a. Exterior Walls: Set units with facing placed toward interior of construction.
- B. Miscellaneous Voids: Install insulation in miscellaneous voids and cavity spaces where required to prevent gaps in insulation using the following materials:
 1. Spray Polyurethane Insulation: Apply according to manufacturer's written instructions.

3.1 INSTALLATION OF CURTAIN-WALL INSULATION

- A. Install board insulation in curtain-wall construction according to curtain-wall manufacturer's written instructions.
 1. Hold insulation in place by securing metal clips and straps or integral pockets within window frames, spaced at intervals recommended in writing by insulation manufacturer to hold insulation securely in place without touching spandrel glass.
 2. Maintain cavity width of dimension indicated on Drawings between insulation and glass.
 3. Install insulation to fit snugly without bowing.

3.2 PROTECTION

- A. Protect installed insulation from damage due to harmful weather exposures, physical abuse, and other causes. Provide temporary coverings or enclosures where insulation is subject to abuse and cannot be concealed and protected by permanent construction immediately after installation.

END OF SECTION 072110

SECTION 072726 - FLUID-APPLIED MEMBRANE AIR BARRIERS

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

- A. The General Conditions, Supplementary Conditions, Instructions to Bidders, and Division 01- General Requirements shall be read in conjunction with and govern this section.
- B. The Specification shall be read as a whole by all parties concerned. Each Section may contain more or less than the complete Work of any trade. The Contractor is solely responsible to make clear to the Subcontractor the extent of their Work.

1.2 SUMMARY

- A. This Section includes requirements for supplying labor, materials, tools, and equipment to complete the Work as shown on the Drawings as specified herein including, but not limited to, the following:
 - 1. Adhesives/Primers
 - 2. Fluid Applied, Vapor Permeable Air & Water Barrier Membrane
 - 3. Transition Membranes
 - 4. Sealant
 - 5. Through wall flashing

1.3 DEFINITIONS

- A. Air-Barrier Material: A primary element that provides a continuous barrier to the movement of air.
- B. Air-Barrier Accessory: A transitional component of the air barrier that provides continuity.
- C. Air-Barrier Assembly: The collection of air-barrier materials and accessory materials applied to an opaque wall, including joints and junctions to abutting construction, to control air movement through the wall.
- D. Transition Membranes has the same meaning as Transition Strips.

1.4 RELATED REQUIREMENTS

- A. Section 042000 – Unit Masonry
- B. Section 061610 - Sheathing
- C. Section 072110 - Thermal Insulation
- D. Section 079200 - Joint Sealants

1.5 REFERENCES

- A. American Architectural Manufacturers Association (AAMA):
 - 1. AMMA 2400-02, Standard Practice for Installation of Windows with a Mounting Flange in Stud Frame Construction

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

1. ASTM D412, Standard Test Method for Vulcanized Rubber and Thermoplastic Elastomers - Tension
2. ASTM D471, Standard Test Method for Rubber Property - Effect of Liquids
3. ASTM D1970, Standard Specification for Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roofing Underlayment for Ice Dam Protection
4. ASTM D2243, Standard Test Method for Freeze-Thaw Resistance of Water-Borne Coatings
5. ASTM D5590, Standard Test Method for Determining the Resistance of Paint Films and Related Coatings to Fungal Defacement by Accelerated Four-Week Agar Plate Assay
6. ASTM E84, Standard Test Method for Surface Burning Characteristics of Building Materials
7. ASTM E96, Standard Test Methods for Water Vapor Transmission of Materials
8. ASTM E283, Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen
9. ASTM E330, Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference
10. ASTM E331, Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference
11. ASTM E1354, Standard Test Method for Heat and Visible Smoke Release Rates for Materials and Products Using an Oxygen Consumption Calorimeter
12. ASTM E1677, Standard Specification for Air Barrier (AB) Material or System for Low-Rise Framed Building Walls
13. ASTM E2112, Standard Practice for Installation of Exterior Windows, Doors and Skylights
14. ASTM E2178, Standard Test Method for Air Permeance of Building Materials
15. ASTM E2357, Standard Test Method for Determining Air Leakage of Air Barrier Assemblies

C. National Fire and Protection Agency (NFPA):

1. NFPA 285, Standard Fire Test Method for Evaluation of Fire Propagation Characteristics of Exterior Non-Load-Bearing Wall Assemblies Containing Combustible Components

D. US Green Building Council (USGBC), Leadership in Energy and Environmental Design (LEED):

1. LEED Reference Guide, Version 4.0, and USGBC Project Calculation Spreadsheet. Web Site <http://www.usgbc.org>.

1.6 ADMINISTRATIVE REQUIREMENTS

A. Coordination:

1. Coordinate the Work of this Section with the installation of exterior substrate. Sequence Work so that installation of fluid-applied air barrier coincides with installation of substrate preparation without causing delay to the Work.

B. Pre-installation meetings:

1. Pre-installation Conference: Conduct conference at Project site.
2. Review air-barrier requirements and installation, special details, mockups, air-leakage and bond testing, air-barrier protection, and work scheduling that covers air barriers.
3. Air Barrier Manufacturer representative will meet with the necessary parties at the jobsite to review and discuss project conditions as it relates to the integrity of the assembly.

1.7 SUBMITTALS

A. ACTION SUBMITTALS:

1. Product Data: For each type of product.
 - a. Include manufacturer's written instructions for evaluating, preparing, and treating substrate; technical data; and tested physical and performance properties of products.
 - b. Air Barrier Manufacturer's guide specification.
 - c. Air Barrier Manufacturer's complete set of technical data sheets for assembly.
 - d. Air Barrier Manufacturer's complete set of standard detail drawings.
2. Shop Drawings: For air-barrier assemblies.
 - a. Show locations and extent of air barrier. Include details for substrate joints and cracks, counterflashing strips, penetrations, inside and outside corners, terminations, and tie-ins with adjoining construction.
 - b. Include details of interfaces with other materials that form part of air barrier.

B. INFORMATIONAL SUBMITTALS

1. Qualification Data: For Installer. Include list of ABAA-certified installers and supervisors employed by the Installer, who work on Project.
2. Product Certificates: From air-barrier manufacturer, certifying compatibility of air barriers and accessory materials with Project materials that connect to or that come in contact with the barrier.
3. Product Test Reports: For each product, for tests performed by a qualified testing agency.
 - a. NFPA 285 wall assembly compliance: Air Barrier Manufacturer statement that anticipated wall assembly passes NFPA 285.
4. Evaluation Reports: from ICC-ES
5. Product certification that the assembly components are supplied and warranted by single source Air Barrier Manufacturer.
6. Statement that installing contractor is authorized by Air Barrier Manufacturer to complete Work as specified.
7. Statement that materials are adhesively and chemical compatible with adjacent materials proposed for use.
8. Reports indicating that field peel-adhesion test on all materials to which sealants are adhered have been performed and the changes made, if required, to other approved materials, in order to achieve successful adhesion.
9. Letter from primary materials manufacturer indicating compatibility of products not manufactured by primary manufacturer.
10. Submit Eco-Efficiency Analysis of each material.
11. Submit recommended values for field adhesion test on each substrate.
12. Submit accreditation number of manufacturer and certification number of installers.
13. Warranty: Sample warranty as specified.

1.8 QUALITY ASSURANCE

A. Single Source Responsibility:

1. Obtain fluid-applied membrane air barrier, transition membranes, air barrier sealants, primers, mastics, and adhesives from a single Air Barrier Manufacturer regularly engaged in the manufacturing and supply of the specified products.
2. Contactor to verify product compliance with federal, state, and local regulations controlling use of Volatile Organic Compounds (VOC).

B. Manufacturer Qualifications:

1. Air Barrier Manufacturer shall demonstrate qualifications to supply materials of this section by certifying the following:
 - a. Air Barrier Manufacturer must not issue warranties for terms longer than they have been manufacturing and supplying specified products for similar scope of Work.
 - C. Installer Qualifications:
 1. Perform Work in accordance with Air Barrier Manufacturer published literature and as specified in this section.
 - a. Installer shall be licensed by ABAA according to ABAA's Quality Assurance Program and shall employ ABAA-certified installers and supervisors on Project.
 2. Maintain one (1) copy of Air Barrier Manufacturer's instructions on site.
 3. At all times during the execution of the Work allow access to site by the Air Barrier Manufacturer representative.
 4. If meeting with Air Barrier Manufacturer during project construction, contact Air Barrier Manufacturer a minimum of two weeks prior to schedule meeting.
 - D. VOC Regulations: Provide products which comply with applicable regulations controlling the use of volatile organic compounds.
 - E. Preconstruction Meeting: Organize and convene a minimum of two weeks prior to commencing Work of this Section. Agenda shall include, at a minimum, construction and testing of mock-up, sequence of construction, coordination with substrate preparation, materials approved for use, compatibility of materials, coordination with installation of adjacent and covering materials, and details of construction. General Contractor is responsible for all site safety requirements. Attendance is required by representatives of related trades including covering materials, substrate materials and adjacent materials.
- 1.9 MOCK-UPS
- A. Construct mock-ups to verify selections made under submittals and to set quality standards for materials and execution in accordance with requirements.
 - B. Mock-Ups: General Contractor is responsible for coordinating the construction of the mock-up. Mock-up shall be representative of primary exterior wall assemblies and glazing assemblies including backup wall, air-barrier assemblies and typical penetrations. Mock-up shall be approximately 8 feet long by 8 feet high or as indicated and include all components in the exterior wall assembly and as indicated.
 - C. Mock-Up Tests for Adhesion: Test mock-up of materials for adhesion in accordance with manufacturer's recommendations. Perform test after curing period recommended by the manufacturer. Record mode of failure and the area(s) which failed the project requirements. When the air barrier material manufacturer has established a minimum adhesion level for the product on the particular substrate, the inspection report shall indicate whether this requirement has been met.
- 1.10 MANUFACTURERS' QUALIFICATIONS/ALTERNATE MANUFACTURERS:
- A. The materials outlined are the type of materials to be used on this project. Please refer to Specification Section "Substitution Procedures" and "Submittal Procedures". "Or Equal" substitutions are permitted so long as they are equal to or superior to the basis of design and the Contractor takes full responsibility for all coordination and costs associated with collateral issues related to the substitution. No Substitutions will be reviewed during the bidding process. The Contractor takes full responsibility for all substitutions. Substitution submittals shall be made no later than 30 days after Notice to Proceed in order to provide time for comparison review. All submittals after 30 days shall be in strict accordance with the basis of

design/specified products. No Substitutions will be considered after 30 days. The following manufacturer criteria must be submitted with the substitution request.

1.11 PERIODIC INSPECTION BY MANUFACTURER'S REPRESENTATIVE

- A. When the project is in progress, the Air Barrier manufacturer shall inspect the work not less than 2 days per week. In addition, the manufacturer shall:
 - 1. Keep the Architect/Engineer informed as to the progress and quality of the work as observed.
 - 2. Report to Architect/Engineer in writing any failure or refusal of the Contractor to correct unacceptable practices called to the Contractor's attention.
 - 3. Confirm after completion that manufacturer has observed no applications procedures in conflict with the specifications other than those that may have been previously reported and corrected.

1.12 DELIVERY, STORAGE, AND HANDLING

- A. Delivery of Materials:
 - 1. Materials shall be delivered to the jobsite in undamaged and clearly marked containers indicating the name of the Air Barrier Manufacturer and product.
- B. Storage of Materials:
 - 1. Store materials as recommended by Air Barrier Manufacturer and conforming to applicable safety regulatory agencies. Refer to all applicable data including but not limited to MSDS sheets, Product Data sheets, product labels, and specific instructions for personal protection.
 - 2. Keep solvents away from open flame or excessive heat.
 - 3. Products should be stored in closed containers.
 - 4. Store rolled materials on end in original packaging.
 - 5. Protect rolls from direct sunlight until ready for use.
 - 6. Refer to Air Barrier Manufacturer published literature.
- C. Handling:
 - 1. Refer to Air Barrier Manufacturer published literature.

1.13 SITE CONDITIONS

- A. Environmental Requirements:
 - 1. No Work shall be performed during rain or inclement weather.
 - 2. No Work shall be performed on frost or wet covered surfaces.
- B. Protection:
 - 1. Cap and protect exposed back-up walls against wet weather conditions during and after application of membrane.
- C. Ensure all preparation Work is completed prior to installing fluid-applied membrane air barrier.

1.14 WARRANTY

- A. Manufacturer Material Warranty:

1. Provide Air Barrier Manufacturer's standard 10 year material warranty from Substantial Completion.

PART 2 - PRODUCTS

2.1 MATERIALS MANUFACTURER

- A. Components and auxiliary materials must be obtained as a single-source from the assembly Air Barrier Manufacturer to ensure total system compatibility and integrity.
- B. Basis of Design:
 1. Henry Company
999 N. Sepulveda Blvd. Suite 800
El Segundo, CA 90245
(800) 486-1278
 2. Or Approved Equal

2.2 MATERIALS

- A. Source Limitations: Obtain primary air-barrier materials and air-barrier accessories from single source from single manufacturer.
- B. Primary Fluid-Applied Membrane Air Barrier (Basis of Design):
 1. One-component, water-based, elastomeric emulsion membrane, designed to provide a vapor permeable air and water barrier when applied above-grade wall assemblies, having the following properties:
 - a. Basis of Design Product: Air-Bloc 17MR
 - b. Color: Graphite
 - c. Solids Content:
 - 1) By Weight: 63%
 - 2) By Volume: 53%
 - d. Service Temperature:
 - 1) Low Temperature: -40 degrees F (-40 degrees C)
 - 2) High Temperature: +180 degrees F (+80 degrees C)
 - e. Application Temperature:
 - 1) Low Temperature: +20 degrees F (-6 degrees C)
 - 2) High Temperature: +122 degrees F (+50 degrees C)
 - f. Tensile Strength (ASTM D412): 104 psi (717 kPa)
 - g. Elongation (ASTM D412): 420%
 - h. Low Temperature Flexibility @ -22 degrees F (-30 degrees C) (ASTM D1970): Pass
 - i. Freeze-Thaw Resistance (ASTM D2243): Pass; 10 cycles
 - j. Nail Sealability (ASTM D1970): Pass
 - k. VOC Content: 100 grams/liter max.
 - l. Water Absorption (ASTM D471, modified): 5.6%
 - m. Water Vapor Permeance (ASTM E96 B) @ 40 mils nominal dry film: 14 perms
 - n. Air Permeability:

- 1) Assembly Air Leakage (ASTM E2357): Pass
- 2) Building Material (ASTM E2178): 0.0001 cfm/ft² (0.0005 L/s.m²)
- o. Chemical Resistance: Resists salt solutions, mild acids and alkalis. Non-resistant to oils, grease or solvents
- p. Fire Testing (NFPA 285): Complies in various assemblies
- q. Flame Spread/Smoke Development (ASTM E84): 10/15
- r. Resistance to Mold, Mildew, and Fungal Growth (ASTM D5590): No growth

C. Auxiliary Materials

1. Transition Membranes:

a. Self-Adhering flashings:

- 1) Non-vapor permeable, self-adhered water resistive air and vapor barrier membrane consisting of an SBS rubberized asphalt compound, which is integrally laminated to a blue engineered thermoplastic film, having the following properties:
 - a) Basis of Design Product: Blueskin SA
 - b) Color: Blue
 - c) Water Vapor Permeance (ASTM E96, Method A): .86 perms
 - d) Air Leakage of Air Barrier Assemblies (ASTM E2357): Pass
 - e) Air Leakage (ASTM E2178): <0.0005 L/s/m² @ 75Pa
 - f) Water Tightness (CAN/CGSB-37.58-M86): Pass.
 - g) Nail Sealability (ASTM D1970): Pass.
 - h) Tensile Strength:
- 2) Membrane (ASTM D412-modified): 500 psi minimum
- 3) Film (ASTM D828): 5000 psi minimum
 - a) Elongation (ASTM D412-modified): 200% minimum

2. Adhesives and Primers:

- a. Polymer emulsion based primer for self-adhered membranes, and having the following properties:
 - 1) Basis of Design Product: Aquatac Primer
 - 2) Color: Aqua.
 - 3) Solids Content (By Weight): 58%.
 - 4) Water based: Maximum VOC: 50 g/l

3. Sealants:

a. Building Envelope Sealant:

- 1) Moisture cure, medium modulus polymer modified sealing compound, having the following properties:
 - a) Basis of Design Product: HE925 BES Sealant
 - b) Complies with Fed. Spec. TT-S-00230C, Type II, Class A.
 - c) Complies with ASTM C920, Type S, Grade NS, Class 35.
 - d) Elongation: 450 – 550%.
 - e) Remains flexible with aging.

- b. Sheathing Joint Sealants:
 - 1) As recommended by Air Barrier Manufacturer
4. Self-Adhesive Through Wall Flashing Membrane:
 - a. Unless otherwise indicated, non-vapor permeable, self-adhered water resistive air and vapor barrier membrane consisting of an SBS rubberized asphalt compound, which is integrally laminated to a blue engineered thermoplastic film, having the following properties:
 - 1) Basis of Design Product: Blueskin TWF
 - 2) Color: Yellow
 - 3) High Temperature Stability - Flow Resistance (ASTM D5147): Pass
 - 4) Air leakage (ASTM E283): 0.005 L/s.m² @ 75 Pa
 - 5) Water vapor permeance (ASTM E96, Method B): 0.03 perms
 - 6) Low temperature flexibility (CGSB 37-GP-56M): Pass
5. Termination bar: stainless steel with sealant receiver.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Substrate Conditions:

1. Verify substrates to receive work and surrounding adjacent surfaces are in accordance with Air Barrier Manufacturer published literature prior to installation of fluid applied membrane air barrier assembly.
2. Sheathing panels must be securely fastened and installed flush to ensure a continuous substrate in accordance with Air Barrier Manufacturer published literature.
3. Fastener penetrations must be set flush with sheathing and fastened into solid backing.
4. Mortar joints in concrete block and form tie holes/voids in poured concrete shall be filled, flush, smooth, and allowed to be cured for a minimum of twenty-four (24) hours.
5. New concrete should be cured for a minimum of sixteen (16) hours after forms are removed.
6. Cap and protect exposed back-up walls against wet weather conditions prior to application of fluid applied membrane air barrier assembly.

B. Notify contractor in writing of any conditions that are not acceptable.

C. The installing contractor shall examine and determine that surfaces and conditions are ready to accept the Work of this section in accordance with published literature. Commencement of Work or any parts thereof shall mean installer acceptance of the substrate.

3.2 PREPARATION

- A. All surfaces must be sound, dry to touch, clean, and free of oil, grease, dirt, excess mortar, frost, laitance, loose and flaking particles, or other contaminants.
- B. Protect adjacent surfaces not included in scope of Work to prevent spillage and overspray.
- C. Hot weather or direct-sun applications over porous substrates, such as concrete, promote rapid surface drying and can form blisters in the fluid applied membrane air barrier during curing. To aid in blister prevention prepare substrate in accordance with one of the following optional procedures:

1. Prime coat:
 - a. Apply a thin prime coat of fluid applied membrane air barrier to substrate.
 - b. Allow fluid applied membrane air barrier to fully cure prior to subsequent application.
 - c. Install primary fluid applied membrane air barrier to Air Barrier Manufacturer minimum recommended mil thickness.

2. Two coat:
 - a. Apply fluid applied membrane air barrier to achieve one-half (1/2) of Air Barrier Manufacturer minimum recommended mil thickness.
 - b. Allow fluid applied membrane air barrier to fully cure prior to subsequent application.
 - c. Apply fluid applied membrane air barrier to achieve one-half (1/2) of Air Barrier Manufacturer minimum recommended mil thickness.
 - d. Overall dry mil thickness shall be in accordance with Air Barrier Air Barrier Manufacturer published literature.

3.3 INSTALLATION

- A. Ensure substrate is ready to receive fluid applied membrane air barrier in accordance with published literature.
- B. If fluid applied membrane air barrier should freeze while in storage, move containers to a controlled environment above 32 degrees F (0 degrees C) until thawed and re-mix using a hand operated power mixer prior to use.
- C. Fluid applied membrane air barrier shall not be applied when ambient (air) and substrate temperatures are below 20 degrees F (-6 degrees C).
- D. Do not proceed with application of air barrier membrane when rain is expected within 16 hours.
- E. Apply sealant at sharp corners, changes in substrate plane, penetrations, and edges to form a smooth transition from one plane to another.
- F. Non-Moving Substrate Joint and Crack Treatment:
 1. Gaps equal to or less than 3/8 inch (10 mm) wide:
 - a. Sheathing Joint Sealant:
 - 1) Apply sealant at rate recommended by Air Barrier Manufacturer.
 - 2) Spread sealant at joint extending a minimum one (1) inch beyond gap to ensure a continuous air and watertight assembly.
 2. Gaps equal to or less than 1/2 inch (12 mm) wide:
 - a. Building Envelope Sealant:
 - 1) Apply sealant at rate recommended by Air Barrier Manufacturer.
 - 2) Spread sealant at joint extending a minimum one (1) inch on each side of substrate gap.
 - b. Liquid applied flashings:
 - 1) Apply liquid applied flashing at rate recommended by Air Barrier Manufacturer.

- 2) Apply liquid applied flashing in accordance with Air Barrier Manufacturer published literature extending a minimum of two (2) inches on each side of substrate gap.
- c. Self-adhering flashings:
 - 1) Apply primer to substrate and allow curing in accordance with published literature prior to installation of self-adhered flashing.
 - 2) Apply self-adhering flashing in accordance with Air Barrier Manufacturer published literature extending a minimum of three (3) inches on each side of substrate gap.
 - 3) Roll membrane with countertop roller to eliminate air pockets between self-adhered flashing and substrate ensuring full adhesion of membrane onto substrate.
 - 4) Seal exposed leading edges of self-adhered membrane with sealant.
3. Gaps greater than 1/2 inch wide:
 - a. Contact Air Barrier Manufacturer.
- G. Refer to Drawings and Air Barrier Manufacturer requirements for installation procedures including, but not limited to, the following:
 1. General:
 - a. Coordinate all requirements and notify the Architect/Engineer of conflicting direction noted. Do not proceed with the Work until the conflict is resolved and written notice is given on how to proceed.
 2. Inside corners
 3. Outside corners
 4. Crack treatment
 5. Penetrations
 6. Rough openings
 7. Control joints
 8. Expansion joints
 9. Changes in substrate
- H. Contact Air Barrier Manufacturer to coordinate transition of fluid applied membrane air barrier to adjacent areas including, but not limited to, the following:
 1. Roof to air barrier
 2. Air barrier to waterproofing
 3. Fastener penetrations
 4. Foundation and walls, including penetrations, ties and anchors.
 5. Walls, windows, curtain walls, storefronts, louvers or doors.
 6. Dissimilar wall assemblies and fixed openings within those assemblies.
 7. Wall and roof connections.
 8. Floors over unconditioned space.
 9. Walls, floor and roof across construction, control and expansion joints.
 10. Utility, pipe and duct penetrations.
 11. Seismic and expansion and control joints.
 12. Leakage pathways in the building envelope.
- I. Through Wall Flashing:
 1. Coordinate with Section 042000 Unit Masonry

2. Provide drip plate as indicated.

J. Primary Liquid Air Barrier Membrane

1. Install fluid applied membrane air barrier in accordance with Air Barrier Manufacturer published literature to ensure an air and watertight fluid applied membrane air barrier assembly.
2. Fluid applied membrane air barrier assembly must be installed in a monolithic application without sags, runs or voids, and transitioning with auxiliary components to create a uniform drainage plane and air barrier.
3. Install fluid applied membrane air barrier and transition membranes so that subsequent membrane installation laps one (1) inch (2.5 cm) onto existing membrane ensuring an air and watertight fluid applied membrane air barrier assembly.
4. Fluid applied membrane air barrier total dry thickness shall be in accordance with Air Barrier Manufacturer published literature. Refer to Air Barrier Manufacturer Technical Data Sheet.

3.4 FIELD QUALITY CONTROL

A. Final Observation and Verification:

1. Final inspection of fluid applied membrane air barrier assembly shall be carried out by the Owner's representative, the contractor, and Air Barrier Manufacturer representative.
2. Contact Air Barrier Manufacturer for warranty issuance requirements.

B. Fluid applied membrane air barrier assembly is not designed for permanent UV exposure. Refer to Air Barrier Manufacturer published literature for product limitations.

3.5 CLEANING

- A. Promptly as the Work proceeds, and upon completion, clean up and remove from the premises all rubbish and surplus materials resulting from the foregoing Work.
- B. Clean soiled surfaces, spatters, and damage caused by Work of this Section.
- C. Check area to ensure cleanliness and remove debris, equipment, and excess material from the site.

END OF SECTION 072726

SECTION 074213 - FORMED METAL WALL PANELS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
1. Concealed-fastener, lap-seam metal wall panels.
- B. Related Requirements:
1. Refer to Division 07 Rainscreen attachment systems.
 2. Refer to Division 07 Thermal Insulation.
 3. Refer to Division 07 Fluid-applied membrane air barriers.

1.3 DEFINITION

- A. Metal Wall Panel Assembly: Metal wall panels attachment system components, miscellaneous metal framing, thermal insulation, liquid applied air vapor barrier, and accessories necessary for a complete, weathertight rainscreen wall system.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of panel and accessory.
- B. Shop Drawings:
1. Include fabrication and installation layouts of metal panels including: details of edge conditions, joints, panel profiles, corners, anchorages, thermal movement accommodations, attachment system, trim, flashings, closures, waterproofing accessories and special details.
 2. Shop drawings and design calculations shall be prepared by the panel system manufacturer and shall be signed and sealed by a qualified professional engineer licensed in the State of New Jersey. Calculations shall demonstrate compliance with performance requirements and for spans indicated in drawings. For all fasteners and hardware part of metal panel systems, clips, and clip attachment to subframing as indicated in drawings.
 3. Accessories: Include details of the flashing, parapet, coping, base of wall termination, typical splices, trim, and anchorage systems, at a scale of not less than **1-1/2 inches per 12 inches (1:10)**.
 4. Provide all fastener pull-out and pull over values.
- C. Samples for Initial Selection: For each type of metal panel indicated with factory-applied finishes.
1. Include Samples of trim and accessories involving color selection.

D. Samples for Verification: For each type of exposed finish, prepared on Samples of size indicated below:

1. Metal Panels: **12 inches (305 mm)** long by actual panel width. Include fasteners, closures, and other metal panel accessories.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.
- B. Product Test Reports: For each product, for tests performed by a qualified testing agency.
- C. Field quality-control reports.
- D. Sample Warranties: For special warranties.

1.6 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For metal panels to include in maintenance manuals.

1.7 QUALITY ASSURANCE

- A. Installer Qualifications
 1. An entity that employs installers and supervisors who are trained and approved by manufacturer with a minimum of three (3) years' experience in the installation of metal wall and soffit panels.
 2. Installer must be certified by manufacturer specified as supplier of panel system and obtain written certification from manufacturer that installer is approved for installation of specified system. If requested, contractor must supply Owner with a copy of this certification.
 3. Installer is required to maintain a full-time supervisor/foreman who is on the job-site at all times during installation of the panel system. Foreman must have a minimum of five (5) years experience with the installation of system similar to that specified.
 4. Installer must obtain all components of the panel system from a single manufacturer including any roll good materials if required. Any secondary products that are required which cannot be supplied by the specified manufacturer must be recommended and approved in writing by primary manufacturer prior to bidding.
 5. If required, fabricator/installer shall submit work experience and evidence of adequate financial responsibility. The Owner's representative reserves the right to inspect fabrication facilities in determining qualifications.
- B. Mockups: Build mockups to verify selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for fabrication and installation.
 1. Build mockup of typical metal panel assembly **as shown ion Drawings**, including supports, attachments, and accessories.
 2. Water-Spray Test: Conduct water-spray test of metal panel assembly mockup, testing for water penetration according to AAMA 501.2.
 3. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
 4. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.
- C. Testing Agency Qualifications: Qualified according to ASTM E 329 for testing indicated.

- D. Source Limitations: Obtain all components of the metal wall panel system from single source manufacturer.
- E. Engage the Manufacturer's Field Representative to conduct required periodic inspections of the work in progress and furnish written documentation of such inspections to the architect.
 - 1. During performance of the work, the manufacturer shall inspect the progress of the work at each major phase and at minimum (1) day per work week.
 - 2. Manufacturer shall provide additional inspection as required to ensure all required warranties, including installation warranty are provided.
 - 3. Report to the architect in writing any failure or refusal of the contractor's workmanship or rejection of installed products, with required corrective action.

1.8 MANUFACTURERS' QUALIFICATIONS/ALTERNATE MANUFACTURERS:

- A. Please refer to Specification Section "Substitution Procedures" and "Submittal Procedures". "Or Equal" substitutions are permitted so long as they are equal to or superior to the basis of design and the Contractor takes full responsibility for all coordination and costs associated with collateral issues related to the substitution. No Substitutions will be reviewed during the bidding process. The Contractor takes full responsibility for all substitutions. Substitution submittals shall be made no later than 30 days after Notice to Proceed in order to provide time for comparison review. All submittals after 30 days shall be in strict accordance with the basis of design/specified products. No Substitutions will be considered after 30 days.
 - 1. The following manufacturer criteria must be submitted with the substitution request. The materials outlined are the type of materials to be used on this project. Panels formed at the job-site on portable roll formers are not permitted. Metal panels must be pre-manufactured and engineered for this project.
 - 2. Submit certified test reports from a testing laboratory that bear the seal and signature of a registered NJ professional engineer to show compliance with specified performance criteria.
 - 3. Tests shall have been made for identical systems within the ranges of specified performance criteria.
 - 4. Indicate fastener types and spacings and provide fastener pullout values.
 - 5. A list of a minimum of five (5) projects completed in the last 5 years where the proposed alternate material was used under similar conditions. The reference list shall include date of project, size of project, address and contact telephone number.
 - 6. A written statement from the alternate manufacturer stating that they will provide the building owner with a daily site inspection for a minimum of one (1) hour by an experienced, full time employee of the company.
 - 7. A copy of alternate manufacturer's warranty covering material, labor, and finishes.
 - 8. Submit sample of panel section, at least 6" x 6" showing seam profile and also a sample of all colors selected.
 - 9. Submit sample of panel clip.
 - 10. Substitution of metal panel subframing, include proprietary hats and zees (girts), shall not be permitted. Refer to Division 07 Rainscreen for attachment system.

1.9 DELIVERY, STORAGE, AND HANDLING

- A. Deliver components, metal panels, and other manufactured items so as not to be damaged or deformed. Package metal panels for protection during transportation and handling.

- B. Unload, store, and erect metal panels in a manner to prevent bending, warping, twisting, and surface damage.
- C. Stack delivered metal panels off ground horizontally on platforms or pallets, covered with suitable weathertight and ventilated covering. Store metal panels to ensure dryness, with positive slope for drainage of water. Do not store metal panels in contact with other materials that might cause staining, denting, or other surface damage.
- D. Handle materials to prevent damage to surfaces, edges and ends of roofing sheets and sheet metal items. Damaged material shall be rejected and removed from the site.
- E. Protect panels from wind-related damages.
- F. Inspect materials upon delivery. Reject and remove physically damaged or marred material from project site
- G. Retain strippable protective covering on metal panels during installation.

1.10 FIELD CONDITIONS

- A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit assembly of metal panels to be performed according to manufacturers' written instructions and warranty requirements.
- B. Ascertain that work of other trades which penetrates the wall or is to be made watertight by the panels is in place and approved prior to installation of roofing.

1.11 COORDINATION

- A. Coordinate metal panel installation with exterior wall/soffit moisture/water management work, flashing, trim, construction of soffits, and other adjoining work to provide a leakproof, secure, and noncorrosive installation.
- B. Field measurements: Visit the site before shop drawing preparation to verify conditions of the work. Verify locations of structural members, wall dimensions, wall opening dimensions and all other dimensions necessary for a complete wall/soffit panel project by field measurements before metal wall panel fabrication and indicate measurements on Shop Drawings.

1.12 WARRANTY

- A. Owner shall receive one (1) warranty from manufacturer of panels covering all of the following criteria. Multiple warranties are not acceptable.
 - 1. 20 year coverage on finish including checking, crazing, peeling, chalking, fading and/or adhesion.
 - 2. 20 year material coverage.
 - 3. Installer shall provide manufacturer with 2 year warranty covering panel system installation and water tightness.
 - 4. Warranties shall commence on date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Structural Performance: Provide metal panel systems capable of withstanding the effects of the following loads, based on testing according to ASTM E1592:
1. Wind Loads: Calculated in accordance with ASCE 7-16 with parameters provided in load schedule in Drawings.
 2. Wall Heights: As indicated in Drawings.
 3. Deflection Limits: For wind loads, no greater than **1/240** of the span, or as required by panel manufacturer, whichever requirement is more stringent.
- B. Air Infiltration: Air leakage of not more than **0.06 cfm/sq. ft. (0.3 L/s per sq. m)** when tested according to ASTM E283 at the following test-pressure difference:
1. Test-Pressure Difference: **1.57 lbf/sq. ft. (75 Pa)**.
- C. Water Penetration under Static Pressure: No water penetration when tested according to ASTM E331 at the following test-pressure difference:
1. Test-Pressure Difference: **6.24 lbf/sq. ft. (300 Pa)**.
- D. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes by preventing buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
1. Temperature Change (Range): **120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.**

2.2 CONCEALED-FASTENER, LAP-SEAM METAL WALL PANELS

- A. General: Provide factory-formed metal panels designed to be field assembled by splice lapping and interconnecting side edges of adjacent panels and mechanically attaching through panel to supports using concealed fasteners in side laps. Include accessories required for weathertight installation.
- B. Reveal-Joint, Concealed-Fastener Metal Wall Panels as indicated in Drawings: Formed with vertical panel edges and **intermediate stiffening ribs symmetrically spaced** panel edges; with narrow reveal joint between panels. Include accessories required for weathertight installation. Panels shall be fabricated in longest lengths practical up to 20 feet in length, with concealed 6-inch-wide splice plates. Overlapping of panel joints at splices will not be accepted.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1) Basis of Design: Innovative Metals Company (IMETCO); "Latitude" Series wall panel LW16S-28F
 - 2) Morin Corporation: Integrity Series, XAB-16
 - 3) Centria Architectural Systems, Centria Concept Series, CS-620

2. Aluminum Sheet: Coil-coated sheet, **ASTM B209 (ASTM B209M)**, alloy as standard with manufacturer, with temper as required to suit forming operations and structural performance required.
 - a. Thickness: 0.050 inch.
 - b. Surface: **Smooth, flat** finish.
 - c. Exterior Finish: **Two-coat fluoropolymer**.
 - d. Color: **As selected by Architect from manufacturer's full range of standard colors**.

3. Panel Characteristics:
 - a. Panel Width: 16 inch nominal.
 - b. Panel Depth: 7/8 inch
 - c. Panel Length: Full length, without joints. See Drawing elevations.
 - d. Panel Face: One (1) "vee" groove per panel, symmetrically and equally spaced.

2.3 MISCELLANEOUS MATERIALS

- A. Metal Subframing and Furring: fabricated 7/8" hat channel subgirts 078F125-43(33ksi.) at 16" oc horizontally. ASTM C645, cold-formed, metallic-coated steel sheet, ASTM A653/A653M, **G90 (Z275 hot-dip galvanized)** coating designation.
- B. Miscellaneous metals: ASTM C 645, cold-formed, metallic-coated steel sheet, ASTM A 653/A 653M, G90 (Z275 hot-dip galvanized) coating designation unless otherwise indicated. Provide subframing and furring as indicated on drawings and as required by manufacturer for support and alignment of metal panel system, whichever is more stringent.
- C. Panel Accessories: Provide components required for a complete, weathertight panel system including trim, copings, fasciae, mullions, sills, corner units, clips, flashings, sealants, gaskets, fillers, closure strips, and similar items. Match material and finish of metal panels unless otherwise indicated.
 1. Closures: Provide closures at intersections at change in materials, eaves and rakes, fabricated of same metal as metal panels.
 2. Backing Plates: Provide metal backing plates at panel end splices, fabricated from material recommended by manufacturer.
 3. Closure Strips: Closed-cell, expanded, cellular, rubber or crosslinked, polyolefin-foam or closed-cell laminated polyethylene; minimum **1-inch- (25-mm-)** thick, flexible closure strips; cut or premolded to match metal panel profile. Provide closure strips where indicated or necessary to ensure weathertight construction.
- D. Flashing and Trim: Provide flashing and trim formed from same material as metal panels as required to seal weather tight and to provide finished appearance. Locations include, but are not limited to, bases, drips, sills, jambs, corners, endwalls, framed openings, fasciae, parapet caps, intersections at change in materials, soffits, reveals, and fillers. Finish flashing and trim with same finish system as adjacent metal panels. Provide vented trims as indicated in Drawings to create a complete ventilated system.
- E. Panel Fasteners: Corrosion resistant self-tapping/drilling steel screws, designed by the manufacturer to withstand design loads.
- F. Provide exposed series 304 stainless steel screw fasteners/rivets with heads matching color of metal panels by means of factory-applied coating. Provide EPDM or PVC sealing washers for exposed fasteners.

- G. Panel Sealants: Provide sealant type recommended by manufacturer that are compatible with panel materials, are nonstaining, and do not damage panel finish.
 - 1. 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 (13 mm)** wide and **1/8 inch (3 mm)** thick.
 - 2. Joint Sealant: ASTM C920; elastomeric polyurethane or silicone sealant; of type, grade, class, and use classifications required to seal joints in metal panels and remain weathertight; and as recommended in writing by metal panel manufacturer.
 - 3. Butyl-Rubber-Based, Solvent-Release Sealant: ASTM C1311.

2.4 FABRICATION

- A. General: Fabricate and finish metal panels and accessories at the factory, by manufacturer's standard procedures and processes, as necessary to fulfill indicated performance requirements demonstrated by laboratory testing. Comply with indicated profiles and with dimensional and structural requirements.
- B. Fabricate metal panel joints with factory-installed captive gaskets or separator strips that provide a weathertight seal and prevent metal-to-metal contact, and that minimize noise from movements.
- C. Sheet Metal Flashing and Trim: Fabricate flashing and trim to comply with manufacturer's recommendations and recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, metal, and other characteristics of item indicated.
 - 1. Form exposed sheet metal accessories that are without oil canning, buckling, and tool marks and that are true to line and levels indicated, with exposed edges folded back to form hems.
 - 2. Seams for Aluminum: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with epoxy seam sealer. Rivet joints for additional strength.
 - 3. Seams for Other Than Aluminum: Fabricate nonmoving seams in accessories with flat-lock seams. Tin edges to be seamed, form seams, and solder.
 - 4. Sealed Joints: Form nonexpansion, but movable, joints in metal to accommodate sealant and to comply with SMACNA standards.
 - 5. Conceal fasteners and expansion provisions where possible. Exposed fasteners are not allowed on faces of accessories exposed to view.
 - 6. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal recommended in writing by metal panel manufacturer.
 - a. Size: As recommended by SMACNA's "Architectural Sheet Metal Manual" or metal wall panel manufacturer for application but not less than thickness of metal being secured.

2.5 FINISHES

- A. Protect mechanical and painted finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- B. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.
- C. Aluminum Panels and Accessories:

1. Two-Coat Fluoropolymer: AAMA 2605. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, metal panel supports, and other conditions affecting performance of the Work.
 1. Examine wall framing to verify that girts, angles, channels, studs, and other structural panel support members and anchorage have been installed within alignment tolerances required by metal wall panel manufacturer.
 2. Examine wall sheathing to verify that sheathing joints are supported by framing or blocking and that installation is within flatness tolerances required by metal wall panel manufacturer.
 - a. Verify that air- or water-resistive barriers have been installed over sheathing or backing substrate to prevent air infiltration or water penetration.
- B. Examine roughing-in for components and systems penetrating metal panels to verify actual locations of penetrations relative to seam locations of metal panels before installation.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Miscellaneous Supports: Install subframing, furring, and other miscellaneous panel support members and anchorages according to ASTM C754 and metal panel manufacturer's written recommendations.

3.3 METAL PANEL INSTALLATION

- A. General: Install metal panels according to manufacturer's written instructions in orientation, sizes, and locations indicated. Install panels perpendicular to supports unless otherwise indicated. Anchor metal panels and other components of the Work securely in place, with provisions for thermal and structural movement.
 1. Shim or otherwise plumb substrates receiving metal panels.
 2. Flash and seal metal panels at perimeter of all openings. Fasten with self-tapping screws. Do not begin installation until air- or water-resistive barriers and flashings that will be concealed by metal panels are installed.
 3. Install screw fasteners in predrilled holes.
 4. Locate and space fastenings in uniform vertical and horizontal alignment.
 5. Install flashing and trim as metal panel work proceeds.
 6. Locate panel splices over, but not attached to, structural supports. Stagger panel splices and end laps to avoid a four-panel lap splice condition.
 7. Align bottoms of metal panels and fasten with blind rivets, bolts, or self-tapping screws. Fasten flashings and trim around openings and similar elements with self-tapping screws.
 8. Provide weathertight escutcheons for pipe- and conduit-penetrating panels.

- B. Fasteners:
1. Aluminum Panels: Use aluminum or stainless-steel fasteners for surfaces exposed to the exterior; use aluminum or galvanized-steel fasteners for surfaces exposed to the interior.
- C. Metal Protection: Where dissimilar metals contact each other or corrosive substrates, protect against galvanic action as recommended in writing by metal panel manufacturer.
- D. Lap-Seam Metal Panels: Fasten metal panels to supports with fasteners at each lapped joint at location and spacing recommended by manufacturer.
1. Lap ribbed or fluted sheets one full rib. Apply panels and associated items true to line for neat and weathertight enclosure.
 2. Provide metal-backed washers under heads of exposed fasteners bearing on weather side of metal panels.
 3. Locate and space exposed fasteners in uniform vertical and horizontal alignment. Use proper tools to obtain controlled uniform compression for positive seal without rupture of washer.
 4. Install screw fasteners with power tools having controlled torque adjusted to compress washer tightly without damage to washer, screw threads, or panels. Install screws in predrilled holes.
 5. Flash and seal panels with weather closures at perimeter of all openings.
- E. Watertight Installation:
1. Apply a continuous ribbon of sealant or tape to seal lapped joints of metal panels, using sealant or tape as recommend by manufacturer on side laps (if side laps and nesting panels are permitted) of nesting-type panels; and elsewhere as needed to make panels watertight.
 2. Provide sealant or tape between panels and protruding equipment, vents, and accessories.
 3. At panel splices (if nesting panels are permitted) , nest panels with minimum **6-inch (152-mm)** end lap, sealed with sealant and fastened together by interlocking clamping plates.
- F. Accessory Installation: Install accessories with positive anchorage to building and weathertight mounting and provide for thermal expansion. Coordinate installation with flashings and other components.
1. Install components required for a complete metal panel system including trim, copings, corners, seam covers, flashings, sealants, gaskets, fillers, closure strips, and similar items. Provide types indicated by metal wall panel manufacturer; or, if not indicated, provide types recommended by metal panel manufacturer.
- G. Flashing and Trim: Comply with performance requirements, manufacturer's written installation instructions, and SMACNA's "Architectural Sheet Metal Manual." Provide concealed fasteners where possible and set units true to line and level as indicated. Install work with laps, joints, and seams that are permanently watertight.
1. Install exposed flashing and trim that is without buckling and tool marks, and that is true to line and levels indicated, with exposed edges folded back to form hems. Install sheet metal flashing and trim to fit substrates and achieve waterproof performance.
 2. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at a maximum of **10 feet (3 m)** with no joints allowed within **24 inches (610 mm)** of corner or intersection. Where lapped expansion provisions cannot be used or would not be sufficiently waterproof, form expansion joints of intermeshing hooked flanges, not less than **1 inch (25 mm)** deep, filled with mastic sealant (concealed within joints).

3.4 FIELD QUALITY CONTROL

- A. Manufacturer's Field Service: Engage a factory-authorized service representative to test and inspect completed metal wall panel installation, including accessories.
- B. Remove and replace metal wall panels where tests and inspections indicate that they do not comply with specified requirements.
- C. Additional tests and inspections, at Contractor's expense, are performed to determine compliance of replaced or additional work with specified requirements.
- D. Prepare test and inspection reports.

3.5 CLEANING AND PROTECTION

- A. Remove temporary protective coverings and strippable films, if any, as metal panels are installed, unless otherwise indicated in manufacturer's written installation instructions. On completion of metal panel installation, clean finished surfaces as recommended by metal panel manufacturer. Maintain in a clean condition during construction.
- B. After metal panel installation, clear weep holes and drainage channels of obstructions, dirt, and sealant.
- C. Replace metal panels that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.
- D. C. Touch up exposed fasteners using paint furnished by metal wall panel manufacturer and matching exposed panel surface finish.

END OF SECTION 074213

SECTION 074800 - RAINSCREEN ATTACHMENT SYSTEM

PART 1 - GENERAL

1.1 SUMMARY

- A. Provide an exterior wall assembly consisting of a fully engineered, thermally broken, highly corrosion resistant, clip and rail rainscreen attachment system fastened directly to the substrate for placement of up to 6-inches of exterior mineral fiber insulation between brackets with air space.
- B. Related Requirements:
 - 1. Refer to Division 04 Section "Unit Masonry".
 - 2. Refer to Division 05 Section "Cold-Formed Metal Framing".
 - 3. Refer to Division 06 Section "Sheathing".
 - 4. Refer to Division 07 Section "Fluid-Applied Membrane Air Barriers Waterproofing".
 - 5. Refer to Division 07 Section "Formed Metal Wall Panels".
 - 6. Refer to Division 07 Section "Thermal Insulation" for exterior mineral fiber insulation.

1.2 SYSTEM DESCRIPTION

- A. System assembly shall include the following components from the substrate out:
 - 1. Substrate: Cold-formed metal framing assembly and sheathing or concrete masonry unit wall as specified in drawings.
 - 2. Fluid applied membrane air barrier system over substrate.
 - 3. Thermally broken rainscreen attachment system.
 - 4. Mineral fiber insulation.
 - 5. Concealed fastener formed exterior metal panel assembly.
- B. Design Requirements:
 - 1. Manufacturer is responsible for designing system, including anchorage to structural system and necessary modifications to meet specified requirements and maintain visual design concepts.
 - 2. Employ registered professional engineer, licensed to practice engineering in jurisdiction where Project is located, to engineer each component of rainscreen attachment system.
 - 3. Structural Design: Exterior-insulated rainscreen wall assembly capable of withstanding effects of load and stresses from dead loads, wind loads, ice loads (if applicable) as indicated on Structural General Notes in Structural Drawings, and normal thermal movement without evidence of permanent defects of assemblies or components.
 - a. Thermal Movements: Provide assemblies that allow for thermal movements resulting from the following maximum ambient temperatures by preventing overstressing of components and other detrimental effects:
 - 1) Temperature Change (range): 120 degrees Fahrenheit (67 degrees C), ambient:
 - 4. Support Framing/Attachment System:

- a. Frequency and spacing of brackets as indicated by manufacture in project specific engineering package.
- C. Performance Requirements:
1. Thermal Performance:
 - a. Wall Assembly effective R-Value (U-Factor): **[INSERT R-VALUE (U-0.XXX)]**
 - b. Perform effective R-Value calculation or modeling in accordance with ASHRAE guidelines as required to demonstrate compliance.
 2. Structural Performance:
 - a. Framing Members:
 - 1) Test framing components to AAMA TIR- A8-[04] – Section 7.2 to determine structural performance and effective moment of inertia for each perforated component. Minimum Effective Moment of Inertia for Primary Rail: 0.0239 in⁴.
 - 2) Localized bending stress for eccentrically loaded framing members must be evaluated with the maximum effective length of resisting element not more than 12 inches.
 - b. Fasteners:
 - 1) Tension shall be taken as sum of direct tension plus tension due to prying for eccentrically loaded connections. Prying may be reduced or eliminated if proven via engineering analysis or testing.
 - 2) Minimum Safety Factor of 3 for both tension and shear values.
 - 3) Combined tension and shear shall be evaluated according to an interaction formula. Sum of terms shall not exceed 1.0.

1.3 SUBMITTALS

- A. Product Data: Submit manufacturer's product literature and descriptions of testing performed on system components to indicate meeting or exceeding specified performance.
- B. Shop Drawings:
 1. Provide project specific connection details, showing interface of rainscreen attachment system to substrate, signed and sealed by a qualified Professional Engineer.
 2. Show system installation and attachment, including fastener size and spacing.
- C. Samples: Submit following material samples for verification:
 1. Wall Brackets: Two (2) samples.
 2. Horizontal Rails: Two (2) 12-inch long samples.
- D. Delegated Design:
 1. As coordinated/demonstrated in delegated design.
 2. Submit rainscreen attachment manufacturer's comprehensive Structural Design analysis signed and sealed by a qualified Professional Engineer.
- E. Test Reports:
 1. Test to the following standards and provide written test reports by a third party:

- a. AAMA TIR-A8-[04]: Structural Performance of Composite Thermal Barrier Framing Systems – Section 7.2.
2. Comprehensive three-dimensional thermal modeling report indicating framing systems impact on exterior insulation rated R-value.

1.4 MANUFACTURER'S QUALIFICATIONS/ALTERNATE MANUFACTURERS:

- A. The materials outlined are the type of materials to be used on this project. Please refer to Specification Section 013300, "Submittal Procedures." "Or Equal" substitutions are permitted so long as they are equal to or superior to the basis of design and the Contractor takes full responsibility for all coordination and costs associated with collateral issues related to the substitution. No Substitutions will be reviewed during the bidding process. The Contractor takes full responsibility for all substitutions. Substitution submittals shall be made no later than 30 days after Notice to Proceed in order to provide time for comparison review. All submittals after 30 days shall be in strict accordance with the basis of design / specified products. No Substitutions will be considered after 30 days. The following manufacturer criteria must be submitted with the substitution request.

1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications:
 1. Minimum 5 years' experience specializing in the manufacturing of façade attachment/support framing similar to those specified.
- B. Installer Qualifications:
 1. Minimum of 3 years' documented experience or minimum of 5 completed projects of equivalent scope and quality and recommended by manufacturer to perform work of this Section.
 2. Onsite superintendent or foreman overseeing installation on site during entire work of this Section with experience equivalent to installer and in good standing with the manufacturer.
- C. Pre-Installation Meeting:
 1. Discuss sequence and scheduling of work and interface with other trades.
 2. Review metal wall framing assemblies for potential interference and conflicts and coordinate layout and support provisions for interfacing work.
 3. Review and document methods, procedures and manufacturer's installation guidelines and safety procedures for exterior wall assembly.
- D. Mock-Ups: Coordinate mock-up materials and requirements with mock-up specified in Division 01, Division 02 Summary of Work, Division 04 Unit Masonry, Division 07 Formed Metal Wall Panels, and as specified in drawings.
 1. Minimum mock up attachment to:
 - a. CMU backup.
 - b. CFMF backup.
 2. Size minimum 3 clips by 3 clips grid with rail.
- E. Approval of mockup is contingent upon inspection of installation by manufacturer.

1.6 QUALITY CONTROL

- A. Single source responsibility:
 - 1. Furnish engineered rainscreen clip and rail attachment system components under direct responsibility of single manufacturer.
- B. Field Measurements: Verify actual supporting and adjoining construction before fabrication.
- C. Record field measurements on project record shop drawings.

1.7 DELIVERY, STORAGE AND HANDLING

- A. Delivery: Deliver materials and components in manufacturers' original, unopened and undamaged containers or bundles, fully identified. Exercise care to avoid damage during unloading, storing and installation.
- B. Store, protect and handle materials and components in accordance with manufacturer recommendations to prevent damage, contamination and deterioration. Keep materials clean, dry, and free of dirt and other foreign matter, and protect from damage due to weather or construction activities.

1.8 SEQUENCING

- A. Ordering: Comply with manufacturers' ordering instructions and lead time requirements to avoid construction delays. Order samples early for approval.
- B. Coordinate construction to ensure that assemblies fit properly to supporting and adjoining construction; coordinate schedule with construction in progress to avoid delaying work.

1.9 WARRANTY

- A. Manufacturer Warranties:
 - 1. Attachment System: Ten (10) year Limited Warranty.
 - a. Covers components of the attachment system, including structural failure of components when all the materials and components are supplied and installed per manufacturer's requirements.
 - b. Includes labor and material for removal and replacement of defective material.
 - c. Includes labor to remove and reinstall façade finish panels, finish closures and façade finish accessories necessary to access defective material.
- B. Contractor's Warranties: 2-year labor warranty, starting from Substantial Completion, to cover repair of materials found to be defective as a result of installation errors.
- C. Limitation of Warranties: Exclude repairs, replacement, and corrective work to the substrate, primary structure, finish panels, and/or property – unless otherwise noted above. Warranties exclude mechanical damage due to abuse, neglect, primary structure failure, or forces of nature greater than normal weather conditions.

PART 2 - PRODUCTS

2.1 RAINSCREEN ATTACHMENT/SUPPORT FRAMING SYSTEM (CLIP AND RAIL)

- A. Basis of Design: Thermal Bracket D plus D-Rail system, as manufactured by Knight Wall Systems, Inc. or approved equal.

1. Comply with ANSI/ASHRAE 90.1-2010.
2. Coating Material: ASTM A1046, Zinc-Aluminum-Magnesium, minimum thickness ZM40.
 - a. ASTM A653 Galvanized steel is not acceptable.
3. Steel Classification: Structural Steel (SS), Grade 50, 50 ksi Yield.
 - a. Spacing: Comply with manufacturer's Professional Engineer's project specific calculations. Spacing of brackets shall not exceed 24" oc vertically and 24" oc horizontally.
4. Wall Brackets:
 - a. Minimum 0.074 inch thick (14 gauge) sheet steel.
 - 1) Dimensions:
 - 2) Offset Brackets 5-inch depth.
 - a) Align offsets to differing wall planes as shown on Drawings within manufacturer tolerances for hardware.
 - b. Pre-Punched Holes: minimum of two wall anchors per bracket and as per manufacturer's delegated design.
 - c. Rail Connector Stem:
 - 1) Pilot Drill Holes:
 - a) Holes allow minimum 0.75 inch adjustment allowing for aligning and plumbing of framing, independent of substrate irregularities and proper cladding installation.
 - b) Spaced appropriately to maintain proper alignment of rails.
 - d. Primary Horizontal Rail:
 - e. Minimum 0.046-inch thick (18 gauge) cold-formed steel.
 - f. Profile: C channel, two flanges of equal length and one web.
 - g. Nominal Dimensions: 1.625 inch minimum flange for attaching to wall bracket and 1.625 inch at web.
 - h. Adjustment capability: 0.75-inches \pm 3/8".
 - 1) Thermal Isolation Thermastop Isolators:
 - i. Material: Injection molded Polyoxymethylene copolymer (POM), non-fiber reinforced.
 - j. Tensile Yield Strength: 9.57 ksi per ISO 527.
 - k. Melting Temperature: 329 degrees Fahrenheit per ISO 3146.
 - l. Components:
 - 1) Wall Anchor Isolation Washer: minimum 0.125 inch thick.
 - 2) Support Wall Substrate Isolation: Minimum 0.375-inch thick at each wall bracket.
 - 3) Rail to Bracket Isolation: Minimum 0.125 inch thick at each connection.

- 4) Bracket Shim: Match support wall substrate isolator profile; available in 0.125-inch thickness and does not decrease thermal or structural performance of system.
- B. Fasteners:
1. Sufficient length to provide solid attachment to structure as required by manufacturer.
 2. Thermally isolated.
 3. Framed substrate with sheathing: Self-drill hex-washer-head stainless steel with 1,000 hour salt-spray rated thermoset polyester coating.
 - a. Embedment depth: 0.625 inches or three full threads minimum, whichever is greater.
 - b. Minimum ultimate pull-out capacity from 18 gauge steel: 450 pounds.
 4. Concrete and concrete masonry units substrate:
 - a. Embedment depth: 1.25 inches minimum.
 - b. Minimum ultimate pull-out capacity from substrate material: 450 pounds.
 - c. 1/4 inch Kwik-Con II+ by Hilti
 - d. 1/4 inch UltraCon by Elco Industries
 - e. Or approved equal.
 5. For primary to secondary rail connection: Self-drill hex-washer-head stainless steel with 1,000 hour salt-spray rated thermoset polyester coating.
 - a. Embedment depth: 0.625 inches or three full threads minimum, whichever is greater.
 - b. Minimum ultimate pull-out capacity from 18 gauge steel: 450 pounds.
- C. Accessories:
1. Bracing, Furring, Bridging, Plates, Gussets, and Clips: Formed sheet steel, thickness as necessary to meet structural requirements for special conditions encountered.
 2. Galvanic Protection (isolation): Utilize tapes and other methods as necessary to separate and prevent contact between dissimilar metals.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions for compliance with manufacturer requirements for installation conditions affecting performance of the work.
1. Do not proceed with installation until unsatisfactory conditions have been corrected.
 2. Ensure fluid applied membrane air barrier assembly is installed prior to installing rainscreen attachment system.
 3. Ensure fenestration, transitions, discontinuities, sills, and ledgers are flashed and sealed to move moisture to the exterior of the building.
- B. Field verify architectural details and mechanical and electrical requirements prior to commencing installation.
- C. Commencement of installation constitutes acceptance of existing conditions and acceptance of responsibility for satisfactory performance.

3.2 RAINSCREEN ATTACHMENT SYSTEM INSTALLATION (CLIP AND RAIL)

- A. Preparation: Review areas of potential interference and conflicts and coordinate layout and support provisions for interfacing work.
- B. Installation: Install in strict accordance with manufacturer's installation instructions.
- C. Wall Brackets and Primary Rail:
 - 1. At cold formed metal framed backup mount wall brackets at 16 inch on center horizontally on support wall directly to stud frames (at each stud location).
 - a. Brackets must be laid out at 0.5 inch increments vertically or horizontally.
 - b. Tighten screws to substructure to a snug tight condition and not stripped. Do not over-torque beyond manufacturer's recommendation. If installed using hand tools, verify for each installer at beginning of project using snug-tight criteria. Do not use stripped holes.
 - 2. Thermally isolate wall bracket attachments by sandwiching thermal break material between metal bracket and support wall substrate.
 - 3. Thermally isolate screw fastener washers using material to thermally isolate fastener heads from metal bracket.
 - 4. Mineral Wool Insulation: Install to expand into and friction fit between wall brackets as specified by Division 07 prior to installing horizontal rails.
 - 5. Attach primary rail to wall bracket stem by use of a self-tapping screw fastener through the pre-punched holes in the rail and into the pre-punched pilot holes on the bracket.
 - 6. Isolate primary rail from bracket by sandwiching a thermal break material between rail and bracket stem.
 - 7. Attach primary rail at proper pre-punched pilot holes on bracket stem to align plumb and true. Account for irregularities in support wall.
 - 8. Establish and re-establish and restart bracket locations using laser or chalk-line at fenestrations and other obstructions to establish horizontal alignments.
- D. Touch-up shop-applied protective coatings damaged during handling and installation.
- E. Use shearing instruments (i.e. snips, nibbler, etc.) for cutting metal framing components. Saws are not permitted. Contractor shall not damage corrosion protective coating.
- F. The systems components should not be cut while installed on the building, unless using a shearing instrument.
- G. Replace thermal isolator pieces that break during installation.
- H. Provide a 3/8" – 1/2" gap between girts for expansion when multiple lengths of rail are installed.
- I. Minimum length of installed cut primary rail is 12" and must be attached to at least two separate wall brackets to prevent rotation of rail. Unsupported cantilever must not exceed 6" unless specified differently by manufacturer's engineer and shall be reviewed per project requirements included in delegated design.
- J. Minimum length of installed cut secondary rail is 12" and must be mechanically attached to at least two separate primary rails.

3.3 ERECTION TOLERANCES

- A. Maximum Framing Member Variation from True Position: 1/4 inch.

- B. Maximum Framing Member Variation from Plane:
 - 1. Individual Framing Members: Do not exceed 1/4 inch in 10 foot.
 - 2. Accumulative Over-all Variation for Wall and Floor System: Do not exceed 1/4 inch.

3.4 FIELD QUALITY CONTROL

- A. Manufacturer's Field Technical Service: Make intermittent and final inspection to verify installation in conformance to manufacturer instructions and suitable as framing assembly for subsequent metal panels, acrylic plastering, and other cladding installations.
 - 1. Confirm snug tight and fastener sizing.
 - 2. Confirm framing members installed in correct orientation.

3.5 ADJUSTING

- A. Inspect and adjust after installation. Replace or repair defective work.
- B. Adjust, and reconfigure as necessary to accommodate cladding systems for installations over work of this Section. Do not reuse pre-drilled holes unless fastener size is increased.

3.6 FAÇADE PANEL INSTALLATION – REFER TO DIVISION 07 FRAMED METAL WALL PANELS

- A. The cavity must be clear and free from air flow and drainage obstructions.

END OF SECTION 074800

SECTION 075000.13 - MEMBRANE ROOFING CUTTING AND PATCHING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. General requirements for cutting and patching roofing membranes.
- B. Related Sections:
 - 1. Division 01 Section "Execution" for other requirements related to cutting and patching.
 - 2. Division 07 Section "Sheet Metal Flashing and Trim"
 - 3. Division 07 Section "Roof Specialties".

1.2 DEFINITIONS

- A. OEM: Original manufacturer for installed roofing systems.

1.3 PERFORMANCE REQUIREMENTS

- A. Weatherproof Integrity: Cutting and patching of membrane roofing to accommodate adjacent renovation or construction activities, and/or for new curbs and other roof penetrations, shall maintain the weather integrity of the existing roofs and shall not permit concealed or visible leaks into the building interior.
 - 1. Comply with the current published requirements of the OEM for roof penetrations of the type necessary for the work.

1.4 SUBMITTALS

- A. Product Data: For each type of product employed in the Work.
- B. Shop Drawings: For roofing penetrations. Provide OEM standard details and modified details where required for the conditions of the work.
- C. Compliance certificates.
- D. Field quality-control reports.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: An employer of workers trained and approved by OEM.
- B. Manufacturer's Representative Qualifications: OEM's authorized representative who is trained and knowledgeable in the installation of units required for this Project.
- C. Preinstallation Conference: Conduct conference at Project site.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver and store products in manufacturer's unopened packaging with labels intact until ready for installation.
- B. Store all roofing materials in a dry place, on pallets or raised platforms, out of direct exposure to the elements until time of application. Store materials at least 4 inches above ground level and covered with "breathable" tarpaulins.
- C. Stored in accordance with the instructions of the manufacturer prior to their application or installation. Store roll goods on end on a clean flat surface. No wet or damaged materials will be used in the application.
- D. Store at room temperature wherever possible, until immediately prior to installing the roll. During winter, store materials in a heated location with a 50 degree F (10 degree C) minimum temperature, removed only as needed for immediate use. Keep materials away from open flame or welding sparks.
- E. Avoid stockpiling of materials on roofs without first obtaining acceptance from the Architect/Engineer.
- F. Adhesive storage shall be between the range of above 50 degree F (10 degree C) and below 80 degree F (27 degree C). Area of storage shall be constructed for flammable storage.

1.7 MANUFACTURERS QUALIFICATIONS / ALTERNATE MANUFACTURERS:

- A. The materials outlined are the type of materials to be used on this project. Please refer to Specification Section 013300, "Submittal Procedures" "Or Equal" substitutions are permitted so long as they are equal to or superior to the basis of design and the Contractor takes full responsibility for all coordination and costs associated with collateral issues related to the substitution. No Substitutions will be reviewed during the bidding process. The Contractor takes full responsibility for all substitutions. Substitution submittals shall be made no later than 30 days after Notice to Proceed in order to provide time for comparison review. All submittals after 30 days shall be in strict accordance with the basis of design / specified products. No Substitutions will be considered after 30 days. The following manufacturer criteria must be submitted with the substitution request.

1.8 PROJECT CONDITIONS

- A. Do not install roofing products on roofs that are wet.

1.9 WARRANTY

- A. Where existing roof is still under OEM warranty, comply with the requirements of the OEM to maintain such warranty:
- B. Installer shall provide a workmanship warranty covering new flashing installation and related work for a period not less than 2 years from date of acceptance.

PART 2 - PRODUCTS

2.1 MATERIALS AND PRODUCTS

- A. General: Provide and employ products only as approved by OEM for the type of roofing involved. In general, do not use any components that do not represent the highest quality approach for the project conditions. Where new products are added to or incorporated into existing roofs, use materials of quality at least as high as the originally installed materials.
- B. Manufacturers:
 - 1. The Garland Company.
 - 2. Or approved equal.
- C. Products
 - 1. Base (Ply) Sheet: One ply bonded to the prepared substrate with Interply Adhesive:
 - a. FlexBase 80:
 - 2. Modified Cap (Ply) Sheet: One ply bonded to the prepared substrate with Interply Adhesive:
 - a. StressPly E FR Mineral:
 - 3. Interply Adhesive:
 - a. Weatherking Flashing Adhesive
 - 4. Insulation Adhesive:
 - a. Insul-Lock HR
 - 5. Primer: Asphalt primer to enhance adhesion of adhesive to substrate
 - a. Garla-Prime VOC
 - 6. Asphalt Mastic: For reinforcing laps and seams in roof membrane.
 - a. Flashing Bond
 - b. Silver-Flash
 - c. Fiberglass reinforcement: Garmesh
 - 7. Surface Treatment:
 - a. Weatherscreen (flood coat adhesive for gravel-sufaced roofs)
 - b. Black Knight Cold (flood coat adhesive for gravel-surfaced roofs with 1/8:12 slope)
 - c. Pyramic Plus LO (white reflective coating for coated roofs)

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine roofing membranes and affected flashings before installation. Inform Owner of existing conditions that could cause leaks that may be misconstrued as the result of the new work.

3.2 ROOFING MEMBRANE CUTTING AND PATCHING

- A. General: Provide the highest quality roof patches that comply with the OEM requirements. Provide redundancy in weather proof membrane where possible.
- B. Provide positive drainage so that no detail or part of roof is required to resist ponded water.

- C. Provide overlaps at counter flashings of minimum dimension to resist wind-blown rain.
- D. Do not use pitch pockets without secondary sheet metal hood.

3.3 PROCEDURES FOR ADDITIONS/ALTERATIONS TO EXISTING GRAVEL SURFACED ROOFS

A. Demolition and Preparation

1. Identify the locations of existing roof system to be affected by new construction.
2. On gravel surfaced roof areas, scarify the gravel surfacing from the location of the future work. Spud gravel away from an area beyond the limit of the cutting or modification of the membrane 24" minimum. Use a stiff bristled broom and blower to clear away all dirt and debris from the work area.
3. Cut out and remove the roof membrane, flashings, and all associated components of roof system as required to accommodate the new construction or reconstruction activities.

B. Temporary Protection

1. Provide watertight temporary protection of existing roof edge and walls as required to accommodate work.
2. Temporary materials are to be sealed to the existing roof with adhesive or sealant which is compatible with existing roof.
3. Any roof surface which will bear traffic, stored materials, or equipment shall be protected with a minimum of 2" extruded polystyrene insulation and 3/4" plywood.

C. New Perimeter Flashing

1. Infill roof insulation with matching thickness polyisocyanurate insulation and wood fiber cover board between existing roof and newly constructed wall. Mechanically attach or adhere boards with Insul-Lock HR insulation adhesive.
2. Install cant strip to the base of the curb with Insul-Lock HR adhesive.
3. Prepare the existing roof surface to receive new membrane.
 - a. Remove acrylic paint from painted roof surfaces with hot air welder. Apply heat and then peel or lightly scrape surface to remove paint film.
 - b. Remove any remaining gravel and heavy adhesive from gravel roof surfaces.
 - c. Once roof surface to receive new membrane tie-in has been prepared, apply 1/2 gallon per 100 sq. ft. Garla-Prime VOC to surface and allow to dry.
4. Install the new roofing membrane base and cap plies: Flexbase 80 and StressPly E FR Mineral into a solid application of Weatherking Flashing Adhesive, 2.5-3 gallon/100 sq. ft.
5. Install field membranes first, if applicable, ending 2" above top of cant strip.
6. Install flashing plies extending up and over the wall, unless indicated otherwise in detail drawings due to interface with exterior sheathing air-vapor barrier system. Secure flashing plies to the top of the wall with cap nails into the wood blocking. Termination bar shall be required for membranes that terminate on the vertical inside face of the wall.
7. The tie-in with the existing roof shall be a minimum of 12". (8" min. for base ply, 4" additional length for cap ply)
8. Apply 3-course Flashing Bond and Garmesh seal along edge of tie-in between new work and existing roof.
9. Apply 3-course Silver-Flash and Garmesh seal over all vertical seams of installed flashing membrane.

10. Upon completion of new work and acceptance by architect and membrane manufacturer, apply surfacing to match existing roof.
 - a. Apply 5 gal/100 sq. ft. appropriate adhesive (Black Knight Cold or Weatherscreen) to surface of new roofing on gravel surfaced roof areas. Broadcast salvaged gravel surfacing into the wet adhesive.
 - b. Apply 2 coats Pyramic Plus LO, 1.25 gallons/100 sq. ft., to match painted roof surface areas.

3.4 FIELD QUALITY CONTROL

- A. Manufacturer's Representative: Review installed work and determine if work meets the highest OEM standards. Provide field report as to work completed and compliance with OEM requirements, including warranty provisions, where applicable.
- B. Contractor: Notify manufacturer's representative of work before starting to coordinate for inspections by the representative during the installation. Schedule a final inspection once all work is complete. A copy of the final inspection will be provided to the Architect and the Owner.

END OF SECTION 0750013

SECTION 076200 - SHEET METAL FLASHING AND TRIM

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Formed wall sheet metal fabrications.
- B. Related Requirements:
 - 1. Section 061000 "Rough Carpentry" for wood nailers, curbs, and blocking.
 - 2. Section 074213 "Formed Metal Wall Panels" for sheet metal flashing and trim integral with metal wall panels.

1.3 COORDINATION

- A. Coordinate sheet metal flashing and trim layout and seams with sizes and locations of penetrations to be flashed, and joints and seams in adjacent materials.
- B. Coordinate sheet metal flashing and trim installation with adjoining roofing and wall materials, joints, and seams to provide leakproof, secure, and noncorrosive installation.

1.4 ACTION SUBMITTALS

- A. Product Data: For each of the following
 - 1. Elastomeric sealant.
 - 2. Butyl sealant.
 - 3. Epoxy seam sealer.
- B. Shop Drawings: For sheet metal flashing and trim.
 - 1. Include plans, elevations, sections, and attachment details.
 - 2. Detail fabrication and installation layouts, expansion-joint locations, and keyed details. Distinguish between shop- and field-assembled Work.
 - 3. Include identification of material, thickness, weight, and finish for each item and location in Project.
 - 4. Include details for forming, including profiles, shapes, seams, and dimensions.
 - 5. Include details for joining, supporting, and securing, including layout and spacing of fasteners, cleats, clips, and other attachments. Include pattern of seams.
 - 6. Include details of termination points and assemblies.
 - 7. Include details of expansion joints and expansion-joint covers, including showing direction of expansion and contraction from fixed points.
 - 8. Include details of roof-penetration flashing.

9. Include details of edge conditions, including eaves, ridges, valleys, rakes, crickets, flashings, and counterflashings.
 10. Include details of special conditions.
 11. Include details of connections to adjoining work.
- C. Samples: For each exposed product and for each color and texture specified, **12 inches (300 mm)** long by actual width.
- D. Samples for Initial Selection: For each type of sheet metal and accessory indicated with factory-applied finishes.
- E. Samples for Verification: For each type of exposed finish.
1. Sheet Metal Flashing: **12 inches (300 mm)** long by actual width of unit, including finished seam and in required profile. Include fasteners, cleats, clips, closures, and other attachments.
 2. Trim, Metal Closures, Expansion Joints, Joint Intersections, and Miscellaneous Fabrications: **12 inches (300 mm)** long and in required profile. Include fasteners and other exposed accessories.
 3. Unit-Type Accessories and Miscellaneous Materials: Full-size Sample.
- 1.5 INFORMATIONAL SUBMITTALS
- A. Qualification Data: For fabricator.
 - B. Product Test Reports: For each product, for tests performed by a qualified testing agency.
 - C. Sample Warranty: For special warranty.
- 1.6 CLOSEOUT SUBMITTALS
- A. Maintenance Data: For sheet metal flashing and trim, and its accessories, to include in maintenance manuals.
 - B. Special warranty.
- 1.7 QUALITY ASSURANCE
- A. Fabricator Qualifications: Employs skilled workers who custom fabricate sheet metal flashing and trim similar to that required for this Project and whose products have a record of successful in-service performance.
 - B. Mockups: Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for fabrication and installation.
 1. Build mockup of wall flashings, including long, including supporting construction cleats, seams, attachments, and accessories.
 2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Owner specifically approves such deviations in writing.
 3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Do not store sheet metal flashing and trim materials in contact with other materials that might cause staining, denting, or other surface damage.
 - 1. Store sheet metal flashing and trim materials away from uncured concrete and masonry.
 - 2. Protect stored sheet metal flashing and trim from contact with water.
- B. Protect strippable protective covering on sheet metal flashing and trim from exposure to sunlight and high humidity, except to extent necessary for period of sheet metal flashing and trim installation.

1.9 WARRANTY

- A. Special Warranty on Finishes: Manufacturer agrees to repair finish or replace sheet metal flashing and trim that shows evidence of deterioration of factory-applied finishes within specified warranty period.
 - 1. Exposed Panel Finish: Deterioration includes, but is not limited to, the following:
 - a. Color fading more than 5 Delta units when tested in accordance with ASTM D2244.
 - b. Chalking in excess of a No. 8 rating when tested in accordance with ASTM D4214.
 - c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.
 - 2. Finish Warranty Period: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. General: Sheet metal flashing and trim assemblies, including cleats, anchors, and fasteners, shall withstand wind loads, structural movement, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Completed sheet metal flashing and trim shall not rattle, leak, or loosen, and shall remain watertight.
- B. Sheet Metal Standard for Flashing and Trim: Comply with **SMACNA's "Architectural Sheet Metal Manual"** requirements for dimensions and profiles shown unless more stringent requirements are indicated.
- C. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes to prevent buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
 - 1. Temperature Change: **120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.**

2.2 SHEET METALS

- A. General: Protect mechanical and other finishes on exposed surfaces from damage by applying strippable, temporary protective film before shipping.
- B. Stainless Steel Sheet: ASTM A240/A240M, **Type 304**, dead soft, fully annealed; with **smooth, flat** surface.

1. Finish: **ASTM A480/A480M, No. 2D (dull, cold rolled)**.
 - a. Surface Preparation: Remove tool and die marks and stretch lines, or blend into finish.

2.3 MISCELLANEOUS MATERIALS

- A. General: Provide materials and types of fasteners, **solder**, protective coatings, sealants, and other miscellaneous items as required for complete sheet metal flashing and trim installation and as recommended by manufacturer of primary sheet metal **or manufactured item** 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 **or manufactured item**.
 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. Provide metal-backed EPDM or PVC sealing washers under heads of exposed fasteners bearing on weather side of metal.
 - 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 Stainless Steel Sheet: Series 300 stainless steel.
- C. Solder:
 1. For Stainless Steel: ASTM B32, **Grade Sn96**, with acid flux of type recommended by stainless steel sheet manufacturer.
- D. Sealant Tape: Pressure-sensitive, 100 percent solids, polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape **1/2 inch (13 mm)** wide and **1/8 inch (3 mm)** thick.
- E. Elastomeric Sealant: ASTM C920, elastomeric **polyurethane** polymer sealant; of type, grade, class, and use classifications required to seal joints in sheet metal flashing and trim and remain watertight.
- F. Butyl Sealant: ASTM C1311, 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 in accordance with ASTM D1187/D1187M.

2.4 FABRICATION, GENERAL

- A. Custom fabricate sheet metal flashing and trim to comply with details indicated and recommendations in cited sheet metal standard that apply to design, dimensions, geometry, metal thickness, and other characteristics of item required.
 1. Fabricate sheet metal flashing and trim in shop to greatest extent possible.

2. Fabricate sheet metal flashing and trim in thickness or weight needed to comply with performance requirements, but not less than that specified for each application and metal.
3. Verify shapes and dimensions of surfaces to be covered and obtain field measurements for accurate fit before shop fabrication.
4. Form sheet metal flashing and trim to fit substrates without excessive oil-canning, buckling, and tool marks; true to line, levels, and slopes; and with exposed edges folded back to form hems.
5. Conceal fasteners and expansion provisions where possible. Do not use exposed fasteners on faces exposed to view.

B. Fabrication Tolerances:

Fabricate sheet metal flashing and trim that is capable of installation to a tolerance of **1/4 inch in 20 feet (6 mm in 6 m)** on slope and location lines indicated on Drawings and within **1/8-inch (3-mm)** offset of adjoining faces and of alignment of matching profiles.

C. Expansion Provisions: Form metal for thermal expansion of exposed flashing and trim.

1. Form expansion joints of intermeshing hooked flanges, not less than **1 inch (25 mm)** deep, filled with butyl sealant concealed within joints.
2. Use lapped expansion joints only where indicated on Drawings.

D. Sealant Joints: Where movable, nonexpansion-type joints are required, form metal in accordance with cited sheet metal standard to provide for proper installation of elastomeric sealant.

E. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal.

F. Fabricate cleats and attachment devices of sizes as recommended by cited sheet metal standard for application, but not less than thickness of metal being secured.

G. Seams:

1. Fabricate nonmoving seams with flat-lock seams. Form seams and seal with elastomeric sealant unless otherwise recommended by sealant manufacturer for intended use. **Rivet joints where necessary for strength and where indicated in Drawings.**

H. Do not use graphite pencils to mark metal surfaces.

2.5 WALL SHEET METAL FABRICATIONS

A. Through-Wall Flashing: Fabricate continuous flashings in minimum **96-inch- (2400-mm-)** long, but not exceeding **12-foot- (3.6-m-)** long, sections, under metal panels and copings as indicated. Fabricate discontinuous lintel, sill, shelf angles and similar flashings to extend **6 inches (150 mm)** beyond each side of wall openings; and form with **2-inch- (50-mm-)** high, end dams. Fabricate from the following materials:

1. Stainless Steel: 0.019 inch thick, min.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with installer present, for compliance with requirements for installation tolerances, substrate, and other conditions affecting performance of the Work.
 - 1. Verify compliance with requirements for installation tolerances of substrates.
 - 2. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and securely anchored.
 - 3. Verify that air- or water-resistant barriers have been installed over sheathing or backing substrate to prevent air infiltration or water penetration.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION, GENERAL

- A. Install sheet metal flashing and trim to comply with details indicated and recommendations of cited sheet metal standard that apply to installation characteristics required unless otherwise indicated on Drawings.
 - 1. Install fasteners, **solder**, protective coatings, separators, sealants, and other miscellaneous items as required to complete sheet metal flashing and trim system.
 - 2. Install sheet metal flashing and trim true to line, levels, and slopes. Provide uniform, neat seams with minimum exposure of **solder, welds, and sealant**.
 - 3. Anchor sheet metal flashing and trim and other components of the Work securely in place, with provisions for thermal and structural movement.
 - 4. Install sheet metal flashing and trim to fit substrates and to result in watertight performance.
 - 5. **Install continuous cleats** with fasteners spaced not more than **12 inches (300 mm)** o.c.
 - 6. Install exposed sheet metal flashing and trim with no oil-canning, and free of buckling and tool marks.
 - 7. Do not field cut sheet metal flashing and trim by torch.
 - 8. Do not use graphite pencils to mark metal surfaces.
- B. Metal Protection: Where dissimilar metals contact each other, or where metal contacts pressure-treated wood or other corrosive substrates, protect against galvanic action or corrosion by painting contact surfaces with bituminous coating or by other permanent separation as recommended by sheet metal manufacturer or cited sheet metal standard.
 - 1. Coat concealed side of **stainless steel** sheet metal flashing and trim with bituminous coating where flashing and trim contact wood, ferrous metal, or cementitious construction.
 - 2. Underlayment: Where installing sheet metal flashing and trim directly on cementitious or wood substrates, install underlayment and cover with slip sheet.
- C. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim.
 - 1. Space movement joints at maximum of **10 feet (3 m)** with no joints within **24 inches (600 mm)** of corner or intersection.
 - 2. Form expansion joints of intermeshing hooked flanges, not less than **1 inch (25 mm)** deep, filled with sealant concealed within joints.
 - 3. Use lapped expansion joints only where indicated on Drawings.

- D. Fasteners: Use fastener sizes that penetrate **substrate not less than recommended by fastener manufacturer to achieve maximum pull-out and pull over resistance and as required for performance.**
- E. Conceal fasteners and expansion provisions where possible in exposed work and locate to minimize possibility of leakage. Cover and seal fasteners and anchors for a weather tight installation.
- F. Seal joints as required for watertight construction.
 - 1. Use sealant-filled joints unless otherwise indicated.
 - a. Embed hooked flanges of joint members not less than **1 inch (25 mm)** into sealant.
 - b. Form joints to completely conceal sealant.
 - c. When ambient temperature at time of installation is between **40 and 70 deg F (4 and 21 deg C)**, set joint members for 50 percent movement each way.
 - d. Adjust setting proportionately for installation at higher ambient temperatures.
 - 1) Do not install sealant-type joints at temperatures below **40 deg F (4 deg C)**.
 - 2. Prepare joints and apply sealants to comply with requirements in Section 079200 "Joint Sealants."
- G. Soldered Joints: Clean surfaces to be soldered, removing oils and foreign matter.
 - 1. Pretin edges of sheets with solder to width of **1-1/2 inches (38 mm)**; however, reduce pretinning where pretinned surface would show in completed Work.
 - 2. Do not use torches for soldering.
 - 3. Heat surfaces to receive solder, and flow solder into joint.
 - a. Fill joint completely.
 - b. Completely remove flux and spatter from exposed surfaces.
 - 4. Stainless Steel Soldering:
 - a. Tin edges of uncoated sheets, using solder for stainless steel and acid flux.
 - b. Promptly remove acid-flux residue from metal after tinning and soldering.
 - c. Comply with solder manufacturer's recommended methods for cleaning and neutralization.
- H. Rivets: Rivet joints in where necessary for strength **and as indicated in Drawings.**

3.3 INSTALLATION OF WALL FLASHINGS

- A. Install sheet metal wall flashing to intercept and exclude penetrating moisture in accordance with cited sheet metal standard unless otherwise indicated. Coordinate installation of wall flashing with installation of wall-opening components such as windows, doors, and louvers.

3.4 INSTALLATION TOLERANCES

- A. Installation Tolerances: Shim and align sheet metal flashing and trim within installed tolerance of **1/4 inch in 20 feet (6 mm in 6 m)** on slope and location lines indicated on Drawings and within **1/8-inch (3-mm)** offset of adjoining faces and of alignment of matching profiles.

3.5 CLEANING

- A. Clean exposed metal surfaces of substances that interfere with uniform oxidation and weathering.
- B. Clean and neutralize flux materials. Clean off excess solder.
- C. Clean off excess sealants.

3.6 PROTECTION

- A. Remove temporary protective coverings and strippable films as sheet metal flashing and trim are installed unless otherwise indicated in manufacturer's written installation instructions.
- B. On completion of sheet metal flashing and trim installation, remove unused materials and clean finished surfaces as recommended in writing by sheet metal flashing and trim manufacturer.
- C. Maintain sheet metal flashing and trim in clean condition during construction.
- D. Replace sheet metal flashing and trim that have been damaged or that have deteriorated beyond successful repair by finish touchup or similar minor repair procedures, as determined by Architect.

END OF SECTION 076200

SECTION 077100- ROOF SPECIALTIES

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including the Conditions of the Contract and Division 01 Specification Sections apply to this section.

1.2 SUMMARY

- A. Provide all labor, equipment, and materials to fabricate and install the following.
 - 1. Coping cap or fascia system at roof edge following wall reconstruction
- B. Related Sections:
 - 1. Division 07 Section Common Work Results for Thermal and Moisture Protection
- C. Related Work Specified Elsewhere:
 - 1. Division 07 Section - Membrane Roofing Cutting and Patching

1.3 REFERENCES

- A. American Society for Testing and Materials (ASTM)
 - 1. ASTM A653 Standard Specification for Steel Sheet, Zinc-Coated (galvanized) or Zinc-Iron Alloy-Coated (galvannealed) by the Hot-Dip Process.
 - 2. ASTM A792 Standard Specification for Steel Sheet, 55% Aluminum-Zinc Alloy Coated by the Hot-Dip Process.
 - 3. ASTM B209 Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
 - 4. ASTM B221 Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
- B. American National Standards Institute and Single Ply Roofing Institute (ANSI/SPRI)
 - 1. ANSI/SPRI ES-1 Testing and Certification Listing of Shop Fabricated Edge Metal
- C. Warnock Hersey International, Inc., Middleton, WI (WH)
- D. Factory Mutual Research Corporation (FMRC)
 - 1. FM 1-49 Loss Prevention Data Sheet
- E. Underwriters Laboratories (UL)
- F. Sheet Metal and Air Conditioning Contractors National Association (SMACNA)
 - 1. 1993 Edition Architectural Sheet Metal Manual

- G. National Roofing Contractors Association (NRCA)
 - 1. Roofing and Waterproofing Manual
- H. American Society of Civil Engineers (ASCE)
 - 1. ASCE 7 Minimum Design Loads for Buildings and Other Structures

1.4 SUBMITTALS FOR REVIEW

- A. Product Data:
 - 1. Provide manufacturer's specification data sheets for each product.
 - 2. Metal material characteristics and installation recommendations.
 - 3. Submit color chart prior to material ordering and/or fabrication so that equivalent colors to those specified can be approved.
- B. Samples: Submit two (2) samples, illustrating typical products to be used for the project (metal edge, coping, gutters, fascia extenders) for material and finish.
- C. Shop Drawings
 - 1. For manufactured and ANSI/SPRI ES-1 compliant shop fabricated gravel stops, fascia, scuppers, and all other sheet metal fabrications.
 - 2. Indicate material profile, jointing details, fastening methods, flashing, terminations, and installation details.
 - 3. Indicate type, gauge and finish of metal
- D. Specimen Warranty: Provide an unexecuted copy of the warranty specified for this Project, identifying the terms and conditions required of the Manufacturer and the Owner.

1.5 SUBMITTALS FOR INFORMATION

- A. Factory Mutual Research Corporation's (FMRC) wind uplift resistance classification: The roof perimeter flashing shall conform to the requirements as defined by the FMRC Loss Prevention Data Sheet 1-49.
- B. A letter from the manufacturing company certifying that the materials furnished for this project are the same as represented in tests and supporting data.
- C. Mill production reports certifying that the steel thicknesses are within allowable tolerances of the nominal or minimum thickness or gauge specified.
- D. Certification of work progress inspection. Refer to Quality Assurance Article below.
- E. Certifications.
 - 1. Submit roof manufacturer's certification that metal fasteners furnished are acceptable to roof manufacturer.
 - 2. Submit roof manufacturer's certification that metal furnished is acceptable to roofing manufacturer as a component of roofing system and is eligible for roof manufacturer's system warranty.

1.6 CONTRACT CLOSEOUT SUBMITTALS

- A. General: Comply with Requirements of Section 01 78 00 – Closeout Submittals
- B. Special Project Warranty: Provide specified warranty for the Project, executed by the authorized agent of the Manufacturer.
- C. Roofing Maintenance Instructions. Provide a manual of manufacturer’s recommendations for maintenance of installed roofing systems.
- D. Insurance Certification: Assist Owner in preparation and submittal of roof installation acceptance certification as may be necessary in connection with fire and extended coverage insurance on roofing and associated work.

1.7 QUALITY ASSURANCE

- A. Engage an experienced roofing contractor specializing in sheet metal flashing work with a minimum of five (5) years experience.
- B. Maintain a full-time supervisor/foreman who is on the job-site at all times during installation. Foreman must have a minimum of five (5) years experience with the installation of similar system to that specified.
- C. Source Limitation: Obtain components from a single manufacturer. Secondary products which cannot be supplied by the specified manufacturer shall be approved in writing by the primary manufacturer prior to bidding.
- D. Upon request fabricator/installer shall submit work experience and evidence of financial responsibility. The Owner’s representative reserves the right to inspect fabrication facilities in determining qualifications.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials in manufacturer’s original, unopened containers or packages with labels intact and legible.
- B. Stack pre-formed and pre-finished material to prevent twisting, bending, or abrasion, and to provide ventilation. Slope metal sheets to ensure drainage.
- C. Prevent contact with materials which may cause discoloration or staining.

1.9 MANUFACTURERS QUALIFICATIONS / ALTERNATE MANUFACTURERS:

- A. The materials outlined are the type of materials to be used on this project. Please refer to Specification Section 013300, “Submittal Procedures.” “Or Equal” substitutions are permitted so long as they are equal to or superior to the basis of design and the Contractor takes full responsibility for all coordination and costs associated with collateral issues related to the substitution. No Substitutions will be reviewed during the bidding process. The Contractor takes full responsibility for all substitutions. Substitution submittals shall be made no later than 30 days after Notice to Proceed in

order to provide time for comparison review. All submittals after 30 days shall be in strict accordance with the basis of design / specified products. No Substitutions will be considered after 30 days. The following manufacturer criteria must be submitted with the substitution request.

1.10 PROJECT CONDITIONS

- A. Determine that work of other trades will not hamper or conflict with necessary fabrication and storage requirements for pre-formed metal edge system.

1.11 DESIGN AND PERFORMANCE CRITERIA

- A. Thermal expansion and contraction:
 - 1. Completed metal edge flashing system, shall be capable of withstanding expansion and contraction of components caused by changes in temperature without buckling, producing excess stress on structure, anchors or fasteners, or reducing performance ability.
- B. Uniform Wind Uplift Load Capacity
 - 1. Installed metal coping system shall withstand negative (uplift) design wind loading pressures complying with the following criteria:
 - a. Wind Loads: Calculated in accordance with ASCE 7-16 Components and Cladding with parameters provided in load schedule in Drawings.
 - b. Wall Heights: As indicated in Drawings.

1.12 WARRANTIES

- A. Owner shall receive one (1) warranty from manufacturer of roofing materials covering all of the following criteria. Multiple warranties are not acceptable.
 - 1. Pre-finished metal material shall require a written thirty (30)- year non-prorated warranty covering fade, chalking and film integrity. The material shall not show a color change greater than 5 NBS color units per ASTM D2244 or chalking excess of 8 units per ASTM D659. If either occurs material shall be replaced per warranty, at no cost to the Owner.
 - 2. Changes: Changes or alterations in the edge metal system without prior written consent from the manufacturer shall render the system unacceptable for a warranty.
 - 3. Warranty shall commence on date of substantial completion or final payment, whichever is agreed by contract.
 - 4. The Contractor shall provide the Owner with a notarized written warranty assuring that all sheet metal work including caulking and fasteners to be watertight and secure for a period of two years from the date of final acceptance of the building. Warranty shall include all materials and

workmanship required to repair any leaks that develop, and make good any damage to other work or equipment caused by such leaks or the repairs thereof.

5. Installing roofing contractor shall be responsible for the installation of the edge metal system in general accordance with the membrane manufacturer's recommendations.
6. Installing contractor shall certify that the edge metal system has been installed per the manufacturer's printed details and specifications.

PART 2 – PRODUCTS

2.1 PRODUCTS, GENERAL

- A. Refer to Division 01 Section “Common Product Requirements.”
- B. Basis of Design: Materials, manufacturer's product designations, and/or manufacturer's names specified herein shall be regarded as the minimum standard of quality required for work of this Section. Comply with all manufacturer and contractor/fabricator quality and performance criteria specified in Part 1.
- C. Substitutions: Products proposed as equal to the products specified in this Section shall be submitted in accordance with Bidding Requirements and Division 01 provisions.
 1. Proposals shall be accompanied by a copy of the manufacturer's standard specification section.
 2. Include a list of three (3) projects of similar type and extent, located within a one hundred mile radius from the location of the project. In addition, the three projects must be at least five (5) years old and be available for inspection by the Architect, Owner or Owner's Representative.
 3. Equivalency of performance criteria, warranty terms, submittal procedures, and contractual terms will constitute the basis of acceptance.
 4. The Owner's decision regarding substitutions will be considered final. Unauthorized substitutions will be rejected.

2.2 MANUFACTURERS

- A. The Garland Company,
- B. Or approved equal.

2.3 MATERIALS

- A. General: Product designations for the materials used in this section shall be based on performance characteristics of the R-Mer_ metal edge system manufactured by The Garland Company, Cleveland, OH, and shall form the basis of the contract documents.

- B. Materials: Minimum gauge of steel or thickness of Aluminum to be specified in accordance with Architectural Sheet Metal Manual, Sheet Metal and Air Conditioning Contractor’s National Association, Inc. recommendations.
- C. R-Mer Edge Coping Cap Cover and Splice Plate
 - 1. Aluminum, ASTM B209, alloy 3105-H14, in thickness of .050” nom.
- D. R-Mer Edge Coping Chairs
 - 1. Zinc-coated steel, ASTM A653, coating designation G-90, in thickness of 0.0635 nom./ 16 gauge, 36” to 48” by coil length, chemically treated, commercial or lock-forming quality.
- E. Finishes
 - 1. Exposed surfaces for coated panels:
 - a. Steel Finishes: fluorocarbon finish. Epoxy primer baked both sides, .2-.25 mils thickness as approved by finish coat manufacturer. Weathering finish as referred by National Coil Coaters Association (NCCA).

<u>PROPERTY</u>	<u>TEST METHOD</u>	<u>FLUOROCARBON*</u>
Pencil Hardness	ASTM D3363 NCCA II-2	HB-H
Bend	ASTM D-4145 NCCA II-19	O-T
Cross-Hatch Adhesion	ASTM D3359	no loss of adhesion
Gloss (60° angle)	ASTM D523	25+/-5%
Reverse	ASTM D2794	no cracking or loss of Impact adhesion
Nominal Thickness	ASTM D1005	
Primer		0.2 mils
Topcoat		0.7 mils min
Clear Coat (optional, only to be used with 22 gauge steel)		0.3 mils

*Subject to minimum quantity requirements

- a. Color shall be as specified

1. Exposed and unexposed surfaces for mill finish flashing, fascia, and coping cap, shall be as shipped from the mil

2.4 RELATED MATERIALS AND ACCESSORIES

- A. Metal Primer: Zinc chromate type.
- B. Plastic Cement: ASTM D 4586
- C. Sealant: Specified in Section 07900 or on drawings.
- D. Self-Adhering Underlayment, one of the following:
 1. 60 mil minimum transition strip
 2. 45 mil high temperature underlayment with cross laminated polymer surface
- E. Fasteners:
 1. Corrosion resistant screw fastener as recommended by metal manufacturer. Finish exposed fasteners same as flashing metal.
 2. Fastening shall conform to Factory Mutual requirements or as stated on section details, whichever is more stringent.

PART 3 – EXECUTION

2. EXECUTION, GENERAL

- A. Refer to Division 07 Section Common Work Results for Thermal and Moisture Protection.

3. PROTECTION

- A. Isolate metal products from dissimilar metals, masonry or concrete with bituminous paint, tape, or slip sheet. Use gasketed fasteners where required to prevent corrosive reactions.

4. GENERAL

- A. Secure fascia to wood nailers at the bottom edge with a continuous cleat.
- B. Fastening of metal to walls and wood blocking shall comply with building code standards.
- C. All accessories or other items essential to the completeness of sheet metal installation, whether specifically indicated or not, shall be provided and of the same material as item to which applied.
- D. Allow sufficient clearances for expansion and contraction of linear metal components. Secure metal using fasteners as required by the system. Exposed face fastening will be rejected.

5. INSPECTION

- A. Verify that curbs are solidly set and nailing strips located.
 - B. Perform field measurements prior to fabrication.
 - C. Coordinate work with work of other trades.
 - D. Verify that substrate is dry, clean and free of foreign matter.
 - E. Commencement of installation shall be considered acceptance of existing conditions.
6. MANUFACTURED SHEET METAL SYSTEMS
- A. Furnish and install manufactured fascia and coping cap systems in strict accordance with manufacturer's printed instructions.
 - B. Provide factory-fabricated accessories including, but not limited to, fascia extenders, miters, scuppers, joint covers, etc. refer to Source limitation provision in Part 1.
7. SHOP-FABRICATED SHEET METAL
- A. Metal work shall be shop fabricated to configurations and forms in accordance with recognized sheet metal practices.
 - B. Hem exposed edges.
 - C. Angle bottom edges of exposed vertical surfaces to form drip.
 - D. Lap corners with adjoining pieces fastened and set in sealant.
 - E. Form joints for gravel stop fascia system, coping cap with a 3/8" opening between sections. Back the opening with an internal drainage plate formed to the profile of fascia piece.
 - F. Install sheet metal to comply with referenced ANSI/SPRI, SMACNA and NRCA standards.
8. FLASHING MEMBRANE INSTALLATION
- A. Snap-On Coping Cap Detail
 - 1. Install Miters first.
 - 2. Position base flashing of the Built-Up and/or Modified Roofing membrane over the wall edge covering nailers completely, fastening eight (8) inches on center. Install membrane and cap sheet with proper material and procedure according to manufacturer's recommendations.
 - 3. Install minimum sixteen (16) gauge, sixteen (16) inch long by specified width anchor chair at 60" or 40" on center, according to manufacturer's design requirements.
 - 4. Install six (6) inch wide splice plate by centering over sixteen (16) inch long by specified width anchor chair. Apply two beads of sealant to either side of the splice plate's center. Approximately two (2) inches from the coping cap

joint. Install Coping Cap by hooking outside hem of coping on outside face of anchor chair. Press downward on inside edge of coping until “snap” occurs and hem is engaged on the entire chair.

9. CLEANING

- A. Clean installed work in accordance with the manufacturer’s instructions.
- B. Replace damaged work than cannot be restored by normal cleaning methods.

10. CONSTRUCTION WASTE MANAGEMENT

- A. Remove and properly dispose of waste products generated. Comply with requirements of authorities having jurisdiction.

11. FINAL INSPECTION

- A. At completion of installation and associated work, meet with Contractor, Architect, installer, installer of associated work, Owner, roofing system manufacturer’s representative, and other representatives directly concerned with performance of roofing system.
- B. Inspect work and flashing of roof penetrations, walls, curbs, and other equipment. List all items requiring correction or completion and furnish copy of list to each party in attendance.
- C. Repair or replace deteriorated or defective work found at time above inspection as required to a produce an installation which is free of damage and deterioration at time of Substantial Completion and according to warranty requirements.
- D. Notify the Architect upon completion of corrections.
- E. Following the final inspection, provide written notice of acceptance of the installation from the roofing system manufacturer.
- F. Immediately correct roof leakage during construction. If the Contractor does not respond within twenty-four (24) hours, the Owner will exercise rights to correct the Work under the terms of the Conditions of the Contract.

12. DEMONSTRATION AND TRAINING

- A. At a time and date agreed to by the Owner, instruct the Owner’s facility manager, or other representative designated by the Owner, on the following procedures:
 - 1. Troubleshooting procedures
 - 2. Notification procedures for reporting leaks or other apparent roofing problems
 - 3. Maintenance
 - 4. The Owner’s obligations for maintaining the warranty in effect and force
 - 5. The Manufacturer’s obligations for maintaining the warranty in effect and force.

END OF SECTION 077100

SECTION 079200 - JOINT SEALANTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:

- 1. Nonstaining silicone joint sealants.
- 2. Urethane joint sealants.
- 3. Latex joint sealants.

- B. Related Requirements:

- 1. Section 042000 "Unit Masonry" for masonry control and expansion joint fillers and gaskets.

1.3 ACTION SUBMITTALS

- A. Product Data: For each joint-sealant product.

- B. Samples for Initial Selection: Manufacturer's color charts consisting of strips of cured sealants showing the full range of colors available for each product exposed to view.

- C. Samples for Verification: For each kind and color of joint sealant required, provide Samples with joint sealants in **1/2-inch-wide** joints formed between two **6-inch-long** strips of material matching the appearance of exposed surfaces adjacent to joint sealants.

- D. Joint-Sealant Schedule: Include the following information:

- 1. Joint-sealant application, joint location, and designation.
- 2. Joint-sealant manufacturer and product name.
- 3. Joint-sealant formulation.
- 4. Joint-sealant color.

1.4 INFORMATIONAL SUBMITTALS

- A. Product Test Reports: For each kind of joint sealant, for tests performed by a qualified testing agency.

- B. Sample Warranties: For special warranties.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: An authorized representative who is trained and approved by manufacturer.
- B. Product Testing: Test joint sealants using a qualified testing agency.
 - 1. Testing Agency Qualifications: Qualified according to ASTM C 1021 to conduct the testing indicated.

1.6 FIELD CONDITIONS

- A. Do not proceed with installation of joint sealants under the following conditions:
 - 1. When ambient and substrate temperature conditions are outside limits permitted by joint-sealant manufacturer.
 - 2. When joint substrates are wet.
 - 3. Where joint widths are less than those allowed by joint-sealant manufacturer for applications indicated.
 - 4. Where contaminants capable of interfering with adhesion have not yet been removed from joint substrates.

1.7 WARRANTY

- A. Special Installer's Warranty: Installer agrees to repair or replace joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.
 - 1. Warranty Period: 5 years from date of Substantial Completion.
- B. Special Manufacturer's Warranty: Manufacturer agrees to furnish joint sealants to repair or replace those joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.
 - 1. Warranty Period: 10 years from date of Substantial Completion.
- C. Special warranties specified in this article exclude deterioration or failure of joint sealants from the following:
 - 1. Movement of the structure caused by stresses on the sealant exceeding sealant manufacturer's written specifications for sealant elongation and compression.
 - 2. Disintegration of joint substrates from causes exceeding design specifications.
 - 3. Mechanical damage caused by individuals, tools, or other outside agents.
 - 4. Changes in sealant appearance caused by accumulation of dirt or other atmospheric contaminants.

2.1 JOINT SEALANTS, GENERAL

- A. Compatibility: Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by joint-sealant manufacturer, based on testing and field experience.
- B. VOC Content of Interior Sealants: Sealants and sealant primers used inside the weatherproofing system shall comply with the following:
 - 1. Sealants and sealant primers for nonporous substrates shall have a VOC content of 250 g/L or less.
- C. Colors of Exposed Joint Sealants: As selected by Architect from manufacturer's full range.
 - 1. Match metal color when installed between two metal materials of the same color.
 - 2. Match the darker of two metals when installed between metal materials of dissimilar color.
 - 3. Match brick masonry when installed in existing brick masonry vertical joints.
 - 4. Match mortar when installed in existing brick masonry horizontal joints.

2.2 NONSTAINING SILICONE JOINT SEALANTS

- A. Nonstaining Joint Sealants: No staining of substrates when tested according to ASTM C 1248.
- B. Silicone, Nonstaining, S, NS, 100/50, NT: Nonstaining, single-component, nonsag, plus 100 percent and minus 50 percent movement capability, nontraffic-use, neutral-curing silicone joint sealant; ASTM C 920, Type S, Grade NS, Class 100/50, Use NT.

2.3 URETHANE JOINT SEALANTS

- A. Urethane, S, NS, 100/50, T, NT: Single-component, nonsag, plus 100 percent and minus 50 percent movement capability, traffic- and nontraffic-use, urethane joint sealant; ASTM C 920, Type S, Grade NS, Class 100/50, Uses T and NT.

2.4 BUTYL JOINT SEALANTS

- A. Butyl-Rubber-Based Joint Sealants: ASTM C 1311.

2.5 JOINT-SEALANT BACKING

- A. Sealant Backing Material, General: Nonstaining; compatible with joint substrates, sealants, primers, and other joint fillers; and approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.

- B. Cylindrical Sealant Backings: ASTM C 1330, Type C (closed-cell material with a surface skin), and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance.
- C. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint-filler materials or joint surfaces at back of joint. Provide self-adhesive tape where applicable.

2.6 MISCELLANEOUS MATERIALS

- A. Primer: Material recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.
- B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming joint substrates and adjacent nonporous surfaces in any way, and formulated to promote optimum adhesion of sealants to joint substrates.
- C. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.
- D. Expansion Joint Filler: Provide expansion joints in concrete pavement surfaces as indicated in Drawings. Premoulded ASTM D 1751, 1/2inch thick unless otherwise indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions and the following requirements:
 - 1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.
 - 2. Clean porous joint substrate surfaces by brushing, grinding, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining after cleaning

operations above by vacuuming or blowing out joints with oil-free compressed air. Porous joint substrates include the following:

- a. Concrete.
 - b. Masonry.
3. Remove laitance and form-release agents from concrete.
 4. Clean nonporous joint substrate surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants. Nonporous joint substrates include the following:
 - a. Metal.
 - b. Glass.
- B. Joint Priming: Prime joint substrates where recommended by joint-sealant manufacturer or as indicated by preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.
- C. Masking Tape: Use masking tape where required to prevent contact of sealant or primer with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

3.3 INSTALLATION OF JOINT SEALANTS

- A. General: Comply with joint-sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.
- B. Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.
- C. Install sealant backings of kind indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
 1. Do not leave gaps between ends of sealant backings.
 2. Do not stretch, twist, puncture, or tear sealant backings.
 3. Remove absorbent sealant backings that have become wet before sealant application, and replace them with dry materials.
- D. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.
- E. Install sealants using proven techniques that comply with the following and at the same time backings are installed:
 1. Place sealants so they directly contact and fully wet joint substrates.
 2. Completely fill recesses in each joint configuration.

3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.
- F. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified in subparagraphs below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.
1. Remove excess sealant from surfaces adjacent to joints.
 2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
 3. Provide concave joint profile per Figure 8A in ASTM C 1193 unless otherwise indicated.
 4. Provide flush joint profile at locations indicated on Drawings according to Figure 8B in ASTM C 1193.
 5. Provide recessed joint configuration of recess depth and at locations indicated on Drawings according to Figure 8C in ASTM C 1193.
 - a. Use masking tape to protect surfaces adjacent to recessed tooled joints.

3.4 CLEANING

- A. Clean off excess sealant or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

3.5 PROTECTION

- A. Protect joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out, remove, and repair damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from original work.

3.6 JOINT-SEALANT SCHEDULE

- A. Joint-Sealant Application: Exterior joints in vertical surfaces and horizontal nontraffic surfaces.
1. Joint Locations:
 - a. Construction joints in cast-in-place concrete.
 - b. Control and expansion joints in unit masonry.
 - c. Joints between metal panels.
 - d. Joints between different materials listed above.
 - e. Perimeter joints between materials listed above and frames of doors, windows, and louvers.
 - f. Control and expansion joints in and other.
 - g. Other joints as indicated on Drawings.

2. Joint Sealant: Elastomeric Polyurethane, S, NS, 100/50, T, NT: or Silicone, nonstaining, S, NS, 50, NT as required by product manufacturer
 3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.
- B. Joint-Sealant Application: Interior joints in horizontal traffic surfaces.
1. Joint Locations:
 - a. Isolation joints in cast-in-place concrete slabs.
 - b. Control and expansion joints in tile flooring.
 - c. Other joints as indicated on Drawings.
 2. Joint Sealant: Urethane, S, P, 25, T, NT.
 3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.
- C. Joint-Sealant Application: Interior joints in vertical surfaces and horizontal nontraffic surfaces.
1. Joint Locations:
 - a. Control and expansion joints on exposed interior surfaces of exterior walls.
 - b. Joints on underside of plant-precast structural concrete planks.
 - c. Other joints as indicated on Drawings.
 2. Joint Sealant: Urethane, S, NS, 25, NT.
 3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.
- D. Joint-Sealant Application: Interior joints in vertical surfaces and horizontal nontraffic surfaces not subject to significant movement.
1. Joint Locations:
 - a. Control joints on exposed interior surfaces of exterior walls.
 - b. Perimeter joints between interior wall surfaces and frames of interior doors and windows.
 - c. Other joints as indicated on Drawings.

END OF SECTION 079200

SECTION 081113 - HOLLOW METAL FRAMES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Standard and custom hollow metal frames.

B. Related Sections:

1. Division 08 Section "Flush Wood Doors".
2. Division 08 Section "Door Hardware".

C. Codes and References: Comply with the version year adopted by the Authority Having Jurisdiction.

1. ANSI/SDI A250.8 - Recommended Specifications for Standard Steel Doors and Frames.
2. ANSI/SDI A250.4 - Test Procedure and Acceptance Criteria for Physical Endurance for Steel Doors, Frames, Frames Anchors and Hardware Reinforcing.
3. ANSI/SDI A250.6 - Recommended Practice for Hardware Reinforcing on Standard Steel Doors and Frames.
4. ANSI/SDI A250.10 - Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames.
5. ANSI/SDI A250.11 - Recommended Erection Instructions for Steel Frames.
6. ASTM A1008 - Standard Specification for Steel Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability.
7. ASTM A653 - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
8. ASTM A924 - Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process.
9. ASTM C 1363 - Standard Test Method for Thermal Performance of Building Assemblies by Means of a Hot Box Apparatus.
10. ANSI/BHMA A156.115 - Hardware Preparation in Steel Doors and Frames.
11. ANSI/SDI 122 - Installation and Troubleshooting Guide for Standard Steel Doors and Frames.
12. ANSI/NFPA 80 - Standard for Fire Doors and Fire Windows; National Fire Protection Association.
13. ANSI/NFPA 105: Standard for the Installation of Smoke Door Assemblies.
14. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies; National Fire Protection Association.
15. UL 10C - Positive Pressure Fire Tests of Door Assemblies.
16. UL 1784 - Standard for Air Leakage Tests of Door Assemblies.

1.2 SUBMITTALS

- A. Product Data: For each type of product indicated. Include construction details, material descriptions, core descriptions, hardware reinforcements, profiles, anchors, fire-resistance rating, and finishes.
- B. Door hardware supplier is to furnish templates, template reference number and/or physical hardware to the steel door frame supplier in order to prepare the frames to receive the finish hardware items.
- C. Shop Drawings: Include the following:
 - 1. Frame details for each frame type, including dimensioned profiles and metal thicknesses.
 - 2. Locations of reinforcement and preparations for hardware.
 - 3. Details of anchorages, joints, field splices, and connections.
 - 4. Details of accessories.
 - 5. Details of moldings, removable stops, and glazing.
 - 6. Details of conduit and preparations for power, signal, and control systems.
- D. Samples for Verification:
 - 1. Samples are only required by request of the architect and for manufacturers that are not current members of the Steel Door Institute.

1.3 QUALITY ASSURANCE

- A. Source Limitations: Obtain hollow metal door frames through one source from a single manufacturer wherever possible.
- B. Quality Standard: In addition to requirements specified, comply with ANSI/SDI A250.8, latest edition, "Recommended Specifications for Standard Steel Doors and Frames".

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Deliver hollow metal work palletized, wrapped, or crated to provide protection during transit and Project site storage. Do not use non-vented plastic.
- B. Deliver welded frames with two removable spreader bars across bottom of frames, tack welded to jambs and mullions.
- C. Store hollow metal work under cover at Project site. Place in stacks of five units maximum in a vertical position with heads up, spaced by blocking, on minimum 4-inch high wood blocking. Do not store in a manner that traps excess humidity.
 - 1. Provide minimum 1/4-inch space between each stacked door to permit air circulation. Door and frames to be stacked in a vertical upright position.

1.5 PROJECT CONDITIONS

- A. Field Measurements: Verify actual dimensions of openings by field measurements before fabrication.

1.6 COORDINATION

- A. Coordinate installation of anchorages for hollow metal frames. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors. Deliver such items to Project site in time for installation.

1.7 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace frames that fail in materials or workmanship within specified warranty period.
- B. Warranty includes installation and finishing that may be required due to repair or replacement of defective door frames.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, Commercial Steel (CS), Type B; suitable for exposed applications.
- B. Metallic-Coated Steel Sheet: ASTM A 653/A 653M, Commercial Steel (CS), Type B; with minimum G60 (Z180) or A60 (ZF180) metallic coating.
- C. Frame Anchors: ASTM A 653/A 653M, Commercial Steel (CS), Commercial Steel (CS), Type B; with minimum G60 (Z180) or A60 (ZF180) metallic coating.

2.2 HOLLOW METAL FRAMES

- A. General: Comply with ANSI/SDI A250.8 and with details indicated for type and profile.
- B. Thermal Break Frames: Subject to the same compliance standards and requirements as standard hollow metal frames. Tested for thermal performance in accordance with NFRC 102, and resistance to air infiltration in accordance with NFRC 400. Where indicated provide thermally broken frame profiles available for use in both masonry and drywall construction. Fabricate with 1/16" positive thermal break and integral vinyl weatherstripping.
- C. Interior Frames: Fabricated from cold-rolled steel sheet that complies with ASTM A 1008/A 1008M.
 - 1. Fabricate frames with mitered or coped corners. Profile as indicated on drawings.
 - 2. Frames: Minimum 16 gauge (0.053-inch -1.3-mm) thick steel sheet.

3. Manufacturers Basis of Design:

a. Curries Company (CU) - M Series.

- D. Fire rated frames: Fabricate frames in accordance with NFPA 80, listed and labeled by a qualified testing agency, for fire-protection ratings indicated.
- E. Hardware Reinforcement: Fabricate according to ANSI/SDI A250.6 Table 4 with reinforcement plates from same material as frames.

2.3 FRAME ANCHORS

A. Jamb Anchors:

- 1. Masonry Type: Adjustable strap-and-stirrup or T-shaped anchors to suit frame size, formed from A60 metallic coated material, not less than 0.042 inch thick, with corrugated or perforated straps not less than 2 inches wide by 10 inches long; or wire anchors not less than 0.177 inch thick.
- 2. Stud Wall Type: Designed to engage stud and not less than 0.042 inch thick.

B. Floor Anchors: Floor anchors to be provided at each jamb, formed from A60 metallic coated material, not less than 0.042 inches thick.

C. Mortar Guards: Formed from same material as frames, not less than 0.016 inches thick.

2.4 ACCESSORIES

A. Mullions and Transom Bars: Join to adjacent members by welding or rigid mechanical anchors.

B. Grout Guards: Formed from same material as frames, not less than 0.016 inches thick.

2.5 FABRICATION

A. Fabricate hollow metal work to be rigid and free of defects, warp, or buckle. Accurately form metal to required sizes and profiles, with minimum radius for thickness of metal. Where practical, fit and assemble units in manufacturer's plant. When shipping limitations so dictate, frames for large openings are to be fabricated in sections for splicing or splining in the field by others.

B. Tolerances: Fabricate hollow metal work to tolerances indicated in ANSI/SDI A250.8.

C. Hollow Metal Frames:

- 1. Shipping Limitations: Where frames are fabricated in sections due to shipping or handling limitations, provide alignment plates or angles at each joint, fabricated of same thickness metal as frames.
- 2. Welded Frames: Weld flush face joints continuously; grind, fill, dress, and make smooth, flush, and invisible.

- a. Welded frames are to be provided with two steel spreaders temporarily attached to the bottom of both jambs to serve as a brace during shipping and handling. Spreader bars are for bracing only and are not to be used to size the frame opening.
 3. High Frequency Hinge Reinforcement: Provide high frequency hinge reinforcements at door openings 48-inches and wider with mortise butt type hinges at top hinge locations.
 4. Continuous Hinge Reinforcement: Provide welded continuous 12 gauge straps for continuous hinges specified in hardware sets in Division 08 Section "Door Hardware".
 5. Provide countersunk, flat- or oval-head exposed screws and bolts for exposed fasteners unless otherwise indicated for removable stops.
 6. Mortar Guards: Provide guard boxes at back of hardware mortises in frames at all hinges and strike preps regardless of grouting requirements.
 7. Floor Anchors: Weld anchors to bottom of jambs and mullions with at least four spot welds per anchor.
 8. Jamb Anchors: Provide number and spacing of anchors as follows:
 - a. Masonry Type: Locate anchors not more than 18 inches from top and bottom of frame. Space anchors not more than 32 inches o.c. and as follows:
 - 1) Two anchors per jamb up to 60 inches high.
 - 2) Three anchors per jamb from 60 to 90 inches high.
 - 3) Four anchors per jamb from 90 to 120 inches high.
 - 4) Four anchors per jamb plus 1 additional anchor per jamb for each 24 inches or fraction thereof above 120 inches high.
 - b. Stud Wall Type: Locate anchors not more than 18 inches from top and bottom of frame. Space anchors not more than 32 inches o.c. and as follows:
 - 1) Three anchors per jamb up to 60 inches high.
 - 2) Four anchors per jamb from 60 to 90 inches high.
 - 3) Five anchors per jamb from 90 to 96 inches high.
 - 4) Five anchors per jamb plus 1 additional anchor per jamb for each 24 inches or fraction thereof above 96 inches high.
 - 5) Two anchors per head for frames above 42 inches wide and mounted in metal stud partitions.
 9. Door Silencers: Except on weatherstripped or gasketed doors, drill stops to receive door silencers. Silencers to be supplied by frame manufacturer regardless if specified in Division 08 Section "Door Hardware".
 10. Bituminous Coating: Where frames are fully grouted with an approved Portland Cement based grout or mortar, coat inside of frame throat with a water based bituminous or asphaltic emulsion coating to a minimum thickness of 3 mils DFT, tested in accordance with UL 10C and applied to the frame under a 3rd party independent follow-up service procedure.
- D. Hardware Preparation: Factory prepare hollow metal work to receive template mortised hardware; include cutouts, reinforcement, mortising, drilling, and tapping according to the Door Hardware Schedule and templates furnished as specified in Division 08 Section "Door Hardware."
1. Locate hardware as indicated, or if not indicated, according to ANSI/SDI A250.8.
 2. Reinforce door frames to receive non-template, mortised and surface mounted door hardware.
 3. Comply with applicable requirements in ANSI/SDI A250.6 and ANSI/DHI A115 Series specifications for preparation of hollow metal work for hardware.

4. Coordinate locations of conduit and wiring boxes for electrical connections with Division 26 Sections.

2.6 STEEL FINISHES

- A. Factory Finish: Clean, degrease, pretreat, and apply manufacture's standard two-coat system consisting of prime coat and baked-on catalyzed acrylic paint thermosetting topcoat, complying with SDI A250.3
 1. Color and Gloss: As selected by Architect from manufacture's full range of gloss and colors.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. General Contractor to verify the accuracy of dimensions given to the steel door frame manufacturer for existing openings or existing frames (strike height, hinge spacing, hinge back set, etc.).
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Remove welded in shipping spreaders installed at factory. Restore exposed finish by grinding, filling, and dressing, as required to make repaired area smooth, flush, and invisible on exposed faces.
- B. Prior to installation, adjust and securely brace welded hollow metal frames for square, level, twist, and plumb condition.
- C. Tolerances shall comply with SDI-117 "Manufacturing Tolerances Standard Steel Doors and Frames."
- D. Drill and tap frames to receive non-template, mortised, and surface-mounted door hardware.

3.3 INSTALLATION

- A. General: Install hollow metal work plumb, rigid, properly aligned, and securely fastened in place; comply with Drawings and manufacturer's written instructions.
- B. Hollow Metal Frames: Install hollow metal frames of size and profile indicated. Comply with ANSI/SDI A250.11 and NFPA 80 at fire rated openings.

1. Set frames accurately in position, plumbed, leveled, aligned, and braced securely until permanent anchors are set. After wall construction is complete and frames properly set and secured, remove temporary braces, leaving surfaces smooth and undamaged. Shim as necessary to comply with installation tolerances.
 2. Floor Anchors: Provide floor anchors for each jamb and mullion that extends to floor, and secure with post-installed expansion anchors.
 3. Masonry Walls: Coordinate installation of frames to allow for solidly filling space between frames and masonry with mortar.
 4. Grout Requirements: Do not grout head of frames unless reinforcing has been installed in head of frame. Do not grout vertical or horizontal closed mullion members.
- C. Retrofit Existing Hollow Metal Door Frames: Patch existing openings in hollow metal door frames with metal plate (thickness to match existing frames); tack weld perimeter of plate, grind smooth to be flush with frame, and prep and paint per paint manufacture's recommendations. Color as selected by Architect.

3.4 ADJUSTING AND CLEANING

- A. Final Adjustments: Check and readjust operating hardware items immediately before final inspection. Leave work in complete and proper operating condition. Remove and replace defective work, including hollow metal work that is warped, bowed, or otherwise unacceptable.
- B. Remove grout and other bonding material from hollow metal work immediately after installation.
- C. Factory Finish Touchup: Touch up rusted or damaged factory finished areas per manufacturer's instructions.

END OF SECTION 081113

SECTION 081416 - FLUSH WOOD DOORS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Solid core doors with wood veneer faces.
2. Factory finishing wood doors.
3. Factory fitting wood doors to frames and factory machining for hardware.
4. Light frames and glazing installed in wood doors.

B. Standards and References: Comply with the version year adopted by the Authority Having Jurisdiction.

1. ANSI A117.1 - Accessible and Usable Buildings and Facilities.
2. ANSI A208.1 – Wood Particleboard.
3. Intertek Testing Service (ITS Warnock Hersey) - Certification Listings for Fire Doors.
4. NFPA 80 - Standard for Fire Doors and Fire Windows; National Fire Protection Association.
5. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies; National Fire Protection Association.
6. UL 10C - Positive Pressure Fire Tests of Door Assemblies; UL 1784 - Standard for Air Leakage Tests of Door Assemblies.
7. Window and Door Manufacturers Association - WDMA I.S.1-A Architectural Wood Flush Doors.

1.2 SUBMITTALS

A. Product Data: For each type of door indicated. Include details of core and edge construction, louvers, trim for openings, and WDMA I.S.1-A classifications. Include factory finishing specifications.

B. Shop Drawings shall include:

1. Indicate location, size, and hand of each door.
2. Indicate dimensions and locations of mortises and holes for hardware.
3. Indicate dimensions and locations of cutouts.
4. Indicate requirements for veneer matching.
5. Indicate location and extent of hardware blocking.
6. Indicate construction details not covered in Product Data.
7. Indicate doors to be factory finished and finish requirements.
8. Indicate fire protection ratings for fire rated doors.

- C. Samples for Initial Selection: For factory finished doors.
 - 1. Factory finishes applied to actual door face materials, approximately 8 by 10 inches, for each material and finish. For each wood species and transparent finish, provide set of three samples showing typical range of color and grain to be expected in the finished work.
 - 2. Corner sections of doors, 8 by 10 inches, with door faces and edges representing actual materials to be used.
 - a. Provide samples for each species of veneer and core material.
 - b. Finish veneer faced door samples with same materials proposed for factory finished doors.
 - 3. Frames for light openings, 6 inches long, for each material, type, and finish required.
- D. Warranty: Provide sample of manufacturer's warranty.

1.3 QUALITY ASSURANCE

- A. Source Limitations: Obtain flush wood doors through one source from a single manufacturer wherever possible.
- B. Quality Standard: In addition to requirements specified, comply with WDMA I.S.1-A, latest edition, "Industry Standard for Architectural Wood Flush Doors".
- C. Fire Rated Wood Doors: Doors complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated, based on testing at positive pressure according to NFPA 252 (neutral pressure at 40" above sill) or UL10C.
 - 1. Temperature Rise Limit: Where required and at vertical exit enclosures (stairwell openings) and exit passageways, provide doors that have a maximum transmitted temperature end point of not more than 450 deg F (250 deg C) above ambient after 30 minutes of standard fire test exposure.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Comply with requirements of referenced standard and manufacturer's written instructions.
- B. Package pre-finished doors individually in plastic bags and wrap bundles of doors in plastic sheeting.
- C. Mark each door on top rail with opening number used on Shop Drawings.

1.5 PROJECT CONDITIONS

- A. Environmental Limitations: Do not deliver or install doors until spaces are enclosed and weather tight, wet work in spaces is complete and dry, and HVAC system is operating and maintaining ambient temperature and humidity conditions at occupancy levels during the remainder of the construction period.

1.6 WARRANTY

- A. Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace doors that fail in materials or workmanship within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Warping (bow, cup, or twist) more than 1/4 inch in a 42-by-84-inch section.
 - b. Telegraphing of core construction in wood face veneers exceeding 0.01 inch in a 3-inch span.
 - 2. Warranty includes installation and finishing that may be required due to repair or replacement of defective doors.
 - 3. Warranty Period for Solid Core Interior Doors: Life of installation.

PART 2 - PRODUCTS

2.1 DOOR CONSTRUCTION – GENERAL

- A. WDMA I.S.1-A Performance Grade: Extra Heavy Duty; Aesthetic Grade: Premium.
- B. Fire Rated Doors: Provide construction and core as needed to provide fire ratings indicated.
 - 1. Category A Edge Construction: Provide fire rated door edge construction with intumescent seals concealed by outer stile (Category A) at 45, 60, and 90 minute rated doors. Comply with specified requirements for exposed edges.
 - 2. Pairs: Provide stiles with concealed intumescent seals. Comply with specified requirements for exposed edges.
 - a. Provide fire retardant stiles that are listed and labeled for applications indicated without formed steel edges and astragals.

2.2 CORE CONSTRUCTION

- A. Structural Composite Lumber Core Doors:
 - 1. Structural Composite Lumber: Engineered hardwood composite wood products tested in accordance with WDMA I.S.1A, Testing Cellulosic Composite Materials for Use in Fenestration Products containing no added Urea Formaldehyde.
- B. Particleboard Core Doors:
 - 1. Particleboard: Wood fiber based materials complying with ANSI A208.1 Particleboard standard. Grade LD-2.
 - 2. Adhesive: Fully bonded construction using Polyurethane (PUR) glue.
 - 3. Blocking: As indicated under article “Blocking”.
- C. Fire Resistant Composite Core Doors:

1. Core: Non-combustible mineral product complying with requirements of referenced quality standard and testing and inspecting agency for fire protection rating indicated.
2. Blocking: As indicated under article "Blocking".
3. Edge Construction: At hinge stiles, provide laminated edge construction with improved screw holding capability and split resistance. Comply with specified requirements for exposed edges.

2.3 BLOCKING

A. Non-Fire-Rated Doors:

1. Blocking is not required when using SCLC or SLC doors.
2. Provide blocking as indicated below:
 - a. HB4: Two 5 inch x 14 inch lock blocking, in doors indicated to have exit devices.
 - b. HB5: Two 5 inch x 14 inch corner blocking, in doors indicated to have flush bolts.

B. Fire Rated Doors:

1. Provide blocking as indicated below:
 - a. HB1: 5 inch in doors indicated to have closers and overhead stops.
 - b. HB4: Two 5 inch x 14 inch lock blocking in doors indicated to have exit devices.
 - c. HB5: Two 5 inch x 14 inch corner blocking in doors indicated to have flush bolts.

2.4 VENEERED DOORS FOR TRANSPARENT FINISH

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

1. ASSA ABLOY Wood Doors (GR): GPD Series.
2. Eggers Industries (EG): Premium Series.
3. Mohawk Flush Doors.
4. Or approved equal.

B. Interior Solid Core Doors:

1. Grade: Premium.
2. Faces: Veneer grades as noted below; veneer minimum 1/50-inch (0.5mm) thickness at moisture content of 12% or less.
 - a. White Birch, A grade faces. Stain to be confirmed and selected by Architect.
3. Match between Veneer Leaves: Book match.
4. Assembly of Veneer Leaves on Door Faces:
 - a. Running Match.
5. Pair and Set Match: Provide for doors hung in same opening or separated only by mullions.
6. Vertical Edges: Matching same species as faces. Wood or composite material, one piece, laminated, or veneered. Minimum requirements per WDMA section P-1, Performance Standards for Architectural Wood Flush Doors.

7. Horizontal Edges: Solid wood or structural composite material meeting the minimum requirements per WDMA section P-1, Performance Standards for Architectural Wood Flush Doors
8. Construction: Five plies. Stiles and rails are bonded to core, then entire unit sanded before applying face veneers.
9. At doors over 40% of the face cut-out for lights and or louvers, furnish engineered composite lumber core.
10. Stain and finish to match existing door; verify with Architect.

2.5 LIGHT FRAMES AND GLAZING

- A. Metal Frames for Light Openings in Fire Rated Doors over 20-minute Rating: Manufacturer's standard frame formed of 0.048-inch-thick, cold rolled steel sheet; with baked enamel or powder coated finish; and approved for use in doors of fire protection rating indicated.
- B. Glazing: Comply with installation requirements in Division 08 Section "Glazing" and with the flush wood door manufacturer's written instructions.

2.6 FABRICATION

- A. Factory fit doors to suit frame opening sizes indicated.
 1. Comply with requirements in NFPA 80 for fire rated doors.
 2. Undercut: As required per manufacturer's templates and sill condition.
- B. Factory machine doors for hardware that is not surface applied. Comply with final hardware schedules, door frame Shop Drawings, DHI A115-W series standards, and hardware templates.
 1. Coordinate with hardware mortises in metal frames to verify dimensions and alignment before factory machining.
 2. Metal Astragals: Factory machine astragals and formed steel edges for hardware for pairs of fire rated doors.
- C. Openings: Cut and trim openings through doors in factory.
 1. Light Openings: Trim openings with moldings of material and profile indicated.
 2. Glazing: Comply with applicable requirements in Division 08 Section "Glazing."
 3. Louvers: Factory install louvers in prepared openings.

2.7 FACTORY FINISHING

- A. General: Comply with referenced quality standard for factory finishing. Complete fabrication, including fitting doors for openings and machining for hardware that is not surface applied, before finishing.
 1. Finish faces, all four edges, edges of cutouts, and mortises. Stains and fillers may be omitted on top and bottom edges, edges of cutouts, and mortises.

- B. Transparent Finish: Provide a clear protective coating over the wood veneer allowing the natural color and grain of the selected wood species to provide the appearance specified. Stain is applied to the wood surface underneath the transparent finish to add color and design flexibility.
 - 1. Finish: Meet or exceed WDMA I.S. 1A TR8 UV Cured Acrylated Polyester finish performance requirements.
 - 2. Staining:
 - a. Custom stain to match architect's sample.
 - 3. Sheen: Satin.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine doors and installed door frames before hanging doors.
 - 1. Verify that frames comply with indicated requirements for type, size, location, and swing characteristics and have been installed with level heads and plumb jambs.
 - 2. Reject doors with defects.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Hardware: For installation, see Division 8 Section "Door Hardware."
- B. Installation Instructions: Install doors and frames to comply with manufacturer's written instructions and the referenced quality standard, and as indicated.
 - 1. Install fire rated doors in corresponding fire rated frames according to NFPA 80.
- C. Factory Fitted Doors: Align in frames for uniform clearance at each edge.
- D. Factory Finished Doors: Restore finish before installation if fitting or machining is required at Project site.
- E. Field modifications to doors shall not be permitted, except those specifically allowed by manufacturer or fire rating requirements.

3.3 ADJUSTING

- A. Operation: Re-hang or replace doors that do not swing or operate freely.
- B. Finished Doors: Replace doors that do not comply with requirements. Doors may be repaired or refinished if work complies with requirements and shows no evidence of repair or refinishing.

END OF SECTION 081416

SECTION 081613 – FIBERGLASS REINFORCED POLYESTER (FRP) DOORS AND ALUMINUM FRAMES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Fiberglass reinforced polyester doors.
2. Aluminum frames for fiberglass reinforced polyester doors.

B. Codes and References: Comply with the version year adopted by the Authority Having Jurisdiction.

1. ANSI/BHMA A156.115 - Hardware Preparation in Steel Doors and Frames.
2. ASTM A1008 - Standard Specification for Steel Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability.
3. ASTM A653 - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
4. ASTM B 209 - Aluminum and Aluminum-Alloy Sheet and Plate.
5. ASTM B 221 - Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
6. ASTM C 1363 - Standard Test Method for Thermal Performance of Building Assemblies by Means of a Hot Box Apparatus.
7. ASTM D 256 - Determining the Pendulum Impact Resistance of Notched Specimens of Plastics.
8. ASTM D 543 - Evaluating the Resistance of Plastics to Chemical Reagents.
9. ASTM D 1308 - Effect of Household Chemicals on Clear and Pigmented Organic Finishes.
10. ASTM D 2126 - Response of Rigid Cellular Plastics to Thermal and Humid Aging.
11. ASTM D 6670-01 - Standard Practice for Full-Scale Chamber Determination of Volatile Organic Emissions from Indoor Materials/Products.
12. ASTM E 84 - Surface Burning Characteristics of Building Materials.
13. NFRC 102 – Procedure for Measuring the Steady-State Thermal Transmittance of Fenestration Systems.
14. NFRC 400 - Procedure for Determining Fenestration Product Air Leakage.
15. UL 10C - Positive Pressure Fire Tests of Door Assemblies.
16. AAMA A440 Air, Water, Structural.
17. AAMA 920 Operating Cycle Performance.
18. AAMA 925 Determining the Vertical Loading Resistance.
19. AAMA 1503 Thermal Transmittance and CRF.
20. ASTM D 683 Tensile Properties of Plastics.
21. ASTM D 696 Coefficient of Linear Thermal Expansion
22. ASTM D 790 Flexural Properties of Unreinforced and Reinforced Plastic Materials.
23. ASTM D 1621 Compressive Properties of Rigid Cellular Plastics.
24. ASTM D 1623 Tensile and Tensile Adhesion Properties of Rigid Cellular Plastics.
25. ASTM D 2583 Indentation Hardness of Rigid Plastics by means of Barcol Impresser.
26. ASTM D 3029 Gardner Impact Strength
27. ASTM D 5420 Impact Resistance of Flat Rigid Plastic by Means of Falling Weight.
28. ASTM E 283 Determining the rate of air leakage through exterior windows and doors.
29. ASTM E 330 Structural Performance of Exterior Windows and Doors by Uniform Static Air Pressure Difference.

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated. Include construction details, material descriptions, components, hardware reinforcements, profiles, and finishes.
- B. Templates: Door hardware supplier is to furnish templates, template reference number and/or physical hardware to the door and frame supplier in order to prepare the doors and frames to receive the finish hardware items.
- C. Shop Drawings: Include the following:
 - 1. Elevations of each door design.
 - 2. Details of doors.
 - 3. Locations of reinforcement and preparations for hardware.
 - 4. Details of each different wall opening condition.
 - 5. Details of accessories.
 - 6. Details of preparations for power, signal, and control systems.
- D. Samples for Verification:
 - 1. Samples are only required by request of the architect.

1.4 QUALITY ASSURANCE

- A. Source Limitations: Obtain doors and frames through one source from a single manufacturer wherever possible.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver work palletized, wrapped, or crated to provide protection during transit and Project-site storage. Do not use non-vented plastic.
- B. Store materials under cover at Project site in accordance with the manufacturer's instructions. Do not store in a manner that traps excess humidity
- C. Provide minimum 1/4-inch (6-mm) space between each stacked door to permit air circulation. Stack doors and frames in a vertical upright position.

1.6 PROJECT CONDITIONS

- A. Field Measurements: Verify actual dimensions of openings by field measurements before fabrication.

1.7 COORDINATION

- A. Coordinate installation of anchorages for door frames. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors. Deliver such items to Project site in time for installation.

1.8 WARRANTY

- A. Provide manufacturer's written warranty against defects in materials and workmanship upon final completion and acceptance of Work in this section. Warranty period is ten years.

1.9 MANUFACTURERS' QUALIFICATIONS / ALTERNATE MANUFACTURERS:

- A. The materials outlined are the type of materials to be used on this project. Please refer to Specification Section "Substitution Procedures" and "Submittal Procedures". "Or Equal" substitutions are permitted so long as they are equal to or superior to the basis of design and the Contractor takes full responsibility for

all coordination and costs associated with collateral issues related to the substitution. No Substitutions will be reviewed during the bidding process. The Contractor takes full responsibility for all substitutions. Substitution submittals shall be made no later than 30 days after Notice to Proceed in order to provide time for comparison review. All submittals after 30 days shall be in strict accordance with the basis of design/specified products. No Substitutions will be considered after 30 days. The following manufacturer criteria must be submitted with the substitution request.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Basis of Design:

1. FRP Architectural Doors. Inc.
 - a. Doors: Heavy Wall Door Series FD55
 - b. Frames: Heavy Wall Aluminum Frames Series FS
2. Commercial Door Systems
3. Curries Company

2.2 PERFORMANCE REQUIREMENTS

- A. Air Infiltration- Single door and frame test specimen 3'0" x 7'0" shall be tested using AAMA A440-08-11 specifications in accordance with ASTM E 283-04(12) pressure differential.
 1. Air Infiltration Measure 0.12 cfm/ft².
- B. C. Structural Performance- Single door and frame test specimen 3'0" x 7'0" shall be tested using AAMA A440-08-11 specifications in accordance with ASTM E 330-14 uniform static air pressure.
 1. Uniform Load Deflection 30.08 psf exterior; measure 0.008"
 2. Uniform Load Structural 45.11 psf exterior; measure 0.003"
- C. Water Resistance- Single door and frame test specimen 3'0" x 7'0" shall be tested using AAMA A440-08-11 specifications in accordance with ASTM E 331 pressure differential.
 1. WTP=0.0 psf; measure No Leakage
- D. Thermal Transmission and CRF, Exterior Doors. Doors shall have a U-Value and a CRF Value per specification AAMA 1503.
- E. Surface Burning Characteristics; ASTM E 84; FRP fiberglass for Doors and Panels shall be:
 1. Flame Spread: Maximum of 200, Class C.
 2. Smoke Developed: Maximum of 450, Class C.
- F. Izod Impact Strength; FRP Fiberglass for Doors and Panels shall have an ASTM D256 nominal value of 14.0 ft-lb/in notched.
- G. Gardner Impact Strength; FRP Fiberglass for Doors and Panels shall have an ASTM D3029 value of 120 in-lb.
- H. Tensile Strength; FRP Fiberglass for Doors and Panels shall have an ASTM D638 value of 13×10^3 psi.
- I. Flexural Strength; FRP Fiberglass for Doors and Panels shall have an ASTM D790 value of 21×10^3 psi.
- J. Barcol Hardness of FRP Fiberglass for Doors and Panels shall have an ASTM D2583 VALUE OF 55.

- K. Coefficient of Linear Thermal Expansion - ASTM D696 Value, 1.3×10^5 in/in/° F.
- L. Water Absorption; FRP Fiberglass for doors and Panels shall have an ASTM D570 value of [0.20%/24hrs@77°F](#).
- M. Gardner Impact Strength; FRP Fiberglass for Doors and Panels shall have an ASTM D3029 value of 120 in-lb.
- N. Taber Abrasion Resistance; FRP Fiberglass for Doors and Panels shall have a C-17 wheel, 1000g Taber Test; 0.01% Maximum Weight Loss after 25 cycles.
- O. Stain Resistance; FRP Fiberglass for Doors and Panels shall be tested in accordance to ASTM D1308 standards and remain unaffected after exposure to food products and stains are to be easily removed with mild abrasive or FRP cleaner.
- P. Chemical Resistance; FRP Fiberglass for Doors and Panels shall have an Excellent Rating when tested in accordance to ASTM D543 standards.
- Q. T. Polystyrene Insulation for Doors and Panels shall have be a nominal density of 2Lb. pcf (25lb psi) and have a thermal resistance nominal R-Value of 6.3.
- R. Thermal Barrier-Optional IBC, Boca code core liner sheet option for doors will be a single .032 sheet aluminum liner placed between the layer of core insulation and the inside door face sheet.
- S. Compressive Strength of Urethane foam core option, Nominal Value, ASTM D 1621: 80 psi
- T. Compressive Modulus of Urethane foam core option, Nominal Value, ASTM D 1621: 140 psi
- U. Tensile Adhesion of Urethane foam core option, Nominal Value, ASTM D 1623: 60 psi
- V. Thermal and Humid Aging of Urethane foam core option, Nominal Value, ASTM D 2126: Less than 2% Volume Change.

2.3 FIBERGLASS REINFORCED POLYESTER DOORS

- A. General: Provide 1-3/4 inch doors of type and design indicated, not less than thickness indicated; fabricated without visible joints or seams on exposed faces unless otherwise indicated.
 - 1. Design: As indicated on the drawings.
 - 2. Heavy Wall Door Series FD55; 1-3/4" thick flush door with fiberglass reinforced polyester (FRP) face sheets.
 - 3. Door trim, vision lights and internal sub-frame stiles and rails are constructed of extruded tubular aluminum shapes using billet aluminum, grade 6063 and a T6 tempered alloy.
 - 4. Door perimeter edge trim, top and bottom are applied to the doors sub-frame.
 - 5. Construction Components:
 - 1. Sub-Frame stiles and rails.
 - a. Top horizontal rails; full rectangular tube 1-1/2"x 6"with 1/8" wall thickness with tie-rod spline.
 - b. Heavy Duty Closer Steel Backup Plates. Steel Sleeve insert, 3/16" Steel.
 - c. Bottom horizontal rails; full rectangular tube 1-1/2"x 2-1/2"with 3/8" tie-rod spline.
 - d. Heavy Duty Bottom horizontal rails; full rectangular tube 1-1/2"x 6"with 1/8" wall thickness with tie-rod spline.
 - e. Lock and hinge vertical stiles; full rectangular tube 1-1/2"x 5 1/2" with flanges and 1/8" wall thickness at hardware points.

- f. Lock and hinge tubes have an interlocking dove tail edge for locking trim to the sub-frame.
 - g. Corner joint assembled using monumental type mortise and tenon joinery thru splines. Mitered Corners unacceptable.
2. Perimeter trims are aluminum shapes and are finished to anodize or paint as selected.
 - a. Top and Bottom trims have tee-slot to accept weather-seal. Bottom trim supplied with pile weather-seal.
 - b. Lock edge trim is beveled with pile weather-seal. Trim interlocks to sub-frame dove and secured in place.
 - c. Door trims shall be replaceable in the field if the trim becomes damaged.
 - d. Provide door perimeter and door meeting stile seals.
3. Core Insulation will be high density expanded polystyrene fitted to fill voids between stiles and rails of sub-frame. Core to have compressive strength ASTM D1621 - 25psi density with a nominal R-Value of 6.5.
4. Thermal Barrier, IBC, Boca code core liner sheet option for doors will be a .032 aluminum sheet placed between the layer of core insulation and the inside door face sheet.
5. Face Sheet to be fiberglass reinforced polyester (FRP) with an abuse resistant surface and U.V. additives to aide in the protection against normal weathering and normal usage
 - a. Face Sheet to be .120 Thickness
 - b. Standard Face sheet to be color throughout. Custom color optional face sheets to be specially designed to accept specially formulated paint products, color to match selected color.
 - c. Face sheet to have patterned pebble embossed texture.
6. Vision Light (cut-outs) to be specifically made to accept options for ¼” or 1” Glass. Glass types are determined under the related glass and glazing sections.

2.4 ALUMINUM FRAMES

- A. General: Provide frames from extruded tube backer with an applied stop.
 1. Heavy Wall Aluminum Frames Series FS, as manufactured by FRP Architectural Doors, Inc
 - a. Rectangle tubular Aluminum with .125 thick walls.
 - b. Shear Block mortise and tenon corner joint assembly.
 - c. Applied surface mounted door stops.
 - d. **.125 Heavy duty wall reinforcing on door stop for rim strikes and closer.**
 - e. **Tee-slotted weatherstripping on door stops.**
 - f. Gutter designed Side Lite and Transom Glazing. Fabricate frames with butted ends.
 - g. Vertical members shall extend the full height of the opening at jambs and mullions
 - h. Finish shall be standard anodized colors (7ml clear satin).
- B. Configuration: Three sided, sidelight, transom, or borrowed light as indicated.
- C. Frames shall include full perimeter gasketing to provide weather seal and to limit air leakage to 0.50 CFM/ft of crack length (ASTM E283).
- D. Surface Applied Hardware Reinforcements: Fabricate according to ANSI/SDI A250.6.
- E. Frame depths: 6”

2.5 FABRICATION

- A. General: Fabricate work to be rigid and free of defects. Accurately form to required sizes and profiles.
- B. Fiberglass Reinforced Polyester Doors:

1. Glazed Lites: Factory cut openings in doors with applied flush aluminum trim kit to fit.
 2. Top Caps: Close tops of doors flush with aluminum top caps.
- C. Aluminum Frames: Where frames are fabricated in sections due to shipping or handling limitations, provide alignment plates or angles at each joint, fabricated of same thickness metal as frames.
- D. Surface Hardware Preparation: Factory prepare work to receive template mortised hardware; include cutouts, reinforcement, mortising, drilling, and tapping according to the Door Hardware Schedule and templates furnished as specified in Division 08 Section, "Door Hardware."
1. Locate hardware as indicated, or if not indicated, according to ANSI/SDI A250.8.
 2. Reinforce doors to receive non-template, mortised and surface-mounted door hardware.
 3. Comply with applicable requirements in ANSI/SDI A250.6 and ANSI/DHI A115 Series specifications for preparation of work for hardware.

2.6 FINISHES

- A. Pebble texture face finish shall be:
1. Architect to select from manufacturer's standard colors.
- B. Aluminum finish for stiles and rails, light kits, and door frames shall be:
1. Satin Clear.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Prior to installation, check openings for squareness, alignment, twist, and plumbness.
- B. Drill and tap doors and frames to receive non-template, mortised, and surface-mounted door hardware.

3.3 INSTALLATION

- A. General: Install work plumb, rigid, properly aligned, and securely fastened in place; comply with Drawings and manufacturer's written instructions. Comply with NFPA 80 at fire rated openings.
- B. Fiberglass Reinforced Polyester Doors: Fit doors accurately in frames, within clearances specified below. Shim as necessary.

1. Non-Fire-Rated Doors:

- a. Jamb and Head: 1/8 inch (3 mm) plus or minus 1/16 inch (1.6 mm).
- b. Between Edges of Pairs of Doors: 1/8 inch (3 mm) plus or minus 1/16 inch (1.6 mm).
- c. Between Bottom of Door and Top of Finish Floor (No Threshold): Maximum 3/4 inch (19 mm).

- C. Glazing: Comply with installation requirements in Division 08 Section "Glazing" and with door manufacturer's written instructions. Comply with NFPA requirements for fire rated glazing.

3.4 ADJUSTING AND CLEANING

- A. Final Adjustments: Check and readjust operating hardware items immediately before final inspection. Leave work in complete and proper operating condition. Remove and replace defective work, including stainless steel work that is warped, bowed, or otherwise unacceptable.
- B. Remove grout and other bonding material from stainless steel work immediately after installation.
- C. Remove stains and materials that will have an adverse effect on the doors and frames and restore slight blemishes in accordance with manufacturer's instructions to match original finish.

END OF SECTION 081613

SECTION 083100 - FLOOR ACCESS DOORS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.1 SUMMARY

- A. Provide factory-fabricated floor access doors.

1.2 SUBMITTALS

- A. Product Data: Submit manufacturer's product data.
- B. Shop Drawings: Submit shop drawings including profiles, accessories, location, adjacent construction interface, and dimensions.
- C. Warranty: Submit executed copy of manufacturer's standard warranty.

1.3 QUALITY ASSURANCE

- A. Manufacturer: A minimum of 5 years experience manufacturing similar products.
- B. Installer: A minimum of 2 years experience installing similar products.
- C. Manufacturer's Quality System: Registered to ISO 9001 Quality Standards including in-house engineering for product design activities.

1.4 DELIVERY, STORAGE AND HANDLING

- A. Deliver products in manufacturer's original packaging. Store materials in a dry, protected, well-vented area. Inspect product upon receipt and report damaged material immediately to delivering carrier and note such damage on the carrier's freight bill of lading.

1.5 WARRANTY

- A. Manufacturer's Warranty: Provide manufacturer's standard warranty. Materials shall be free of defects in material and workmanship for a period of twenty 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.

1.6 MANUFACTURERS' QUALIFICATIONS / ALTERNATE MANUFACTURERS:

- A. The materials outlined are the type of materials to be used on this project. Please refer to Specification Section "Substitution Procedures" and "Submittal Procedures". "Or Equal" substitutions are permitted so long as they are equal to or superior to the basis of design and the Contractor takes full responsibility for all coordination and costs associated with collateral issues related to the substitution. No Substitutions will be reviewed during the bidding process. The Contractor takes full responsibility for all substitutions. Substitution submittals shall be made no later than 30 days after Notice to Proceed in order to provide

time for comparison review. All submittals after 30 days shall be in strict accordance with the basis of design/specified products. No Substitutions will be considered after 30 days. The following manufacturer criteria must be submitted with the substitution request.

PART 2 - PRODUCTS

2.1 MANUFACTURER

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Basis of Design: Type J-AL Access Door by The Bilco Company
2. Babcock Davis
3. Mifab
4. Or approved equal

2.2 ACCESS DOOR

A. Furnish and install exterior weatherproof access door assembly, with face of door fit flush with frame and with exposed frame. Include extruded door gaskets and minimum 2-inch-thick (50-mm-thick) fiberglass insulation.

B. Performance characteristics:

1. Cover: Shall be reinforced to support a minimum live load of 300 psf (1464 kg/m²) with a maximum deflection of 1/150th of the span.
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 door, including all hardware components, shall be highly corrosion resistant.

C. Frame size: +/- 4'-10" X 3'-4 1/2", single leaf. Dimensions to be verified in the field.

D. Cover: Shall be 1/4" (6mm) aluminum diamond pattern.

E. Frame: Channel frame shall be extruded aluminum with bend down anchor tabs around the perimeter.

F. Hinges: Shall be specifically designed for horizontal installation and shall be through bolted to covers with tamperproof Type 316 stainless steel lock bolts and shall be through bolted to the frame with Type 316 stainless steel bolts and locknuts.

G. Drain Coupling: Provide a 1-1/2" (38mm) drain coupling located in the right front corner of the channel frame [note: can be placed at a different location if specified].

H. Lifting mechanisms: Manufacturer shall provide the required number and size of compression spring operators enclosed in telescopic tubes to provide, smooth, easy, and controlled cover operation throughout the entire arc of opening and to act as a check in retarding downward motion of the covers when 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 fastened to a formed 1/4" (6mm) gusset support plate.

- I. A removable exterior turn/lift handle with a spring loaded ball detent shall be provided to open the cover and the latch release shall be protected by a flush, gasketed, removable screw plug.
- J. Hardware:
 - 1. Hinges: Heavy forged Type 316 stainless steel hinges, each having a minimum 1/4" (6mm) diameter Type 316 stainless steel pin, shall be provided and shall pivot so the covers do not protrude into the channel frame.
 - 2. Cover shall be equipped with a hold open arm which automatically locks each cover in the open position.
 - 3. Cover shall be fitted with the required number and size of compression spring operators. Springs and spring tubes shall be Type 316 stainless steel.
 - 4. A Type 316 stainless steel snap lock with fixed handle shall be mounted on the underside of one cover.
 - 5. Hardware: Shall be Type 316 stainless steel throughout.
 - 6. Provide recessed padlock hasp covered by a flush hinged lid.
- K. Accessories:
 - 1. Ladder – Up safety Post
 - a. Operation: Post locks in place on full extension; release mechanism returns post to closed position; a pull up loop shall be provided at the upper end of the post to facilitate raising the post.
 - b. Height: 42 inches above hatch.
 - c. Material: Steel tube.
 - d. Post: 1-5/8-inch- diameter pipe.
 - e. Finish: Manufacturer's standard powder coat.
 - f. Color: Powder Coated - Safety yellow.
 - g. Hardware: Stainless Steel
 - 2. Fall Protection Grating System
 - a. Manufacture's standard safety grate, permanently mounted under access door.
 - b. Size to be verified in the field.
- L. Finishes: Factory finish shall be mill finish aluminum with bituminous coating applied to the exterior of the frame.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and openings for compliance with requirements for installation tolerances and other conditions affecting performance. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Install products in strict accordance with manufacturer's instructions and approved submittals. Locate units level, plumb, and in proper alignment with adjacent work.
 - 1. Test units for proper function and adjust until proper operation is achieved.

2. Repair finishes damaged during installation.
3. Restore finishes so no evidence remains of corrective work.

3.3 ADJUSTING AND CLEANING

- A. Clean exposed surfaces using methods acceptable to the manufacturer which will not damage finish.

END OF SECTION 083100

SECTION 084213 - ALUMINUM-FRAMED ENTRANCES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:

- 1. Exterior manual-swing aluminum-framed entrance door systems.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.

- 1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.

- B. Shop Drawings: For aluminum-framed entrances. Include plans, elevations, sections, full-size details, and attachments to other work.

- 1. Include details of provisions for assembly expansion and contraction and for draining moisture occurring within the assembly to the exterior.
- 2. Include full-size isometric details of each vertical-to-horizontal intersection of aluminum-framed entrances, showing the following:
 - a. Joinery, including concealed welds.
 - b. Anchorage.
 - c. Expansion provisions.
 - d. Glazing.
 - e. Flashing and drainage.

- 3. Show connection to and continuity with adjacent thermal, weather, air, and vapor barriers.

- C. Samples for Initial Selection: For units with factory-applied color finishes.

1.4 INFORMATIONAL SUBMITTALS

- A. Product Test Reports: For aluminum-framed entrances.
- B. Sample Warranties: For special warranties.

1.5 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For aluminum-framed entrances to include in maintenance manuals.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.

1.7 WARRANTY

- A. Special Warranty: Manufacturer agrees to repair or replace components of aluminum-framed entrances that do not comply with requirements or that fail in materials or workmanship within specified warranty period.

- 1. Warranty Period: Two years from date of Substantial Completion.

- B. Special Finish Warranty: Standard form in which manufacturer agrees to repair finishes or replace aluminum that shows evidence of deterioration of factory-applied finishes within specified warranty period.

- 1. Deterioration includes, but is not limited to, the following:

- a. Color fading more than 5 Hunter units when tested according to ASTM D 2244.
 - b. Chalking in excess of a No. 8 rating when tested according to ASTM D 4214.
 - c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.

- 2. Warranty Period: 10 years from date of Substantial Completion.

1.8 MANUFACTURERS' QUALIFICATIONS / ALTERNATE MANUFACTURERS:

- A. The materials outlined are the type of materials to be used on this project. Please refer to Specification Section "Substitution Procedures" and "Submittal Procedures". "Or Equal" substitutions are permitted so long as they are equal to or superior to the basis of design and the Contractor takes full responsibility for all coordination and costs associated with collateral issues related to the substitution. No Substitutions will be reviewed during the bidding process. The Contractor takes full responsibility for all substitutions. Substitution submittals shall be made no later than 30 days after Notice to Proceed in order to provide time for comparison review. All submittals after 30 days shall be in strict accordance with the basis of design/specified products. No Substitutions will be considered after 30 days. The following manufacturer criteria must be submitted with the substitution request.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. General Performance: Comply with performance requirements specified, as determined by testing of aluminum-framed entrances representing those indicated for this Project without failure due to defective manufacture, fabrication, installation, or other defects in construction.

B. Structural Loads:

1. Wind Loads: Calculated in accordance with ASCE 7-16 with parameters provided in load schedule in Drawings.
2. Other Design Loads: Calculated in accordance with ASCE 7-16 with parameters provided in load schedule in Drawings.

C. Structural: Test according to ASTM E 330 as follows:

1. When tested at positive and negative wind-load design pressures, assemblies do not evidence deflection exceeding specified limits.
2. When tested at 150 percent of positive and negative wind-load design pressures, assemblies, including anchorage, do not evidence material failures, structural distress, or permanent deformation of main framing members exceeding 0.2 percent of span.
3. Test Durations: As required by design wind velocity, but not less than 10 seconds.

D. Air Infiltration: Test according to ASTM E 283 for infiltration as follows:

1. Entrance Doors:

- a. Pair of Doors: Maximum air leakage of 1.0 cfm/sq. ft. at a static-air-pressure differential of 1.57 lbf/sq. ft.
- b. Single Doors: Maximum air leakage of 0.5 cfm/sq. ft. at a static-air-pressure differential of 1.57 lbf/sq. ft.

E. Water Penetration under Static Pressure: Test according to ASTM E 331 as follows:

1. No evidence of water penetration through fixed glazing and framing areas when tested according to a minimum static-air-pressure differential of 20 percent of positive wind-load design pressure, but not less than 6.24 lbf/sq. ft.

F. Thermal Movements: Allow for thermal movements resulting from ambient and surface temperature changes:

1. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.

2.2 MANUFACTURERS

A. 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. Basis of Design: Kawneer 500 Tuffline Swing Door, by Kawneer North America,
- b. Efc0 Corporation, D500 Wide Stile Doors
- c. YKK AP
- d. Or approved equal.

2.3 ENTRANCE DOOR SYSTEMS

A. Entrance Doors: Manufacturer's Wide stile glazed entrance doors for manual swing operation: , 5" vertical stile, 5" top rail, 10" bottom rail; 2" depth, 3/16" wall thickness, for high traffic and high abuse applications.

- B. Glazing gaskets shall be either EPDM elastomeric extrusions or a thermoplastic elastomer.
- C. Provide adjustable glass jacks to help center the glass in the door opening.

2.4 FRAMING SYSTEM

- A. Framing Members: Manufacturer's standard extruded aluminum, minimum 0.125 inch thick and reinforced as required to support imposed loads.
 - 1. Nominal Size: 2" x 6" heavy duty framing.
- B. Non-Brackets and Reinforcements: Manufacturer's standard high-strength aluminum with nonstaining, nonferrous shims for aligning system components.
- C. Fasteners and Accessories: Manufacturer's standard corrosion-resistant, nonstaining, nonbleeding fasteners and accessories compatible with adjacent materials. Where exposed shall be stainless steel.
- D. Perimeter Anchors: When steel anchors are used, provide insulation between steel material and aluminum material to prevent galvanic action.
- E. Materials:
 - 1. Aluminum: Alloy and temper recommended by manufacturer for type of use and finish indicated.
 - a. Aluminum Extrusions: Alloy and temper recommended by aluminum-framed entrance door manufacturer for strength, corrosion resistance, and application of required finish and not less than 0.090" wall thickness at any location for the main frame and door leaf members.
 - b. Fasteners: Aluminum, nonmagnetic stainless steel or other materials to be non-corrosive and compatible with aluminum-framed entrance door members, trim hardware, anchors, and other components.
 - c. Anchors, Clips, and Accessories: Aluminum, nonmagnetic stainless steel, or zinc-coated steel or iron complying with ASTM B 633 for SC 3 severe service conditions or other suitable zinc coating; provide sufficient strength to withstand design pressure indicated.
 - d. Reinforcing Members: Aluminum, nonmagnetic stainless steel, or nickel/chrome-plated steel complying with ASTM B 456 for Type SC 3 severe service conditions, or zinc-coated steel or iron complying with ASTM B 633 for SC 3 severe service conditions or other suitable zinc coating; provide sufficient strength to withstand design pressure indicated.
 - e. Weather Seals: Provide weather stripping with integral barrier fin or fins of semi-rigid, polypropylene sheet or polypropylene-coated material. Comply with AAMA 701/702.

2.5 ENTRANCE DOOR HARDWARE

- A. Entrance Door Hardware: Hardware not specified in this Section is specified in Section 087100 "Door Hardware."

2.6 GLAZING

- A. Glazing: Comply with Section 088000 "Glazing."
- B. Glazing Gaskets: Manufacturer's standard sealed-corner pressure-glazing system of black, resilient elastomeric glazing gaskets, setting blocks, and shims or spacers.
- C. Glazing Sealants: As recommended by manufacturer.

2.7 ACCESSORIES

- A. Fasteners and Accessories: Manufacturer's standard corrosion-resistant, nonstaining, nonbleeding fasteners and accessories compatible with adjacent materials.
 - 1. Use self-locking devices where fasteners are subject to loosening or turning out from thermal and structural movements, wind loads, or vibration.
 - 2. Reinforce members as required to receive fastener threads.
 - 3. Use exposed fasteners with countersunk Phillips screw heads, finished to match framing system.
- B. Anchors: Three-way adjustable anchors with minimum adjustment of **1 inch** that accommodate fabrication and installation tolerances in material and finish compatible with adjoining materials and recommended by manufacturer.
 - 1. Concrete and Masonry Inserts: Hot-dip galvanized cast-iron, malleable-iron, or steel inserts complying with ASTM A 123/A 123M or ASTM A 153/A 153M requirements.
- C. Concealed Flashing: Dead-soft, **0.018-inch**-thick stainless steel, ASTM A 240/A 240M of type recommended by manufacturer.
- D. Bituminous Paint: Cold-applied asphalt-mastic paint complying with SSPC-Paint 12 requirements except containing no asbestos, formulated for **30-mil** thickness per coat.

2.8 FABRICATION

- A. Form or extrude aluminum shapes before finishing.
- B. Weld in concealed locations to greatest extent possible to minimize distortion or discoloration of finish. Remove weld spatter and welding oxides from exposed surfaces by descaling or grinding.
- C. Fabricate components that, when assembled, have the following characteristics:
 - 1. Profiles that are sharp, straight, and free of defects or deformations.

2. Accurately fitted joints with ends coped or mitered.
 3. Physical and thermal isolation of glazing from framing members.
 4. Accommodations for thermal and mechanical movements of glazing and framing to maintain required glazing edge clearances.
 5. Fasteners, anchors, and connection devices that are concealed from view to greatest extent possible.
- D. Entrance Door Frames: Reinforce as required to support loads imposed by door operation and for installing entrance door hardware.
1. At exterior doors, provide compression weather stripping at fixed stops.
- E. Entrance Doors: Reinforce doors as required for installing entrance door hardware.
1. At pairs of exterior doors, provide sliding-type weather stripping retained in adjustable strip and mortised into door edge.
 2. At exterior doors, provide weather sweeps applied to door bottoms.
- F. Entrance Door Hardware Installation: Factory install entrance door hardware to the greatest extent possible. Cut, drill, and tap for factory-installed entrance door hardware before applying finishes.
- G. After fabrication, clearly mark components to identify their locations in Project according to Shop Drawings.

2.9 ALUMINUM FINISHES

- A. Color: Anodic Finish: AAMA 611, AA-M12C22A42/A44, Class I, 0.018 mm or thicker.
1. Color: Clear

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Prepare surfaces that are in contact with structural sealant according to sealant manufacturer's written instructions to ensure compatibility and adhesion. Preparation includes, but is not limited to, cleaning and priming surfaces.

3.3 INSTALLATION

A. General:

1. Comply with manufacturer's written instructions.
2. Do not install damaged components.
3. Fit joints to produce hairline joints free of burrs and distortion.
4. Rigidly secure nonmovement joints.
5. Install anchors with separators and isolators to prevent metal corrosion and electrolytic deterioration and to prevent impeding movement of moving joints.
6. Seal perimeter and other joints watertight unless otherwise indicated.

B. Metal Protection:

1. Where aluminum is in contact with dissimilar metals, protect against galvanic action by painting contact surfaces with materials recommended by manufacturer for this purpose or installing nonconductive spacers.
2. Where aluminum is in contact with concrete or masonry, protect against corrosion by painting contact surfaces with bituminous paint.

C. Set continuous sill members and flashing in full sealant bed as specified in Section 079200 "Joint Sealants" to produce weathertight installation.

D. Install components plumb and true in alignment with established lines and grades.

E. Install glazing as specified in Section 088000 "Glazing."

F. Entrance Doors: Install doors to produce smooth operation and tight fit at contact points.

1. Exterior Doors: Install to produce weathertight enclosure and tight fit at weather stripping.
2. Field-Installed Entrance Door Hardware: Install surface-mounted entrance door hardware according to entrance door hardware manufacturers' written instructions using concealed fasteners to greatest extent possible.

3.4 MAINTENANCE SERVICE

A. Entrance Door Hardware:

1. Maintenance Tools and Instructions: Furnish a complete set of specialized tools and maintenance instructions as needed for Owner's continued adjustment, maintenance, and removal and replacement of entrance door hardware.

END OF SECTION 084213

SECTION 084413 - GLAZED ALUMINUM CURTAIN WALLS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes glazed aluminum curtain walls with fixed and projected windows and solar shade system.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.
- B. Shop Drawings: For glazed aluminum curtain walls. Include plans, elevations, sections, full-size details, and attachments to other work.
 - 1. Include details of provisions for assembly expansion and contraction and for draining moisture occurring within the assembly to the exterior.
 - 2. Include full-size isometric details of each vertical-to-horizontal intersection of glazed aluminum curtain walls, showing the following:
 - a. Joinery, including concealed welds.
 - b. Anchorage.
 - c. Expansion provisions.
 - d. Glazing.
 - e. Flashing and drainage.
 - 3. Show connection to and continuity with adjacent thermal, weather, air, and vapor barriers.
- C. Samples for Initial Selection: For units with factory-applied color finishes.
- D. Samples for Verification: For each type of exposed finish required, in manufacturer's standard sizes.
- E. Fabrication Sample: Of each vertical-to-horizontal intersection of assemblies, made from 12-inch lengths of full-size components and showing details of the following:
 - 1. Joinery, including concealed welds.

2. Anchorage.
3. Expansion provisions.
4. Glazing.
5. Flashing and drainage.

- F. Delegated-Design Submittal: For glazed aluminum curtain walls 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. Qualification Data: For Installer and field testing agency.
- B. Energy Performance Certificates: For glazed aluminum curtain walls, accessories, and components from manufacturer.
1. Basis for Certification: NFRC-certified energy performance values for each glazed aluminum curtain wall.
- C. Product Test Reports: For glazed aluminum curtain walls, for tests performed by manufacturer and witnessed by a qualified testing agency.
- D. Sample Warranties: For special warranties.

1.5 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For glazed aluminum curtain walls to include in maintenance manuals.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.
- B. Product Options: Information on Drawings and in Specifications establishes requirements for aesthetic effects and performance characteristics of assemblies. Aesthetic effects are indicated by dimensions, arrangements, alignment, and profiles of components and assemblies as they relate to sightlines, to one another, and to adjoining construction.
1. Do not change intended aesthetic effects, as judged solely by Architect, except with Architect's approval. If changes are proposed, submit comprehensive explanatory data to Architect for review.

1.7 WARRANTY

- A. Special Assembly Warranty: Manufacturer agrees to repair or replace components of glazed aluminum curtain wall that do not comply with requirements or that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:
 - a. Structural failures including, but not limited to, excessive deflection.
 - b. Noise or vibration created by wind and thermal and structural movements.
 - c. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
 - d. Water penetration through fixed glazing and framing areas.
 - e. Failure of operating components.
 2. Warranty Period: 10 years from date of Substantial Completion.
- B. Special Finish Warranty: Standard form in which manufacturer agrees to repair finishes or replace aluminum that shows evidence of deterioration of factory-applied finishes within specified warranty period.
1. Warranty Period: 10 years from date of Substantial Completion.
- 1.8 MANUFACTURERS' QUALIFICATIONS / ALTERNATE MANUFACTURERS:
- A. The materials outlined are the type of materials to be used on this project. Please refer to Specification Section "Substitution Procedures" and "Submittal Procedures". "Or Equal" substitutions are permitted so long as they are equal to or superior to the basis of design and the Contractor takes full responsibility for all coordination and costs associated with collateral issues related to the substitution. No Substitutions will be reviewed during the bidding process. The Contractor takes full responsibility for all substitutions. Substitution submittals shall be made no later than 30 days after Notice to Proceed in order to provide time for comparison review. All submittals after 30 days shall be in strict accordance with the basis of design/specified products. No Substitutions will be considered after 30 days. The following manufacturer criteria must be submitted with the substitution request.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Engage a qualified professional engineer, as defined in Section 014000 "Quality Requirements," to design glazed aluminum curtain walls.
- B. General Performance: Comply with performance requirements specified, as determined by testing of glazed aluminum curtain walls representing those indicated for this Project without failure due to defective manufacture, fabrication, installation, or other defects in construction.
 1. Glazed aluminum curtain walls shall withstand movements of supporting structure including, but not limited to, story drift, twist, column shortening, long-term creep, and deflection from uniformly distributed and concentrated live loads.
 2. Failure also includes the following:
 - a. Thermal stresses transferring to building structure.
 - b. Glass breakage.
 - c. Noise or vibration created by wind and thermal and structural movements.
 - d. Loosening or weakening of fasteners, attachments, and other components.

e. Failure of operating units.

C. Structural Loads:

1. Wind Loads: Calculated in accordance with ASCE 7-16 with parameters provided in load schedule in Drawings.
2. Other Design Loads: Calculated in accordance with ASCE 7-16 with parameters provided in load schedule in Drawings.

D. Deflection of Framing Members: At design wind pressure, as follows:

1. Deflection Normal to Wall Plane: Limited to 1/175 of clear span for spans up to 13 feet 6 inches and to 1/240 of clear span plus 1/4 inch for spans greater than 13 feet 6 inches or an amount that restricts edge deflection of individual glazing lites to 3/4 inch, whichever is less.
2. Deflection Parallel to Glazing Plane: Limited to amount not exceeding that which reduces glazing bite to less than 75 percent of design dimension and that which reduces edge clearance between framing members and glazing or other fixed components to less than 1/8 inch.
 - a. Operable Units: Provide a minimum 1/16-inch clearance between framing members and operable units.
3. Cantilever Deflection: Where framing members overhang an anchor point, as follows:
 - a. Perpendicular to Plane of Wall: No greater than 1/240 of clear span plus 1/4-inch for spans greater than 11 feet 8-1/4 inches or 1/175 times span, for spans less than 11 feet 8-1/4 inches.

E. Structural: Test according to ASTM E 330 as follows:

1. When tested at positive and negative wind-load design pressures, assemblies do not evidence deflection exceeding specified limits.
2. When tested at 150 percent of positive and negative wind-load design pressures, assemblies, including anchorage, do not evidence material failures, structural distress, or permanent deformation of main framing members exceeding 0.2 percent of span.
3. Test Durations: As required by design wind velocity, but not less than 10 seconds.

F. Air Infiltration: Test according to ASTM E 283 for infiltration as follows:

1. Fixed Framing and Glass Area:
 - a. Maximum air leakage of 0.06 cfm/sq. ft. at a static-air-pressure differential of 6.24 lbf/sq. ft.

G. Water Penetration under Static Pressure: Test according to ASTM E 331 as follows:

1. No evidence of water penetration through fixed glazing and framing areas when tested according to a minimum static-air-pressure differential of 20 percent of positive wind-load design pressure, but not less than 12 lbf/sq. ft.

- H. Water Penetration under Dynamic Pressure: Test according to AAMA 501.1 as follows:
1. No evidence of water penetration through fixed glazing and framing areas when tested at dynamic pressure equal to 20 percent of positive wind-load design pressure, but not less than 12 lbf/sq. ft.
 2. Maximum Water Leakage: According to AAMA 501.1. Water leakage does not include water controlled by flashing and gutters, or water that is drained to exterior.
- I. Energy Performance: Certify and label energy performance according to NFRC as follows:
1. Thermal Transmittance (U-factor): Fixed glazing and framing areas shall have U-factor of not more than 0.45 Btu/sq. ft. x h x deg F as determined according to NFRC 100.
 2. Solar Heat Gain Coefficient: Fixed glazing and framing areas shall have a solar heat gain coefficient of no greater than 0.40 as determined according to NFRC 200.
 3. Condensation Resistance: Fixed glazing and framing areas shall have an NFRC-certified condensation resistance rating of no less than 63 as determined according to NFRC 500.
- J. Noise Reduction: Test according to ASTM E 90, with ratings determined by ASTM E 1332, as follows:
1. Outdoor-Indoor Transmission Class: Minimum 30.
- K. Thermal Movements: Allow for thermal movements resulting from ambient and surface temperature changes:
1. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.
 2. Thermal Cycling: No buckling; stress on glass; sealant failure; excess stress on framing, anchors, and fasteners; or reduction of performance when tested according to AAMA 501.5.
 - a. High Exterior Ambient-Air Temperature: That which produces an exterior metal-surface temperature of 180 deg F.
 - b. Low Exterior Ambient-Air Temperature: 0 deg F.

2.2 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Basis of Design: Kawneer 1600 Wall System 1 Curtain Wall, by Kawneer North America. 2 ½" outside glazed plate format, full mullion; system depth 7 ½" for 1" insulating glazing with 8225TLF Thermal Project In and Project Out Windows.
 2. Efc0 Corporation, 5600 Series, outside glazed with fiberglass pressure plate
 3. YKK AP, YCW 750 OG Aluminum Curtain Wall System
 4. Or approved equal.
- B. Source Limitations: Obtain all components of curtain wall system and accessories, from single manufacturer.

2.3 FRAMING

- A. Framing Members: Manufacturer's standard extruded- or formed-aluminum framing members of thickness required and reinforced as required to support imposed loads.
 - 1. Glazing System: 4 sided captured.
 - 2. Glazing Plane: Front.
- B. Brackets and Reinforcements: Manufacturer's standard high-strength aluminum with nonstaining, nonferrous shims for aligning system components.
- C. Framing Sealants: Shall be suitable for glazed aluminum curtain wall as recommended by sealant manufacturer.
- D. Fasteners and Accessories: Manufacturer's standard corrosion-resistant, nonstaining, nonbleeding fasteners and accessories compatible with adjacent materials. Where exposed shall be stainless steel.
- E. Perimeter Anchors: When steel anchors are used, provide insulation between steel material and aluminum material to prevent galvanic action.
- F. Packing, Shipping, Handling and Unloading: Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.
- G. Storage and Protection: Store materials protected from exposure to harmful weather conditions. Handle curtain wall material and components to avoid damage. Protect curtain wall material against damage from elements, construction activities, and other hazards before, during and after installation.

2.4 VENTING WINDOWS

- A. Aluminum Windows: AAMA/WDMA/CSA 101/I.S.2/A440, manufacturer's standard, with self-flashing mounting fins, and as follows:
 - 1. Window Type: Projected In and Projected Out.
 - 2. Minimum Performance Grade and Class: AW-PG90-AP.
 - 3. Aluminum Extrusions: ASTM B 221, alloy and temper recommended by manufacturer for strength, corrosion resistance, and application of required finish, but not less than 0.064-inch thickness at any location for main frame and sash members.
 - a. Thermally Improved Construction: Fabricate window units with an integral, concealed, low-conductance thermal barrier; located between exterior materials and window members exposed on interior side; in a manner that eliminates direct metal-to-metal contact.
 - 4. Mullions: Between adjacent windows, fabricated of extruded aluminum matching finish of window units.
 - 5. Fasteners, Anchors, and Clips: Nonmagnetic stainless steel, aluminum, or other noncorrosive material, compatible with aluminum window members, trim, hardware, anchors, and other components of window units. Fasteners shall not be exposed, except for attaching hardware.

- a. Reinforcement: Where fasteners screw-anchor into aluminum less than 0.128 inch thick, reinforce interior with aluminum or nonmagnetic stainless steel to receive screw threads, or provide standard, noncorrosive, pressed-in, spline grommet nuts.
6. Hardware: Manufacturer's standard; of aluminum, stainless steel, die-cast steel, malleable iron, or bronze; including the following:
 - a. Hinges: Stainless Steel, 4-Bar non-friction type, not less than two per sash.
 - b. Lock: Lever handle and cam-action lock with keeper.
 - c. Limit Devices: Shim limit devices designed to restrict sash opening.
 - d. Limit clear opening to 4 inches for ventilation; with custodial key release.
 - e. Provide pole ring cam handle and pole for windows with projected locking hardware above 5'-0" above finished floor. Provide two (2) poles.
7. Sliding-Type Weather Stripping: Woven-pile weather stripping of wool, polypropylene, or nylon pile and resin-impregnated backing fabric; complying with AAMA 701/702.
- B. Glazing: Same as adjacent glazed aluminum curtain-wall glazing.
- C. Finish: Match adjacent glazed aluminum curtain-wall finish.

2.5 MATERIALS

- A. Aluminum Extrusions: Alloy and temper recommended by glazed aluminum curtain wall manufacturer for strength, corrosion resistance, and application of required finish and not less than 0.070" (1.78) wall thickness at any location for the main frame and complying with ASTM B 221: 6063-T6 alloy and temper.
- B. Aluminum sheet alloy: Shall meet the requirements of ASTM B209.
- C. Fasteners: Aluminum, nonmagnetic stainless steel or other materials to be non-corrosive and compatible with aluminum window members, trim hardware, anchors, and other components.
- D. Anchors, Clips, and Accessories: Aluminum, nonmagnetic stainless steel, or zinc-coated steel or iron complying with ASTM B 633 for SC 3 severe service conditions or other suitable zinc coating; provide sufficient strength to withstand design pressure indicated.
- E. Pressure Plate: Pressure plate shall be aluminum and fastened to the mullion with stainless steel screws.
- F. Reinforcing Members: Aluminum, nonmagnetic stainless steel, or nickel/chrome-plated steel complying with ASTM B 456 for Type SC 3 severe service conditions, or zinc-coated steel or iron complying with ASTM B 633 for SC 3 severe service conditions or other suitable zinc coating; provide sufficient strength to withstand design pressure indicated.
- G. Sealant: For sealants required within fabricated curtain wall system, provide permanently elastic, non-shrinking, and non-migrating type recommended by sealant manufacturer for joint size and movement.
- H. Thermal Barrier: Thermal separator shall be extruded of a silicone compatible elastomer that provides a minimum 1/4" (6.3) separation.

- I. Tolerances: Reference to tolerances for wall thickness and other cross-sectional dimensions of glazed curtain wall members are nominal and in compliance with AA Aluminum Standards and Data.

2.6 GLAZING

- A. Glazing: Comply with Section 088000 "Glazing."
- B. Glazing Gaskets: Manufacturer's standard sealed-corner pressure-glazing system of black, resilient elastomeric glazing gaskets, setting blocks, and shims or spacers.
- C. Glazing Sealants: As recommended by manufacturer.
- D. Sealants used inside the weatherproofing system shall have a VOC content of 250 g/L or less.

2.7 ACCESSORIES

- A. Solar Shade
 1. Basis of Design: Kawneer Versoleil Sunshade Outrigger System, 36" Length; Type: Square; Blade Type: Airfoil Blade Type.
 2. Outrigger Blade System: An aluminum sunshade, consisting of outriggers, louvers, and fascia, that is anchored directly to the vertical curtain wall mullions.
 3. Louvers, fascia, and anchors shall be painted; color as selected by Architect from manufacture's standard colors.
- B. Fasteners and Accessories: Manufacturer's standard corrosion-resistant, nonstaining, nonbleeding fasteners and accessories compatible with adjacent materials.
 1. Use self-locking devices where fasteners are subject to loosening or turning out from thermal and structural movements, wind loads, or vibration.
 2. Reinforce members as required to receive fastener threads.
 3. Use exposed fasteners with countersunk Phillips screw heads, finished to match framing system.
- C. Anchors: Three-way adjustable anchors with minimum adjustment of 1 inch that accommodate fabrication and installation tolerances in material and finish compatible with adjoining materials and recommended by manufacturer.
 1. Concrete and Masonry Inserts: Hot-dip galvanized cast-iron, malleable-iron, or steel inserts complying with ASTM A 123/A 123M or ASTM A 153/A 153M requirements.
- D. Concealed Flashing: Manufacturer's standard corrosion-resistant, nonstaining, nonbleeding flashing compatible with adjacent materials.
- E. Bituminous Paint: Cold-applied asphalt-mastic paint complying with SSPC-Paint 12 requirements except containing no asbestos, formulated for 30-mil thickness per coat.

2.8 FABRICATION

- A. Form or extrude aluminum shapes before finishing.
- B. Weld in concealed locations to greatest extent possible to minimize distortion or discoloration of finish. Remove weld spatter and welding oxides from exposed surfaces by descaling or grinding.
- C. Fabricate components that, when assembled, have the following characteristics:
 - 1. Profiles that are sharp, straight, and free of defects or deformations.
 - 2. Accurately fitted joints with ends coped or mitered.
 - 3. Physical and thermal isolation of glazing from framing members.
 - 4. Accommodations for thermal and mechanical movements of glazing and framing to maintain required glazing edge clearances.
 - 5. Provisions for field replacement of glazing from exterior.
 - 6. Fasteners, anchors, and connection devices that are concealed from view to greatest extent possible.
- D. Fabricate components to resist water penetration as follows:
 - 1. Internal guttering system or other means to drain water passing joints, condensation occurring within framing members, and moisture migrating within glazed aluminum curtain wall to exterior.
 - 2. Pressure-equalized system or double barrier design with primary air and vapor barrier at interior side of glazed aluminum curtain wall and secondary seal weeped and vented to exterior.
- E. Curtain-Wall Framing: Fabricate components for assembly using shear-block system.
- F. Factory-Assembled Frame Units:
 - 1. Rigidly secure nonmovement joints.
 - 2. Prepare surfaces that are in contact structural sealant according to sealant manufacturer's written instructions to ensure compatibility and adhesion.
 - 3. Preparation includes, but is not limited to, cleaning and priming surfaces.
 - 4. Seal joints watertight unless otherwise indicated.
 - 5. Install glazing to comply with requirements in Section 088000 "Glazing."
- G. After fabrication, clearly mark components to identify their locations in Project according to Shop Drawings.

2.9 ALUMINUM FINISHES

- A. Color Anodic Finish: AAMA 611, AA-M12C22A42/A44, Class I, 0.018 mm or thicker.
 - 1. Color: Clear.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Prepare surfaces that will contact structural sealant according to sealant manufacturer's written instructions to ensure compatibility and adhesion. Preparation includes, but is not limited to, cleaning and priming surfaces.

3.3 INSTALLATION

A. General:

- 1. Comply with manufacturer's written instructions.
- 2. Do not install damaged components.
- 3. Fit joints to produce hairline joints free of burrs and distortion.
- 4. Rigidly secure nonmovement joints.
- 5. Install anchors with separators and isolators to prevent metal corrosion and electrolytic deterioration and to prevent impeding movement of moving joints.
- 6. Where welding is required, weld components in concealed locations to minimize distortion or discoloration of finish. Protect glazing surfaces from welding.
- 7. Seal joints watertight unless otherwise indicated.

B. Metal Protection:

- 1. Where aluminum is in contact with dissimilar metals, protect against galvanic action by painting contact surfaces with primer, applying sealant or tape, or installing nonconductive spacers as recommended by manufacturer for this purpose.
- 2. Where aluminum is in contact concrete or masonry, protect against corrosion by painting contact surfaces with bituminous paint.

C. Install components to drain water passing joints, condensation occurring within framing members, and moisture migrating within glazed aluminum curtain wall to exterior.

D. Install components plumb and true in alignment with established lines and grades.

E. Install operable units level and plumb, securely anchored, and without distortion. Adjust weather-stripping contact and hardware movement to produce proper operation.

F. Install glazing as specified in Section 088000 "Glazing."

G. Install weatherseal sealant according to Section 079200 "Joint Sealants" and according to sealant manufacturer's written instructions to produce weatherproof joints. Install joint filler behind sealant as recommended by sealant manufacturer.

3.4 ERECTION TOLERANCES

- A. Erection Tolerances: Install glazed aluminum curtain walls to comply with the following maximum tolerances:
1. Plumb: 1/8 inch in 10 feet; 1/4 inch in 40 feet.
 2. Level: 1/8 inch in 20 feet; 1/4 inch in 40 feet.
 3. Alignment:
 - a. Where surfaces abut in line or are separated by reveal or protruding element up to 1/2 inch wide, limit offset from true alignment to 1/16 inch.
 - b. Where surfaces are separated by reveal or protruding element from 1/2 to 1 inch wide, limit offset from true alignment to 1/8 inch.
 - c. Where surfaces are separated by reveal or protruding element of 1 inch wide or more, limit offset from true alignment to 1/4 inch.
 4. Location: Limit variation from plane to 1/8 inch in 12 feet; 1/2 inch over total length.

END OF SECTION 084413

SECTION 085113 - ALUMINUM WINDOWS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes aluminum windows for exterior locations.
- B. Related Requirements:
 - 1. Section 088000 "Glazing" for glass and glazing
 - 2. Section 084413 "Glazed Aluminum Curtain Wall" for coordinating finish among aluminum fenestration units.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include construction details, material descriptions, glazing and fabrication methods, dimensions of individual components and profiles, hardware, and finishes for aluminum windows.
- B. Shop Drawings: Include plans, elevations, sections, hardware, accessories, operational clearances, and details of installation, including anchor, flashing, and sealant installation.
- C. Samples: For each exposed product and for each color specified, 2 by 4 inches in size.
- D. Product Schedule: For aluminum windows. Use same designations indicated on Drawings.

1.4 INFORMATIONAL SUBMITTALS

- A. Product Test Reports: For each type of aluminum window, for tests performed by a qualified testing agency.
- B. Sample Warranties: For manufacturer's warranties.

1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: A manufacturer capable of fabricating aluminum windows that meet or exceed performance requirements indicated and of documenting this performance by test reports, and calculations.

- B. Installer Qualifications: An installer acceptable to aluminum window manufacturer for installation of units required for this Project.
- C. An NFRC Component Modeling Approach (CMA) generated label certificate shall be provided by the manufacturer. The label certificate shall be project specific and will contain thermal performance ratings of the manufacturer's framing combined with specific glass, and the glass spacer used in the fabrication of the glass, at NFRC standard test size as defined in table 4-3 in NFRC 100-2010.

1.6 WARRANTY

- A. Manufacturer's Warranty: Manufacturer agrees to repair or replace aluminum windows that fail in materials or workmanship within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Failure to meet performance requirements.
 - b. Structural failures including excessive deflection, water leakage, condensation, and air infiltration.
 - c. Faulty operation of movable sash and hardware.
 - d. Deterioration of materials and finishes beyond normal weathering.
 - e. Failure of insulating glass.
 - 2. Warranty Period:
 - a. Window: 10 years from date of Substantial Completion.
 - b. Glazing Units: 10 years from date of Substantial Completion.
 - c. Aluminum Finish: 10 years from date of Substantial Completion.

1.7 MANUFACTURERS' QUALIFICATIONS / ALTERNATE MANUFACTURERS:

- A. The materials outlined are the type of materials to be used on this project. Please refer to Specification Section "Substitution Procedures" and "Submittal Procedures". "Or Equal" substitutions are permitted so long as they are equal to or superior to the basis of design and the Contractor takes full responsibility for all coordination and costs associated with collateral issues related to the substitution. No Substitutions will be reviewed during the bidding process. The Contractor takes full responsibility for all substitutions. Substitution submittals shall be made no later than 30 days after Notice to Proceed in order to provide time for comparison review. All submittals after 30 days shall be in strict accordance with the basis of design/specified products. No Substitutions will be considered after 30 days. The following manufacturer criteria must be submitted with the substitution request.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

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

1. Basis of Design: Series 450X Thermal, EfcO Corporation
2. Architectural Window Manufacturing Corporation
3. Wausau.
4. Or approved equal.

B. Source Limitations: Obtain aluminum windows from single source from single manufacturer.

2.2 WINDOW PERFORMANCE REQUIREMENTS

A. Product Standard: Comply with AAMA/WDMA/CSA 101/I.S.2/A440 for definitions and minimum standards of performance, materials, components, accessories, and fabrication unless more stringent requirements are indicated.

1. Window Certification: AMMA certified with label attached to each window.

B. Performance Class and Grade: AAMA/WDMA/CSA 101/I.S.2/A440 as follows:

1. Fixed: Minimum Performance Class Grade: AW150
2. Project Out: Minimum Performance Class Grade: AW120
3. Project In: Minimum Performance Class Grade: AW150

C. Thermal Transmittance: NFRC 100 maximum whole-window U-factor of

1. Fixed: 0.42 Btu/sq. ft. x h x deg F
2. Operable: 0.49 Btu/sq. ft. x h x deg F.

D. Solar Heat-Gain Coefficient (SHGC): NFRC 200 maximum whole-window SHGC of 0.40.

E. Condensation-Resistance Factor (CRF): Provide aluminum windows tested for thermal performance according to AAMA 1503, showing a CRF of 63 minimum.

F. Thermal Movements: Provide aluminum windows, including anchorage, that allow for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures by preventing buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.

1. Temperature Change: 120 deg F , ambient; 180 deg F material surfaces.

G. Sound Transmission Class (STC): Rated for not less than 26 STC when tested for laboratory sound transmission loss according to ASTM E 90 and determined by ASTM E 413.

H. Outside-Inside Transmission Class (OITC): Rated for not less than 24 OITC when tested for laboratory sound transmission loss according to ASTM E 90 and determined by ASTM E 1332.

2.3 ALUMINUM WINDOWS

A. Operating Types: Provide the following operating types in locations indicated on Drawings:

1. Fixed
2. Project out.
3. Project in.

- B. Frames and Sashes: Aluminum extrusions complying with AAMA/WDMA/CSA 101/I.S.2/A440.
 - 1. Thermally Improved Construction: Fabricate frames, sashes, and muntins with an integral, concealed, low-conductance thermal barrier located between exterior materials and window members exposed on interior side in a manner that eliminates direct metal-to-metal contact.
 - C. Insulating-Glass Units: Comply with Section 088000 "Glazing".
 - D. Glazing System: Manufacturer's standard factory-glazing system that produces weathertight seal.
 - E. Hardware, General: Provide manufacturer's standard hardware fabricated from aluminum, stainless steel, carbon steel complying with AAMA 907, or other corrosion-resistant material compatible with adjacent materials; designed to smoothly operate, tightly close, and securely lock windows, and sized to accommodate sash weight and dimensions.
 - 1. Exposed Hardware Color and Finish: As selected by Architect from manufacturer's full range.
 - F. Projected Window Hardware:
 - 1. Hinges: Stainless Steel, 4-Bar non-friction type, not less than two per sash.
 - 2. Lock: Lever handle and cam-action lock with keeper.
 - 3. Limit Devices: Shim limit devices designed to restrict sash opening.
 - a. Limit clear opening to 4 inches for ventilation; with custodial key release.
 - 4. Provide pole ring cam handle and pole for windows with projected locking hardware above 5'-0" above finished floor. Provide two (2) poles.
 - G. Weather Stripping: Provide full-perimeter weather stripping for each operable sash unless otherwise indicated.
 - H. Fasteners: Noncorrosive and compatible with window members, trim, hardware, anchors, and other components.
 - 1. Exposed Fasteners: Do not use exposed fasteners to the greatest extent possible. For application of hardware, use fasteners that match finish hardware being fastened.
- 2.4 ACCESSORIES
- A. Subsills: Thermally broken, extruded-aluminum subsills in configurations indicated on Drawings.
 - B. Column Covers: Extruded-aluminum profiles in sizes and configurations indicated on Drawings.
 - C. Interior Trim: Extruded-aluminum profiles in sizes and configurations indicated on Drawings.
 - D. Panning Trim: Extruded-aluminum profiles in sizes and configurations indicated on Drawings.

- E. Receptor System: Two-piece, snap-together, thermally broken, extruded-aluminum receptor system that anchors windows in place.
- F. Mullions: Extruded-aluminum profiles in sizes and configurations indicated on Drawings.

2.5 FABRICATION

- A. Fabricate aluminum windows in sizes indicated. Include a complete system for assembling components and anchoring windows.
- B. Glaze aluminum windows in the factory.
- C. Weather strip each operable sash to provide weathertight installation.
- D. Weep Holes: Provide weep holes and internal passages to conduct infiltrating water to exterior.
- E. Provide water-shed members above side-hinged sashes and similar lines of natural water penetration.
- F. Mullions: Provide mullions and cover plates, matching window units, complete with anchors for support to structure and installation of window units. Allow for erection tolerances and provide for movement of window units due to thermal expansion and building deflections, as indicated. Provide mullions and cover plates capable of withstanding design wind loads of window units.
- G. Complete fabrication, assembly, finishing, hardware application, and other work in the factory to greatest extent possible. Disassemble components only as necessary for shipment and installation.

2.6 GENERAL FINISH REQUIREMENTS

- A. Comply with NAAMM's "Metal Finishes Manual" for recommendations for applying and designating finishes.
- B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- C. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

2.7 ALUMINUM FINISHES

- A. Finish designations prefixed by AA comply with the system established by the Aluminum Association for designating aluminum finishes.
- B. Class I, Clear Anodic Finish: AA-M12C22A41 (Mechanical Finish: nonspecular as fabricated; Chemical Finish: etched, medium matte; Anodic Coating: Architectural Class I, clear coating 0.018 mm or thicker) complying with AAMA 611.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine openings, substrates, structural support, anchorage, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Verify rough opening dimensions, levelness of sill plate, and operational clearances.
- C. Examine wall flashings, vapor retarders, water and weather barriers, and other built-in components to ensure weathertight window installation.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Comply with manufacturer's written instructions for installing windows, hardware, accessories, and other components. For installation procedures and requirements not addressed in manufacturer's written instructions, comply with installation requirements in ASTM E 2112.
- B. Install windows level, plumb, square, true to line, without distortion or impeding thermal movement, anchored securely in place to structural support, and in proper relation to wall flashing and other adjacent construction to produce weathertight construction.
- C. Install windows and components to drain condensation, water penetrating joints, and moisture migrating within windows to the exterior.
- D. Separate aluminum and other corrodible surfaces from sources of corrosion or electrolytic action at points of contact with other materials.

3.3 ADJUSTING, CLEANING, AND PROTECTION

- A. Adjust operating sashes and hardware for a tight fit at contact points and weather stripping for smooth operation and weathertight closure.
- B. Clean exposed surfaces immediately after installing windows. Avoid damaging protective coatings and finishes. Remove excess sealants, glazing materials, dirt, and other substances.
 - 1. Keep protective films and coverings in place until final cleaning.
- C. Remove and replace glass that has been broken, chipped, cracked, abraded, or damaged during construction period.
- D. Protect window surfaces from contact with contaminating substances resulting from construction operations. If contaminating substances do contact window surfaces, remove contaminants immediately according to manufacturer's written instructions.

END OF SECTION 085113

SECTION 087100 – DOOR HARDWARE

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 commercial door hardware for the following:
 - 1. Swinging doors.
- B. Door hardware includes, but is not necessarily limited to, the following:
 - 1. Mechanical door hardware.
 - 2. Cylinders specified for doors in other sections.
- C. Related Sections:
 - 1. Division 08 Section “Aluminum Framed Entrances”.
 - 2. Division 08 Section “Fiberglass Reinforced Polyester (FRP) Doors and Aluminum Frames”.
- D. Codes and References: Comply with the version year adopted by the Authority Having Jurisdiction.
 - 1. ANSI A117.1 - Accessible and Usable Buildings and Facilities.
 - 2. ICC/IBC - International Building Code.
 - 3. NFPA 80 - Fire Doors and Windows.
 - 4. NFPA 101 - Life Safety Code.
 - 5. NFPA 105 - Installation of Smoke Door Assemblies.
 - 6. State Building Codes, Local Amendments.
- E. Standards: All hardware specified herein shall comply with the following industry standards:
 - 1. ANSI/BHMA Certified Product Standards - A156 Series
 - 2. UL10C – Positive Pressure Fire Tests of Door Assemblies

1.3 SUBMITTALS

- A. Product Data: Manufacturer's product data sheets including installation details, material descriptions, dimensions of individual components and profiles, operational descriptions and finishes.

- B. Door Hardware Schedule: Prepared by or under the supervision of supplier, detailing fabrication and assembly of door hardware, as well as procedures and diagrams. Coordinate the final Door Hardware Schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.
1. Format: Comply with scheduling sequence and vertical format in DHI's "Sequence and Format for the Hardware Schedule."
 2. Organization: Organize the Door Hardware Schedule into door hardware sets indicating complete designations of every item required for each door or opening. Organize door hardware sets in same order as in the Door Hardware Sets at the end of Part 3. Submittals that do not follow the same format and order as the Door Hardware Sets will be rejected and subject to resubmission.
 3. Content: Include the following information:
 - a. Type, style, function, size, label, hand, and finish of each door hardware item.
 - b. Manufacturer of each item.
 - c. Fastenings and other pertinent information.
 - d. Location of door hardware set, cross-referenced to Drawings, both on floor plans and in door and frame schedule.
 - e. Explanation of abbreviations, symbols, and codes contained in schedule.
 - f. Mounting locations for door hardware.
 - g. Door and frame sizes and materials.
 - h. Warranty information for each product.
 4. Submittal Sequence: Submit the final Door Hardware Schedule at earliest possible date, particularly where approval of the Door Hardware Schedule must precede fabrication of other work that is critical in the Project construction schedule. Include Product Data, Samples, Shop Drawings of other work affected by door hardware, and other information essential to the coordinated review of the Door Hardware Schedule.
- C. Informational Submittals:
1. Product Test Reports: Indicating compliance with cycle testing requirements, based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified independent testing agency.
- D. Operating and Maintenance Manuals: Provide manufacturers operating and maintenance manuals for each item comprising the complete door hardware installation in quantity as required in Division 01, Closeout Submittals.

1.4 QUALITY ASSURANCE

- A. Manufacturers Qualifications: Engage qualified manufacturers with a minimum 5 years of documented experience in producing hardware and equipment similar to that indicated for this Project and that have a proven record of successful in-service performance.

- B. Installer Qualifications: A minimum 3 years documented experience installing standard door hardware similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.
- C. Door Hardware Supplier Qualifications: Experienced commercial door hardware distributors with a minimum 5 years documented experience supplying mechanical hardware installations comparable in material, design, and extent to that indicated for this Project. Supplier recognized as a factory direct distributor by the manufacturers of the primary materials with a warehousing facility in Project's vicinity. Supplier to have on staff a certified Architectural Hardware Consultant (AHC) available during the course of the Work to consult with Contractor, Architect, and Owner concerning standard mechanical door hardware and keying.
- D. Source Limitations: Obtain each type and variety of door hardware specified in this section from a single source unless otherwise indicated.
- E. Each unit to bear third party permanent label demonstrating compliance with the referenced standards.
- F. Pre-Submittal Conference: Conduct coordination conference in compliance with requirements in Division 01 Section "Project Meetings" with attendance by representatives of Supplier(s), Installer(s), and Contractor(s) to review proper methods and the procedures for receiving, handling, and installing door hardware.
 - 1. Prior to installation of door hardware, conduct a project specific training meeting to instruct the installing contractors' personnel on the proper installation and adjustment of their respective products. Product training to be attended by installers of door hardware for aluminum, hollow metal and wood doors. Training will include the use of installation manuals, hardware schedules, templates and physical product samples as required.
 - 2. Review sequence of operation narratives for each unique access controlled opening.
 - 3. Review and finalize construction schedule and verify availability of materials.
 - 4. Review the required inspecting, testing, commissioning, and demonstration procedures
- G. At completion of installation, provide written documentation that components were applied to manufacturer's instructions and recommendations and according to approved schedule.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Inventory door hardware on receipt and provide secure lock-up and shelving for door hardware delivered to Project site.
- B. Tag each item or package separately with identification related to the final Door Hardware Schedule, and include basic installation instructions with each item or package.
- C. Deliver, as applicable, construction keys, cylinders, construction cores, access control credentials, software and related accessories directly to Owner via registered mail or overnight package service.

1.6 COORDINATION

- A. Templates: Obtain and distribute to the parties involved templates for doors, frames, and other work specified to be factory prepared for installing standard hardware. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing hardware to comply with indicated requirements.

1.7 WARRANTY

- A. General Warranty: Reference Division 01, General Requirements. Special warranties specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.
- B. Warranty Period: Written warranty, executed by manufacturer(s), agreeing to repair or replace components of standard door hardware that fails in materials or workmanship within specified warranty period after final acceptance by the Owner. Failures include, but are not limited to, the following:
 - 1. Structural failures including excessive deflection, cracking, or breakage.
 - 2. Faulty operation of the hardware.
 - 3. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
- C. Standard Warranty Period: One year from date of Substantial Completion, unless otherwise indicated.
- D. Special Warranty Periods:
 - 1. Ten years for mortise locks and latches.
 - 2. Five years for exit hardware.
 - 3. Twenty five years for manual surface door closer bodies.

1.8 MAINTENANCE SERVICE

- A. Maintenance Tools and Instructions: Furnish a complete set of specialized tools and maintenance instructions as needed for Owner's continued adjustment, maintenance, and removal and replacement of door hardware.

1.9 MANUFACTURERS' QUALIFICATIONS / ALTERNATE MANUFACTURERS:

- A. The materials outlined are the type of materials to be used on this project. Please refer to Specification Section "Substitution Procedures" and "Submittal Procedures". "Or Equal" substitutions are permitted so long as they are equal to or superior to the basis of design and the Contractor takes full responsibility for all coordination and costs associated with collateral issues related to the substitution. No Substitutions will be reviewed during the bidding process. The Contractor takes full responsibility for all substitutions. Substitution submittals shall be made no later than 30 days after Notice to Proceed in order to provide time for comparison review. All submittals after 30 days shall be in strict accordance with the basis of design/specified products. No

Substitutions will be considered after 30 days. The following manufacturer criteria must be submitted with the substitution request.

PART 2 - PRODUCTS

2.1 SCHEDULED DOOR HARDWARE

- A. General: Contractor shall furnish and install door hardware for each door to comply with requirements in Door Hardware Sets and each referenced section that products are to be supplied under.
- B. Designations: Requirements for quantity, item, size, finish or color, grade, function, and other distinctive qualities of each type of door hardware are indicated in the Door Hardware Sets at the end of Part 3. Products are identified by using door hardware designations, as follows:
 - 1. Named Manufacturer's Products: Product designation and manufacturer are listed for each door hardware type required for the purpose of establishing requirements. Manufacturers' names are abbreviated in the Door Hardware Schedule.
- C. Substitutions: Requests for substitution and product approval for inclusive mechanical door hardware in compliance with the specifications must be submitted in writing and in accordance with the procedures and time frames outlined in Division 01, Substitution Procedures. Approval of requests is at the discretion of the architect, owner, and their designated consultants.

2.2 HANGING DEVICES

- A. Hinges: ANSI/BHMA A156.1 certified butt hinges with number of hinge knuckles and other options as specified in the Door Hardware Sets.
 - 1. Quantity: Provide the following hinge quantity:
 - a. Two Hinges: For doors with heights up to 60 inches.
 - b. Three Hinges: For doors with heights 61 to 90 inches.
 - c. Four Hinges: For doors with heights 91 to 120 inches.
 - d. For doors with heights more than 120 inches, provide 4 hinges, plus 1 hinge for every 30 inches of door height greater than 120 inches.
 - 2. Hinge Size: Provide the following, unless otherwise indicated, with hinge widths sized for door thickness and clearances required:
 - a. Widths up to 3'0": 4-1/2" standard or heavy weight as specified.
 - b. Sizes from 3'1" to 4'0": 5" standard or heavy weight as specified.
 - 3. Hinge Weight and Base Material: Unless otherwise indicated, provide the following:
 - a. Exterior Doors: Heavy weight, non-ferrous, ball bearing or oil impregnated bearing hinges unless Hardware Sets indicate standard weight.

- b. Interior Doors: Standard weight, steel, ball bearing or oil impregnated bearing hinges unless Hardware Sets indicate heavy weight.
 4. Hinge Options: Comply with the following:
 - a. Non-removable Pins: Provide set screw in hinge barrel that, when tightened into a groove in hinge pin, prevents removal of pin while door is closed; for the all out-swinging lockable doors.
 5. Manufacturers:
 - a. Hager Companies (HA).
 - b. McKinney Products; ASSA ABLOY Architectural Door Accessories (MK).
 - c. Stanley Hardware (ST).
- B. Continuous Geared Hinges: ANSI/BHMA A156.26 Grade 1-600 certified continuous geared hinge. with minimum 0.120-inch thick extruded 6060 T6 aluminum alloy hinge leaves and a minimum overall width of 4 inches. Hinges are non-handed, reversible and fabricated to template screw locations. Factory trim hinges to suit door height.
1. Manufacturers:
 - a. Hager Companies (HA).
 - b. McKinney Products; ASSA ABLOY Architectural Door Accessories (MK).
 - c. Pemko Products; ASSA ABLOY Architectural Door Accessories (PE).
 - d. Stanley Hardware (ST).

2.3 DOOR OPERATING TRIM

- A. Door Push Plates and Pulls: ANSI/BHMA A156.6 certified door pushes and pulls of type and design specified in the Hardware Sets. Coordinate and provide proper width and height as required where conflicting hardware dictates.
 1. Door Pull and Push Bar Design: Size, shape, and material as indicated in the hardware sets. Minimum clearance of 2 1/2-inches from face of door unless otherwise indicated.
 2. Offset Pull Design: Size, shape, and material as indicated in the hardware sets. Minimum clearance of 2 1/2-inches from face of door and offset of 90 degrees unless otherwise indicated.
 3. Fasteners: Provide manufacturer's designated fastener type as indicated in Hardware Sets.
 4. Manufacturers:
 - a. Hiawatha, Inc. (HI).
 - b. Rockwood Products; ASSA ABLOY Architectural Door Accessories (RO).
 - c. Trimco (TC).

2.4 CYLINDERS AND KEYING

- A. General: Cylinder manufacturer to have minimum (10) years experience designing secured master key systems and have on record a published security keying system policy.

- B. Source Limitations: Obtain each type of keyed cylinder and keys from the same source manufacturer as locksets and exit devices, unless otherwise indicated.
- C. Cylinders: Original manufacturer cylinders complying with the following:
 - 1. Mortise Type: Threaded cylinders with rings and cams to suit hardware application.
 - 2. Rim Type: Cylinders with back plate, flat-type vertical or horizontal tailpiece, and raised trim ring.
 - 3. Bored-Lock Type: Cylinders with tailpieces to suit locks.
 - 4. Mortise and rim cylinder collars to be solid and recessed to allow the cylinder face to be flush and be free spinning with matching finishes.
 - 5. Keyway: Match Facility Standard.
- D. Construction Cores: Provide Construction Cores that are replaceable by permanent cores.
- E. Permanent Cores: Permanent cores shall be provided by Owner.
- F. Patented Cylinders: ANSI/BHMA A156.5, Grade 1, certified patented cylinders employing a utility patented and restricted keyway requiring the use of a patented key. Cylinders are to be protected from unauthorized manufacture and distribution by manufacturer's United States patents. Cylinders are to be factory keyed with owner having the ability for on-site original key cutting.
 - 1. Manufacturers:
 - a. Stanley Best (BE).
- G. Key Quantity: Provide the following minimum number of keys:
 - 1. Change Keys per Cylinder: Two (2)
 - 2. Construction Master Keys (per Master Key Level/Group): Five (5).
 - 3. Construction Keys (where required): Ten (10).
- H. Construction Keying: Provide construction master keyed cylinders.

2.5 MECHANICAL LOCKS AND LATCHING DEVICES

- A. Mortise Locksets, Grade 1 (Heavy Duty): ANSI/BHMA A156.13, Series 1000, Operational and Security Grade 1 certified mortise locksets conforming to impact requirements of ASTM F1577-95b Detention Locks for Swinging Doors. Locksets are to be manufactured with a corrosion resistant steel case and be field-reversible for handing without disassembly of the lock body.
 - 1. Manufacturers:
 - a. Sargent Manufacturing (SA)
 - b. Or approved equal.

2.6 LOCK AND LATCH STRIKES

- A. Strikes: Provide manufacturer's standard strike with strike box for each latch or lock bolt, with curved lip extended to protect frame, finished to match door hardware set, unless otherwise indicated, and as follows:
1. Flat-Lip Strikes: For locks with three-piece antifriction latchbolts, as recommended by manufacturer.
 2. Extra-Long-Lip Strikes: For locks used on frames with applied wood casing trim.
 3. Aluminum-Frame Strike Box: Provide manufacturer's special strike box fabricated for aluminum framing.
 4. Double-lipped strikes: For locks at double acting doors. Furnish with retractable stop for rescue hardware applications.
- B. Standards: Comply with the following:
1. Strikes for Mortise Locks and Latches: BHMA A156.13.
 2. Strikes for Bored Locks and Latches: BHMA A156.2.
 3. Strikes for Auxiliary Deadlocks: BHMA A156.36.
 4. Dustproof Strikes: BHMA A156.16.

2.7 CONVENTIONAL EXIT DEVICES

- A. General Requirements: All exit devices specified herein shall meet or exceed the following criteria:
1. At doors not requiring a fire rating, provide devices complying with NFPA 101 and listed and labeled for "Panic Hardware" according to UL305. Provide proper fasteners as required by manufacturer including sex nuts and bolts at openings specified in the Hardware Sets.
 2. Where exit devices are required on fire rated doors, provide devices complying with NFPA 80 and with UL labeling indicating "Fire Exit Hardware". Provide devices with the proper fasteners for installation as tested and listed by UL. Consult manufacturer's catalog and template book for specific requirements.
 3. Except on fire rated doors, provide exit devices with hex key dogging device to hold the pushbar and latch in a retracted position. Provide optional keyed cylinder dogging on devices where specified in Hardware Sets.
 4. Devices must fit flat against the door face with no gap that permits unauthorized dogging of the push bar. The addition of filler strips is required in any case where the door light extends behind the device as in a full glass configuration.
 5. Lever Operating Trim: Where exit devices require lever trim, furnish manufacturer's heavy duty escutcheon trim with threaded studs for thru-bolts.
 - a. Lock Trim Design: As indicated in Hardware Sets, provide finishes and designs to match that of the specified locksets.

- b. Where function of exit device requires a cylinder, provide a cylinder (Rim or Mortise) as specified in Hardware Sets.
 6. Vertical Rod Exit Devices: Where surface or concealed vertical rod exit devices are used at interior openings, provide as less bottom rod (LBR) unless otherwise indicated. Provide dust proof strikes where thermal pins are required to project into the floor.
 7. Narrow Stile Applications: At doors constructed with narrow stiles, or as specified in Hardware Sets, provide devices designed for maximum 2" wide stiles.
 8. Rail Sizing: Provide exit device rails factory sized for proper door width application.
 9. Through Bolt Installation: For exit devices and trim as indicated in Door Hardware Sets.
- B. Conventional Push Rail Exit Devices (Heavy Duty): ANSI/BHMA A156.3, Grade 1 certified panic and fire exit hardware devices furnished in the functions specified in the Hardware Sets. Exit device latch to be stainless steel, pullman type, with deadlock feature.
1. Manufacturers:
 - a. Corbin Russwin Hardware (RU) - ED4000 / ED5000 Series.
 - b. Sargent Manufacturing (SA) - 80 Series.
 - c. Von Duprin (VD) - 35A/98 XP Series.

2.8 DOOR CLOSERS

- A. All door closers specified herein shall meet or exceed the following criteria:
1. General: Door closers to be from one manufacturer, matching in design and style, with the same type door preparations and templates regardless of application or spring size. Closers to be non-handed with full sized covers including installation and adjusting information on inside of cover.
 2. Standards: Closers to comply with UL-10C for Positive Pressure Fire Test and be U.L. listed for use of fire rated doors.
 3. Cycle Testing: Provide closers which have surpassed 15 million cycles in a test witnessed and verified by UL.
 4. Size of Units: Comply with manufacturer's written recommendations for sizing of door closers depending on size of door, exposure to weather, and anticipated frequency of use. Where closers are indicated for doors required to be accessible to the physically handicapped, provide units complying with ANSI ICC/A117.1.
 5. Closer Arms: Provide heavy duty, forged steel closer arms unless otherwise indicated in Hardware Sets.
 6. Closers shall not be installed on exterior or corridor side of doors; where possible install closers on door for optimum aesthetics.

7. Closer Accessories: Provide door closer accessories including custom templates, special mounting brackets, spacers and drop plates as required for proper installation. Provide through-bolt and security type fasteners as specified in the hardware sets.
- B. Door Closers, Surface Mounted (Heavy Duty): ANSI/BHMA A156.4, Grade 1 surface mounted, heavy duty door closers with complete spring power adjustment, sizes 1 thru 6; and fully operational adjustable according to door size, frequency of use, and opening force. Closers to be rack and pinion type, one piece cast iron or aluminum alloy body construction, with adjustable backcheck and separate non-critical valves for closing sweep and latch speed control. Provide non-handed units standard. Provide brackets and drop plate as required for a complete door closer installation.
1. Manufacturers:
 - a. Corbin Russwin Hardware (RU) – DC6000 Series.
 - b. LCN Closers (LC) - 4040 Series.
 - c. Sargent Manufacturing (SA) - 351 Series.
 - d. Norton Door Controls (NO) - 7500 Series.
 - e. Yale Locks and Hardware (YA) - 4400 Series.
- C. **NOTE: For mounting of door closer, Contractor shall provide screws long enough to accommodate extra .125 thick heavy duty wall reinforcing in aluminum door frame.**
- D. **Provide brackets and drop plate as required for a complete door closer installation.**
- 2.9 ARCHITECTURAL TRIM
- A. Door Protective Trim
1. General: Door protective trim units to be of type and design as specified below or in the Hardware Sets.
 2. Size: Fabricate protection plates (kick, armor, or mop) not more than 2" less than door width (LDW) on stop side of single doors and 1" LDW on stop side of pairs of doors, and not more than 1" less than door width on pull side. Coordinate and provide proper width and height as required where conflicting hardware dictates. Height to be as specified in the Hardware Sets.
 3. Where plates are applied to fire rated doors with the top of the plate more than 16" above the bottom of the door, provide plates complying with NFPA 80. Consult manufacturer's catalog and template book for specific requirements for size and applications.
 4. Protection Plates: ANSI/BHMA A156.6 certified protection plates (kick, armor, or mop), fabricated from the following:
 - a. Stainless Steel: 300 grade, 050-inch thick.
 5. Options and fasteners: Provide manufacturer's designated fastener type as specified in the Hardware Sets. Provide countersunk screw holes.

6. Manufacturers:

- a. Rockwood Products; ASSA ABLOY Architectural Door Accessories (RO);
- b. Or approved equal.

2.10 DOOR STOPS AND HOLDERS

- A. General: Door stops and holders to be of type and design as specified below or in the Hardware Sets.
- B. Door Stops and Bumpers: ANSI/BHMA A156.16, Grade 1 certified door stops and wall bumpers. Provide wall bumpers, either convex or concave types with anchorage as indicated, unless floor or other types of door stops are specified in Hardware Sets. Do not mount floor stops where they will impede traffic. Where floor or wall bumpers are not appropriate, provide overhead type stops and holders.

1. Manufacturers:

- a. Hiawatha, Inc. (HI).
- b. Rockwood Products; ASSA ABLOY Architectural Door Accessories (RO).
- c. Trimco (TC).

2.11 THRESHOLDS

- A. Thresholds: BHMA A156.21; fabricated to full width of opening indicated.
- B. Thresholds shall be continuous over entire opening and full width of door jamb.

2.12 ARCHITECTURAL SEALS

- A. General: Thresholds, weatherstripping, and gasket seals to be of type and design as specified below or in the Hardware Sets. Provide continuous weatherstrip gasketing on exterior doors and provide smoke, light, or sound gasketing on interior doors where indicated. At exterior applications provide non-corrosive fasteners and elsewhere where indicated.
- B. Smoke Labeled Gasketing: Assemblies complying with NFPA 105 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for smoke control ratings indicated, based on testing according to UL 1784.
 1. Provide smoke labeled perimeter gasketing at all smoke labeled openings.
- C. Fire Labeled Gasketing: Assemblies complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated, based on testing according to UL-10C.
 1. Provide intumescent seals as indicated to meet UL10C Standard for Positive Pressure Fire Tests of Door Assemblies, and NPFA 252, Standard Methods of Fire Tests of Door Assemblies.

- D. Sound-Rated Gasketing: Assemblies that are listed and labeled by a testing and inspecting agency, for sound ratings indicated.
- E. Replaceable Seal Strips: Provide only those units where resilient or flexible seal strips are easily replaceable and readily available from stocks maintained by manufacturer.
- F. Manufacturers:
 - 1. National Guard Products (NG).
 - 2. Pemko Products; ASSA ABLOY Architectural Door Accessories (PE).
 - 3. Reese Enterprises, Inc. (RE).

2.13 FABRICATION

- A. Fasteners: Provide door hardware manufactured to comply with published templates generally prepared for machine, wood, and sheet metal screws. Provide screws according to manufacturers recognized installation standards for application intended.

2.14 FINISHES

- A. Standard: Designations used in the Hardware Sets and elsewhere indicate hardware finishes complying with ANSI/BHMA A156.18, including coordination with traditional U.S. finishes indicated by certain manufacturers for their products.
- B. Provide quality of finish, including thickness of plating or coating (if any), composition, hardness, and other qualities complying with manufacturer's standards, but in no case less than specified by referenced standards for the applicable units of hardware
- C. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine scheduled openings, with Installer present, for compliance with requirements for installation tolerances, labeled fire door assembly construction, wall and floor construction, and other conditions affecting performance.
- B. Notify architect of any discrepancies or conflicts between the door schedule, door types, drawings and scheduled hardware. Proceed only after such discrepancies or conflicts have been resolved in writing.

3.2 PREPARATION

- A. Hollow Metal Doors and Frames: Comply with ANSI/DHI A115 series.

- B. Wood Doors: Comply with ANSI/DHI A115-W series.

3.3 INSTALLATION

- A. Install each item of mechanical hardware and access control equipment to comply with manufacturer's written instructions and according to specifications.
 - 1. Installers are to be trained and certified by the manufacturer on the proper installation and adjustment of fire, life safety, and security products including: hanging devices; locking devices; closing devices; and seals.
- B. Mounting Heights: Mount door hardware units at heights indicated in following applicable publications, unless specifically indicated or required to comply with governing regulations:
 - 1. Standard Steel Doors and Frames: DHI's "Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames."
 - 2. Wood Doors: DHI WDHS.3, "Recommended Locations for Architectural Hardware for Wood Flush Doors."
 - 3. Where indicated to comply with accessibility requirements, comply with ANSI A117.1 "Accessibility Guidelines for Buildings and Facilities."
 - 4. Provide blocking in drywall partitions where wall stops or other wall mounted hardware is located.
- C. Retrofitting: Install door hardware to comply with manufacturer's published templates and written instructions. Where cutting and fitting are required to install door hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation of surface protective trim units with finishing work specified in Division 9 Sections. Do not install surface-mounted items until finishes have been completed on substrates involved.
- D. Thresholds: Set thresholds for exterior and acoustical doors in full bed of sealant complying with requirements specified in Division 7 Section "Joint Sealants."
- E. Storage: Provide a secure lock up for hardware delivered to the project but not yet installed. Control the handling and installation of hardware items so that the completion of the work will not be delayed by hardware losses before and after installation.

3.4 FIELD QUALITY CONTROL

- A. Field Inspection: Supplier will perform a final inspection of installed door hardware and state in report whether work complies with or deviates from requirements, including whether door hardware is properly installed, operating and adjusted.

3.5 ADJUSTING

- A. Initial Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to

operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.

3.6 CLEANING AND PROTECTION

- A. Protect all hardware stored on construction site in a covered and dry place. Protect exposed hardware installed on doors during the construction phase. Install any and all hardware at the latest possible time frame.
- B. Clean adjacent surfaces soiled by door hardware installation.
- C. Clean operating items as necessary to restore proper finish. Provide final protection and maintain conditions that ensure door hardware is without damage or deterioration at time of owner occupancy.

3.7 DEMONSTRATION

- A. Instruct Owner's maintenance personnel to adjust, operate, and maintain mechanical door hardware.

3.8 DOOR HARDWARE SETS

- A. The hardware sets represent the design intent and direction of the owner and architect. They are a guideline only and should not be considered a detailed hardware schedule. Discrepancies, conflicting hardware and missing items should be brought to the attention of the architect with corrections made prior to the bidding process. Omitted items not included in a hardware set should be scheduled with the appropriate additional hardware required for proper application and functionality.
- B. The supplier is responsible for handing and sizing all products and providing the correct option for the appropriate door type and material where more than one is presented in the hardware sets. Quantities listed are for each pair of doors, or for each single door.
- C. Building Abbreviations:
 - 1. BES: Barton Elementary School
 - 2. KSE: Kingston Elementary School
 - 3. KNES: Knight Elementary School
 - 4. MES: Mann Elementary School
 - 5. SES: Stockton Elementary School
 - 6. WES: Woodcrest Elementary School
 - 7. BMS: Beck Middle School
 - 8. HWS: Cherry Hill High School West
 - 9. EHS: Cherry Hill High School East
- D. Manufacturer's Abbreviations:
 - 1. MK - McKinney
 - 2. MR- Markar
 - 3. PE - Pemko

4. SA - Sargent
5. BE - Stanley Security Solutions Inc (BE)
6. RO - Rockwood
7. RF - Rixson
8. NO - Norton
9. AD – Adams Rite

3.9

3.9 HARDWARE SETS

Hardware Sets

Note: Threshold depth to match door jamb depth, threshold length shall be full width of door opening.

Set: 1.0

Doors from Cafeteria 1 and 2 to Courtyard A

Doors: A-02, A-04

2	Continuous Hinge	FM300	630	MR
1	Removeable Mullion*	L980S	US28	SA
1	Mullion Stabilizer Kit	651		SA
2	Mortise Deadlock	MS1850S	628	AD
2	Cylinder Cores	by owner		
2	Push Bar & Pull	BF15847	US32D	RO
2	Overhead Stop	1-X36 (heavy duty concealed)	630	RF
2	Surface Closer	351 CPS (stop arm) door opens 180°	EN	SA
1	Threshold	272 A 36, 1842 A S 36		PE
1	Rain Guard	346C		PE
1	Gasketing	by door supplier		
2	Door Bottom	234APK		PE
2	Sign	RM1110H (push)	US32D	RO
2	Sign	RM1110L (pull)	US32D	RO
1	Status Indicator	4089	130	AD

Notes:

- Provide three-sided aluminum closure panel at space above removeable mullion top retainer and bottom of door frame.

Set: 1.1

Doors from Cafeteria 1 and 2 to Courtyard A

Doors: A-01, A-05

2	Continuous Hinge	FM300	630	MR
2	Mortise Deadlock	MS1850S	628	AD
2	Cylinder Cores	by owner		
2	Push Bar & Pull	BF15847	US32D	RO
2	Overhead Stop	1-X36 (heavy duty concealed)	630	RF

2	Surface Closer	351 CPS (stop arm)	door opens 180°	EN	SA
1	Threshold	272 A 36, 1842 A S 36			PE
1	Rain Guard	346C			PE
1	Gasketing	by door supplier			
2	Door Bottom	234APK			PE
1	Sign	RM1110H (push)		US32D	RO
1	Sign	RM1110L (pull)		US32D	RO
2	Status Indicator	4089		130	AD

Set: 2.0

Doors from Courtyards A and B to Links

Doors: A-06, A-07, B-01, B-02

1	Continuous Hinge	FM300		630	MR
1	Exit Device (storeroom)	CPC 16 8504		US32D	SA
2	Cylinder cores	by owner			
1	Door Pull	BF158, mounting Type 1		US32D	RO
1	Overhead Stop	1-X36 (heavy duty concealed)		630	RF
1	Surface Closer	351 O/P9		EN	SA
1	Kick Plate	K1050 10" CSK TORX BEV		US32D	RO
1	Threshold	272 A 36, 1842 A S 36			PE
1	Gasketing	(HSS2000) S88BL			PE
1	Rain Guard	346C			PE
1	Door Bottom	234APK			PE

Notes:

- Opening(s) can be dogged down for push/pull operation via cylinder dogging.

Set: 3.0

Kiln Room Door

Doors: B-03

3	Hinge	TA2314 NRP		US32D	MK
1	Classroom Security Lock	8238 LNP		US26D	SA
2	Cylinder	by owner			
1	Overhead Stop	1-X36 (heavy duty concealed)		630	RF
1	Surface Closer	351 O/P9		EN	SA
1	Kick Plate	K1050 10" CSK TORX BEV		US32D	RO

1	Threshold	272 A 36, 1842 A S 36		PE
1	Gasketing	(HSS2000) S88BL		PE
1	Rain Guard	346C		PE
1	Door Bottom	234APK		PE

Set: 4.0

Door to Crawlspace

Door: B-06

2	Hinge	TA2314 NRP	US32D	MK
1	Storeroom/Closet Lock	8204 LNP	US26D	SA
1	Cylinder Core	by owner		
1	Overhead Stop	1-X36 (heavy duty concealed)	630	RF
1	Surface Closer	351 O/P9	EN	SA
1	Threshold	274x4AFG		PE
1	Gasketing	(HSS2000) S88BL		PE
1	Door Bottom	234APK		PE
1	Flush door pull by FRP door manufacturer			

Set: 5.0

Café 1/ Café 2/ Teacher Dining

Door: A-03

1	Continuous Hinge	FM300	630	MR
1	Utility Lock	8231 LNP	US26D	SA
1	Cylinder	by owner		
1	Overhead Stop	1-X36 (heavy duty concealed)	630	RF
1	Surface Closer	351 O/P9	EN	SA
1	Threshold	272 A 36, 1842 A S 36		PE
1	Rain Guard	346C		PE
1	Gasketing	by door supplier		
1	Door Bottom	234APK		PE

Set: 6.0

Photography Room F-074

Doors: F-074.1

3	Hinge	TA2714 NRP	US26D	MK
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1	Classroom Security Lock	8238 LNL	US26D	SA
1	Cylinder	1E (type to suit) (included collar)	626	BE
1	Cylinder Core	by owner		OT
3	Silencer	608		RO
1	Surface Closer	351 O/P9	EN	SA

Set: 7.0

Doors from Courtyard B to Link 2

Door: B-04, B-05

2	Continuous Hinge	FM300	630	
1	Exit Device (nightlatch)	16 AD8610 106	US32D	
1	Exit Device (exit only)	16 AD8610	US32D	
3	Cylinder	by owner		
2	Door Pull	BF158	US32D	
2	Overhead Stop	1-X36 (heavy duty concealed)	630	
2	Surface Closer	351 O/P9	EN	
2	Kick Plate	K1050 10" CSK TORX BEV	US32D	
1	Threshold	272 A 36, 1842 A S 36	PE	
1	Rain Guard	346C	PE	
1	Gasketing	by door supplier		
2	Door Bottom	234APK	PE	

END OF SECTION 087100

SECTION 088000 - GLAZING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes glazing for the following products and applications, including those specified in other Sections where glazing requirements are specified by reference to this Section:
 - 1. Windows
 - 2. Doors.
 - 3. Glazed curtain walls.
 - 4. Glazing sealants and accessories.
- B. Related Requirements:
 - 1. Division 08 Section "Glazed Aluminum Curtain Walls."
 - 2. Division 08 Section "Aluminum Windows."

1.3 DEFINITIONS

- A. Glass Manufacturers: Firms that produce primary glass, fabricated glass, or both, as defined in referenced glazing publications.
- B. Glass Thicknesses: Indicated by thickness designations in millimeters according to ASTM C 1036.
- C. IBC: International Building Code.
- D. Interspace: Space between lites of an insulating-glass unit.

1.4 COORDINATION

- A. Coordinate glazing channel dimensions to provide necessary bite on glass, minimum edge and face clearances, and adequate sealant thicknesses, with reasonable tolerances.

1.5 ACTION SUBMITTALS

- A. Product Data: For each type of product.

- B. Glass Samples: For each type of glass product other than clear monolithic vision glass; 12 inches square.
- C. Glazing Schedule: List glass types and thicknesses for each size opening and location. Use same designations indicated on Drawings.

1.6 INFORMATIONAL SUBMITTALS

- A. Product Certificates: For glass.
- B. Product Test Reports: For tinted glass, insulating glass, and glazing sealants, for tests performed by a qualified testing agency.
 - 1. For glazing sealants, provide test reports based on testing current sealant formulations within previous 36-month period.

1.7 QUALITY ASSURANCE

- A. Manufacturer Qualifications for Insulating-Glass Units with Sputter-Coated, Low-E Coatings: A qualified insulating-glass manufacturer who is approved and certified by coated-glass manufacturer.
- B. Installer Qualifications: A qualified installer who employs glass installers for this Project who are certified under the National Glass Association's Certified Glass Installer Program.
- C. Glass Testing Agency Qualifications: A qualified independent testing agency accredited according to the NFRC CAP 1 Certification Agency Program.
- D. Sealant Testing Agency Qualifications: An independent testing agency qualified according to ASTM C 1021 to conduct the testing indicated.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Protect glazing materials according to manufacturer's written instructions. Prevent damage to glass and glazing materials from condensation, temperature changes, direct exposure to sun, or other causes.
- B. Comply with insulating-glass manufacturer's written instructions for venting and sealing units to avoid hermetic seal ruptures due to altitude change.

1.9 FIELD CONDITIONS

- A. Environmental Limitations: Do not proceed with glazing when ambient and substrate temperature conditions are outside limits permitted by glazing material manufacturers and when glazing channel substrates are wet from rain, frost, condensation, or other causes.
 - 1. Do not install glazing sealants when ambient and substrate temperature conditions are outside limits permitted by sealant manufacturer or are below 40 deg F.

1.10 WARRANTY

- A. Manufacturer's Special Warranty for Insulating Glass: Manufacturer agrees to replace insulating-glass units that deteriorate within specified warranty period. Deterioration of insulating glass is defined as failure of hermetic seal under normal use that is not attributed to glass breakage or to maintaining and cleaning insulating glass contrary to manufacturer's written instructions. Evidence of failure is the obstruction of vision by dust, moisture, or film on interior surfaces of glass.

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

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Basis-of-Design Glass Product Subject to compliance with requirements, provide product indicated in glass schedules or comparable product by one of the following:

1. Pilkington Architectural
2. PPG Industries
3. Oldcastle Glass
4. Or approved equal.

- B. Source Limitations for Glass: Obtain from single source from single manufacturer for each glass type.

1. Obtain tinted glass from single source from single manufacturer.

- C. Source Limitations for Glazing Accessories: Obtain from single source from single manufacturer for each product and installation method.

2.2 PERFORMANCE REQUIREMENTS

- A. General: Installed glazing systems shall withstand normal thermal movement and wind and impact loads (where applicable) without failure, including loss or glass breakage attributable to the following: defective manufacture, fabrication, or installation; failure of sealants or gaskets to remain watertight and airtight; deterioration of glazing materials; or other defects in construction.

- B. Structural Performance: Glazing shall withstand the effects of the following design loads within limits and under conditions indicated determined according to the NJ IBC 2018 and ASTM E 1300.

1. Design Wind Pressures: Calculated in accordance with ASCE 7-16 with parameters provided in load schedule in Drawings.
2. Design Snow Loads: Calculated in accordance with ASCE 7-16 with parameters provided in load schedule in Drawings.
3. Thickness of Patterned Glass: Base design of patterned glass on thickness at thinnest part of the glass.

4. Maximum Lateral Deflection: For glass supported on all four edges, limit center-of-glass deflection at design wind pressure to not more than 1/50 times the short-side length or 1 inch , whichever is less.
 5. Differential Shading: Design glass to resist thermal stresses induced by differential shading within individual glass lites.
- C. Safety Glazing: Where safety glazing is indicated, provide glazing that complies with 16 CFR 1201, Category II.
- D. Thermal and Optical Performance Properties: Provide glass with performance properties specified, as indicated in manufacturer's published test data, based on procedures indicated below:
1. For monolithic-glass lites, properties are based on units with lites of thickness indicated.
 2. For insulating-glass units, properties are based on units of thickness indicated for overall unit and for each lite.
 3. U-Factors: Center-of-glazing values, according to NFRC 100 and based on LBL's WINDOW 5.2 computer program, expressed as Btu/sq. ft. x h x deg F.
 4. Solar Heat-Gain Coefficient and Visible Transmittance: Center-of-glazing values, according to NFRC 200 and based on LBL's WINDOW 5.2 computer program.
 5. Visible Reflectance: Center-of-glazing values, according to NFRC 300.

2.3 GLASS PRODUCTS, GENERAL

- A. Glazing Publications: Comply with published recommendations of glass product manufacturers and organizations below unless more stringent requirements are indicated. See these publications for glazing terms not otherwise defined in this Section or in referenced standards.
- B. Safety Glazing Labeling: Where safety glazing is indicated, permanently mark glazing with certification label of the SGCC or another certification agency acceptable to authorities having jurisdiction or manufacturer. Label shall indicate manufacturer's name, type of glass, thickness, and safety glazing standard with which glass complies.
- C. Insulating-Glass Certification Program: Permanently marked either on spacers or on at least one component lite of units with appropriate certification label of IGCC.
- D. Thickness: Where glass thickness is indicated, it is a minimum. Provide glass that complies with performance requirements and is not less than the thickness indicated.
1. Minimum Glass Thickness for Exterior Lites: 6 mm.
 2. Thickness of Tinted Glass: Provide same thickness for each tint color indicated throughout Project.
- E. Strength: Where annealed float glass is indicated, provide annealed float glass, heat-strengthened float glass, or fully tempered float glass as needed to comply with "Performance Requirements" Article. Where heat-strengthened float glass is indicated, provide heat-strengthened float glass or fully tempered float glass as needed to comply with "Performance Requirements" Article. Where fully tempered float glass is indicated, provide fully tempered float glass.

2.4 GLASS PRODUCTS

- A. Refer to Primary Tinted Float Glass Product Data Sheet for tint color and nominal performance characteristics of Class 2 uncoated tinted glass for monolithic glazing relative to visible light transmittance, U-values, shading coefficient, and visible reflectance.
- B. Refer to requirements for sealed glass units for performance characteristics of assembled units composed of tinted glass, coated or uncoated, relative to visible light transmittance, U-values, shading coefficient, and visible reflectance.
- C. Fully Tempered Float Glass: ASTM C 1048, Kind FT (fully tempered), Condition A (uncoated) unless otherwise indicated, Type I, Class 1 (clear) or Class 2 (tinted) as indicated, Quality-Q3.
 - 1. Fabrication Process: By horizontal (roller-hearth) process with roll-wave distortion parallel to bottom edge of glass as installed unless otherwise indicated.
- D. Heat-Strengthened Float Glass: ASTM C 1048, Kind HS (heat strengthened), Type I, Condition A (uncoated) unless otherwise indicated, Type I, Class 1 (clear) or Class 2 (tinted) as indicated, Quality-Q3.
 - 1. Fabrication Process: By horizontal (roller-hearth) process with roll-wave distortion parallel to bottom edge of glass as installed unless otherwise indicated.

2.5 INSULATING GLASS

- A. Insulating-Glass Units: Factory-assembled units consisting of sealed lites of glass separated by a dehydrated interspace, qualified according to ASTM E 2190.
 - 1. Sealing System: Dual seal, with manufacturer's standard primary and secondary sealants.
 - 2. Spacer: Manufacturer's standard spacer material and construction.
 - 3. Desiccant: Molecular sieve or silica gel, or a blend of both.

2.6 GLAZING SEALANTS

- A. General:
 - 1. Compatibility: Compatible with one another and with other materials they contact, including glass products, seals of insulating-glass units, and glazing channel substrates, under conditions of service and application, as demonstrated by sealant manufacturer based on testing and field experience.
 - 2. Suitability: Comply with sealant and glass manufacturers' written instructions for selecting glazing sealants suitable for applications indicated and for conditions existing at time of installation.
 - 3. Colors of Exposed Glazing Sealants: As selected by Architect from manufacturer's full range.
- B. Glazing Sealant: Neutral-curing silicone glazing sealant complying with ASTM C 920, Type S, Grade NS, Class 100/50, Use NT.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - a. GE Advanced Materials - Silicones; SilPruf LM SCS2700
 - b. Sika Corporation, Construction Products Division; SikaSil-C990;
 - c. Tremco Incorporated; Spectrem 1;
 - d. Or approved equal.
2. Applications: As indicated.

2.7 GLAZING GASKETS

- A. Lock-Strip Gaskets: Neoprene extrusions in size and shape indicated, fabricated into frames with molded corner units and zipper lock strips, complying with ASTM C 542, black.
- B. Dense Compression Gaskets: Molded or extruded gaskets of material indicated below, complying with standards referenced with name of elastomer indicated below, and of profile and hardness required to maintain watertight seal:
 1. Neoprene, ASTM C 864.
 2. EPDM, ASTM C 864.
 3. Silicone, ASTM C 1115.
 4. Thermoplastic polyolefin rubber, ASTM C 1115.
- C. Soft Compression Gaskets: Extruded or molded closed-cell, integral-skinned gaskets of material indicated below, complying with ASTM C 509, Type II, black, and or profile and hardness required to maintain watertight seal.
 1. Neoprene.
 2. Silicone.
 3. Thermoplastic polyolefin rubber.

2.8 GLAZING TAPES

- A. Back-Bedding Mastic Glazing Tapes: Preformed, butyl-based, 100 percent solids elastomeric tape; nonstaining and nonmigrating in contact with nonporous surfaces; with or without spacer rod as recommended in writing by tape and glass manufacturers for application indicated; and complying with ASTM C 1281 and AAMA 800 for products indicated below:
 1. AAMA 804.3 tape, where indicated.
 2. AAMA 806.3 tape, for glazing applications in which tape is subject to continuous pressure.
 3. AAMA 807.3 tape, for glazing applications in which tape is not subject to continuous pressure.
- B. Expanded Cellular Glazing Tapes: Closed-cell, PVC foam tapes; factory coated with adhesive on both surfaces; and complying with AAMA 800 for the following types:
 1. AAMA 810.1, Type 1, for glazing applications in which tape acts as the primary sealant.

2. AAMA 810.1, Type 2, for glazing applications in which tape is used in combination with a full bead of liquid sealant.

2.9 MISCELLANEOUS GLAZING MATERIALS

- A. General: Provide products of material, size, and shape complying with referenced glazing standard, with requirements of manufacturers of glass and other glazing materials for application indicated, and with a proven record of compatibility with surfaces contacted in installation.
- B. Cleaners, Primers, and Sealers: Types recommended by sealant or gasket manufacturer.
- C. Setting Blocks: Elastomeric material with a Shore, Type A durometer hardness of 85, plus or minus 5.
- D. Spacers: Elastomeric blocks or continuous extrusions of hardness required by glass manufacturer to maintain glass lites in place for installation indicated.
- E. Edge Blocks: Elastomeric material of hardness needed to limit glass lateral movement (side walking).
- F. Cylindrical Glazing Sealant Backing: ASTM C 1330, Type O (open-cell material), of size and density to control glazing sealant depth and otherwise produce optimum glazing sealant performance.

2.10 FABRICATION OF GLAZING UNITS

- A. Fabricate glazing units in sizes required to fit openings indicated for Project, with edge and face clearances, edge and surface conditions, and bite complying with written instructions of product manufacturer and referenced glazing publications, to comply with system performance requirements.
 1. Allow for thermal movements from ambient and surface temperature changes acting on glass framing members and glazing components.
 - a. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.
- B. Clean-cut or flat-grind vertical edges of butt-glazed monolithic lites to produce square edges with slight chamfers at junctions of edges and faces.
- C. Grind smooth and polish exposed glass edges and corners.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine framing, glazing channels, and stops, with Installer present, for compliance with the following:

1. Manufacturing and installation tolerances, including those for size, squareness, and offsets at corners.
2. Presence and functioning of weep systems.
3. Minimum required face and edge clearances.
4. Effective sealing between joints of glass-framing members.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Clean glazing channels and other framing members receiving glass immediately before glazing. Remove coatings not firmly bonded to substrates.
- B. Examine glazing units to locate exterior and interior surfaces. Label or mark units as needed so that exterior and interior surfaces are readily identifiable. Do not use materials that leave visible marks in the completed Work.

3.3 GLAZING, GENERAL

- A. Comply with combined written instructions of manufacturers of glass, sealants, gaskets, and other glazing materials, unless more stringent requirements are indicated, including those in referenced glazing publications.
- B. Protect glass edges from damage during handling and installation. Remove damaged glass from Project site and legally dispose of off Project site. Damaged glass includes glass with edge damage or other imperfections that, when installed, could weaken glass, impair performance, or impair appearance.
- C. Apply primers to joint surfaces where required for adhesion of sealants, as determined by preconstruction testing.
- D. Install setting blocks in sill rabbets, sized and located to comply with referenced glazing publications, unless otherwise required by glass manufacturer. Set blocks in thin course of compatible sealant suitable for heel bead.
- E. Do not exceed edge pressures stipulated by glass manufacturers for installing glass lites.
- F. Provide spacers for glass lites where length plus width is larger than **50 inches**.
 1. Locate spacers directly opposite each other on both inside and outside faces of glass. Install correct size and spacing to preserve required face clearances, unless gaskets and glazing tapes are used that have demonstrated ability to maintain required face clearances and to comply with system performance requirements.
 2. Provide **1/8-inch** minimum bite of spacers on glass and use thickness equal to sealant width. With glazing tape, use thickness slightly less than final compressed thickness of tape.

- G. Provide edge blocking where indicated or needed to prevent glass lites from moving sideways in glazing channel, as recommended in writing by glass manufacturer and according to requirements in referenced glazing publications.
- H. Set glass lites in each series with uniform pattern, draw, bow, and similar characteristics.
- I. Set glass lites with proper orientation so that coatings face exterior or interior as specified.
- J. Where wedge-shaped gaskets are driven into one side of channel to pressurize sealant or gasket on opposite side, provide adequate anchorage so gasket cannot walk out when installation is subjected to movement.
- K. Square cut wedge-shaped gaskets at corners and install gaskets in a manner recommended by gasket manufacturer to prevent corners from pulling away; seal corner joints and butt joints with sealant recommended by gasket manufacturer.

3.4 TAPE GLAZING

- A. Position tapes on fixed stops so that, when compressed by glass, their exposed edges are flush with or protrude slightly above sightline of stops.
- B. Install tapes continuously, but not necessarily in one continuous length. Do not stretch tapes to make them fit opening.
- C. Cover vertical framing joints by applying tapes to heads and sills first, then to jambs. Cover horizontal framing joints by applying tapes to jambs, then to heads and sills.
- D. Place joints in tapes at corners of opening with adjoining lengths butted together, not lapped. Seal joints in tapes with compatible sealant approved by tape manufacturer.
- E. Do not remove release paper from tape until right before each glazing unit is installed.
- F. Apply heel bead of elastomeric sealant.
- G. Center glass lites in openings on setting blocks and press firmly against tape by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings.
- H. Apply cap bead of elastomeric sealant over exposed edge of tape.

3.5 GASKET GLAZING (DRY)

- A. Cut compression gaskets to lengths recommended by gasket manufacturer to fit openings exactly, with allowance for stretch during installation.
- B. Insert soft compression gasket between glass and frame or fixed stop so it is securely in place with joints miter cut and bonded together at corners.

- C. Installation with Drive-in Wedge Gaskets: Center glass lites in openings on setting blocks and press firmly against soft compression gasket by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings. Compress gaskets to produce a weathertight seal without developing bending stresses in glass. Seal gasket joints with sealant recommended by gasket manufacturer.
- D. Installation with Pressure-Glazing Stops: Center glass lites in openings on setting blocks and press firmly against soft compression gasket. Install dense compression gaskets and pressure-glazing stops, applying pressure uniformly to compression gaskets. Compress gaskets to produce a weathertight seal without developing bending stresses in glass. Seal gasket joints with sealant recommended by gasket manufacturer.
- E. Install gaskets so they protrude past face of glazing stops.

3.6 SEALANT GLAZING (WET)

- A. Install continuous spacers, or spacers combined with cylindrical sealant backing, between glass lites and glazing stops to maintain glass face clearances and to prevent sealant from extruding into glass channel and blocking weep systems until sealants cure. Secure spacers or spacers and backings in place and in position to control depth of installed sealant relative to edge clearance for optimum sealant performance.
- B. Force sealants into glazing channels to eliminate voids and to ensure complete wetting or bond of sealant to glass and channel surfaces.
- C. Tool exposed surfaces of sealants to provide a substantial wash away from glass.

3.7 LOCK-STRIP GASKET GLAZING

- A. Comply with ASTM C 716 and gasket manufacturer's printed recommendations. Provide supplementary wet seal and weep system unless otherwise indicated.

3.8 CLEANING AND PROTECTION

- A. Immediately after installation remove nonpermanent labels and clean surfaces.
- B. Protect glass from contact with contaminating substances resulting from construction operations. Examine glass surfaces adjacent to or below exterior concrete and other masonry surfaces at frequent intervals during construction, but not less than once a month, for buildup of dirt, scum, alkaline deposits, or stains.
 - 1. If, despite such protection, contaminating substances do come into contact with glass, remove substances immediately as recommended in writing by glass manufacturer. Remove and replace glass that cannot be cleaned without damage to coatings.
- C. Remove and replace glass that is damaged during construction period.

- D. Wash glass on both exposed surfaces not more than four days before date scheduled for inspections that establish date of Substantial Completion. Wash glass as recommended in writing by glass manufacturer.

3.9 GLASS SCHEDULE

A. **Glass Type INSUL-1:** Low-E-coated, insulating glass.

1. Overall Unit Thickness: **1 inch.**
2. Minimum Thickness of Each Glass Lite: 6 mm.
3. Outdoor Lite: Tinted fully tempered float glass.
4. Tint Color: Evergreen.
5. Low-E Coating: Pyrolytic on second surface.
6. Interspace Content: Argon.
7. Indoor Lite: Clear heat-strengthened float glass.
8. Winter Nighttime U-Factor .28 maximum.
9. Summer Daytime U-Factor: .30 maximum.
10. Visible Light Transmittance: 70 % minimum.
11. Solar Heat Gain Coefficient:.44 maximum.
12. Safety glazing required.

B. **Glass Type INSUL-2:** Low-E-coated, tinted insulating glass.

1. Overall Unit Thickness: **1 inch.**
2. Minimum Thickness of Each Glass Lite: 6 mm.
3. Outdoor Lite: Tinted fully tempered float glass.
4. Tint Color: Evergreen.
5. Low-E Coating: Pyrolytic on second surface.
6. Interspace Content: Argon.
7. Indoor Lite: Tinted heat-strengthened float glass.
8. Tint Color: Solarcool
9. Winter Nighttime NFRC U-Factor: 1.03 maximum.
10. Summer Daytime NFRC U-Factor: 0.93 maximum.
11. Exterior Reflectance: 11%
12. Interior Reflectance: 36%
13. Visible Light Transmittance: 17% minimum.
14. Solar Heat Gain Coefficient: .44 maximum.
15. Safety glazing required.

C. **Glass Type GL-1:** Clear Fully Tempered Float Glass.

1. Minimum Thickness: 6 mm.
2. Safety glazing required.

END OF SECTION 088000

SECTION 092900 - GYPSUM BOARD

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:

- 1. Interior gypsum board.

- B. Related Requirements:

- 1. Section 061600 "Sheathing" for gypsum sheathing for exterior walls.
 - 2. Division 09 "Interior Paint" Section for primers applied to gypsum board surfaces.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.

- B. Samples: For the following products:

- 1. Trim Accessories: Full-size Sample in 12-inch-long length for each trim accessory indicated.
 - 2. Textured Finishes: 12" x 12" for each textured finish indicated and on same backing indicated for Work.

1.4 QUALITY ASSURANCE

1.5 DELIVERY, STORAGE AND HANDLING

- A. Store materials inside under cover and keep them dry and protected against weather, condensation, direct sunlight, construction traffic, and other potential causes of damage. Stack panels flat and supported on risers on a flat platform to prevent sagging.

1.6 FIELD CONDITIONS

- A. Environmental Limitations: Comply with ASTM C 840 requirements or gypsum board manufacturer's written recommendations, whichever are more stringent.

- B. Do not install paper-faced gypsum panels until installation areas are enclosed and conditioned.
- C. Do not install panels that are wet, those that are moisture damaged, and those that are mold damaged.
 - 1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
 - 2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Fire-Resistance-Rated Assemblies: For fire-resistance-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E 119 by an independent testing agency.

2.2 GYPSUM BOARD, GENERAL

- A. Size: Provide maximum lengths and widths available that will minimize joints in each area and that correspond with support system indicated.

2.3 INTERIOR GYPSUM BOARD

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. USG Corporation.
 - 2. Georgia Pacific Building Products.
 - 3. National Gypsum Company
 - 4. Or approved equal.
- B. Gypsum Board, : ASTM C 1396/C 1396M.
 - 1. Thickness: 3/8 inch, **5/8 inch**.
 - 2. Long Edges: Tapered.
- C. Gypsum Ceiling/Soffit Board: ASTM C 1396/C 1396M.
 - 1. Thickness: **1/2 inch (12.7 mm)**.
 - 2. Long Edges: Tapered.

2.4 TRIM ACCESSORIES

- A. Interior Trim: ASTM C 1047.
 - 1. Material: Galvanized or aluminum-coated steel sheet or rolled zinc.

2. Shapes:
 - a. Cornerbead.
 - b. LC-Bead: J-shaped; exposed long flange receives joint compound.
 - c. Expansion (control) joint.

2.5 JOINT TREATMENT MATERIALS

- A. General: Comply with ASTM C 475/C 475M.
- B. Joint Tape:
 1. Interior Gypsum Board: Paper.
- C. Joint Compound for Interior Gypsum Board: For each coat use formulation that is compatible with other compounds applied on previous or for successive coats.
 1. Prefilling: At open joints, rounded or beveled panel edges, and damaged surface areas, use setting-type taping compound.
 2. Embedding and First Coat: For embedding tape and first coat on joints, fasteners, and trim flanges, use setting-type taping compound.
 - a. Use setting-type compound for installing paper-faced metal trim accessories.
 3. Fill Coat: For second coat, use drying-type, all-purpose compound.
 4. Finish Coat: For third coat, use setting-type, sandable topping compound.
 5. Skim Coat: For final coat of Level 5 finish, use setting-type, sandable topping compound.

2.6 AUXILIARY MATERIALS

- A. General: Provide auxiliary materials that comply with referenced installation standards and manufacturer's written recommendations.
- B. Laminating Adhesive: Adhesive or joint compound recommended for directly adhering gypsum panels to continuous substrate.
 1. Laminating adhesive shall have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
- C. Steel Drill Screws: ASTM C 1002, unless otherwise indicated.
 1. Use screws complying with ASTM C 954 for fastening panels to steel members from **0.033 to 0.112 inch** thick.
- D. Thermal Insulation: As specified in Section 072100 "Thermal Insulation."

2.7 TEXTURE FINISHES

- A. Primer: As recommended by textured finish manufacturer.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas and substrates including welded hollow-metal frames and framing, with Installer present, for compliance with requirements and other conditions affecting performance.
- B. Examine panels before installation. Reject panels that are wet, moisture damaged, and mold damaged.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 APPLYING AND FINISHING PANELS, GENERAL

- A. Comply with ASTM C 840.
- B. Install panels with face side out. Butt panels together for a light contact at edges and ends with not more than **1/16 inch** of open space between panels. Do not force into place.
- C. Locate edge and end joints over supports, except in ceiling applications where intermediate supports or gypsum board back-blocking is provided behind end joints. Do not place tapered edges against cut edges or ends. Stagger vertical joints on opposite sides of partitions. Do not make joints other than control joints at corners of framed openings.
- D. Form control and expansion joints with space between edges of adjoining gypsum panels.
- E. Cover both faces of support framing with gypsum panels in concealed spaces (above ceilings, etc.), except in chases braced internally.
 - 1. Unless concealed application is indicated or required for sound, fire, air, or smoke ratings, coverage may be accomplished with scraps of not less than **8 sq. ft.** in area.
 - 2. Fit gypsum panels around ducts, pipes, and conduits.
 - 3. Where partitions intersect structural members projecting below underside of floor/roof slabs and decks, cut gypsum panels to fit profile formed by structural members; allow **1/4- to 3/8-inch-wide** joints to install sealant.
- F. Isolate perimeter of gypsum board applied to non-load-bearing partitions at structural abutments, except floors. Provide **1/4- to 1/2-inch-wide** spaces at these locations and trim edges with edge trim where edges of panels are exposed. Seal joints between edges and abutting structural surfaces with acoustical sealant.
- G. Attachment to Steel Framing: Attach panels so leading edge or end of each panel is attached to open (unsupported) edges of stud flanges first.

3.3 APPLYING INTERIOR GYPSUM BOARD

- A. Install interior gypsum board in the following locations:
 - 1. Wallboard Type: As indicated on Drawings.

B. Single-Layer Application:

1. On ceilings, apply gypsum panels before wall/partition board application to greatest extent possible and at right angles to framing unless otherwise indicated.
2. On partitions/walls, apply gypsum panels vertically (parallel to framing) unless otherwise indicated or required by fire-resistance-rated assembly, and minimize end joints.
 - a. Stagger abutting end joints not less than one framing member in alternate courses of panels.
 - b. At stairwells and other high walls, install panels horizontally unless otherwise indicated or required by fire-resistance-rated assembly.
3. On Z-furring members, apply gypsum panels vertically (parallel to framing) with no end joints. Locate edge joints over furring members.
4. Fastening Methods: Apply gypsum panels to supports with steel drill screws.

3.4 INSTALLING TRIM ACCESSORIES

- A. General: For trim with back flanges intended for fasteners, attach to framing with same fasteners used for panels. Otherwise, attach trim according to manufacturer's written instructions.
- B. Interior Trim: Install in the following locations:
 1. Cornerbead: Use at outside corners.
 2. LC-Bead: Use at exposed panel edges.

3.5 FINISHING GYPSUM BOARD

- A. General: Treat gypsum board joints, interior angles, edge trim, control joints, penetrations, fastener heads, surface defects, and elsewhere as required to prepare gypsum board surfaces for decoration. Promptly remove residual joint compound from adjacent surfaces.
- B. Prefill open joints, rounded or beveled edges, and damaged surface areas.
- C. Apply joint tape over gypsum board joints, except for trim products specifically indicated as not intended to receive tape.
- D. Gypsum Board Finish Levels: Finish panels to levels indicated below and according to ASTM C 840:
 1. Level 1: Ceiling plenum areas, concealed areas, and where indicated.
 2. Level 3: Typical, unless noted otherwise.

3.6 PROTECTION

- A. Protect adjacent surfaces from drywall compound and promptly remove from floors and other non-drywall surfaces. Repair surfaces stained, marred, or otherwise damaged during drywall application.
- B. Protect installed products from damage from weather, condensation, direct sunlight, construction, and other causes during remainder of the construction period.
- C. Remove and replace panels that are wet, moisture damaged, and mold damaged.
 - 1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
 - 2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

END OF SECTION 092900

SECTION 096513 - RESILIENT BASE AND ACCESSORIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:

- 1. Resilient base.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Samples: For each exposed product and for each color and texture specified, not less than 12 inches long.

1.4 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Furnish not less than 10 linear feet for every 500 linear feet or fraction thereof, of each type, color, pattern, and size of resilient product installed.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Store resilient products and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by manufacturer, but not less than 50 deg F or more than 90 deg F.

1.6 FIELD CONDITIONS

- A. Maintain ambient temperatures within range recommended by manufacturer, but not less than 70 deg F or more than 95 deg F, in spaces to receive resilient products during the following time periods:
 - 1. 48 hours before installation.
 - 2. During installation.
 - 3. 48 hours after installation.
- B. After installation and until Substantial Completion, maintain ambient temperatures within range recommended by manufacturer, but not less than 55 deg F or more than 95 deg F.
- C. Install resilient products after other finishing operations, including painting, have been completed.

PART 2 - PRODUCTS

2.1 THERMOPLASTIC-RUBBER BASE:

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Armstrong World Industries, Inc.
 - 2. Flexco.
 - 3. Johnsonite; a Tarkett company.
 - 4. Roppe Corporation, USA.
- B. Product Standard: ASTM F 1861, Type TP (rubber, thermoplastic).
 - 1. Group: I (solid, homogeneous).
 - 2. Style and Location:
 - a. Style B, Cove: Provide where indicated on Drawings.
- C. Thickness: **0.125 inch.**
- D. Height: **4 inches.**
- E. Lengths: Coils in manufacturer's standard length.
- F. Outside Corners: Preformed.
- G. Inside Corners: Preformed.
- H. Colors: As selected by Architect from full range of industry colors.

2.2 INSTALLATION MATERIALS

- A. Adhesives: Water-resistant type recommended by resilient-product manufacturer for resilient products and substrate conditions indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, with Installer present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
 - 1. Verify that finishes of substrates comply with tolerances and other requirements specified in other Sections and that substrates are free of cracks, ridges, depressions, scale, and foreign deposits that might interfere with adhesion of resilient products.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.
 - 1. Installation of resilient products indicates acceptance of surfaces and conditions.

3.2 PREPARATION

- A. Prepare substrates according to manufacturer's written instructions to ensure adhesion of resilient products.
- B. Do not install resilient products until they are the same temperature as the space where they are to be installed.
 - 1. At least 48 hours in advance of installation, move resilient products and installation materials into spaces where they will be installed.
- C. Immediately before installation, sweep and vacuum clean substrates to be covered by resilient products.

3.3 RESILIENT BASE INSTALLATION

- A. Comply with manufacturer's written instructions for installing resilient base.
- B. Apply resilient base to walls, columns, pilasters, casework and cabinets in toe spaces, and other permanent fixtures in rooms and areas where base is required.
- C. Install resilient base in lengths as long as practical without gaps at seams and with tops of adjacent pieces aligned.
- D. Tightly adhere resilient base to substrate throughout length of each piece, with base in continuous contact with horizontal and vertical substrates.
- E. Do not stretch resilient base during installation.
- F. On masonry surfaces or other similar irregular substrates, fill voids along top edge of resilient base with manufacturer's recommended adhesive filler material.
- G. Preformed Corners: Install preformed corners before installing straight pieces.

3.4 RESILIENT ACCESSORY INSTALLATION

- A. Comply with manufacturer's written instructions for installing resilient accessories.

3.5 CLEANING AND PROTECTION

- A. Comply with manufacturer's written instructions for cleaning and protecting resilient products.
- B. Perform the following operations immediately after completing resilient-product installation:
 - 1. Remove adhesive and other blemishes from exposed surfaces.
- C. Protect resilient products from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.
- D. Cover resilient products subject to wear and foot traffic until Substantial Completion.

END OF SECTION 096513

SECTION 096519 - RESILIENT TILE FLOORING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Vinyl composition floor tile.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: For each type of floor tile. Include floor tile layouts, edges, columns, doorways, enclosing partitions, built-in furniture, cabinets, and cutouts.
 - 1. Show details of special patterns.
- C. Samples: Full-size units of each color and pattern of floor tile required.
 - 1. For heat-welding bead, manufacturer's standard-size Samples, but not less than 9 inches (230 mm) long, of each color required.
- D. Samples for Initial Selection: For each type of floor tile indicated.
- E. Product Schedule: For floor tile. Use same designations indicated on Drawings.

1.4 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For each type of floor tile to include in maintenance manuals.

1.5 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Floor Tile: Furnish one box for every 50 boxes or fraction thereof, of each type, color, and pattern of floor tile installed.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: A qualified installer who employs workers for this Project who are competent in techniques required by manufacturer for floor tile installation and seaming method indicated.
 - 1. Engage an installer who employs workers for this Project who are trained or certified by floor tile manufacturer for installation techniques required.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Store floor tile and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by manufacturer, but not less than 50 deg F (10 deg C) or more than 90 deg F (32 deg C). Store floor tiles on flat surfaces.

1.8 FIELD CONDITIONS

- A. Maintain ambient temperatures within range recommended by manufacturer, but not less than 70 deg F (21 deg C) or more than 95 deg F (35 deg C), in spaces to receive floor tile during the following time periods:
 - 1. 48 hours before installation.
 - 2. During installation.
 - 3. 48 hours after installation.
- B. After installation and until Substantial Completion, maintain ambient temperatures within range recommended by manufacturer, but not less than 55 deg F (13 deg C) or more than 95 deg F (35 deg C).
- C. Close spaces to traffic during floor tile installation.
- D. Close spaces to traffic for 48 hours after floor tile installation.
- E. Install floor tile after other finishing operations, including painting, have been completed.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Fire-Test-Response Characteristics: For resilient tile flooring, as determined by testing identical products according to ASTM E 648 or NFPA 253 by a qualified testing agency.
 - 1. Critical Radiant Flux Classification: Class I, not less than 0.45 W/sq. cm.

2.2 VINYL COMPOSITION FLOOR TILE

- A. Products: Subject to compliance with requirements, provide one of the following:
 - 1. Armstrong World Industries, Inc. Standard Excelon, Basis of Design;
 - 2. Mannington Commercial;
 - 3. Congoleum Corporation;
 - 4. Or approved equal.

- B. Tile Standard: ASTM F 1066, Class 2, through-pattern tile.
- C. Wearing Surface: Smooth.
- D. Thickness: 0.125 inch (3.2 mm).
- E. Size: 12 inches by 12 inches square.
- F. Color and pattern: Two (2) color pattern: 75% field color tile 1 and 25% accent color tile 2. Colors as selected by Architect from manufacture's standard colors and patterns.

2.3 INSTALLATION MATERIALS

- A. Trowelable Leveling and Patching Compounds: Latex-modified, portland cement based or blended hydraulic-cement-based formulation provided or approved by floor tile manufacturer for applications indicated.
- B. Adhesives: Water-resistant type recommended by floor tile and adhesive manufacturers to suit floor tile and substrate conditions indicated.
- C. Floor Polish: Provide protective, liquid floor-polish products recommended by floor tile manufacturer.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, with Installer present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
 - 1. Verify that finishes of substrates comply with tolerances and other requirements specified in other Sections and that substrates are free of cracks, ridges, depressions, scale, and foreign deposits that might interfere with adhesion of floor tile.
- B. Clean substrates of substances that could impair bond of adhesive, including dust, dirt, oil, grease, and incompatible materials and encapsulants.
 - 1. Remove incompatible materials. Abrade existing subfloor if necessary to provide a smooth floor surface for adhesive.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Prepare substrates according to floor tile manufacturer's written instructions to ensure adhesion of resilient products.
- B. Concrete Substrates: Prepare according to ASTM F 710.
 - 1. Verify that substrates are dry and free of curing compounds, sealers, and hardeners.

2. Remove substrate coatings and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by floor tile manufacturer. Do not use solvents.
3. Alkalinity and Adhesion Testing: Perform tests recommended by floor tile manufacturer. Proceed with installation only after substrate alkalinity falls within range on pH scale recommended by manufacturer in writing, but not less than 5 or more than 9 pH.
4. Moisture Testing: Proceed with installation only after substrates pass testing according to floor tile manufacturer's written recommendations, but not less stringent than the following:
 - a. Perform anhydrous calcium chloride test according to ASTM F 1869. Proceed with installation only after substrates have maximum moisture-vapor-emission rate of **3 lb of water/1000 sq. ft. (1.36 kg of water/92.9 sq. m)** in 24 hours.
 - b. Perform relative humidity test using in situ probes according to ASTM F 2170. Proceed with installation only after substrates have a maximum 75 percent relative humidity level.
- C. Access Flooring Panels: Remove protective film of oil or other coating using method recommended by access flooring manufacturer.
- D. Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound; remove bumps and ridges to produce a uniform and smooth substrate.
- E. Do not install floor tiles until they are the same temperature as the space where they are to be installed.
 1. At least 48 hours in advance of installation, move resilient floor tile and installation materials into spaces where they will be installed.
- F. Immediately before installation, sweep and vacuum clean substrates to be covered by resilient floor tile.

3.3 FLOOR TILE INSTALLATION

- A. Comply with manufacturer's written instructions for installing floor tile.
- B. Lay out floor tiles from center marks established with principal walls, discounting minor offsets, so tiles at opposite edges of room are of equal width. Adjust as necessary to avoid using cut widths that equal less than one-half tile at perimeter.
 1. Lay tiles square with room axis.
- C. Match floor tiles for color and pattern by selecting tiles from cartons in the same sequence as manufactured and packaged, if so numbered. Discard broken, cracked, chipped, or deformed tiles.
 1. Lay tiles with grain running in one direction.
- D. Scribe, cut, and fit floor tiles to butt neatly and tightly to vertical surfaces and permanent fixtures including built-in furniture, cabinets, pipes, outlets, and door frames.
- E. Extend floor tiles into toe spaces, door reveals, closets, and similar openings. Extend floor tiles to center of door openings.
- F. Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on floor tiles as marked on substrates. Use chalk or other nonpermanent marking device.

- G. Install floor tiles on covers for telephone and electrical ducts, building expansion-joint covers, and similar items in finished floor areas. Maintain overall continuity of color and pattern between pieces of tile installed on covers and adjoining tiles. Tightly adhere tile edges to substrates that abut covers and to cover perimeters.
- H. Adhere floor tiles to flooring substrates using a full spread of adhesive applied to substrate to produce a completed installation without open cracks, voids, raising and puckering at joints, telegraphing of adhesive spreader marks, and other surface imperfections.

3.4 CLEANING AND PROTECTION

- A. Comply with manufacturer's written instructions for cleaning and protecting floor tile. Cover floor tile until Substantial Completion.
- B. Perform the following operations immediately after completing floor tile installation:
 - 1. Remove adhesive and other blemishes from exposed surfaces.
 - 2. Sweep and vacuum surfaces thoroughly.
 - 3. Damp-mop surfaces to remove marks and soil.
- C. Protect floor tile from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.
- D. Floor Polish: Remove soil, adhesive, and blemishes from floor tile surfaces before applying liquid floor polish.
 - 1. Apply number of coats per manufacturer's written instructions.
- E. Joint Sealant: Apply sealant to resilient terrazzo floor tile perimeter and around columns, at door frames, and at other joints and penetrations.

END OF SECTION 096519

SECTION 096813 - TILE CARPETING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

- 1. Modular carpet tile.

B. Related Requirements:

- 1. Section 024119 "Selective Demolition" for removing existing floor coverings.
- 2. Section 096513 "Resilient Base and Accessories" and Section 096519 "Resilient Tile Flooring" for resilient wall base and accessories installed with carpet tile.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

- 1. Include manufacturer's written data on physical characteristics, durability, and fade resistance.
- 2. Include manufacturer's written installation recommendations for each type of substrate.

B. Shop Drawings: For carpet tile installation, plans showing the following:

- 1. Columns, doorways, enclosing walls or partitions, built-in cabinets, and locations where cutouts are required in carpet tiles.
- 2. Carpet tile type, color, and dye lot.
- 3. Type of subfloor.
- 4. Type of installation.
- 5. Pattern of installation.
- 6. Pattern type, location, and direction.
- 7. Pile direction.
- 8. Type, color, and location of insets and borders.
- 9. Type, color, and location of edge, transition, and other accessory strips.
- 10. Transition details to other flooring materials.

- C. Samples: For each of the following products and for each color and texture required. Label each Sample with manufacturer's name, material description, color, pattern, and designation indicated on Drawings and in schedules.

1. Carpet Tile: Full-size Sample.
2. Exposed Edge, Transition, and Other Accessory Stripping: 12-inch- (300-mm-) long Samples.

D. Samples for Initial Selection: For each type of carpet tile.

1. Include Samples of exposed edge, transition, and other accessory stripping involving color or finish selection.

E. Product Schedule: For carpet tile. Use same designations indicated on Drawings.

1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.
- B. Product Test Reports: For carpet tile, for tests performed by a qualified testing agency.
- C. Sample Warranty: For special warranty.

1.5 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For carpet tiles to include in maintenance manuals. Include the following:
 1. Methods for maintaining carpet tile, including cleaning and stain-removal products and procedures and manufacturer's recommended maintenance schedule.
 2. Precautions for cleaning materials and methods that could be detrimental to carpet tile.

1.6 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 1. Carpet Tile: Full-size units equal to 5 percent of amount installed for each type indicated, but not less than 10 sq. yd. (8.3 sq. m).

1.7 QUALITY ASSURANCE

- A. Installer Qualifications: An experienced installer who is trained in the installation of carpet tile.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Comply with the Carpet and Rug Institute's CRI 104.

1.9 FIELD CONDITIONS

- A. Comply with the Carpet and Rug Institute's CRI 104 for temperature, humidity, and ventilation limitations.
- B. Environmental Limitations: Do not deliver or install carpet tiles until spaces are enclosed and weathertight, wet-work in spaces is complete and dry, and ambient temperature and humidity conditions are maintained at levels planned for building occupants during the remainder of the construction period.
- C. Do not install carpet tiles over concrete slabs until slabs have cured and are sufficiently dry to bond with adhesive and concrete slabs have pH range recommended by carpet tile manufacturer.
- D. Where demountable partitions or other items are indicated for installation on top of carpet tiles, install carpet tiles before installing these items.

1.10 WARRANTY

- A. Special Warranty for Carpet Tiles: Manufacturer agrees to repair or replace components of carpet tile installation that fail in materials or workmanship within specified warranty period.
 - 1. Warranty does not include deterioration or failure of carpet tile due to unusual traffic, failure of substrate, vandalism, or abuse.
 - 2. Failures include, but are not limited to, the following:
 - a. More than 10 percent edge raveling, snags, and runs.
 - b. Dimensional instability.
 - c. Excess static discharge.
 - d. Loss of tuft-bind strength.
 - e. Loss of face fiber.
 - f. Delamination.
 - 3. Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 CARPET TILE: CPT TILE

- A. Manufacturers:
 - 1. Patcraft, Infrastructure Color Choice Modular, Basis of Design.
 - 2. Or approved equal.
- B. Color and Pattern: As selected by Architect from manufacturer's full range.
- C. Fiber: Nylon

- D. Dye Method: 100% Solution Dyed
- E. Backing: Manufacturer's standard composite materials
- F. Protective Treatment: Manufacturer's standard composite materials
- G. Size: 24" x 24"
- H. Gauge: 1/10
- I. Stitches: 11.5 per inch
- J. Finished Pile Thickness: 0.093
- K. Tufted Pile Height: 5/32"
- L. Average Density: 11613 per cubic yard
- M. Total Thickness: 0.263
- N. Tufted Yarn Weight: 30.0 oz/yd²
- O. Applied Treatments:
 - 1. Soil-Resistance Treatment: Manufacturer's standard treatment.
 - 2. Antimicrobial Treatment: Manufacturer's standard treatment that protects carpet tiles as follows:
 - a. Antimicrobial Activity: Not less than 2-mm halo of inhibition for gram-positive bacteria, not less than 1-mm halo of inhibition for gram-negative bacteria, and no fungal growth, according to AATCC 174.
- P. Performance Characteristics:
 - 1. Traffic Class: Severe
 - 2. Appearance Retention Rating: Heavy traffic, 3.0 minimum according to ASTM D7330.
 - 3. Critical Radiant Flux Classification: Not less than 0.45 W/sq. cm according to NFPA 253.
 - 4. Electrostatic Propensity: Less than 3.5 kV according to AATCC 134.
 - 5. Pill Test: Passes (DOFF-1-70)
 - 6. Radiant Panel: Class 1 (ASTM E-648).
 - 7. NBS Smoke: Less than 450 ASTM-E-662.
 - 8. ADA: Meets the guidelines as set forth in the Americans with Disabilities Act for minimum static coefficient for friction of 0.6 for accessible routes.

2.2 INSTALLATION ACCESSORIES

- A. Trowelable Leveling and Patching Compounds: Latex-modified, hydraulic-cement-based formulation provided or recommended by carpet tile manufacturer. Use a cementitious patching/leveling compound that meets or exceeds the required moisture level and pH requirements. Use of gypsum-based patching and/or leveling compounds which contain

Portland or high alumina cement and meet or exceed the compressive strength of 3,000 psi are acceptable.

- B. Adhesives: Water-resistant, mildew-resistant, nonstaining, pressure-sensitive type to suit products and subfloor conditions indicated, that comply with flammability requirements for installed carpet tile, and are recommended by carpet tile manufacturer for releasable installation.
- C. Metal Edge/Transition Strips: Extruded aluminum with mill finish of profile and width shown, of height required to protect exposed edge of carpet, and of maximum lengths to minimize running joints.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for maximum moisture content, alkalinity range, installation tolerances, and other conditions affecting carpet tile performance.
- B. Examine carpet tile for type, color, pattern, and potential defects.
- C. Concrete Slabs: Verify that finishes comply with requirements specified in Section 033000 "Cast-in-Place Concrete" and that surfaces are free of cracks, ridges, depressions, scale, and foreign deposits.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. General: Comply with the Carpet and Rug Institute's CRI 104 and with carpet tile manufacturer's written installation instructions for preparing substrates indicated to receive carpet tile.
- B. Use trowelable leveling and patching compounds, according to manufacturer's written instructions, to fill cracks, holes, depressions, and protrusions in substrates. Fill or level cracks, holes and depressions 1/8 inch (3 mm) wide or wider, and protrusions more than 1/32 inch (0.8 mm) unless more stringent requirements are required by manufacturer's written instructions.
- C. Concrete Substrates: Remove coatings, including curing compounds, and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, without using solvents. Use mechanical methods recommended in writing by adhesive and carpet tile manufacturers.
- D. Broom and vacuum clean substrates to be covered immediately before installing carpet tile.

3.3 INSTALLATION

- A. General: Comply with the Carpet and Rug Institute's CRI 104, Section 10, "Carpet Tile," and with carpet tile manufacturer's written installation instructions.
- B. Installation Method: As recommended in writing by carpet tile manufacturer.
- C. Maintain dye-lot integrity. Do not mix dye lots in same area.
- D. Maintain pile-direction patterns recommended in writing by carpet tile manufacturer.
- E. Cut and fit carpet tile to butt tightly to vertical surfaces, permanent fixtures, and built-in furniture including cabinets, pipes, outlets, edgings, thresholds, and nosings. Bind or seal cut edges as recommended by carpet tile manufacturer.
- F. Extend carpet tile into toe spaces, door reveals, closets, open-bottomed obstructions, removable flanges, alcoves, and similar openings.
- G. Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on carpet tile as marked on subfloor. Use nonpermanent, nonstaining marking device.
- H. Install pattern parallel to walls and borders.

3.4 CLEANING AND PROTECTION

- A. Perform the following operations immediately after installing carpet tile:
 - 1. Remove excess adhesive and other surface blemishes using cleaner recommended by carpet tile manufacturer.
 - 2. Remove yarns that protrude from carpet tile surface.
 - 3. Vacuum carpet tile using commercial machine with face-beater element.
- B. Protect installed carpet tile to comply with the Carpet and Rug Institute's CRI 104, Section 13.7.
- C. Protect carpet tile against damage from construction operations and placement of equipment and fixtures during the remainder of construction period. Use protection methods indicated or recommended in writing by carpet tile manufacturer.
- D. MAINTENANCE
 - a. Post-installation Care
 - i. Place plywood over the carpet when heavy objects will be moved within 24 hours after installation.
 - b. Preventative Floor Care
 - i. Use protective chair mats under chairs with casters.
 - ii. Use soil removal mats at exterior entrances.
 - iii. Use absorbent mats in areas where moisture, oil and grease are present.
 - c. Routine Maintenance
 - i. Set a schedule depending on traffic and vacuum regularly.

- ii. Remove spots with spot removers as soon as they occur.
- iii. Use encapsulation agents periodically.
- iv. Clean with hot water extraction periodically.

Traffic Level	Vacuum	Spot Removal	Interim Cleaning	Hot Water Extraction
Light	2/week	As needed	As needed	1/year
Moderate	1/day	As needed	As needed	1/year
Heavy	1/day	As needed	Monthly	4/year
Extra Heavy	1/day	As needed	Weekly	Monthly

END OF SECTION 096813

SECTION 099113 - EXTERIOR PAINTING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes surface preparation and the application of paint systems on the following exterior substrates:
 - 1. Steel Galvanized Substrates;
 - 2. Steel and Iron Substrates;

1.3 DEFINITIONS

- A. MPI Gloss Level 1: Not more than five units at 60 degrees and 10 units at 85 degrees, according to ASTM D 523.
- B. MPI Gloss Level 3: 10 to 25 units at 60 degrees and 10 to 35 units at 85 degrees, according to ASTM D 523.
- C. MPI Gloss Level 4: 20 to 35 units at 60 degrees and not less than 35 units at 85 degrees, according to ASTM D 523.
- D. MPI Gloss Level 5: 35 to 70 units at 60 degrees, according to ASTM D 523.
- E. MPI Gloss Level 6: 70 to 85 units at 60 degrees, according to ASTM D 523.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product. Include preparation requirements and application instructions.
 - 1. Include printout of current "MPI Approved Products List" for each product category specified, with the proposed product highlighted.
 - 2. Indicate VOC content.
- B. Samples for Initial Selection: For each type of topcoat product.

1.5 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Paint: 5 percent, but not less than 1 gal. (3.8 L) of each material and color applied.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 45 deg F (7 deg C).
 - 1. Maintain containers in clean condition, free of foreign materials and residue.
 - 2. Remove rags and waste from storage areas daily.

1.7 FIELD CONDITIONS

- A. Apply paints only when temperature of surfaces to be painted and ambient air temperatures are between 50 and 95 deg F (10 and 35 deg C).
- B. Do not apply paints in snow, rain, fog, or mist; when relative humidity exceeds 85 percent; at temperatures less than 5 deg F (3 deg C) above the dew point; or to damp or wet surfaces.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Sherwin Williams, Basis of Design;
 - 2. Benjamin Moore & Company;
 - 3. PPG Industries, Inc.;
 - 4. Or approved equal.

2.2 PAINT, GENERAL

- A. MPI Standards: Products shall comply with MPI standards indicated and shall be listed in its "MPI Approved Products Lists."
- B. Material Compatibility:
 - 1. Materials for use within each paint system shall be compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.

2. For each coat in a paint system, products shall be recommended in writing by topcoat manufacturers for use in paint system and on substrate indicated.
- C. Colors: As selected by Architect from manufacturer's full range.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
- B. Verify suitability of substrates, including surface conditions and compatibility, with existing finishes and primers.
- C. Proceed with coating application only after unsatisfactory conditions have been corrected.
 1. Application of coating indicates acceptance of surfaces and conditions.
- D. Verify that pavement is dry and in suitable condition to begin pavement marking according to manufacturer's written instructions. Proceed with pavement marking only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Comply with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual" applicable to substrates and paint systems indicated.
- B. Remove hardware, covers, plates, and similar items already in place that are removable and are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.
 1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection.
- C. Clean substrates of substances that could impair bond of paints, including dust, dirt, oil, grease, and incompatible paints and encapsulants.
 1. Remove incompatible primers and reprime substrate with compatible primers or apply tie coat as required to produce paint systems indicated.
- D. Steel Substrates: Remove rust, loose mill scale, and shop primer if any. Clean using methods recommended in writing by paint manufacturer.
 1. SSPC-SP 2.
 2. SSPC-SP 3.
 3. SSPC-SP 7/NACE No. 4.
 4. SSPC-SP 11.

- E. Galvanized-Metal Substrates: Remove grease and oil residue from galvanized sheet metal by mechanical methods to produce clean, lightly etched surfaces that promote adhesion of subsequently applied paints.
- F. Aluminum Substrates: Remove all surface contamination such as dirt, oil, grease, oxidation, and other foreign matter. Clean using methods recommended in writing by paint manufacturer.
 - 1. SSPC-SP 7.

3.3 APPLICATION

- A. Apply paints according to manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual."
 - 1. Use applicators and techniques suited for paint and substrate indicated.
 - 2. Paint surfaces behind movable items same as similar exposed surfaces. Before final installation, paint surfaces behind permanently fixed items with prime coat only.
 - 3. Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.
 - 4. Primers specified in painting schedules may be omitted on items that are factory primed or factory finished if acceptable to topcoat manufacturers.
- B. Tint undercoats same color as topcoat, but tint each undercoat a lighter shade to facilitate identification of each coat if multiple coats of same material are to be applied. Provide sufficient difference in shade of undercoats to distinguish each separate coat.
- C. If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform paint finish, color, and appearance.
- D. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.

3.4 CLEANING AND PROTECTION

- A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.
- B. After completing paint application, clean spattered surfaces. Remove spattered paints by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.
- C. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.
- D. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

3.5 EXTERIOR PAINTING SCHEDULE

A. Galvanized Steel and Substrates:

1. Alkyd System:

- a. Prime Coat: Rust Inhibitive primer, (Sherwin Williams Pro Industrial Procryl Universal Primer, MPI # 107, Basis of Design).
- b. Intermediate Coat: Exterior, urethane alkyd enamel, (Sherwin Williams Pro Industrial Urethane Enamel, Basis of Design).
- c. Topcoat: Exterior, urethane alkyd enamel, gloss. (Sherwin Williams Pro Industrial Urethane Enamel Gloss, Basis of Design).

B. Steel and Iron Substrates:

1. Alkyd System:

- a. Prime Coat: Coat: Rust Inhibitive primer, (Sherwin Williams Pro Industrial Procryl Universal Primer, MPI # 107, Basis of Design).
- b. Vgyut Buy Intermediate Coat: Exterior, urethane alkyd enamel, (Sherwin Williams Pro Industrial Urethane Enamel, Basis of Design).
- c. Topcoat: Exterior, urethane alkyd enamel, semi-gloss, (Sherwin Williams Pro Industrial Urethane Enamel Semi-Gloss, Basis of Design).

END OF SECTION 099113

SECTION 099120 - INTERIOR PAINTING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes surface preparation and the application of paint systems on the following interior substrates:
 - 1. Gypsum board
 - 2. Concrete masonry units (CMU)
 - 3. Concrete

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product. Include preparation requirements and application instructions.
- B. Samples for Initial Selection: For each type of topcoat product.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 45 deg F.
 - 1. Maintain containers in clean condition, free of foreign materials and residue.
 - 2. Remove rags and waste from storage areas daily.

1.5 FIELD CONDITIONS

- A. Apply paints only when temperature of surfaces to be painted and ambient air temperatures are between 50 and 95 deg F.
- B. Do not apply paints when relative humidity exceeds 85 percent; at temperatures less than 5 deg F above the dew point; or to damp or wet surfaces.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
1. Sherwin-Williams Company (The).
 2. Benjamin Moore & Co.
 3. M.A.B. Paints.
 4. Or approved equal.

2.2 PAINT, GENERAL

- A. MPI Standards: Provide products that comply with MPI standards indicated and that are listed in its "MPI Approved Products List."
- B. Material Compatibility:
1. Provide materials for use within each paint system that are compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
 2. For each coat in a paint system, provide products recommended in writing by manufacturers of topcoat for use in paint system and on substrate indicated.
- C. VOC Content: Products shall comply with VOC limits of authorities having jurisdiction and, for interior paints and coatings applied at Project site, the following VOC limits, exclusive of colorants added to a tint base, when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
1. Flat Paints and Coatings: 50 g/L.
 2. Nonflat Paints and Coatings: 150 g/L.
 3. Dry-Fog Coatings: 400 g/L.
 4. Primers, Sealers, and Undercoaters: 200 g/L.
 5. Anticorrosive and Antirust Paints Applied to Ferrous Metals: 250 g/L.
 6. Zinc-Rich Industrial Maintenance Primers: 340 g/L.
 7. Pretreatment Wash Primers: 420 g/L.
 8. Floor Coatings: 100 g/L.
 9. Shellacs, Clear: 730 g/L.
 10. Shellacs, Pigmented: 550 g/L.
- D. Colors: As selected by Architect from manufacturer's full range.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
- B. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:

1. Gypsum Board: 12 percent.
- C. Gypsum Board Substrates: Verify that finishing compound is sanded smooth.
- D. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers.
- E. Proceed with coating application only after unsatisfactory conditions have been corrected.
 1. Application of coating indicates acceptance of surfaces and conditions.

3.2 PREPARATION

- A. Comply with manufacturer's written instructions and recommendations in "MPI Manual" applicable to substrates indicated.
- B. Remove hardware, covers, plates, and similar items already in place that are removable and are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.
 1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection if any.
- C. Clean substrates of substances that could impair bond of paints, including dust, dirt, oil, grease, and incompatible paints and encapsulants.
 1. Remove incompatible primers and reprime substrate with compatible primers or apply tie coat as required to produce paint systems indicated. Abrade existing concrete floor if necessary to provide a smooth floor surface for painting.

3.3 APPLICATION

- A. Apply paints according to manufacturer's written instructions and to recommendations in "MPI Manual."
 1. Use applicators and techniques suited for paint and substrate indicated.
 2. Paint surfaces behind movable equipment and furniture same as similar exposed surfaces. Before final installation, paint surfaces behind permanently fixed equipment or furniture with prime coat only.
 3. Paint front and backsides of access panels, removable or hinged covers, and similar hinged items to match exposed surfaces.
 4. Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.
 5. Primers specified in painting schedules may be omitted on items that are factory primed or factory finished if acceptable to topcoat manufacturers.
- B. Tint each undercoat a lighter shade to facilitate identification of each coat if multiple coats of same material are to be applied. Tint undercoats to match color of topcoat, but provide sufficient difference in shade of undercoats to distinguish each separate coat.
- C. If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform paint finish, color, and appearance.

- D. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.

3.4 CLEANING AND PROTECTION

- A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.
- B. After completing paint application, clean spattered surfaces. Remove spattered paints by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.
- C. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.
- D. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

3.5 INTERIOR PAINTING SCHEDULE

- A. Ceiling/Soffit Gypsum Board Substrates:
 - 1. Prime Coat: Interior latex primer, (Sherwin Williams ProMar 200 Zero VOC Interior Latex Primer, MPI50, Basis of Design).
 - 2. Intermediate and Top Coat: Interior Latex Flat, (Sherwin Williams ProMar Ceiling Flat, Basis of Design).
- B. Interior Gypsum Board Substrates
 - 1. Prime Coat: Interior latex primer, (Sherwin Williams ProMar 200 Zero VOC Interior Primer, MPI 50, Basis of Design)
 - 2. Intermediate and Top Coat: Precatalyzed water based epoxy Eg-Shel, (Sherwin Williams Pro Industrial PreCatalyzed Waterbased Epoxy Eg-Shel, MPI 139, Basis of Design).
- C. Concrete masonry units (CMU) Substrates:
 - 1. Prime Coat: Block filler, interior latex primer, (Sherwin Williams PrepRite Interior/Exterior Latex Block Filler MPI 4, Basis of Design).
 - 2. Intermediate and Top Coat: Interior Latex Eg-Shel, (Sherwin Williams ProMar 200 Zero VOC Interior Latex Eg-Shel MPI 52, Basis of Design).
- D. Concrete Substrates, Traffic Surfaces
 - 1. Prime Coat: Prep floor to be smooth and to receive primer per manufacture's recommendations. Water based epoxy primer. (Sherwin Williams ArmorSeal Heavy Duty Floor Coatings, Basis of Design).
 - 2. Intermediate and Top Coat: Pre-catalyzed acrylic epoxy paint, Gloss, with slip-resistive additive. (Sherwin Williams ArmorSeal Heavy Duty Floor Coatings, Basis of Design).

END OF SECTION 099120

SECTION 101100 - VISUAL DISPLAY SURFACES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Tackboards.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for visual display surfaces.
- B. Shop Drawings: For visual display surfaces. Include plans, elevations, sections, details, and attachments to other work.
 - 1. Show locations of panel joints.
 - 2. Include sections of typical trim members.
- C. Samples for Initial Selection: For each type of visual display surface indicated, for units with factory-applied color finishes, and as follows:
 - 1. Actual sections of porcelain-enamel face sheet.
 - 2. Fabric swatches of fabric-faced tack assemblies.
 - 3. Include accessory Samples to verify color selected.
- D. Product Schedule: For visual display surfaces. Use same designations indicated on Drawings.

1.5 INFORMATIONAL SUBMITTALS

- A. Warranties: Sample of special warranties.

1.6 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For visual display surfaces to include in maintenance manuals.

1.7 QUALITY ASSURANCE

- A. Source Limitations: Obtain visual display surfaces from single source from single manufacturer.

- B. Surface-Burning Characteristics: As determined by testing identical products according to ASTM E 84 by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
 - 1. Flame-Spread Index: 25 or less.
 - 2. Smoke-Developed Index: 50 or less.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Deliver factory-built visual display surfaces, including factory-applied trim where indicated, completely assembled in one piece without joints, where possible. If dimensions exceed maximum manufactured panel size, provide two or more pieces of equal length as acceptable to Architect. When overall dimensions require delivery in separate units, prefit components at the factory, disassemble for delivery, and make final joints at the site.
- B. Store visual display surfaces vertically with packing materials between each unit.

1.9 PROJECT CONDITIONS

- A. Environmental Limitations: Do not deliver or install visual display surfaces until spaces are enclosed and weathertight, wet work in spaces is complete and dry, work above ceilings is complete, and temporary HVAC system is operating and maintaining ambient temperature and humidity conditions at occupancy levels during the remainder of the construction period.
- B. Field Measurements: Verify actual dimensions of construction contiguous with visual display surfaces by field measurements before fabrication.
 - 1. Allow for trimming and fitting where taking field measurements before fabrication might delay the Work.

1.10 WARRANTY

- A. Special Warranty for Porcelain-Enamel Face Sheets: Manufacturer's standard form in which manufacturer agrees to repair or replace porcelain-enamel face sheets that fail in materials or workmanship within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Surfaces lose original writing and erasing qualities.
 - b. Surfaces exhibit crazing, cracking, or flaking.
 - 2. Warranty Period: 50 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

- A. Vinyl Fabric: Mildew resistant, washable, complying with FS CCC-W-408D, Type II; weighing not less than 13 oz./sq. yd. (440 g/sq. m); with surface-burning characteristics indicated.

- B. Fiberboard: ASTM C 208.
- C. Extruded Aluminum: ASTM B 221 (ASTM B 221M), Alloy 6063.
- D. Adhesives: Manufacturer's standard product that complies with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

2.2 TACKBOARD ASSEMBLIES

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. ADP Lemco, Inc.
 - 2. Claridge Products and Equipment, Inc.
 - 3. Tri-Best Visual Display Products.
 - 4. Or approved equal.
- B. Vinyl-Fabric-Faced Tackboard: Vinyl fabric factory laminated to 7/8" thick fiberboard backing.

2.3 TACKBOARD ACCESSORIES

- A. Aluminum Frames and Trim: Fabricated from not less than 0.062-inch- (1.57-mm-) thick, extruded aluminum; standard size and shape.
 - 1. Field-Applied Trim: Manufacturer's standard, snap-on trim with no visible screws or exposed joints.
 - 2. Factory-Applied Trim: Manufacturer's standard.

2.4 FABRICATION

- A. Factory-Assembled Visual Display Units: Coordinate factory-assembled units with trim and accessories indicated. Join parts with a neat, precision fit.
 - 1. Make joints only where total length exceeds maximum manufactured length. Fabricate with minimum number of joints, as indicated on approved Shop Drawings.
 - 2. Provide manufacturer's standard mullion trim at joints between tackboards of combination units.
 - 3. Where size of visual display boards or other conditions require support in addition to normal trim, provide structural supports or modify trim as indicated or as selected by Architect from manufacturer's standard structural support accessories to suit conditions indicated.
- B. Aluminum Frames and Trim: Fabricate units straight and of single lengths, keeping joints to a minimum. Miter corners to a neat, hairline closure.
 - 1. Where factory-applied trim is indicated, trim shall be assembled and attached to visual display units at manufacturer's factory before shipment.

2.5 GENERAL FINISH REQUIREMENTS

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- C. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

2.6 ALUMINUM FINISHES

- A. Clear Anodic Finish: AAMA 611, AA-M12C22A31, Class II, 0.010 mm or thicker.

2.7 VISUAL DISPLAY SURFACE SCHEDULE

- A. Tackboard: Factory assembled.
 - 1. Tack Surface: Vinyl-fabric-faced tackboard assembly.
 - a. Color: As selected by Architect from full range of industry colors
 - 2. Corners: Square.
 - 3. Sizes:
 - TB-1: 4'-0" wide x 4'-0" high
 - TB-2: 8'-0" wide x 4'-0" high
 - 4. Mounting: Wall.
 - 5. Mounting Height: Bottom mounted at 2'-8" AFF; verify mounting height at unit ventilators with Architect.
 - 6. Edges: Concealed by trim.
 - a. Factory-Applied Aluminum Trim: Manufacturer's standard finish.
 - 1) Color: As selected by Architect from full range of industry colors and color densities.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with Installer present, for compliance with requirements for installation tolerances, surface conditions of wall, and other conditions affecting performance of the Work.
- B. Examine walls and partitions for proper preparation and backing for visual display surfaces.
- C. Examine walls and partitions for suitable framing depth where sliding visual display units will be installed.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Comply with manufacturer's written instructions for surface preparation.
- B. Clean substrates of substances that could impair the performance of and affect the smooth, finished surfaces of visual display boards, including dirt, mold, and mildew.
- C. Prepare recesses for sliding visual display units as required by type and size of unit.

3.3 INSTALLATION, GENERAL

A. General: Install visual display surfaces in locations and at mounting heights indicated on Drawings, or if not indicated, at heights indicated below. Keep perimeter lines straight, level, and plumb. Provide grounds, clips, backing materials, adhesives, brackets, anchors, trim, and accessories necessary for complete installation.

3.4 INSTALLATION OF FACTORY-FABRICATED VISUAL DISPLAY BOARDS AND ASSEMBLIES

- A. Visual Display Boards: Attach concealed clips, hangers, and grounds to wall surfaces and to visual display boards with fasteners at not more than 16 inches (400 mm) o.c. Secure both top and bottom of boards to walls.

3.5 INSTALLATION OF VISUAL DISPLAY RAILS

- A. Display Rails: Install rails in locations and at mounting heights indicated on Drawings, or if not indicated, at height indicated below. Attach to wall surface with fasteners at not more than 16 inches (400 mm) o.c.

1. Mounting Height: 60 inches (1524 mm) above finished floor to top of rail.

3.6 CLEANING AND PROTECTION

- A. Clean visual display surfaces according to manufacturer's written instructions.
- B. Attach one cleaning label to visual display surface in each room.
- C. Touch up factory-applied finishes to restore damaged or soiled areas.
- D. Cover and protect visual display surfaces after installation and cleaning.

END OF SECTION 101100

SECTION 101400 - SIGNAGE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Panel signs.

1.3 DEFINITIONS

- A. ADA-ABA Accessibility Guidelines: U.S. Architectural & Transportation Barriers Compliance Board's "Americans with Disabilities Act (ADA) Accessibility Guidelines for Buildings and Facilities; Architectural Barriers Act (ABA) Accessibility Guidelines."

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: Show fabrication and installation details for signs.
 - 1. Show sign mounting heights, locations of supplementary supports to be provided by others, and accessories.
 - 2. Provide message list, typestyles, graphic elements, including tactile characters and Braille, and layout for each sign.
 - 3. Wiring Diagrams: Power, signal, and control wiring.
- C. Samples for Initial Selection: Manufacturer's color charts consisting of actual units or sections of units showing the full range of colors available for the following:
 - 1. Acrylic sheet.
 - 2. Die-cut vinyl characters and graphic symbols. Include representative samples of available typestyles and graphic symbols.
- D. Sign Schedule: Use same designations indicated on Drawings.

1.5 INFORMATIONAL SUBMITTALS

- A. Warranty: Special warranty specified in this Section.

1.6 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For signs to include in maintenance manuals.

1.7 QUALITY ASSURANCE

- A. Fabricator Qualifications: Shop that employs skilled workers who custom-fabricate products similar to those required for this Project and whose products have a record of successful in-service performance.
- B. Source Limitations for Signs: Obtain each sign type indicated from one source from a single manufacturer.
- C. Regulatory Requirements: Comply with applicable provisions in ADA-ABA Accessibility Guidelines and ICC/ANSI A117.1.

1.8 PROJECT CONDITIONS

- A. Weather Limitations: Proceed with installation only when existing and forecasted weather Field Measurements: Verify recess openings by field measurements before fabrication and indicate measurements on Shop Drawings.

1.9 COORDINATION

- A. Coordinate placement of anchorage devices with templates for installing signs.

1.10 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of signs that fail in materials or workmanship within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Deterioration of embedded graphic image colors.
 - 2. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Acrylic Sheet: ASTM D 4802, Category A-1 (cell-cast sheet), Type UVA (UV absorbing).

2.2 PANEL SIGNS

- 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. ACE Sign Systems, Inc.
 2. Gemini Incorporated.
 3. Signature Signs, Incorporated.
 4. Or approved equal.
- B. Panel Signs: Provide smooth sign panel surfaces constructed to remain flat under installed conditions within a tolerance of plus or minus **1/16 inch (1.5 mm)** measured diagonally from corner to corner, complying with the following requirements:
1. Acrylic Sheet: **1/8" inch** thick.
 2. Phenolic-Backed Photopolymer Sheet: At exterior mounted signs: Provide light-sensitive, UV resistant, water-wash photopolymer face layer bonded to a phenolic base layer to produce a composite sheet with overall, face layer, and base-layer thicknesses, respectively, of **0.120, 0.040, and 0.080 inch (3.0, 1.0, and 2.03 mm)**.
 3. Laminated, Etched Photopolymer: Raised graphics with Braille **1/32 inch (0.8 mm)** above surface with contrasting colors as selected by Architect from manufacturer's full range and laminated to acrylic back.
 4. Edge Condition: Square cut.
 5. Corner Condition: Rounded to $\frac{3}{4}$ " radius.
 6. Mounting: Unframed, wall mounted with two-face tape. Provide
 7. Color: As selected by Architect from manufacturer's full range.
 8. Tactile Characters: Characters and Grade 2 Braille raised **1/32 inch (0.8 mm)** above surface with contrasting colors.
- C. Tactile and Braille Sign: Manufacturer's standard process for producing text and symbols complying with ADA-ABA Accessibility Guidelines and with ICC/ANSI A117.1. Text shall be accompanied by Grade 2 Braille. Produce precisely formed characters with square-cut edges free from burrs and cut marks; Braille dots with domed or rounded shape.
1. Panel Material: Photopolymer.
 2. Raised-Copy Thickness: Not less than **1/32 inch (0.8 mm)**.
- D. Subsurface Engraved Acrylic Sheet: Reverse-engage back face of clear acrylic sheet. Fill resulting copy with enamel. Apply opaque background color coating over enamel-filled copy.
- E. Colored Coatings for Acrylic Sheet: For copy and background colors, provide colored coatings, including inks, dyes, and paints, that are recommended by acrylic manufacturers for optimum adherence to acrylic surface and are UV and water resistant for five]years for application intended.
1. Color: As selected by Architect from manufacturer's full range.
- F. Provide blank back panel to match size and type of sign for signs mounted on glass.

2.3 FABRICATION

- A. General: Provide manufacturer's standard signs of configurations indicated.

1. Conceal fasteners if possible; otherwise, locate fasteners where they will be inconspicuous.

2.4 FINISHES, GENERAL

- A. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

2.5 ACRYLIC SHEET FINISHES

- A. Colored Coatings for Acrylic Sheet: For copy and background colors, provide colored coatings, including inks, dyes, and paints, that are recommended by acrylic manufacturers for optimum adherence to acrylic surface and that are UV and water resistant for five years for application intended.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of work.
- B. Verify that items, including anchor inserts, are sized and located to accommodate signs.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Locate signs and accessories where indicated, using mounting methods of types described and complying with manufacturer's written instructions.
 1. Install signs level, plumb, and at heights indicated, with sign surfaces free of distortion and other defects in appearance.
 2. Interior Wall Signs: Install signs on walls adjacent to latch side of door where applicable. Where not indicated or possible, such as double doors, install signs on nearest adjacent walls. Locate to allow approach within 3 inches (75 mm) of sign without encountering protruding objects or standing within swing of door.
- B. Wall-Mounted Signs: Comply with sign manufacturer's written instructions except where more stringent requirements apply.
 1. Two-Face Tape: Mount signs to smooth, nonporous surfaces. Do not use this method for vinyl-covered or rough surfaces.

2. Silicone-Adhesive Mounting: Attach signs to irregular, porous, or vinyl-covered surfaces.

3.3 CLEANING AND PROTECTION

- A. After installation, clean soiled sign surfaces according to manufacturer's written instructions. Protect signs from damage until acceptance by Owner.

3.4 SIGN SCHEDULE – Refer to Drawings for size and mounting locations

- A. Sign Type 01: Acrylic sheet to read "Maximum Occupancy XXX persons", per the following:
 - a. Courtyard A: 1180 Occupants
 - b. Courtyard B: 640 Occupants
- B. Sign Type 02: Acrylic sheet to read: "NOT AN EXIT".

END OF SECTION 101400

SECTION 122413 - ROLLER WINDOW SHADES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:

- 1. Manually operated roller shades with single rollers.

- B. Related Requirements:

- 1. Section 061000 " Rough Carpentry" for wood blocking and grounds for mounting roller shades and accessories.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.

- 1. Include construction details, material descriptions, dimensions of individual components and profiles, features, finishes, and operating instructions for roller shades.

- B. Shop Drawings: Show fabrication and installation details for roller shades, including shadeband materials, their orientation to rollers, and their seam and batten locations.

- C. Samples for Initial Selection: For each type and color of shadeband material.

- 1. Include Samples of accessories involving color selection.

- D. Product Schedule: For roller shades. Use same designations indicated on Drawings.

1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.

- B. Product Certificates: For each type of shadeband material.

- C. Product Test Reports: For each type of shadeband material, for tests performed by manufacturer and witnessed by a qualified testing agency.

1.5 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For roller shades to include in maintenance manuals.

1.6 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Roller Shades: Full-size units equal to 5 percent of quantity installed for each size, color, and shadeband material indicated, but no fewer than two units.

1.7 QUALITY ASSURANCE

- A. Installer Qualifications: Fabricator of products.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Deliver roller shades in factory packages, marked with manufacturer, product name, and location of installation using same designations indicated on Drawings.
- B. Deliver materials and units in unopened bundles and store in an interior temperature-controlled conditioned dry place with adequate air circulation.

1.9 FIELD CONDITIONS

- A. Environmental Limitations: Do not install roller shades until construction and finish work in spaces, including painting, is complete and dry and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.
- B. Field Measurements: Where roller shades are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication and indicate measurements on Shop Drawings. Allow clearances for operating hardware of operable glazed units through entire operating range. Notify Architect of installation conditions that vary from Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

1.10 WARRANTY

- A. Hardware and Shade Fabric: Manufacturer's standard 25-year year limited warranty.
- B. Spring Roller Shades: Manufacturer's standard 10 year limited warranty.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Source Limitations: Obtain roller shades from single source from single manufacturer.

2.2 MANUALLY OPERATED SHADES WITH SINGLE ROLLERS

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

1. Draper, Inc., Spring Roller FlexShade, Basis of Design,
2. Hunter Douglas Contract,
3. MechoShade Systems, Inc.,
4. Or approved equal.

- B. Chain-and-Clutch Operating Mechanisms: With continuous-loop bead chain and clutch that stops shade movement when bead chain is released; permanently adjusted and lubricated.

1. Bead Chains: Manufacturer's standard.
 - a. Loop Length: Full length of roller shade.
 - b. Limit Stops: Provide upper and lower ball stops.
 - c. Chain-Retainer Type: Chain tensioner, sill mounted.

- C. Rollers: Corrosion-resistant steel or extruded-aluminum tubes of diameters and wall thicknesses required to accommodate operating mechanisms and weights and widths of shadebands indicated without deflection. Provide with permanently lubricated drive-end assemblies and idle-end assemblies designed to facilitate removal of shadebands for service.

1. Roller Drive-End Location: Right side of interior face of shade.
2. Direction of Shadeband Roll: Regular, from back (exterior face) of roller.
3. Shadeband-to-Roller Attachment: Manufacturer's standard adhesive strip.

- D. Mounting Hardware: Corrosion resistant and compatible with roller assembly, operating mechanism, installation accessories, and mounting location for mounting conditions indicated. Roller shades shall be mounted to window frame.

- E. Installation Accessories:

1. Exposed Headbox: Rectangular, extruded-aluminum enclosure, top and back covers, endcaps, and removable bottom closure.
 - a. Height: Manufacturer's standard height required to enclose roller and shadeband assembly when shade is fully open, but not less than **4 inches (102 mm)**.
2. Endcap Covers: To cover exposed endcaps.

3. Side Channels: With light seals and designed to eliminate light gaps at sides of shades as shades are drawn down. Provide side channels with shadeband guides or other means of aligning shadebands with channels at tops.
4. Bottom (Sill) Channel or Angle: With light seals and designed to eliminate light gaps at bottoms of shades when shades are closed.
Installation Accessories Color and Finish: As selected from manufacturer's full range.

2.3 SHADEBAND MATERIALS

- A. Shadeband Material Flame-Resistance Rating: Comply with NFPA 701. Testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
- B. **RS-1: Room Darkening Fabric:** Close woven fiberglass base textile and sun resistant vinyl film bonded to each side, opaque fabric, washable and stain and fade resistant.

Basis of Design: SunBloc Series SB9000, by Draper, Inc.

1. Source: Roller shade manufacturer.
2. Type: Fiberglass textile with sun resistant vinyl film bonded to both sides.
3. Thickness: .015 inches.
4. Tensile strength: 190 pounds for warp and 180 pounds for fill.
5. Weight: 12 oz./sq. yd. (g/sq. m).
6. Roll Width: Contractor to field measure windows to receive shades.
7. Orientation on Shadeband: Up the bolt.
8. Features: Washable and stain resistant.
9. Heat seamed hem with 1 ¼" maple slat.
10. Size: Verify in field.
11. Color: As selected by Architect from manufacturer's full range.

- C. **RS-2: Light Filtering Fabric:** Close woven fiberglass base textile and sun resistant vinyl film bonded to each side, opaque fabric, washable and stain and fade resistant.

Basis of Design: E Screen Conventional Basketweave 5% openness by Draper, Inc.

1. Source: Roller shade manufacturer.
2. Type: Fiberglass textile with sun resistant vinyl film bonded to both sides.
3. Thickness: .015 inches.
4. Tensile strength: 190 pounds for warp and 180 pounds for fill.
5. Weight: 12 oz./sq. yd. (g/sq. m).
6. Roll Width: Contractor to field measure windows to receive shades.
7. Orientation on Shadeband: Up the bolt.
8. Features: Washable and stain resistant.
9. Heat seamed hem with 1 ¼" maple slat.
10. Size: Verify in field.
11. Color: As selected by Architect from manufacturer's full range.

2.4 ROLLER SHADE FABRICATION

- A. Product Safety Standard: Fabricate roller shades to comply with WCMA A 100.1, including requirements for flexible, chain-loop devices; lead content of components; and warning labels.
- B. Unit Sizes: Fabricate units in sizes to fill window and other openings as follows, measured at **74 deg F (23 deg C)**:

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, operational clearances, and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 ROLLER SHADE INSTALLATION

- A. Install roller shades level, plumb, and aligned with adjacent units according to manufacturer's written instructions.
 - 1. Opaque Shadebands: Located so shadeband is not closer than **2 inches (51 mm)** to interior face of glass. Allow clearances for window operation hardware.
- B. Roller Shade Locations: As indicated on Drawings.

3.3 ADJUSTING

- A. Adjust and balance roller shades to operate smoothly, easily, safely, and free from binding or malfunction throughout entire operational range.

3.4 CLEANING AND PROTECTION

- A. Clean roller shade surfaces, after installation, according to manufacturer's written instructions.
- B. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer, that ensure that roller shades are without damage or deterioration at time of Substantial Completion.
- C. Replace damaged roller shades that cannot be repaired, in a manner approved by Architect, before time of Substantial Completion.

3.5 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain motor-operated roller shades.

END OF SECTION 122413

SECTION 123661 - SIMULATED STONE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:

- 1. Solid-surface-material window stools.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product below.

- 1. Window stools.

- B. Shop Drawings:

- 1. Show location of each item, dimensioned plans and elevations, large-scale details, attachment devices and other components.
 - a. Show full-size details, edge details, thermoforming requirements, attachments, etc.
 - b. Show locations and sizes of furring, blocking, including concealed blocking and reinforcement specified in other sections.

- C. Samples for Initial Selection: For each type of material exposed to view.

1.4 QUALITY ASSURANCE

- A. Qualifications:

- 1. Shop that employs skilled workers who custom fabricate products similar to those required for this project and whose products have a record of successful in-service performance.

- B. Fabricator / Installer Qualifications:

- 1. Work of this section shall be by a certified fabricator/installer, certified in writing by the manufacturer.

- C. Applicable standards:

1. Standards of the following, as referenced herein:
 - a. American National Standards Institute (ANSI)
 - b. American Society for Testing and Materials (ASTM)
 - c. National Electrical Manufacturers Association (NEMA)
 - d. NSF International
2. Fire test response characteristics:
 - a. Provide with the following Class A (Class I) surface burning characteristics as determined by testing identical products per UL 723 (ASTM E84) or another testing and inspecting agency acceptable to authorities having jurisdiction:
 - 1) Flame Spread Index: 25 or less.
 - 2) Smoke Developed Index: 450 or less.

1.5 PROJECT CONDITIONS

- A. Field Measurements: Verify dimensions by field measurements before fabrication is complete.

1.6 DELIVERY, STORAGE AND HANDLING

- A. Deliver no components to project site until areas are ready for installation.
- B. Store components indoors prior to installation.
- C. Handle materials to prevent damage to finished surfaces.
 1. Provide protective coatings to prevent physical damage or staining following installation for duration of project.

1.7 COORDINATION

- A. Coordinate locations of utilities that will penetrate countertops or backsplashes.

1.8 MAINTENANCE

- A. Provide maintenance requirements as specified by the manufacturer.
 1. Warranty shall provide material and labor to repair or replace defective materials.
 2. Damage caused by physical or chemical abuse or damage from excessive heat will not be warranted.

1.9 WARRANTY

- A. Provide manufacturer's warranty against defects in materials.

PART 2 - PRODUCTS

2.1 SOLID-SURFACE-MATERIAL

- A. Configuration: Provide components as indicated in the Drawings.
- B. Fabrication: Fabricate tops in one piece with shop-applied edges unless otherwise indicated. Comply with solid-surface-material manufacturer's written instructions for adhesives, sealers, fabrication, and finishing.

2.2 SOLID-SURFACE COMPONENTS

- A. Solid Surface Material: Homogeneous solid sheets of filled plastic resin complying with ANSI SS1.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Corian surfaces from the DuPont company;
 - b. Centura Solid Surfaces;
 - c. Meganite;
 - d. Or approved equal.
 - 2. Colors and Patterns: As selected by Architect from manufacturer's full range.
- B. Thickness: As indicated.
- C. Edge treatment: As indicated.
- D. Performance characteristics:

Property	Typical Result	Test
Tensile Strength	6,000 psi	ASTM D 638
Tensile Modulus	1.5 x 10 ⁶ psi	ASTM D 638
Tensile Elongation	0.4% min.	ASTM D 638
Flexural Strength	10,000 psi	ASTM D 790
Flexural Modulus	1.2 x 10 ⁶ psi	ASTM D 790
Hardness	>85	Rockwell "M"
Scale	56	ASTM D 785
Barcol Impressor		ASTM D 2583
Thermal Expansion	3.02 x 10 ⁻⁵ in./in./°C (1.80 x 10 ⁻⁵ in./in./°F)	ASTM D 696
Gloss (60° Gardner)	5–75 (matte—highly polished)	ANSI Z124
Light Resistance	(Xenon Arc) No effect Method 3.3	NEMA LD 3-2000
Wear and Cleanability	Passes	ANSI Z124.3 & Z124.6

Stain Resistance: Sheets Passes		ANSI Z124.3 & Z124.6	
Fungus and Bacteria Resistance	Does not support microbial growth	ASTM G21&G22	
Boiling Water Resistance	No visible change	NEMA LD 3-2000 Method 3.5	
High Temperature Resistance	No change	NEMA LD 3-2000 Method 3.6	
Izod Impact (Notched Specimen)	0.28 ft.-lbs./in. of notch	ASTM D 256 (Method A)	
Ball Impact Resistance: Sheets	No fracture—1/2 lb. ball: 1/4" slab—36" drop 1/2" slab—144" drop	NEMA LD 3-2000 Method 3.8	
Weatherability	$\Delta E^*_{94} < 5$ in 1,000 hrs.	ASTM G 155	
Specific Gravity †	1.7		
Water Absorption	Long-term	ASTM D 570	
	0.4% (3/4")		
	0.6% (1/2")		
	0.8% (1/4")		
Toxicity Pittsburgh	99 (solid colors) Protocol		
	66 (patterned colors) ("LC50" Test)	Test	
Flammability	All colors (Class I and Class A)	ASTM E 84, NFPA 255 & UL 723	
Flame Spread Index	<25		
Smoke Developed Index	<25		

Approximate weight per square foot: 1/4" (6 mm) 2.2 lbs., 1/2" (12.3 mm) 4.4 lbs.
Shapes meet or exceed the ANSI Z124.3 and ANSI Z124.6 standards for plastic sinks and lavatories.
NEMA results based on the NEMA LD 3-2000

2.3 ACCESSORIES

A. Joint adhesive:

1. Manufacturer's standard one - or two-part adhesive kit to create inconspicuous, nonporous joints.

B. Sealant:

1. Manufacturer's standard mildew-resistant, FDA-compliant, NSF 51-compliant (food zone - any type), UL-listed silicone sealant in colors matching components.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with fabricator present for compliance with requirements for installation tolerances and other conditions affecting performance of work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Install level to a tolerance of **1/8 inch in 8 feet**. Install components plumb, level and rigid, scribed to adjacent finishes, in accordance with approved shop drawings and product data.
 - 1. Carefully dress joints smooth, remove surface scratches, and clean entire surface.
 - 2. Provide product in largest pieces available.
 - 3. Form field joints using manufacturer's recommended adhesive, with joints inconspicuous in finished work.
 - a. Exposed joints/seams shall not be allowed.
 - b. Reinforce with strip of solid polymer material, 2" wide.
 - 4. Cut and finish component edges with clean, sharp returns.
 - 5. Rout radii and contours to template.

3.3 REPAIR

- A. Repair or replace damaged work which cannot be repaired to architect's satisfaction.

3.4 CLEANING AND PROTECTION

- A. Keep components clean during installation.
- B. Remove adhesives, sealants and other stains.

END OF SECTION 123661

SECTION 312000 - EARTH MOVING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
1. Excavating and backfilling for buildings and structures.

1.2 DEFINITIONS

- A. Backfill: Soil material used to fill an excavation.
- B. Borrow Soil: Satisfactory soil imported from off-site for use as fill or backfill.
- C. Drainage Course: Aggregate layer supporting the slab-on-grade that also minimizes upward capillary flow of pore water.
- D. Excavation: Removal of material encountered above subgrade elevations and to lines and dimensions indicated.
1. Authorized Additional Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions as directed by Architect. Authorized additional excavation and replacement material will be paid for according to Contract provisions for changes in the Work.
 2. Unauthorized Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions without direction by Architect. Unauthorized excavation, as well as remedial work directed by Architect, shall be without additional compensation.
- E. Fill: Soil materials used to raise existing grades.
- F. Structures: Buildings, footings, foundations, retaining walls, slabs, tanks, curbs, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below the ground surface.
- G. Subbase Course: Aggregate layer placed between the subgrade and base course for hot-mix asphalt pavement, or aggregate layer placed between the subgrade and a cement concrete pavement or a cement concrete or hot-mix asphalt walk.
- H. Subgrade: Uppermost surface of an excavation or the top surface of a fill or backfill immediately below subbase, drainage fill, drainage course, or topsoil materials.
- I. Utilities: On-site underground pipes, conduits, ducts, and cables as well as underground services within buildings.

1.3 INFORMATIONAL SUBMITTALS

- A. Material test reports.

1.4 FIELD CONDITIONS

- A. Utility Locator Service: Notify utility locator service for area where Project is located before beginning earth-moving operations.

PART 2 - PRODUCTS

2.1 SOIL MATERIALS

- A. General: Provide borrow soil materials when sufficient satisfactory soil materials are not available from excavations.
- B. Satisfactory Soils: Soil Classification Groups GW, GP, GM, SW, SP, and SM according to ASTM D 2487, Groups A-1, A-2-4, A-2-5, and A-3 according to AASHTO M 145, or a combination of these groups; free of rock or gravel larger than 3 inches in any dimension, debris, waste, frozen materials, vegetation, and other deleterious matter.
- C. Unsatisfactory Soils: Soil Classification Groups GC, SC, CL, ML, OL, CH, MH, OH, and PT according to ASTM D 2487, Groups A-2-6, A-2-7, A-4, A-5, A-6, and A-7 according to AASHTO M 145, or a combination of these groups.
 - 1. Unsatisfactory soils also include satisfactory soils not maintained within 2 percent of optimum moisture content at time of compaction.
- D. Subbase Material: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940/D 2940M; with at least 90 percent passing a 1-1/2-inch sieve and not more than 12 percent passing a No. 200 sieve.
- E. Base Course: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 294/D 2940M 0; with at least 95 percent passing a 1-1/2-inch sieve and not more than 8 percent passing a No. 200 sieve.
- F. Engineered Fill: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940/D 2940M; with at least 90 percent passing a 1-1/2-inch sieve and not more than 12 percent passing a No. 200 sieve.
- G. Bedding Course: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940/D 2940M; except with 100 percent passing a 1-inch sieve and not more than 8 percent passing a No. 200 sieve.
- H. Drainage Course: Narrowly graded mixture of washed crushed stone, or crushed or uncrushed gravel; ASTM D 448; coarse-aggregate grading Size 57; with 100 percent passing a 1-1/2-inch sieve and zero to 5 percent passing a No. 8 sieve.

2.2 ACCESSORIES

- A. Warning Tape: Acid- and alkali-resistant, polyethylene film warning tape manufactured for marking and identifying underground utilities, 6 inches wide and 4 mils thick, continuously inscribed with a description of the utility; colored to comply with local practice or requirements of authorities having jurisdiction.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earth-moving operations.
- B. Protect and maintain erosion and sedimentation controls during earth-moving operations.
- C. Protect subgrades and foundation soils from freezing temperatures and frost. Remove temporary protection before placing subsequent materials.

3.2 EXCAVATION, GENERAL

- A. Unclassified Excavation: Excavate to subgrade elevations regardless of the character of surface and subsurface conditions encountered. Unclassified excavated materials may include rock, soil materials, and obstructions. No changes in the Contract Sum or the Contract Time will be authorized for rock excavation or removal of obstructions.
 - 1. If excavated materials intended for fill and backfill include unsatisfactory soil materials and rock, replace with satisfactory soil materials.
- B. Excavations at Edges of Tree- and Plant-Protection Zones:
 - 1. Excavate by hand or with an air spade to indicated lines, cross sections, elevations, and subgrades. If excavating by hand, use narrow-tine spading forks to comb soil and expose roots. Do not break, tear, or chop exposed roots. Do not use mechanical equipment that rips, tears, or pulls roots.
 - 2. Cut and protect roots according to requirements in Section 015639 "Temporary Tree and Plant Protection."

3.3 EXCAVATION FOR WALKS AND PAVEMENTS

- A. Excavate surfaces under walks and pavements to indicated lines, cross sections, elevations, and subgrades.

3.4 UNAUTHORIZED EXCAVATION

- A. Fill unauthorized excavation under foundations or wall footings by extending bottom elevation of concrete foundation or footing to excavation bottom, without altering top elevation. Lean concrete fill, with 28-day compressive strength of 2500 psi, may be used when approved by Architect.
 - 1. Fill unauthorized excavations under other construction, pipe, or conduit as directed by Architect.

3.5 STORAGE OF SOIL MATERIALS

- A. Stockpile borrow soil materials and excavated satisfactory soil materials without intermixing. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
 - 1. Stockpile soil materials away from edge of excavations. Do not store within drip line of remaining trees.

3.6 SOIL FILL

- A. Plow, scarify, bench, or break up sloped surfaces steeper than 1 vertical to 4 horizontal so fill material will bond with existing material.
- B. Place and compact fill material in layers to required elevations as follows:
 - 1. Under grass and planted areas, use satisfactory soil material.
 - 2. Under walks and pavements, use satisfactory soil material.

3.7 SOIL MOISTURE CONTROL

- A. Uniformly moisten or aerate subgrade and each subsequent fill or backfill soil layer before compaction to within 2 percent of optimum moisture content.
 - 1. Do not place backfill or fill soil material on surfaces that are muddy, frozen, or contain frost or ice.
 - 2. Remove and replace, or scarify and air dry, otherwise satisfactory soil material that exceeds optimum moisture content by 2 percent and is too wet to compact to specified dry unit weight.

3.8 COMPACTION OF SOIL BACKFILLS AND FILLS

- A. Place backfill and fill soil materials in layers not more than 8 inches in loose depth for material compacted by heavy compaction equipment and not more than 4 inches in loose depth for material compacted by hand-operated tampers.
- B. Place backfill and fill soil materials evenly on all sides of structures to required elevations and uniformly along the full length of each structure.

- C. Compact soil materials to not less than the following percentages of maximum dry unit weight according to ASTM D 698:
 - 1. Under structures, building slabs, steps, and pavements, scarify and recompact top 12 inches of existing subgrade and each layer of backfill or fill soil material at 95 percent.
 - 2. Under walkways, scarify and recompact top 6 inches below subgrade and compact each layer of backfill or fill soil material at 92 percent.
 - 3. Under turf or unpaved areas, scarify and recompact top 6 inches below subgrade and compact each layer of backfill or fill soil material at 85 percent.

3.9 GRADING

- A. General: Uniformly grade areas to a smooth surface, free of irregular surface changes. Comply with compaction requirements and grade to cross sections, lines, and elevations indicated.
- B. Site Rough Grading: Slope grades to direct water away from buildings and to prevent ponding. Finish subgrades to elevations required to achieve indicated finish elevations, within the following subgrade tolerances:
 - 1. Turf or Unpaved Areas: Plus or minus 1 inch.
 - 2. Walks: Plus or minus 1 inch.
 - 3. Pavements: Plus or minus 1/2 inch.

3.10 SUBBASE AND BASE COURSES UNDER PAVEMENTS AND WALKS

- A. Place subbase course and base course on subgrades free of mud, frost, snow, or ice.
- B. On prepared subgrade, place subbase course and base course under pavements and walks as follows:
 - 1. Shape subbase course and base course to required crown elevations and cross-slope grades.
 - 2. Place subbase course and base course that exceeds 6 inches in compacted thickness in layers of equal thickness, with no compacted layer more than 6 inches thick or less than 3 inches thick.
 - 3. Compact subbase course and base course at optimum moisture content to required grades, lines, cross sections, and thickness to not less than 95 percent of maximum dry unit weight according to ASTM D 698.

3.11 DRAINAGE COURSE UNDER CONCRETE SLABS-ON-GRADE

- A. Place drainage course on subgrades free of mud, frost, snow, or ice.
- B. On prepared subgrade, place and compact drainage course under cast-in-place concrete slabs-on-grade as follows:
 - 1. Place drainage course that exceeds 6 inches in compacted thickness in layers of equal thickness, with no compacted layer more than 6 inches thick or less than 3 inches thick.

2. Compact each layer of drainage course to required cross sections and thicknesses to not less than 95 percent of maximum dry unit weight according to ASTM D 698.

3.12 PROTECTION

- A. Protecting Graded Areas: Protect newly graded areas from traffic, freezing, and erosion. Keep free of trash and debris.
- B. Repair and reestablish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or where they lose compaction due to subsequent construction operations or weather conditions.
- C. Where settling occurs before Project correction period elapses, remove finished surfacing, backfill with additional soil material, compact, and reconstruct surfacing.
 1. Restore appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to greatest extent possible.

3.13 DISPOSAL OF SURPLUS AND WASTE MATERIALS

- A. Remove surplus satisfactory soil and waste materials, including unsatisfactory soil, trash, and debris, and legally dispose of them off Owner's property.

END OF SECTION 312000

SECTION 321216 - ASPHALT PAVING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Hot-mix asphalt patching.
2. Hot-mix asphalt paving.

B. Related Requirements:

1. Section 312000 "Earth Moving" for subgrade preparation, fill material, unbound-aggregate subbase and base courses, and aggregate pavement shoulders.
2. Section 099113 "Exterior Painting" for pavement striping paint.

1.2 CONSTRUCTION MEETINGS

- A. Construction Conference: Conduct conference as scheduled by the Architect.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.

1.4 INFORMATIONAL SUBMITTALS

- A. Material Certificates: For each paving material.

1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: A paving-mix manufacturer registered with and approved by the New Jersey Department of Transportation.
- B. Regulatory Requirements: Comply with materials, workmanship, and other applicable requirements of the New Jersey Department of Transportation for asphalt paving work.
1. Measurement and payment provisions and safety program submittals included in standard specifications do not apply to this Section.

PART 2 - PRODUCTS

2.1 AGGREGATES

- A. Coarse Aggregate: ASTM D 692/D 692M, sound; angular crushed stone, crushed gravel, or cured, crushed blast-furnace slag.
- B. Fine Aggregate: ASTM D 1073 or AASHTO M 29, sharp-edged natural sand or sand prepared from stone, gravel, cured blast-furnace slag, or combinations thereof.
- C. Mineral Filler: ASTM D 242/D 242M or AASHTO M 17, rock or slag dust, hydraulic cement, or other inert material.

2.2 ASPHALT MATERIALS

- A. Asphalt Binder: AASHTO M 320, PG 58-28.
- B. Tack Coat: ASTM D 977 or AASHTO M 140 emulsified asphalt, or ASTM D 2397 or AASHTO M 208 cationic emulsified asphalt, slow setting, diluted in water, of suitable grade and consistency for application.

2.3 AUXILIARY MATERIALS

- A. Recycled Materials for Hot-Mix Asphalt Mixes: Reclaimed asphalt pavement; reclaimed, unbound-aggregate base material; and recycled tires, asphalt shingles, or glass from sources and gradations that have performed satisfactorily in previous installations, equal to performance of required hot-mix asphalt paving produced from all new materials.
- B. Herbicide: Commercial chemical for weed control, registered by the EPA, and not classified as "restricted use" for locations and conditions of application. Provide in granular, liquid, or wettable powder form.

2.4 MIXES

- A. Hot-Mix Asphalt: Dense-graded, hot-laid, hot-mix asphalt plant mixes approved by the New Jersey Department of Transportation and complying with the following requirements:
 - 1. Provide mixes with a history of satisfactory performance in geographical area where Project is located.
 - 2. Base Course: As indicated on Drawings.
 - 3. Surface Course: As indicated on Drawings.

PART 3 - EXECUTION

3.1 PATCHING

- A. Asphalt Pavement: Saw cut perimeter of patch and excavate existing pavement section to sound base. Excavate rectangular or trapezoidal patches, extending 12 inches into perimeter of adjacent sound pavement, unless otherwise indicated. Cut excavation faces vertically. Remove excavated material. Recompact existing unbound-aggregate base course to form new subgrade.
- B. Tack Coat: Before placing patch material, apply tack coat uniformly to vertical asphalt surfaces abutting the patch. Apply at a rate of 0.05 to 0.15 gal./sq. yd.
 - 1. Allow tack coat to cure undisturbed before applying hot-mix asphalt paving.
 - 2. Avoid smearing or staining adjoining surfaces, appurtenances, and surroundings. Remove spillages and clean affected surfaces.
- C. Placing Patch Material: Fill excavated pavement areas with hot-mix asphalt base mix for full thickness of patch and, while still hot, compact flush with adjacent surface.

3.2 SURFACE PREPARATION

- A. General: Immediately before placing asphalt materials, remove loose and deleterious material from substrate surfaces. Ensure that prepared subgrade is ready to receive paving.
- B. Proof-roll subgrade below pavements with heavy pneumatic-tired equipment to identify soft pockets and areas of excess yielding. Do not proof-roll wet or saturated subgrades.
- C. Herbicide Treatment: Apply herbicide according to manufacturer's recommended rates and written application instructions. Apply to dry, prepared subgrade or surface of compacted-aggregate base before applying paving materials.
- D. Tack Coat: Apply uniformly to surfaces of existing pavement at a rate of 0.05 to 0.15 gal./sq. yd.
 - 1. Allow tack coat to cure undisturbed before applying hot-mix asphalt paving.
 - 2. Avoid smearing or staining adjoining surfaces, appurtenances, and surroundings. Remove spillages and clean affected surfaces.

3.3 PLACING HOT-MIX ASPHALT

- A. Machine place hot-mix asphalt on prepared surface, spread uniformly, and strike off. Place asphalt mix by hand in areas inaccessible to equipment in a manner that prevents segregation of mix. Place each course to required grade, cross section, and thickness when compacted.
 - 1. Spread mix at a minimum temperature of 250 deg F.
 - 2. Regulate paver machine speed to obtain smooth, continuous surface free of pulls and tears in asphalt-paving mat.

- B. Place paving in consecutive strips not less than 10 feet wide unless infill edge strips of a lesser width are required.
- C. Promptly correct surface irregularities in paving course behind paver. Use suitable hand tools to remove excess material forming high spots. Fill depressions with hot-mix asphalt to prevent segregation of mix; use suitable hand tools to smooth surface.

3.4 JOINTS

- A. Construct joints to ensure a continuous bond between adjoining paving sections. Construct joints free of depressions, with same texture and smoothness as other sections of hot-mix asphalt course.
 - 1. Clean contact surfaces and apply tack coat to joints.
 - 2. Offset longitudinal joints, in successive courses, a minimum of 6 inches.
 - 3. Offset transverse joints, in successive courses, a minimum of 24 inches.
 - 4. Construct transverse joints at each point where paver ends a day's work and resumes work at a subsequent time. Construct these joints using either "bulkhead" or "papered" method according to AI MS-22, for both "Ending a Lane" and "Resumption of Paving Operations."

3.5 COMPACTION

- A. General: Begin compaction as soon as placed hot-mix paving will bear roller weight without excessive displacement. Compact hot-mix paving with hot, hand tampers or with vibratory-plate compactors in areas inaccessible to rollers.
 - 1. Complete compaction before mix temperature cools to 185 deg F.
- B. Breakdown Rolling: Complete breakdown or initial rolling immediately after rolling joints and outside edge. Examine surface immediately after breakdown rolling for indicated crown, grade, and smoothness. Correct laydown and rolling operations to comply with requirements.
- C. Intermediate Rolling: Begin intermediate rolling immediately after breakdown rolling while hot-mix asphalt is still hot enough to achieve specified density. Continue rolling until hot-mix asphalt course has been uniformly compacted to the following density:
 - 1. Average Density: 92 percent of reference maximum theoretical density according to ASTM D 2041, but not less than 90 percent or greater than 96 percent.
- D. Finish Rolling: Finish roll paved surfaces to remove roller marks while hot-mix asphalt is still warm.
- E. Edge Shaping: While surface is being compacted and finished, trim edges of pavement to proper alignment. Bevel edges while asphalt is still hot; compact thoroughly.
- F. Protection: After final rolling, do not permit vehicular traffic on pavement until it has cooled and hardened.

- G. Erect barricades to protect paving from traffic until mixture has cooled enough not to become marked.

3.6 INSTALLATION TOLERANCES

- A. Pavement Thickness: Compact each course to produce the thickness indicated within the following tolerances:
 - 1. Base Course: Plus or minus 1/2 inch.
 - 2. Surface Course: Plus 1/4 inch, no minus.
- B. Pavement Surface Smoothness: Compact each course to produce a surface smoothness within the following tolerances as determined by using a 10-foot straightedge applied transversely or longitudinally to paved areas:
 - 1. Base Course: 1/4 inch.
 - 2. Surface Course: 1/8 inch.
 - 3. Crowned Surfaces: Test with crowned template centered and at right angle to crown. Maximum allowable variance from template is 1/4 inch.

3.7 FIELD QUALITY CONTROL

- A. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections.
- B. Replace and compact hot-mix asphalt where core tests were taken.
- C. Remove and replace or install additional hot-mix asphalt where test results or measurements indicate that it does not comply with specified requirements.

END OF SECTION 321216

SECTION 321313 - CONCRETE PAVING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes Concrete Paving Including the Following:
 - 1. Walks.
- B. Comply with ACI 301 Specifications for Structural Concrete and as indicated.

1.3 DEFINITIONS

- A. Cementitious Materials: Portland cement alone or in combination with one or more of blended hydraulic cement, fly ash, slag cement, and other pozzolans.
- B. W/C Ratio: The ratio by weight of water to cementitious materials.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Design Mixtures: For each concrete paving mixture. Include alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For qualified **ready-mix concrete manufacturer**.
- B. Material Certificates: For the following, from manufacturer:
 - 1. Cementitious materials.
 - 2. Steel reinforcement and reinforcement accessories.
 - 3. Fiber reinforcement.
 - 4. Admixtures.
 - 5. Curing compounds.
 - 6. Applied finish materials.
 - 7. Bonding agent or epoxy adhesive.
 - 8. Joint fillers.
- C. Material Certifications from Suppliers of Soils (topsoil and fill); Aggregate (fill and subgrades):

1. NJDOT QPL suppliers.
2. Certified Clean Fill

D. Material Test Reports: For each of the following:

1. Aggregates: **Include service-record data indicating absence of deleterious expansion of concrete due to alkali-aggregate reactivity.**
2. Field Quality control reports

1.6 QUALITY ASSURANCE

A. Ready-Mix-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 according to NRMCA's "Certification of Ready Mixed Concrete Production Facilities" (Quality Control Manual - Section 3, "Plant Certification Checklist").

B. Testing Agency Qualifications: Qualified according to ASTM C1077 and ASTM E329 for testing indicated.

1. Personnel conducting field tests shall be qualified as ACI Concrete Field Testing Technician, Grade 1, according to ACI CP-1 or an equivalent certification program.

C. CERTIFIED CLEAN FILL (NON ACTIONABLE SITE)

1. Material Test Reports: For each borrow soil material proposed for topsoil, fill and backfill as follows:
 - a. Classification according to ASTM D 2487 and NJDOT.
Laboratory compaction curve according to ASTM D 1557.
2. Clean Fill Certification: Provide documentation for each imported soil material in accordance with "certified clean fill". "Certified Clean Fill" means fill which is:
 - a. Supported by analytical testing data and analysis demonstrating that the fill material does not contain constituents of concern in excess of NJDEP Soil Remediation Standards;
 - b. Or supported by documentation in accordance with NJDEP Technical Requirements for Site Remediation (7:26E-6.4(b)2 and 3) This documentation shall be in the form of a written certification provided by the supplier of the fill stating:
 - (a) that the fill is clean, virgin material from a commercial or non-commercial source, or is decontaminated recycled soil;
 - (b) the name of the affiant and relationship to the source of the fill; the location where the till was obtained, including the street, town, lot and block, county, and state, and a brief history of the site which is the source of the fill; and
 - (c) a statement that to the best of the affiant's knowledge and belief the fill being provided is not contaminated pursuant to any applicable remediation standards and a description of the steps taken to confirm such.

1.7 FIELD CONDITIONS

- A. Traffic Control: Maintain access for vehicular and pedestrian traffic as required for other construction activities.
- B. Cold-Weather Concrete Placement: Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing, or low temperatures. Comply with ACI 306.1 and the following:
 - 1. When air temperature has fallen to or is expected to fall below **40 deg F (4.4 deg C)**, uniformly heat water and aggregates before mixing to obtain a concrete mixture temperature of not less than **50 deg F (10 deg C)** and not more than **80 deg F (27 deg C)** at point of placement.
 - 2. Do not use frozen materials or materials containing ice or snow.
 - 3. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in design mixtures.
- C. Hot-Weather Concrete Placement: Comply with **ACI 301 (ACI 301M)** and as follows when hot-weather conditions exist:
 - 1. Cool ingredients before mixing to maintain concrete temperature below **90 deg F (32 deg C)** at time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated in total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.
 - 2. Cover steel reinforcement with water-soaked burlap, so steel temperature will not exceed ambient air temperature immediately before embedding in concrete.
 - 3. Fog-spray forms, **steel reinforcement**, and subgrade just before placing concrete. Keep subgrade moisture uniform without standing water, soft spots, or dry areas.

PART 2 - PRODUCTS

2.1 CONCRETE, GENERAL

- A. ACI Publications: Comply with **ACI 301 (ACI 301M)** unless otherwise indicated.

2.2 FORMS

- A. Form Materials: Plywood, metal, metal-framed plywood, or other approved panel-type materials to provide full-depth, continuous, straight, and smooth exposed surfaces.
 - 1. Use flexible or uniformly curved forms for curves with a radius of **100 feet (30.5 m)** or less. **Do not use notched and bent forms.**
- B. Form-Release Agent: Commercially formulated form-release agent that will not bond with, stain, or adversely affect concrete surfaces and that will not impair subsequent treatments of concrete surfaces.

2.3 STEEL REINFORCEMENT

- A. Plain-Steel Welded-Wire Reinforcement: ASTM A1064/A1064M, fabricated from **galvanized**-steel wire into flat sheets.
- B. Deformed-Steel Welded-Wire Reinforcement: ASTM A1064/A1064M, flat sheet.

- C. Reinforcing Bars: ASTM A615/A615M, **Grade 60 (Grade 420)**; deformed.
- D. Galvanized Reinforcing Bars: ASTM A767/A767M, Class II zinc coated, hot-dip galvanized after fabrication and bending; with ASTM A615/A615M, **Grade 60 (Grade 420)** deformed bars.
- E. Steel Bar Mats: ASTM A184/A184M; with ASTM A615/A615M, **Grade 60 (Grade 420)** deformed bars; assembled with clips.
- F. Plain-Steel Wire: ASTM A1064/A1064M, **galvanized**.
- G. Deformed-Steel Wire: ASTM A1064/A1064M.
- H. Joint Dowel Bars: ASTM A615/A615M, **Grade 60 (Grade 420)** plain-steel bars; **zinc coated (galvanized) after fabrication according to ASTM A767/A767M, Class I coating**. Cut bars true to length with ends square and free of burrs.
- I. Tie Bars: ASTM A615/A615M, **Grade 60 (Grade 420)**; deformed.
- J. Hook Bolts: **ASTM A307, Grade A (ASTM F568M, Property Class 4.6)**, internally and externally threaded. Design hook-bolt joint assembly to hold coupling against paving form and in position during concreting operations, and to permit removal without damage to concrete or hook bolt.
- K. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars, welded-wire reinforcement, and dowels in place. Manufacture bar supports according to CRSI's "Manual of Standard Practice" from steel wire, plastic, or precast concrete of greater compressive strength than concrete specified, and as follows:
 - 1. Equip wire bar supports with sand plates or horizontal runners where base material will not support chair legs.
 - 2. For epoxy-coated reinforcement, use epoxy-coated or other dielectric-polymer-coated wire bar supports.
- L. Zinc Repair Material: ASTM A780/A780M.

2.4 CONCRETE MATERIALS

- A. Cementitious Materials: Use the following cementitious materials, of same type, brand, and source throughout Project:
 - 1. Portland Cement: ASTM C150/C150M, **gray portland cement Type I/II**.
 - 2. Fly Ash: ASTM C618, **Class F**.
 - 3. Slag Cement: ASTM C989/C989M, Grade 100 or 120.
- B. Normal-Weight Aggregates: ASTM C33/C33M, **Class 4M**, uniformly graded. Provide aggregates from a single source **with documented service-record data of at least 10 years' satisfactory service in similar paving applications and service conditions using similar aggregates and cementitious materials**.
 - 1. For concrete 4" thickness: Nominal Maximum Coarse-Aggregate Size **1 inch (25 mm)**. Gradation ASTM C33 size 57.
 - 2. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.
- C. Air-Entraining Admixture: ASTM C260/C260M.

- D. Chemical Admixtures: Admixtures certified by manufacturer to be compatible with other admixtures and to contain not more than 0.1 percent water-soluble chloride ions by mass of cementitious material.
 - 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.
- E. Water: Potable and complying with ASTM C94/C94M.

2.5 CURING MATERIALS

- A. Absorptive Cover: AASHTO M 182, **Class 3, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. (305 g/sq. m) dry.**
- B. Moisture-Retaining Cover: ASTM C171, polyethylene film or white burlap-polyethylene sheet.
- C. Water: Potable.

2.6 RELATED MATERIALS

- A. Joint Fillers: **ASTM D1751, asphalt-saturated cellulosic fiber** in preformed strips.
- B. Bonding Agent: ASTM C1059/C1059M, Type II, non-redispersible, acrylic emulsion or styrene butadiene.
- C. Epoxy-Bonding Adhesive: ASTM C881/C881M, two-component epoxy resin capable of humid curing and bonding to damp surfaces; of class suitable for application temperature, of grade complying with requirements, and of the following types:
 - 1. **Types I and II, nonload bearing** for bonding hardened or freshly mixed concrete to hardened concrete.

2.7 CONCRETE MIXTURES

- A. All concrete mixture designs shall be optimized for ACI 318 Exposure Class F3.
- B. Prepare design mixtures, proportioned according to, comply with 4.2.2 Performance and design requirements of ACI 301 to provide workability and consistency so concrete can be worked readily into forms and around reinforcement without segregation, and to provide an average compressive strength adequate to meet acceptance requirements of ACI 301 1.6.6.1. for each type and strength of normal-weight concrete, and as determined by either laboratory trial mixtures or field experience.
- C. Admixtures used in concrete shall be the same as those used in the concrete represented by submitted field test
 - 1. Use a qualified independent testing agency for preparing and reporting proposed concrete design mixtures for the trial batch method.

2. When automatic machine placement is used, determine design mixtures and obtain laboratory test results that comply with or exceed requirements.
- D. Cementitious Materials **Limit percentage, by weight, of cementitious materials other than portland cement in concrete as follows:**
1. Fly Ash or Pozzolan: 25 percent.
 2. Slag Cement: 50 percent.
 3. Combined Fly Ash or Pozzolan, and Slag Cement: 50 percent, with fly ash or pozzolan not exceeding 25 percent.
- E. Add air-entraining admixture at manufacturer's prescribed rate to result in normal-weight concrete at point of placement having an air content as follows:
1. Air Content: **6 percent** for **1-inch (25-mm)** nominal maximum aggregate size.
- F. Limit water-soluble, chloride-ion content in hardened concrete to **0.15 percent** by weight of cement.
- G. Chemical Admixtures: Use admixtures according to manufacturer's written instructions.
1. Use admixtures with proven history of satisfactory performance in mix designs 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.
- H. Concrete Mixtures: Normal-weight concrete.
1. Minimum compressive Strength (28 Days): **4500 psi (31 MPa)**.
 2. Maximum W/C Ratio at Point of Placement: **0.45**.
 3. Point of delivery slump without plasticizing /water reducing admixtures : **4 inches (100 mm)** plus or minus **1 inch (25 mm)**. With plasticizing /water reducing admixtures proportion mixture for a slump of 2'-4" before admixtures are added and 8" maximum at point of delivery after admixtures are added.
 - 4.
- 2.8 CONCRETE MIXING
- A. Ready-Mixed Concrete: Measure, batch, and mix concrete materials and concrete according to ASTM C94/C94M. Furnish batch certificates for each batch discharged and used in the Work.
1. When air temperature is between **85 and 90 deg F (30 and 32 deg C)**, reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above **90 deg F (32 deg C)**, reduce mixing and delivery time to 60 minutes.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine exposed subgrades and subbase surfaces for compliance with requirements for dimensional, grading, and elevation tolerances.

- B. Proof-roll prepared subbase surface below **concrete paving** to identify soft pockets and areas of excess yielding.
 - 1. Completely proof-roll subbase in one direction **and repeat in perpendicular direction**. Limit vehicle speed to **3 mph (5 km/h)**.
 - 2. Proof-roll with a pneumatic-tired and loaded, 10-wheel, tandem-axle dump truck weighing not less than **15 tons (13.6 tonnes)**.
 - 3. Correct subbase with soft spots and areas of pumping or rutting exceeding depth of **1/2 inch (13 mm)** by removing pumping material and backfilling with NJDOT I5 material or NJDOT DGA of natural or manufactured aggregate and compact to 95% modified proctor. **RECYCLED AGGREGATE AND RECYCLED SOIL MATERIALS ARE NOT PERMITTED ON SITE.** All soil/aggregate materials shall be sourced from NJDOT QPL suppliers.
 - 4. Proof-roll and repeat above until pumping is eliminated.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Remove loose material from compacted subbase surface immediately before placing concrete.

3.3 EDGE FORMS AND SCREED CONSTRUCTION

- A. Set, brace, and secure edge forms, bulkheads, and intermediate screed guides to required lines, grades, and elevations. Install forms to allow continuous progress of work and so forms can remain in place at least 24 hours after concrete placement.
- B. Clean forms after each use and coat with form-release agent to ensure separation from concrete without damage.

3.4 STEEL REINFORCEMENT INSTALLATION

- A. General: Comply with CRSI's "Manual of Standard Practice" for fabricating, placing, and supporting reinforcement.
- B. Clean reinforcement of loose rust and mill scale, earth, ice, or other bond-reducing materials.
- C. Arrange, space, and securely tie bars and bar supports to hold reinforcement in position during concrete placement. Maintain minimum cover to reinforcement.
- D. Install welded-wire reinforcement in lengths as long as practicable. Lap adjoining pieces at least one full mesh, and lace splices with wire. Offset laps of adjoining widths to prevent continuous laps in either direction.
- E. Zinc-Coated Reinforcement: Use galvanized-steel wire ties to fasten zinc-coated reinforcement. Repair cut and damaged zinc coatings with zinc repair material.
- F. Install fabricated bar mats (rolled material not permitted) in lengths as long as practicable. Handle units to keep them flat and free of distortions. Straighten bends, kinks, and other irregularities, or replace units as required before placement. Set mats for a minimum **2-inch (50-mm)** overlap of adjacent mats.

3.5 JOINTS

- A. General: Form construction, isolation, and contraction joints and tool edges true to line, with faces perpendicular to surface plane of concrete. Construct transverse joints at right angles to centerline unless otherwise indicated.
1. When joining existing paving, place transverse joints to align with previously placed joints unless otherwise indicated.
- B. Construction Joints: Set construction joints at side and end terminations of paving and at locations where paving operations are stopped for more than one-half hour unless paving terminates at isolation joints. Set construction joints with fixed screeds at concrete surfaces indicated with grades less than 2% slope.
1. Continue steel reinforcement across construction joints unless otherwise indicated. Do not continue reinforcement through sides of paving strips unless otherwise indicated.
 2. Provide tie bars at sides of paving strips where indicated.
 3. Doweled Joints: Install dowel bars and support assemblies at joints where indicated. Lubricate or coat with asphalt one-half of dowel length to prevent concrete bonding to one side of joint.
- C. Isolation Joints: Form isolation joints of preformed joint-filler strips abutting concrete curbs, catch basins, manholes, inlets, structures, other fixed objects and at all restraints to slab shrinkage may occur. and where indicated.
1. Locate expansion joints at intervals of **25 feet** unless otherwise indicated.
 2. Extend joint fillers full width and depth of joint.
 3. Terminate joint filler not less than **1/2 inch (13 mm)** or more than **1 inch (25 mm)** below finished surface if joint sealant is indicated.
 4. Place top of joint filler flush with finished concrete surface if joint sealant is not indicated.
 5. Furnish joint fillers in one-piece lengths. Where more than one length is required, lace or clip joint-filler sections together.
 6. During concrete placement, protect top edge of joint filler with metal, plastic, or other temporary preformed cap. Remove protective cap after concrete has been placed on both sides of joint.
- D. Contraction Joints: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least one-fourth of the concrete thickness, as follows, **and to match jointing of existing adjacent concrete paving** where applicable:
1. Grooved Joints: Form contraction joints after initial floating by grooving and finishing each edge of joint with grooving tool to a **1/4-inch (6-mm)** radius. Repeat grooving of contraction joints after applying surface finishes. **Eliminate grooving-tool marks on concrete surfaces.**
 2. Doweled Contraction Joints: Install dowel bars and support assemblies at joints where indicated. Lubricate or coat with asphalt one-half of dowel length to prevent concrete bonding to one side of joint.
- E. Edging: After initial floating, tool edges of paving, gutters, curbs, and joints in concrete with an edging tool to a **1/2-inch (6-mm)** radius. Repeat tooling of edges after applying surface finishes. **Eliminate edging-tool marks on concrete surfaces.**

3.6 CONCRETE PLACEMENT

- A. Before placing concrete, inspect and complete formwork installation, **steel reinforcement**, and items to be embedded or cast-in.
- B. Remove snow, ice, or frost from subbase surface **and steel reinforcement** before placing concrete. Do not place concrete on frozen surfaces.
- C. Moisten subbase to provide a uniform dampened condition at time concrete is placed. Do not place concrete around manholes or other structures until they are at required finish elevation and alignment.
- D. Comply with **ACI 301 (ACI 301M)** requirements for measuring, mixing, transporting, and placing concrete.
- E. Do not add water to concrete during delivery or at Project site. Do not add water to fresh concrete after testing.
- F. Deposit and spread concrete in a continuous operation between transverse joints. Do not push or drag concrete into place or use vibrators to move concrete into place.
- G. Consolidate concrete according to **ACI 301 (ACI 301M)** by mechanical vibrating equipment supplemented by hand spading, rodding, or tamping.
 - 1. Consolidate concrete along face of forms and adjacent to transverse joints with an internal vibrator. Keep vibrator away from joint assemblies, **reinforcement**, or side forms. Use only square-faced shovels for hand spreading and consolidation. Consolidate with care to prevent dislocating **reinforcement, dowels, and** joint devices.
- H. Screed paving surface with a straightedge and strike off.
- I. Commence initial floating using bull floats or darbies to impart an open-textured and uniform surface plane before excess moisture or bleedwater appears on the surface. Do not further disturb concrete surfaces before beginning finishing operations or spreading surface treatments.
- J. Curbs and Gutters: Use design mixture for automatic machine placement. Produce curbs and gutters to required cross section, lines, grades, finish, and jointing.
- K. Slip-Form Paving: Use design mixture for automatic machine placement. Produce paving to required thickness, lines, grades, finish, and jointing.
 - 1. Compact subbase and prepare subgrade of sufficient width to prevent displacement of slip-form paving machine during operations.

3.7 FLOAT FINISHING

- A. General: Do not add water to concrete surfaces during finishing operations.
- B. Float Finish: Begin the second floating operation when bleedwater sheen has disappeared and concrete surface has stiffened sufficiently to permit operations. Float surface with power-driven floats or by hand floating if area is small or inaccessible to power units. Finish surfaces to true planes. Cut down high spots and fill low spots. Refloat surface immediately to uniform granular texture.

1. Fine-to-Medium-Textured Broom Finish: Provide a coarse finish by striating float-finished concrete surface **1/16 to 1/8 inch (1.6 to 3 mm)** deep with a stiff-bristled broom, perpendicular to line of traffic.

3.8 CONCRETE PROTECTION AND CURING

- A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures.
- B. Comply with ACI 306.1 for cold-weather protection.
- C. Evaporation Retarder: Apply evaporation retarder to concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching **0.2 lb/sq. ft. x h (1 kg/sq. m x h)** before and during finishing operations only: Curing after finishing operations is moisture curing described below.. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete but before float finishing.
- D. Begin curing after finishing concrete but not before free water has disappeared from concrete surface.
- E. Curing Methods: Cure concrete by **moisture curing** or **moisture-retaining-cover curing** as follows:
 1. Moisture Curing: Keep surfaces continuously moist for not less than seven days with the following materials:
 - a. Water.
 - b. Absorptive cover, water saturated and kept continuously wet. Cover concrete surfaces and edges with **12-inch (300-mm)** lap over adjacent absorptive covers.
 2. Moisture-Retaining-Cover Curing: Cover Absorptive covered concrete surfaces with moisture-retaining cover, placed in widest practicable width, with sides and ends lapped at least **12 inches (300 mm)**, and sealed by waterproof tape or adhesive. Immediately repair any holes or tears occurring during installation or curing period, using cover material and waterproof tape. Remove Moisture Retaining Cover after 7 days of moist curing, wet absorptive cover and retain absorptive cover until concrete surface is dry (gradual moisture taper)

3.9 PAVING TOLERANCES

- A. Comply with tolerances in **ACI 117 (ACI 117M)** and as follows:
 1. Elevation: **3/4 inch (19 mm)**.
 2. Thickness: Plus **3/8 inch (10 mm)**, minus **1/4 inch (6 mm)**.
 3. Surface: Gap below **10-feet- (3-m-)** long; unlevelled straightedge not to exceed **1/2 inch (13 mm)**.
 4. Alignment of Tie-Bar End Relative to Line Perpendicular to Paving Edge: **1/2 inch per 12 inches (13 mm per 300 mm)** of tie bar.
 5. Lateral Alignment and Spacing of Dowels: **1 inch (25 mm)**.
 6. Vertical Alignment of Dowels: **1/4 inch (6 mm)**.
 7. Alignment of Dowel-Bar End Relative to Line Perpendicular to Paving Edge: **1/4 inch per 12 inches (6 mm per 300 mm)** of dowel.
 8. Joint Spacing: **3 inches (75 mm)**.
 9. Contraction Joint Depth: Plus **1/4 inch (6 mm)**, no minus.
 10. Joint Width: Plus **1/8 inch (3 mm)**, no minus.
 11. Limits for accessibility requirements supersede above tolerances.

3.10 FIELD QUALITY CONTROL

- A. Testing Agency: **Owner will engage** a qualified testing agency to perform tests and inspections.
- B. Testing Services: Testing and inspecting of composite samples of fresh concrete obtained according to ASTM C172/C172M shall be performed according to the following requirements:
 - 1. Testing Frequency: Obtain at least one composite sample for each **100 cu. yd. (76 cu. m)** or fraction thereof of each concrete mixture placed each day.
 - a. When frequency of testing will provide fewer than five compressive-strength tests for each concrete mixture, testing shall be conducted from at least five randomly selected batches or from each batch if fewer than five are used.
 - 2. Slump: ASTM C143/C143M; one test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mixture. Perform additional tests when concrete consistency appears to change.
 - 3. Air Content: ASTM C231/C231M, pressure method; one test for each composite sample, but not less than one test for each day's pour of each concrete mixture.
 - 4. Concrete Temperature: ASTM C1064/C1064M; one test hourly when air temperature is **40 deg F (4.4 deg C)** and below and when it is **80 deg F (27 deg C)** and above, and one test for each composite sample.
 - 5. Compression Test Specimens: ASTM C31/C31M; cast and laboratory cure one set of three standard cylinder specimens for each composite sample.
 - 6. Compressive-Strength Tests: ASTM C39/C39M; test one specimen at seven days and two specimens at 28 days.
 - a. A compressive-strength test shall be the average compressive strength from two specimens obtained from same composite sample and tested at 28 days.
- C. Strength of each concrete mixture will be satisfactory if average of any three consecutive compressive-strength tests equals or exceeds specified compressive strength and no compressive-strength test value falls below specified compressive strength by more than **500 psi (3.4 MPa)**.
- D. Test results shall be reported in writing to Architect, concrete manufacturer, and Contractor within 48 hours of testing. Reports of compressive-strength tests shall contain Project identification name and number, date of concrete placement, name of concrete testing and inspecting agency, location of concrete batch in Work, design compressive strength at 28 days, concrete mixture proportions and materials, compressive breaking strength, and type of break for both 7- and 28-day tests.
- E. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by Architect but will not be used as sole basis for approval or rejection of concrete.
- F. Additional Tests: Testing and inspecting agency shall make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by Architect.
- G. Concrete paving will be considered defective if it does not pass tests and inspections.
- H. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
- I. Prepare test and inspection reports.

3.11 REPAIR AND PROTECTION

- A. Remove and replace concrete paving that is broken, damaged, or defective or that does not comply with requirements in this Section. Remove work in complete sections from joint to joint unless otherwise approved by Architect.
- B. Drill test cores, where directed by Architect, when necessary to determine magnitude of cracks or defective areas. Fill drilled core holes in satisfactory paving areas with portland cement concrete bonded to paving with epoxy adhesive.
- C. Protect concrete paving from damage. Exclude traffic from paving for at least 14 days after placement. When construction traffic is permitted, maintain paving as clean as possible by removing surface stains and spillage of materials as they occur.
- D. Maintain concrete paving free of stains, discoloration, dirt, and other foreign material. Sweep paving not more than two days before date scheduled for Substantial Completion inspections.

END OF SECTION 321313

SECTION 321373 - CONCRETE PAVING JOINT SEALANTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:

1. Cold-applied joint sealants.
2. Hot-applied joint sealants.
3. Joint-sealant backer materials.
4. Primers.

- B. Related Requirements:

1. Section 079200 "Joint Sealants" for sealing nontraffic and traffic joints in locations not specified in this Section.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.

- B. Samples for Verification: For each kind and color of joint sealant required, provide Samples with joint sealants in **1/2-inch**-wide joints formed between two **6-inch**-long strips of material matching the appearance of exposed surfaces adjacent to joint sealants.

- C. Paving-Joint-Sealant Schedule: Include the following information:

1. Joint-sealant application, joint location, and designation.
2. Joint-sealant manufacturer and product name.
3. Joint-sealant formulation.
4. Joint-sealant color.

1.4 INFORMATIONAL SUBMITTALS

- A. Product Certificates: For each type of joint sealant and accessory.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.

1.6 FIELD CONDITIONS

- A. Do not proceed with installation of joint sealants under the following conditions:
1. When ambient and substrate temperature conditions are outside limits permitted by joint-sealant manufacturer or are below 40 deg F.
 2. When joint substrates are wet.
 3. Where joint widths are less than those allowed by joint-sealant manufacturer for applications indicated.
 4. Where contaminants capable of interfering with adhesion have not yet been removed from joint substrates.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

- A. Compatibility: Provide joint sealants, backing materials, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by joint-sealant manufacturer, based on testing and field experience.

2.2 COLD-APPLIED JOINT SEALANTS

- A. Multicomponent, Pourable, Urethane, Elastomeric Joint Sealant: ASTM C 920, Type M, Grade P, Class 25, for Use T.
1. Products: Subject to compliance with requirements, provide one of the following:
 - a. Pecora Corporation; Urexpan NR-200
 - b. Or approved equal.

2.3 HOT-APPLIED JOINT SEALANTS

- A. Hot-Applied, Single-Component Joint Sealant for Concrete; ASTM D 3406
1. Products: Subject to compliance with requirements, provide one of the following:
 - a. Crafcoc Inc., an Ergon company; Superseal 444/777.
 - b. Or approved equal.

2.4 JOINT-SEALANT BACKER MATERIALS

- A. Joint-Sealant Backer Materials: Nonstaining; compatible with joint substrates, sealants, primers, and other joint fillers; and approved for applications indicated by joint-sealant manufacturer, based on field experience and laboratory testing.
- B. Backer Strips for Cold- and Hot-Applied Joint Sealants: ASTM D 5249; Type 2; of thickness and width required to control joint-sealant depth, prevent bottom-side adhesion of sealant, and fill remainder of joint opening under sealant.

2.5 PRIMERS

- A. Primers: Product recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine joints to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting joint-sealant performance.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Surface Cleaning of Joints: Before installing joint sealants, clean out joints immediately to comply with joint-sealant manufacturer's written instructions.
 - 1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.
- B. Joint Priming: Prime joint substrates where indicated or where recommended in writing by joint-sealant manufacturer, based on preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.

3.3 INSTALLATION OF JOINT SEALANTS

- A. Comply with joint-sealant manufacturer's written installation instructions for products and applications indicated unless more stringent requirements apply.
- B. Joint-Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions.
- C. Install joint-sealant backings to support joint sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
 - 1. Do not leave gaps between ends of joint-sealant backings.
 - 2. Do not stretch, twist, puncture, or tear joint-sealant backings.
 - 3. Remove absorbent joint-sealant backings that have become wet before sealant application and replace them with dry materials.
- D. Install joint sealants immediately following backing installation, using proven techniques that comply with the following:
 - 1. Place joint sealants so they fully contact joint substrates.
 - 2. Completely fill recesses in each joint configuration.

3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.
- E. Provide joint configuration to comply with joint-sealant manufacturer's written instructions unless otherwise indicated.

3.4 CLEANING AND PROTECTION

- A. Clean off excess joint sealant as the Work progresses, by methods and with cleaning materials approved in writing by joint-sealant manufacturers.
- B. Protect joint sealants, during and after curing period, from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealants immediately and replace with joint sealant so installations in repaired areas are indistinguishable from the original work.

3.5 PAVING-JOINT-SEALANT SCHEDULE

- A. Joint-Sealant Application: Joints within concrete paving.
 1. Joint Location:
 - a. Expansion and isolation joints in concrete paving.
 - b. Contraction joints in concrete paving.
 - c. Other joints as indicated.
 2. Joint-Sealant Color: As selected by Architect from manufacturer's full range.

END OF SECTION 321373

SECTION 329200 - TURF AND GRASSES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes

1. Seeding

1.2 DEFINITIONS

- A. Pesticide: A substance or mixture intended for preventing, destroying, repelling, or mitigating a pest. This includes insecticides, miticides, herbicides, fungicides, rodenticides, and molluscicides. It also includes substances or mixtures intended for use as a plant regulator, defoliant, or desiccant.

1.3 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site

1.4 INFORMATIONAL SUBMITTALS

- A. Certification of grass seed.

1. Certification of each seed mixture for turfgrass sod.

- B. Product certificates.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: A qualified landscape Installer whose work has resulted in successful turf establishment.

1. Pesticide Applicator: State licensed, commercial.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Seed and Other Packaged Materials: Deliver packaged materials in original, unopened containers showing weight, certified analysis, name and address of manufacturer, and indication of compliance with state and Federal laws, as applicable.

PART 2 - PRODUCTS

2.1 SEED

- A. Grass Seed: Fresh, clean, dry, new-crop seed complying with AOSA's "Rules for Testing Seeds" for purity and germination tolerances.
- B. Seed Species:
 - 1. Quality: Seed of grass species as listed below for solar exposure, with not less than 85 percent germination, not less than 95 percent pure seed, and not more than 0.5 percent weed seed:

2.2 FERTILIZERS

- A. Commercial Fertilizer: Commercial-grade complete fertilizer of neutral character, consisting of fast- and slow-release nitrogen, 50 percent derived from natural organic sources of urea formaldehyde, phosphorous, and potassium in the following composition:
 - 1. Composition: 1 lb/1000 sq. ft. (0.45 kg/92.9 sq. m) of actual nitrogen, 4 percent phosphorous, and 2 percent potassium, by weight.
- B. Slow-Release Fertilizer: Granular or pelleted fertilizer consisting of 50 percent water-insoluble nitrogen, phosphorus, and potassium in the following composition:
 - 1. Composition: 20 percent nitrogen, 10 percent phosphorous, and 10 percent potassium, by weight.

2.3 MULCHES

- A. Straw Mulch: Provide air-dry, clean, mildew- and seed-free, salt hay or threshed straw of wheat, rye, oats, or barley.
- B. Sphagnum Peat Mulch: Partially decomposed sphagnum peat moss, finely divided or of granular texture, and with a pH range of 3.4 to 4.8.
- C. Muck Peat Mulch: Partially decomposed moss peat, native peat, or reed-sedge peat, finely divided or of granular texture, with a pH range of 6 to 7.5, and having a water-absorbing capacity of 1100 to 2000 percent, and containing no sand.
- D. Compost Mulch: Well-composted, stable, and weed-free organic matter, pH range of 5.5 to 8; moisture content 35 to 55 percent by weight; 100 percent passing through 1-inch (25-mm) sieve; soluble salt content of 2 to 5 decisiemens/m; not exceeding 0.5 percent inert contaminants and free of substances toxic to plantings; and as follows:

2.4 PESTICIDES

- A. General: Pesticide, registered and approved by the EPA, acceptable to authorities having jurisdiction, and of type recommended by manufacturer for each specific problem and as

required for Project conditions and application. Do not use restricted pesticides unless authorized in writing by authorities having jurisdiction.

PART 3 - EXECUTION

3.1 TURF AREA PREPARATION

- A. General: Prepare planting area for soil placement and mix planting soil.
- B. Moisten prepared area before planting if soil is dry. Water thoroughly and allow surface to dry before planting. Do not create muddy soil.
- C. Before planting, obtain Architect's acceptance of finish grading; restore planting areas if eroded or otherwise disturbed after finish grading.

3.2 SEEDING

- A. Sow seed with spreader or seeding machine. Do not broadcast or drop seed when wind velocity exceeds **5 mph (8 km/h)**.
 - 1. Evenly distribute seed by sowing equal quantities in two directions at right angles to each other.
 - 2. Do not use wet seed or seed that is moldy or otherwise damaged.
 - 3. Do not seed against existing trees. Limit extent of seed to outside edge of planting saucer.
- B. Sow seed at a total rate of **5 to 8 lb/1000 sq. ft. (2.3 to 3.6 kg/92.9 sq. m)**.
- C. Rake seed lightly into top **1/8 inch (3 mm)** of soil, roll lightly, and water with fine spray.
- D. Protect seeded areas with slopes not exceeding 1:6 by spreading straw mulch. Spread uniformly at a minimum rate of **2 tons/acre (42 kg/92.9 sq. m)** to form a continuous blanket **1-1/2 inches (38 mm)** in loose thickness over seeded areas.
 - 1. Anchor straw mulch by crimping into soil with suitable mechanical equipment.
- E. Protect seeded areas from hot, dry weather or drying winds by applying compost mulch within 24 hours after completing seeding operations. Soak areas, scatter mulch uniformly to a thickness of **3/16 inch (4.8 mm)**, and roll surface smooth.

3.3 SATISFACTORY TURF

- A. Owner will maintain turf after seeding and mulching is complete.

END OF SECTION 329200

